

Landis on Mechanics of Patent Claim Drafting, Introduction

LANDIS ON MECHANICS OF PATENT CLAIM DRAFTING -- FIFTH EDITION

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INTRODUCTION

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Introduction

The primary object of this treatise is to present a simple and direct approach to the mechanics of claim drafting. The major emphasis in chapters 1-6 is on practical techniques for composing claims to many different types of inventions. In chapters 1-6, there is also emphasis on various preferred claim-drafting practices and techniques that have grown up over the years by case law, ¹ Patent and Trademark Office ² rules and memoranda, and, simply, custom, as well as definitions and preferred usage of stylized words and phrases in the patent law, such as "comprising," "consisting," "means for," "step for," and "whereby."

There is also extensive discussion of many case law doctrines relating to nonart rejections, ³ both classic rules and modern trends. In many of these areas, there have been liberalizing trends by the courts ⁴ in recent years to overthrow or simplify rejections not based on prior art. In particular, this treatise covers both the classic and the more recent constructions of means clauses (section 3:25), inherent function of the apparatus doctrine (section 4:5), mental steps and computer programs (section 4:9), product-by-process claims (section 5:2), claims referring to drawings (section 6:6), new use claims and preamble limitations (section 6:7), *Jepson* claims (section 6:8), undue multiplicity (section 8:3), old combination (section 8:4), aggregation (section 8:5), and printed matter (section 8:6).

There are many examples of suggested claims to various types of inventions: machines (chapter 3), processes (chapter 4), articles of manufacture (chapter 5), compositions of matter (chapter 6), computer inventions (section 4:9), designs (section 5:3) and plants (section 5:4), as well as dependent claims (section 2:9), *Jepson* claims (section 6:8), generic and species claims (section 6:9), subcombination claims (section 6:10), and biotechnology (chapter 9).

Many quotations from claims on appeal and in litigation are given, so that the reader can see for himself or herself which types of limitations and phrases have been judicially approved and which not.

Unfortunately, it is too often true that the inventor or patentee wins or loses because of formal rules and language problems in the claims, not because of any lack of "invention" over the prior art. This book is intended to help the practitioner in designing claims around these myriad rules and doctrines, to draft the most effective types of claims for each type of invention.

The author would like to acknowledge Rochelle K. Seide, Esq. of Baker & Botts, and the staff of Ostrolenk, Faber, Gerb & Soffen, without whose splendid efforts the manuscript would not have been prepared, and the staff of the Practising Law Institute, without whose assiduous efforts this book would not have been published.

FOOTNOTES:

☛Footnote 1. Court or Patent and Trademark Office Board of Patent Appeals and Interferences decisions. The Board is an administrative tribunal in the Patent and Trademark Office that hears appeals from adverse decisions of the patent examiners on substantive issues. The Board usually sits in panels of three designated members.

☛Footnote 2. Formerly the Patent Office.

☛Footnote 3. Rejections based on doctrines other than anticipation or obviousness over prior art.

☛Footnote 4. The Court of Customs and Patent Appeals was a special five-judge federal court having jurisdiction over appeals from Patent Office administrative tribunals, as well as customs appeals. The C.C.P.A. was succeeded in 1982 by the United States Court of Appeals for the Federal Circuit.

Dedication

This book is dedicated to the faculty of PLI claim-drafting tutors, who have given most generously of their time and talents in the patent bar review course, helping the students to draft better claims. The book is also dedicated to Ruth Druss, Program Attorney of PLI and founder of the PLI patent and patent bar review courses, and to Carol Faber, who encouraged the writing.

I also dedicate this book to my partners in Ostrolenk, Faber, Gerb & Soffen, who have always set the highest standards of professionalism in all respects.

But the highest tribute goes to John L. Landis, the author of the first two editions of this book, who so thoroughly covered and so clearly presented the material that writing the following editions was a pleasure.

About the Author

Robert C. Faber has been an intellectual property lawyer for over thirty years. He is a graduate of Cornell University and Harvard Law School. He is a partner in the New York City intellectual property law firm of Ostrolenk, Faber, Gerb & Soffen.

A member of the faculty of PLI's Patent Bar Review course, which focused on the Agent's Examination and claims writing, for more than twenty years, of the faculty of PLI's Advanced Claim and Amendment writing course since its inception and of the faculty of PLI's Fundamentals of Patent Prosecution since its inception, Mr. Faber has lectured on intellectual property and patent matters for PLI, the Bureau of National Affairs, and other organizations.

Foreword

The enthusiastic reception of the first four editions of this book in America and abroad, including a translation into Japanese, has led to this expanded, revised version, incorporating new cases, and further discussion of developing fields.

Mr. Landis, for many years the chief lecturer for the institute in the area of drafting patent claims, passed away in 1984. His contribution, as well as the contributions of John D. Kaufmann, Bryan W. Sheffield, Myron Cohen, and Rochelle Seide will long endure.

The experienced patent practitioner will find this volume both a distillation of advanced technique and a review of the fundamentals of the field. The person new to patent practice will welcome the absence of jargon and the inclusion of texts of relevant statutes, rules, and procedural interpretations. The attorney or business person with occasional need to evaluate an existing patent should find the numerous claims, both court-approved and specially developed for illustrative purposes, convenient keys to understanding the result of the drafting process.

§ 112:1 The Statute

In the beginning, 35 U.S.C. § 112: 1

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

This is the fundamental rule, with which all others must be consistent. It was almost ever thus; the Patent Act of 1836, which started the modern examination system, provided that the applicant "shall also particularly specify and point out the part, improvement, or combination which he claims as his own invention or discovery." 2

The statute presents two requirements: (1) set forth the subject matter; and (2) particularly point out and distinctly claim it.³ The first requirement is subjective and even may change during prosecution of the application.⁴ But once the subject matter is selected, the second requirement for that invention must be met.⁵

Under this very broad and general statutory directive, various rules and practices have grown up by case law, Commissioner's regulations, and custom since 1836 as to how and how not to fulfill the statutory mandate of *particularly pointing out and distinctly claiming*.

In general, this means that the claims must define "the invention," meaning the claimed subject matter, in such detail that the patent examiner and, later, the world of prospective infringers and judges who construe the claims can understand what the claimed subject matter is; that is, what is forbidden territory and what is open, insofar as the particular patent is concerned.

Summary

Patent claims must particularly point out and distinctly claim what applicant (usually, you, the patent practitioner) regards as his invention after reading this book.

FOOTNOTES:

✚Footnote 1. This is the section of the basic patent statutes (title 35, United States Code) relating to the patent specification, including claims. Sections of the statutes and Patent Office Rules of Practice mentioned are reproduced in appendixes C1 and C2.

✚Footnote 2. See W. Robinson, *Robinson on Patents* § 504-38 (Hein 1st ed. 1972).

✚Footnote 3. Manual of Patent Examining Procedure [hereinafter MPEP] §2171. The *Manual of Patent Examining Procedure* is a Patent and Trademark Office publication setting forth detailed instructions to the examiners on almost every point that could arise in practice before the Patent and Trademark Office. Sections of the Manual cited in this book are reproduced as appendix C3. The Manual represents the official position or opinion of the Office on practically every point of law and procedure, and is continuously amended and supplemented as changes occur. Since the Manual normally operates as the examiner's bible, its mandates should be followed to the letter except where one is convinced that the Manual is wrong and one's client's interests are likely to be prejudiced. In that case an appeal (35 U.S.C. §134) or petition to the Commissioner (Rule 181) will usually be necessary, in effect to reverse the Manual. When that succeeds, the Manual is amended to reflect the change.

✚Footnote 4. MPEP §2172.

Footnote 5. MPEP §2171.

§1:2 Omnibus Claims

All of the specific rules and tests must be derived from, or at least not be inconsistent with, the dominating statutory provision. For example, a first rule is that "omnibus" or formal claims are not permitted in utility patents. ⁶ Such claims as: "A device substantially as shown and described," or

"the apparatus as shown and described in figures 1-6," or the classic and all encompassing: "Any and all features of novelty described, referred to, exemplified, or shown," are not permitted in the United States, although they are allowed in some foreign countries. Obviously, these claims do not "particularly point out and distinctly claim" anything, certainly not the "invention." The examiner rejects such claims out of hand, as being "non-statutory."

The basic concept of United States claims is that the inventor owes the public a duty to define the forbidden territory of the patent in words as precise as the circumstances permit. Correspondingly, all features disclosed but not claimed are held to be dedicated to the public, ⁷ at least insofar as that patent is concerned.

A customary analogy is that the patentee must stake out the precise boundaries of his claim, in a manner similar to the description of the boundaries of a plot of land. For this reason United States claims are sometimes referred to as "peripheral" claims, meaning that the outer boundaries or periphery of the patentee's claim must be stated.

This concept of claim certainty is very useful to potential infringers but often very hard on the patentee, because the real "essence of the invention" is sometimes not fully understood until many years later--when the somewhat different structure of the accused infringer is known and when the art of the pertinent field has become developed. The doctrine of equivalents, designed by the courts to permit a finding of infringement by an equivalent that differs insubstantially from the patent claim, diminishes the harshness of claim certainty. ⁸ Claim certainty also is hard on the patentee, as even a clearly absurd element cannot be corrected by the court. ^{8,1}

Summary

Claims must define the invention with certainty and in detail. Omnibus claims are not permitted in utility patents.

FOOTNOTES:

Footnote 6. MPEP § 1302.04(b) and 2173.05(r). Utility patents are patents other

than designs (section 5:3) and plants (section 5:4).

Footnote 7. Not normally through benevolence on the part of the patentee, but merely because the patent becomes prior art against the inventor one year after patenting. 35 U.S.C. §102(b); *In re Gibbs*, 168 U.S.P.Q. (BNA) 578 (C.C.P.A. 1971); *In re Bauman*, 214 U.S.P.Q. (BNA) 585, 589 (C.C.P.A. 1982); and see MPEP §706.03(s); and it becomes prior art against others as of its earliest effective filing date in the United States, under 35 U.S.C. §102(e). This can include the date of an earlier United States application to which the patent is entitled under 35 U.S.C. §120, but not the date of an earlier foreign application to which the patent is entitled under 35 U.S.C. §119.

Footnote 8. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 35 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995), *rev'd on other grounds*, 520 U.S. 17, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 8.1. See *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 69 U.S.P.Q.2d (BNA) 1857 (Fed. Cir. 2004).

§1:3 The Statutory Classes

The statute, 35 U.S.C. §101, sets out four main categories of technical subject matter for which utility patents can be granted. These are "process, machine, [article of] manufacture, or composition of matter," usually termed "the statutory classes." Many of the claim drafting rules to follow stem from case law definitions of the words "process," "machine," "manufacture," and "composition of matter" in the statute. No matter how novel or how valuable an "invention" may be, it cannot be patented if it cannot be fit within one of those classes. Thus, such things as mathematical formulas, or algorithms (see section 4:9), printed matter, and articles found in nature have been held unpatentable because they are not within the classes set up by Congress. If a claimed element, particularly in a product claim, is a person, rather than some man-made object, then the claim is invalid as indefinite, because the specification does not disclose a structure corresponding to the claimed function ("third monitoring means for monitoring the ECG signal").⁹ Computer programs or software and genetically engineered live organisms, animal and vegetable, that is, "any invention made by man," are currently patentable under Patent and Trademark Office guidelines. (See sections 4:9 and 9:2.) However, statute prevents patenting human organisms, human embryos, human fetuses, or human beings, but not methods to produce human organisms.^{9,1}

It had long been accepted that a method of doing business did not fall within one of the statutory classes. But that exception was laid to rest in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,¹⁰ which held that the test for patentability of a business method is under sections 102, 103, and 112, not section

101. If the method is novel and unobvious and does not simply appropriate an algorithm without transforming something, it can be properly claimed. This was confirmed in *AT&T Corp. v. Excel Communications, Inc.*¹¹ (See section 4:10.)

This leads to a second fundamental rule, that a claim, no matter how beautifully drafted, must define the invention in such a way as to fit it into one or more of the statutory classes. (See section 7:2 hereof concerning claiming an invention in several classes.)

With these few basic principles in mind, the following chapter concerns some details and common practices for transforming inventions, generally, into claims, after which chapters 3 through 6 in turn cover particular problems encountered in the four statutory classes.

Summary

Claims must fit within the "statutory classes" of patentable subject matter, as construed by court decisions. For utility patents, these classes are machine, process, (article of) manufacture, and composition of matter. Ornamental designs and certain agricultural plants are separate statutory classes with different rules (sections 5:3- 5:4).

FOOTNOTES:

Footnote 9. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725, 1732-33 (Fed. Cir. 2002).

Footnote 9.1. Weldon Amendment, H.R. 2673, Pub. L. No. 108-199 (2004). See section 9:2.

Footnote 10. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 47 U.S.P.Q.2d (BNA) 1596, 1602-04 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1093 (1999).

Footnote 11. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447 (Fed. Civ. 1999).

7:2:1 Placement After Specification

35 U.S.C. 7112 and 37 C.F.R. 775(a)¹ provide that the "specification shall conclude with one or more claims. . . ." Claims are placed after the specification. The practice in some countries is for the claims to precede the specification. But that is not good form for the United States. (The Patent and Trademark Office accepts and examines claims that precede the specification. But avoid that where possible.)

FOOTNOTES:

Footnote 1. The rules governing patent applications are codified in title 37 of the Code of Federal Regulations. References herein are to "rule . . ." ?2:2 Single Sentence

So far the only known (or at least acceptable) way to "particularly point out and distinctly claim" an invention in a statutory class is by means of an English sentence. This is unfortunate, because many of the problems in claim drafting stem from problems in writing English and in the meanings of words.

To begin at the beginning, the standard custom as to sentence construction is that each claim must be the object of a single sentence, however long, beginning with a standard introductory phrase such as "I [or We] claim," "The invention claimed is," or the equivalent. ² In an application with more than one claim, the introductory phrase, such as "I claim," appears only once, before the first claim.

Standard Office practice also is to insist that each claim begin with a capital or upper-case letter and end with a period, so that each claim reads as a complete sentence when taken with the introductory words, for example, "I claim," "We claim," "The invention claimed is," ³ or "What is claimed is," or the equivalent language. Except for such standard capitalization as [degrees]C., ⁴ no other capital letters may appear in the body of the claim. ⁵ For example:

I claim: A pencil having an eraser fastened to one end.

The above claim is to illustrate layout and form only, not as an example of patentable subject matter. (A different claim to such a combination was held unpatentable by the Supreme Court in *Reckendorfer v. Faber*. ⁶)

In connection with the single-sentence rule, it is important to watch grammar, particularly verb forms, to make sure the claim reads as a complete sentence. For example, "I claim: A pencil *comprises* . . . [parts A and B] ⁷" does not form a complete sentence. However, the generally standard phraseology, "I claim: A pencil *comprising* . . . [parts A and B]" does form a sentence.

This is sometimes troublesome in long, complicated claims with many elements, subelements, and intricate relationships between elements; independent claims (section 2:9); and in *Jepson* claims (section 6:8). Therefore, you should select a verb form, for example, participle ("-ing"), or third person ("-s,"), and use it consistently throughout each entire claim. You can switch verb styles between claims, if you wish.

Also, where possible, the verb form in a claim is preferably in the present tense, unless a past or future event is being described.

Summary

Make sure the claim forms a complete sentence forming the direct object of the phrase "I claim." Begin each claim with a capital letter and end it with a period.

FOOTNOTES:

Footnote 2. See MPEP §608.01(m).

Footnote 3. Preceding examples suggested in MPEP §608.01(m).

Footnote 4. Modern practice does not use a period in [degrees]C.

Footnote 5. See MPEP §608.01(m).

Footnote 6. *Reckendorfer v. Faber*, 92 U.S. 347 (1875), discussed *infra* at section 8:5, "Aggregation."

Footnote 7. Letters ("A," "B," etc.) conventionally stand for the "elements" of the claims, such as "pencil" and "eraser" in the above example.

§2:3 Numbering and Order

Section 112 of the statute, on utility patents, provides that the "specification shall conclude with one or more claims. . . ." In design patents (section 5:3) and plant patents (section 5:4), only one claim is permitted. Almost always, more than one claim is submitted in a utility patent application. (Sometimes only one claim is allowed by the examiner, and one is lucky to obtain that one.)

When only one claim is presented, no numeral is used, as in the above example to the pencil. When more than one claim is submitted, each claim must start with an Arabic numeral. * The claims must be numbered consecutively, and good practice dictates that the claims be grouped and numbered in a logical order for consideration. ° The usual practice is to begin with the broadest claim and proceed to the narrowest, and to group similar types of claims together.

As to preferred order, §608.01(m) of the MPEP provides:

Claims should preferably be arranged in order of scope so that the first claim presented is the broadest. Where separate species are claimed, the claims of like species should be grouped together where possible and physically separated by drawing a line between claims or groups of claims. . . . Similarly, product and process claims should be separately grouped.

In view of this, as well as general good sense, the claims should be grouped in what the claim writer thinks is the most logical order for consideration. The practice occasionally seen of trying to slip in an unusually broad claim, for example, as claim seventeen out of nineteen claims, is condemnable. ¹⁰

Special rules apply to the number of certain dependent claims. ¹¹

How many claims may be presented and how different they must be from each other are discussed in sections 7:1-8:3. For an *example of a complete claims layout*:

I claim:

1. A pencil having . . .
2. A pencil as recited in claim I, wherein . . . [more detail].
3. A pencil comprising . . . [the most detailed combination acceptable to the applicant].

A claim number is not reused. If a claim is canceled, its claim number is not reused in that patent application. Added claims receive the next number in sequence after the last claim. Claims are not renumbered during application prosecution, except in a continuing application; some claims from a parent application, especially later added claims, may be renumbered in the continuing application. (At conclusion of prosecution, the claims are renumbered by the Patent Office for the patent to be printed.)

Summary

Present multiple claims in a logical order and number them consecutively.

FOOTNOTES:

Footnote 8. Rule 75(f).

Footnote 9. *Id.*

Footnote 10. For a discussion of how generic, subgeneric, and species are to be grouped, see section 6:9.

Footnote 11. *See infra*, section 2:9.
?2:4 Preamble

Claims should have "preambles," or introductory statements, the purposes of which are to indicate the statutory class of the claim (often by implication from the words

in the preamble) and to name or define the thing that is to be claimed. It defines the field of the invention claimed. Preambles may be quite long or very short, depending on the type of claim one is using, but a shorter preamble is preferred. For example, in *Karsten Manufacturing Corp. v. Cleveland Golf Co.*,¹² the patent claims all recited "an improved correlated set of iron-type golf-clubs." The court held that "correlated set" was a claim limitation, although it appeared only in the preamble. It appears that it was an unessential limitation for patentability. Had it been omitted, the claim would have been broader.

The best type of preamble for most claims is simply a general definition of the combination to be claimed, with whatever detail or length is necessary to define what appears in the body of the claim. The preamble and the body of the claim should be consistent one with the other, two parts making up a whole. The preamble cannot be written properly until the scope of the claim-to-be is determined, and the preamble should be checked for consistency after the claim has been finished. When a claim is revised or amended, the preamble should be scrutinized for consistency.

¹³

One of the best sources for the claim preamble is the title of the invention at the head of the specification. Sometimes that title is modified to conform to the claim preamble. The title of the invention is typically short, and so should be the preamble. But if the claim is to an element or a subcombination of a fuller invention, using the title as the preamble could cause the preamble to be misleading as too encompassing. Further, where the title differs from the claim preamble, the title does not define the claimed invention, as it would be reading a limitation from the specification into the claim.¹⁴

To avoid a too-limited scope preamble, the claim writer might be tempted to merely recite the broad "Apparatus comprising" or use "device" or a similar nonspecific noun. But a too-broad scope preamble is also not good practice, although not improper. Also, the examiner will likely require that a preamble more descriptive of the invention be substituted.

The preamble should focus on the actual subject or field of the invention and not cover too broad a field, if inapplicable. For an invention in a bicycle, for example, a preamble that says "vehicle" would appear to be of broader scope than a preamble that says "bicycle." Yet if the invention is clearly directed to a bicycle, there is no benefit to having a preamble "vehicle," which is more encompassing than the invention itself. The preamble should be realistically narrow in scope. Conversely, if the preamble says "bicycle," but the invention is adaptable not only for bicycles but for motorcycles, and if an infringer were later to market a product that had all of the feature limitations in the claim, but that was a motorcycle rather than a bicycle, the infringer might argue that the claim does not reach the accused product because the claim is limited in scope to a bicycle. The preamble must be sufficiently broad to

cover the product in the preferred embodiment to which the inventor has directed his attention (bicycle), but also to cover other embodiments, as "two-wheeled vehicles," to which the invention may be directed.

In general, one should avoid any unnecessary limitations or statements anywhere in the broader claims, even in the preamble. Some practitioners briefly describe an object of the invention in a preamble ("Apparatus for shaking articles to dislodge impurities"). This is unnecessary, however, as the preamble is preferably a short introduction to the body of the claim. Also, there may be other objects of the invention, and recitation of one may impliedly exclude accomplishment of others when the claim is later interpreted.

Where the invention operates upon a workpiece, some practitioners include relevant details of the workpiece in the preamble ("Apparatus for shaking articles having a soft covering over a plurality of frangible legs . . ."). Usually, description of the workpiece in the preamble is not needed. Instead, as a particular element of the apparatus acts upon the workpiece, the relevant interaction of the element upon the workpiece is described in the body of the claim, and possibly in a "whereby" clause. Sometimes, however, it is appropriate to describe the workpiece somewhat fully in the preamble as it may not otherwise be easy to comprehend the rest of the claim. That is true more often in a method claim wherein the workpiece or the apparatus used in the method in the body of the claim is introduced in the preamble. But the claim writer may then have limited the claim scope to the elements in the preamble.¹⁵ In that case, the better choice is to have the fuller preamble. An example of an overlong preamble that may have confused the Board of Appeals somewhat appears in *In re Stencel*.¹⁶

On the other hand, the preamble may have to be longer because, in order to understand an invention, one must understand its context. Therefore, sometimes the purpose of the invention is recited in the preamble before the transition word, as in "Apparatus for treating a web to prevent tearing, the apparatus comprising . . ." ¹⁷ The title of the invention at the head of the specification may be slightly different, but there is no short claim preamble that does the job.

In composition of matter claims, where the composition may have no recognized name, it may be necessary to describe certain qualities or features of the composition in the preamble in order to clearly explain or understand the elements in the following body of the claim, for example, "A composition having a density of x and a color y with a brightness level not less than z, comprising material a, at least 10% of material b and material c." The elements of the composition are better understood with a fuller preamble. But the specifics in the preamble, between "composition" and "comprising," may alternately be included in a functional or "whereby" clause placed after the elements are recited in the body of the claim.

Long preambles mentioning elements other than the invention itself may make what the subsequent transition word refers to ambiguous (see section 2:5). For example, in "Apparatus for shaking articles to dislodge impurities comprising . . ." clearly, the transition word "comprising" refers back to the apparatus, not the impurities. For clarity, the preamble should repeat the key word of the name of the invention in the preamble before the transition word, as "Apparatus for shaking articles to dislodge impurities, the apparatus comprising . . ."

With the prevalence of the use of dependent claims, any dependent claim should usually cover the same invention as its preceding or parent claim. If the independent claim begins "Apparatus for shaking articles," a following dependent claim should not claim a different apparatus, for example, "A device for containing articles to be shaken, as recited in Claim 1, comprising . . ." A dependent claim includes all of the text of its preceding claims. The dependent claim just described, however, appears to claim a different invention than or less than all of the invention of its preceding claim. Hence, a dependent claim should have the preamble of the previous claim upon which it is dependent, "The apparatus for shaking articles of Claim 1. . . ." If the previous claim is to "bicycle," the dependent claim should not be to "vehicle." Change one or the other claim for consistency.

Often the preamble of a dependent claim is shortened to the key word or words, for example, the noun, of the preamble of its preceding independent claim ("The apparatus of Claim 1"). As long as that leaves no ambiguity, the shortened preamble is even preferred.

Claims of different scope are often used to describe different aspects of an entire invention, a combination and a subcombination, a genus and a species, etc. A different preamble may be used for each different claim grouping: "Apparatus for shaking articles . . ." and "Device for containing articles to be shaken . . ." Just make each different invention or aspect of one invention subject to separate claims, each group of claims with a separate preamble.

Jepson claims under Rule 75(e) have a different type of preamble, which is rather lengthy. ¹⁸ It includes a name of the invention and then recites the elements of that complete apparatus, process, composition, or article that is in the prior art. ¹⁹ This is a special situation. Because the preamble of a *Jepson* claim recites elements of a claimed invention and defines not only the context or field of the invention but also its scope, ²⁰ an element or limitation that appears only at the start of the preamble is considered a claim element. ²¹

The preamble is often the basis used by the PTO to assign the application to a particular Examining Art Unit for review of and action on the application. Preferably, the preamble describes the field of the invention to correctly guide the invention classifiers when the application is filed and initially assigned to an Art Unit.

Furthermore, the preamble defines the scope of relevant prior art. Accuracy in the preamble is recommended.

Some case precedents suggest that the content of the preamble does not limit the scope of the claim. However, in *Bell Communications Research, Inc. v. Vitalink Communications Corp.*,²² the court said that the determination is made with reference to the specific claim and there found the preamble element limiting.

The MPEP states at ?2111.02 that the preamble is not given the effect of a limitation unless it breathes life and meaning into the claim.²³ Repeated references in the specification to liners as "blown-film" liners, including in the preferred embodiment, and in each claim, made "blown-film" in the preamble a substantive claim limitation, as it gave life, meaning, and vitality to the claims.^{23.1} Phraseology in the preamble that limits the structure must be given weight. See the cases discussed in that section of the Manual.²⁴

The Federal Circuit recently restated the rule:

[T]he preamble simply states the intended use or purpose of the invention. . . . Such a preamble usually does not limit the scope of the claim unless the preamble provides antecedents for ensuing claim terms and limits the claim accordingly.²⁵

When a term ("communication system") appears in the preamble, but not in the body of the claim, and the court determines that the term does not give "life, meaning or vitality" to the claim, then its absence from an accused device does not avoid infringement of the claim.²⁶

In *Bard*, the preamble provided antecedents by reciting the structure into which needles fit, and the claim was not anticipated or obvious over prior art, which lacked the preamble features. The preamble features saved the claim validity, but those same elements narrow the scope of the claim to be asserted against infringements.

In *Pitney Bowes, Inc. v. Hewlett-Packard Co.*,²⁷ the intended purpose of the invention stated in the preamble as "producing on a photoreceptor an image of generated shapes made up of spots" was held not to be a mere statement of intended field of use, but was so intimately meshed with the remaining claim language that the preamble and the remainder of the claim were to be construed as one unified internally consistent recitation of the invention.

In *Eaton Corp. v. Rockwell Int'l Corp.*,²⁸ the claim preamble of a method claim had a detailed description of structure that performs the recited method steps. The court there found that the claim was an example of the drafter's using both the preamble and the body of the claim to define the invention, and the preamble was given limiting effect.

Another example is found in *Jansen v. Rexall Sundown, Inc.*,^{28.1} wherein the preamble was to a method of "treating or preventing" pernicious anemia and the body of the claim recited that the treatment is provided "to a human in need thereof." The Court said that the preamble sets forth the objective of the method, the body of the claim directs on whom the method be performed. Therefore, the body of the claim gives meaning to the preamble's statement of purpose, making the preamble not merely a statement of effect that may or may not be appreciated. This is the reverse of the normal reasoning for considering the preamble as a limitation to be met, that is, here the body of the claim gives life and meaning to the preamble.

A statement of the purpose of the invention in the preamble can be nonlimiting, as in "A method *for reducing hematologic toxicity* in a cancer patient," because it states a purpose and the claim can be infringed even if the purpose was not always achieved.²⁹

But the opposite may be true in a particular case. In *Griffin v. Bertina*,³⁰ the Federal Circuit said that a claim preamble has the import that the claim as a whole suggests. The preamble is directed to diagnosing an increased risk from a genetic defect that causes thrombosis. Diagnosis was therefore the object of the invention claimed. Performing the steps without the objective in the preamble would be an empty exercise. The preamble was essential.

In *Catalina Marketing Int'l, Inc. v. Coolsavings.com, Inc.*,³¹ the Federal Circuit held that the preamble limitation "located at predesignated sites such as consumer stores" merely states an intended use for the claimed system and is not a claim limitation. The claimed system is structurally completely claimed in the body of the claim, while the preamble only states the purpose, benefits or intended use of the invention. Infringement was found even though the accused method would be performed at any Internet-accessible computer and not only at "consumer stores" as in the preamble. (Note the presence of "such as" in the preamble, which would be indefinite had it appeared in the body of the claim or in a preamble which is a claim element.)

Yet in *Ex parte Futo*,³² the Board found that the claimed use of a wrench recited in the preamble for rotating plastic slip nuts, recited an environment that avoided a prior art soda bottle wrench being prior art to render the invention obvious.

The Federal Circuit has identified guideposts for identifying limiting preamble language:

(a) a *Jepson* claim uses the preamble to define the invention;

- (b) dependence on a phrase in dispute to provide an antecedent basis indicates reliance on the preamble;
- (c) the preamble is needed to understand elements in the claim body;
- (d) the specification emphasizes additional elements as important;
- (e) clear reliance on the preamble to avoid prior art during application prosecution.

In *Invitrogen Corp. v. Biocrest Mfg., LP*,³³ the applicant amended "E. coli cells" in the claim preamble to "E. coli cells of improved competence," which should not be viewed as structural and might be viewed as stating a purpose of the invention. But the Federal Circuit said those words were added to avoid prior art and thus infringement required a particular improvement level. The recited claim elements were not changed but the preamble narrowed the claim scope.

In *In re Cruciferous Sprout Litigation*,³⁴ the court found the preamble words "rich in glucosinolates" and other words in the preamble to have been relied on to avoid prior art as helping to define the invention.³⁵

In *Schumer v. Laboratory Computer Systems, Inc.*,³⁶ the preamble of a method claim described features that necessarily exist in any coordinate system for a digitizer, but did not describe how the device operates with respect to those features. The body of the claim details the functional attributes of the device that performs the methods. The preamble was deemed superfluous.

In *Intirtool v. Texar Corp.*,^{36.1} the court said that if the body of the claim "describes a structurally complete invention such that detection of the preamble phrase does not affect the structure or steps of the claimed invention". . . . Here the preamble does not recite any "additional structure or steps underscored as important by the specification." These are tests for the preamble having to be considered as a limiting claim element.

These cases show different treatments of preamble recitations. But if the preamble lacks unnecessary words, there is no interpretation issue raised.

There is nothing to gain by having an overlong preamble, with many elements recited. Each may become a claim limitation which a later copyist could avoid using.

Recommended preambles for different types of claims are set out in subsequent parts of this treatise.

Summary

Use descriptive preambles defining the nature of the combination claimed. Do not put unnecessary limitations even in the preamble. Assume every word you write in a claim is critical, and may some day be used against your client, to restrict the scope of his invention.

FOOTNOTES:

Footnote 12. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 58 U.S.P.Q.2d (BNA) 1286, 1288 (Fed. Cir. 2001).

Footnote 13. As to the effect of limitations in the preamble, see below and also see section 6:7, on new use claims; preamble limitations.

Footnote 14. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 51 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 1999).

Footnote 15. *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 66 U.S.P.Q.2d (BNA) 1271, 1277 (Fed. Cir. 2003).

Footnote 16. *In re Stencel*, 4 U.S.P.Q.2d (BNA) 1071 (Fed. Cir. 1987).

Footnote 17. *See Heidelberg Harris, Inc. v. Mitsubishi Heavy Indus., Ltd.*, 56 U.S.P.Q.2d (BNA) 1714, 1719 (Fed. Cir. 2000) (labeled unpublished); *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 U.S.P.Q.2d (BNA) 1161, 1165-66 (Fed. Cir. 1999).

Footnote 18. *See infra*, section 6:8.

Footnote 19. MPEP ?608.01(m).

Footnote 20. *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61 U.S.P.Q.2d (BNA) 1470 (Fed. Cir. 2002).

Footnote 21. *Rowe v. Dror*, 42 U.S.P.Q.2d (BNA) 1550, 1553 (Fed. Cir. 1997).

Footnote 22. *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 34 U.S.P.Q.2d (BNA) 1816 (Fed. Cir. 1995).

Footnote 23. *Intirtool Ltd. v. Texar Corp.*, 369 F.3d 1289, 70 U.S.P.Q.2d (BNA) 1780 (Fed. Cir. 2004); *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 62 U.S.P.Q.2d (BNA) 1781 (Fed. Cir. 2002); *Griffin v. Bertina*, 285 F.3d 1029, 62 U.S.P.Q.2d (BNA) 1431 (Fed. Cir. 2002).

Footnote 23.1. *Poly-America LP v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 72 U.S.P.Q.2d (BNA) 1685 (Fed. Cir. 2004).

Footnote 24. *See also* Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1257, 9 U.S.P.Q.2d (BNA) 1962 (Fed. Cir. 1989); *In re* Burke, Inc., 786 F. Supp. 1537, 22 U.S.P.Q.2d (BNA) 1368, 1371 (C.D. Cal. 1992).

Footnote 25. C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 48 U.S.P.Q.2d (BNA) 1225, 1230-31 (Fed. Cir. 1998), *reh'g denied*, 161 F.3d 1380, 49 U.S.P.Q.2d (BNA) 1319 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 1804 (1999). *See* Gerber Garment Tech, Inc. v. Lectra Sys., Inc., 916 F.2d 683, 688-89, 16 U.S.P.Q.2d (BNA) 1436, 1441 (Fed. Cir. 1990); Heidelberg Harris, Inc. v. Mitsubishi Heavy Indus., Ltd., 56 U.S.P.Q.2d (BNA) 1714, 1719-20 (Fed. Cir. 2000) (labeled unpublished); Allen Eng'g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 63 U.S.P.Q.2d (BNA) 1769, 1774 (Fed. Cir. 2002).

Footnote 26. NTP, Inc. v. Research in Motion Ltd., 261 F. Supp. 2d 423, 67 U.S.P.Q.2d (BNA) 1574 (E.D. Va. 2002).

Footnote 27. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 51 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 1999).

Footnote 28. Eaton Corp. v. Rockwell Int'l Corp., 323 F.3d 1332, 66 U.S.P.Q.2d (BNA) 1271,

1277 (Fed. Cir. 2003).

Footnote 28.1. Jansen v. Rexall Sundown, Inc., 342 F.3d 1329, 68 U.S.P.Q.2d (BNA) 1154 (Fed. Cir. 2003).

Footnote 29. Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc., 246 F.3d 1368, 58 U.S.P.Q.2d (BNA) 1508, 1513 (Fed. Cir. 2001).

Footnote 30. Griffin v. Bertina, 285 F.3d 1029, 62 U.S.P.Q.2d (BNA) 1431, 1434 (Fed. Cir. 2002).

Footnote 31. Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 62 U.S.P.Q.2d (BNA) 1781 (Fed. Cir. 2002).

Footnote 32. *Ex parte* Futo, 59 U.S.P.Q.2d (BNA) 1955 (Board of Patent Appeals and Interference 2000).

Footnote 33. Invitrogen Corp. v. Biocrest Mfg., LP, 327 F.3d 1364, 66 U.S.P.Q.2d (BNA) 1631 (Fed. Cir. 2003).

Footnote 34. *In re* Cruciferous Sprout Litig., 301 F.3d 1345, 64 U.S.P.Q.2d (BNA)

1202, 1205 (Fed. Cir. 2002).

Footnote 35. *See* Storage Tech. Corp. v. Cisco Sys., Inc., 329 F.3d 823, 66 U.S.P.Q.2d (BNA)

1545 (Fed. Cir. 2003).

Footnote 36. *Schumer v. Lab. Computer Sys., Inc.*, 308 F.3d 1304, 64 U.S.P.Q.2d (BNA) 1832 (Fed. Cir. 2003).

Footnote 36.1. *Intirtool Ltd. v. Texar Corp.*, 369 F.3d 1289, 70 U.S.P.Q.2d (BNA) 1780 (Fed. Cir. 2004).

?2:5 Transition from Preamble to Body--"Comprising" and Other Open-Ended Terms

Most ordinary combination claims require a transitional word or phrase between the preamble (naming the thing to be claimed) and the body of the claim (defining what the elements or parts of the thing are). Two recommended forms of transition that can be employed for most claims are the phrases: "which comprises" or "comprising." The choice between the two is immaterial.

The word "comprises" has been construed to mean, in patent law, "including the following elements but not excluding others." ³⁷The claim is "open," not "closed." ³⁸ Additional elements in an accused device or method do not avoid such an open claim. ³⁹The clause "comprising . . . a group of first, second, and third blades . . ." covered a four-blade razor. Both "comprising" and "group of" are open-ended claim terms. This was held despite the specification's repeatedly teaching that the invention was in a three-blade razor.

"Comprises" not only permits additional elements besides those specifically recited, it does not enable removal of elements specifically recited. ^{39.1} All elements recited in the claim are construed as having to be present.

"Comprising" and "consists" may both be present in a claim:

A purified oligonucleotide comprising at least a portion of . . . wherein said portion consists of . . .

The Federal Circuit held that "the term 'consists' limits the 'said portion' language to the subsequently recited numbered nucleotides, but the earlier term 'comprising' means that the claim can include that portion plus other nucleotides." ^{39.2}

When "comprising" is used as a transition word in a method claim, that claim encompasses a method including additional steps to those expressly recited in the claim, including a step preceding or following one of the steps expressly recited.

⁴⁰Further, "comprising the steps of" does not convert the claim element to step-plus-function form under section 112, para 6. ^{40.1}

Other words, less often used, have been given the same meaning in patent claim interpretation as "comprising": "including," ⁴¹ "having," ⁴² "containing," ^{42.1} and even "wherein." ⁴³However, "comprising" is recommended simply because it has become a standardized word of the patent art.

Lampi Corp. v. American Power Products, Inc. ⁴⁴ illustrates the risk a claim writer takes by using a word, here "having" rather than "comprising," as an open-ended transition word. The court spent much time analyzing the specification to see if the word "having" was open-ended in a claim. The court also relied on a dependent claim that used the word "comprising" as a basis for finding the "having" in the parent claim open-ended. So, why take a risk in claiming? The Federal Circuit yet again construed "having," ⁴⁵ saying that word does not presumptively "open" the body of the claim. It is not as strongly open a word as "comprising." The court therefore had to examine the claim in context to determine the limits of "having."

For example, a claim to "A writing implement *comprising* a pencil with an eraser fastened at one end" covers any type of eraser-tipped pencil: wood, mechanical, etc.; with or without a clip to hook it in one's pocket; and whether or not additional features or additions are patentable to later inventors. Thus, in patent shorthand, "the combination comprising A+B (individual elements or parts)" covers A+B+C . . . or A+B' (a variation of element B falling under the claim definition). In general, the technique of writing broad claims is to claim the minimum number of elements that will function in the combination, each defined as broadly as the prior art and claim drafting doctrines will allow. In that manner, the main "point of the invention," or "inventive concept," ⁴⁶ should be crystallized in concrete terms.

Comprising or including enables part of or a subset of group of elements that are present, either in the patent disclosure or in an accused product or method, to have the claimed characteristic(s) while another subset of the same elements do not have the claimed characteristic(s). ^{46.1}

However, despite use of "comprising" as the transition, a claim can be interpreted such that all of the elements of one type have a claimed characteristic, although the claim recites that a plurality of those elements have that characteristic--suggesting to the patent owner that some of those elements in an accused product may lack that characteristic yet still be within the claim. ⁴⁷

Some form of the word "comprise" is practically always used for mechanical or method combination claims.

Although the foregoing discussion was directed at transitions following a preamble,

it applies to transitional phrases throughout a claim, wherein any claim element is defined as comprising other elements. The foregoing does not apply to elements that are not transition words. They can be open-ended as well, meaning that they are not limited to the specific components or elements recited for that word. "Mixture" is not always limited to the specific component parts thereof expressly recited, but may include others because the claim has an open-ended transition word. ^{47.1}

Summary

Use the open-ended transition like "comprising" or "which comprises," except in very unusual cases.

FOOTNOTES:

Footnote 37. MPEP ?2111.03; *Moleculon Research Corp. v. CBS, Inc.*, 229 U.S.P.Q. (BNA)

805, 812 (Fed. Cir. 1986).

Footnote 38. MPEP ?2111.03; *Burke, Inc. v. Everest & Jennings, Inc.*, 991 F.2d 812, 29 U.S.P.Q.2d (BNA) 1393, 1397 (Fed. Cir. 1993) (unpublished); *Special Metals Corp. v. Teledyne Indus., Inc.*, 219 U.S.P.Q. (BNA) 953 (4th Cir. 1983); *Air Prods. & Chems., Inc. v. Chas. S. Tanner Co.*, 219 U.S.P.Q. (BNA) 223 (D.S.D. 1983); *In re Certain Slide Fastener Stringers*, 216 U.S.P.Q. (BNA) 907 (Ct. Int'l Trade 1981). A patent claim "which uses the term 'comprising,' is an 'open' claim which will read on devices which add additional elements. . . ." *Carl Zeiss Stiftung v. Renishaw PLC*, 945 F.2d 1173, 20 U.S.P.Q.2d (BNA) 1094 (Fed. Cir. 1991); *Abtox, Inc. v. Exitron Corp.*, 43 U.S.P.Q.2d (BNA) 1545, 1548 (Fed. Cir. 1997), *modified on other grounds*, 46 U.S.P.Q.2d (BNA) 1735 (Fed. Cir. 1997); *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 U.S.P.Q.2d (BNA) 1608, 1613 (Fed. Cir. 1997); *see also* *T.J. Smith & Nephew Ltd. v. Parke, Davis & Co.*, 871 F.2d 1098, 10 U.S.P.Q.2d (BNA) 1946 (Fed. Cir. 1989); *Berenter v. Quigg*, 737 F. Supp. 5, 14 U.S.P.Q.2d (BNA) 1175 (D.D.C. 1988); *Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 54 U.S.P.Q.2d (BNA) 1841 (Fed. Cir. 2000).

Footnote 39. *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 74 U.S.P.Q.2d (BNA) 1586 (Fed. Cir. 2005); *Power Mosfet Techs. LLC v. Siemens AG*, 378 F.3d 1396, 72 U.S.P.Q.2d 1129 (Fed. Cir. 2004); *Smith & Nephew, Inc. v. Ethicon, Inc.*, 276 F.3d 1304, 61 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2002); *Dow Chem. Co. v. Sumitomo Chem. Co.*, 59 U.S.P.Q.2d (BNA) 1609, 1620 (Fed. Cir. 2001); *Vivid Tech, Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 811, 53 U.S.P.Q.2d (BNA) 1289, 1301 (Fed. Cir. 1999).

Footnote 39.1. *Power Mosfet Techs. LLC v. Siemens AG*, 378 F.3d 1396, 72

U.S.P.Q.2d 1129 (Fed. Cir. 2004).

☛Footnote 39.2. *In re* Crish, 393 F.3d 1253, 1257, 73 U.S.P.Q.2d (BNA) 1364 (Fed. Cir. 2004).

☛Footnote 40. *In vitro*gen Corp. v. Biocrest Mfg., LP, 327 F.3d 1364, 66 U.S.P.Q.2d (BNA) 1631

(Fed. Cir. 2003).

☛Footnote 40.1. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 137, 72 U.S.P.Q.2d (BNA) 1333 (Fed. Cir. 2004).

☛Footnote 41. *San Disk Corp. v. Memorex Prods. Inc.*, 415 F.3d 1278, 75 U.S.P.Q.2d (BNA) 1475 (Fed. Cir. 2005); *In re* Certain Slide Fastener Stringers, 216 U.S.P.Q. (BNA) 907 (Ct. Int'l Trade 1981); *Burke, Inc. v. Everest & Jennings, Inc.*, 991 F.2d 812, 29 U.S.P.Q.2d (BNA) 1393, 1397 (Fed. Cir. 1993) (unpublished).

☛Footnote 42. *In re* Certain Slide Fastener Stringers, 216 U.S.P.Q. (BNA) 907 (Ct. Int'l Trade 1981); *Compro-Frank Corp. v. Valk Mfg. Co.*, 216 U.S.P.Q. (BNA) 531 (E.D. Pa. 1982). *But see* *Lampi Corp. v. Am. Power Prods., Inc.*, 228 F.3d 1365, 56 U.S.P.Q.2d (BNA) 1445, 1453-54 (Fed. Cir. 2000).

☛Footnote 42.1. *Mars, Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 71 U.S.P.Q.2d (BNA) 1837 (Fed. Cir. 2004). Some claims had "containing at least . . ." while others had "containing." The latter claims were still considered to be open-ended.

☛Footnote 43. *Ex parte* Grasselli, 231 U.S.P.Q. (BNA) 395 (Board of Patent Appeals and Interferences 1983).

☛Footnote 44. *Lampi Corp. v. Am. Power Prods., Inc.*, 228 F.3d 1365, 56 U.S.P.Q.2d (BNA) 1445 (Fed. Cir. 2000).

☛Footnote 45. *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*, 57 U.S.P.Q.2d (BNA) 1953, 1958-59 (Fed. Cir. 2001).

☛Footnote 46. Note, some attorneys sometimes speak loosely of "the invention," meaning the point of novelty or inventive concept, rather than merely the technical subject matter to be patented, as the word "invention" is defined in the statute. This double or triple meaning for the word "invention" is confusing and should be avoided.

☛Footnote 46.1. *In* *San Disk Corp. v. Memorex Prods. Inc.*, 415 F.3d 1278, 75 U.S.P.Q.2d (BNA)

1475 (Fed. Cir. 2005), some memory cells had the claimed characteristics while others did not, and that arrangement was covered by the claim because the transition word was "includes."

☛Footnote 47. *Tex. Instruments, Inc. v. United States Int'l Trade Comm'n*, 26 U.S.P.Q.2d (BNA) 1018, 1024 (Fed. Cir. 1993).

☛Footnote 47.1. *Mars, Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 71 U.S.P.Q.2d (BNA) 1837 (Fed. Cir. 2004).

§2:6 "Consisting"--"Consisting Essentially Of" and Other Close-Ended Transition Terms

Other transitions have more limited meanings. They are used primarily in chemical cases, where the art or other reason requires limitation.

"Consisting" or "consisting of," especially in a mechanical claim, means that the claim covers devices having the recited elements, and no more or no less,⁴⁸ and in method claims, means that the process has only the recited steps.⁴⁹ Other words may be similarly closed ended, like "composed of," "constituting,"⁵⁰ "having,"⁵¹ or "being." But that is not automatic and whether each is closed or open ended must be interpreted in light of the specification.⁵² (In this author's opinion, "having" is an open ended word.) "Consisting of"--in chemical claims, the term excludes more than traces of other ingredients.⁵³ One sees greater use of "closed" claims with "consisting of" as the transition because chemical combinations are not predictable, and the addition of an element to a chemical combination could change the characteristics of the combination as they relate to the invention.

Norian Corporation v. Stryker Corporation^{53.1} made clear that a combination consisting of certain elements would not be infringed by another combination which included an additional element related to the invention, but would be infringed if the additional element was not part of the invention. In *Norian*, the claim was to a kit consisting of certain chemicals. But the claim did not recite a spatula as one of the elements. (Nor did it recite a container and other environmental elements.) The court said that ". . . while 'consisting of' limits the claimed invention, it did not limit aspects unrelated to the invention. . . . While the term 'consisting of' permits no other chemicals in the kit, a spatula is not part of the invention that is described. . . . Infringement is not avoided by the presence of the spatula for the spatula has no interaction with the chemicals and is irrelevant to the invention."

In a *Markush* grouping of elements, primarily used in chemical claims, the term "consisting of" is used to introduce the *Markush* group.⁵⁴

"Consisting essentially of" occupies a middle ground between 'closed' claims that

are written in a 'consisting of' format and fully open claims that are drafted in a 'comprising' format." ⁵⁵

"Consisting essentially of" excludes other elements from having any essential significance to the combination, that is, it allows some "reading on" additional unspecified substances, ⁵⁶ that is, those which do not materially affect the basic and novel characteristics of the claimed invention, ⁵⁷ "the signal 'consisting essentially of' allows for the presence of small amounts of components outside of the designated [composition]." ⁵⁸ Although "consisting essentially of" is typically used for compositions, it may also be used for method steps. ⁵⁹

For example, in *In re Garnero*, ⁶⁰ the C.C.P.A. ruled that the phrase "consisting essentially of" excludes "additional unspecified ingredients which would affect the basic and novel characteristics of the product defined in the balance of the claim." ⁶¹ These meanings were discussed by the Patent Office Board of Appeals in *Ex parte Davis* ⁶² as a "code" adopted by a group of primary examiners for their guidance. These meanings are now quite stylized in the patent law. "Composed of," one might have thought, is the same as "consisting of." But the Federal Circuit, quoting MPEP §2110.03, interprets "composed of" as "consisting essentially of," which is slightly open-ended. ⁶³

These more limited claims are spoken of as "closed" or "closed ended," ⁶⁴ because other elements or other material elements are excluded from the combination. ⁶⁵ Of course, "consisting" should be avoided in the broader claims wherever possible as it is severely limiting. The test of when "consisting essentially" is required instead of the broad "comprising" is not clear.

Other, hybrid phraseologies may be acceptable as having a scope somewhere between "comprising" and "consisting essentially." For example, *Natta et al.* patent 3,112,301 has a claim that reads, "consists prevailingly but not essentially of . . ."

In *Ziegler v. Phillips Petroleum Co.*, ⁶⁶ the court on specific facts held that "consisting essentially" permitted material additions so long as the "consisting essentially" ingredients were "necessarily present," and the composition with the additions still used the "real invention." ⁶⁷

Summary

Do not use the expressions "consisting" or "consisting essentially" unless the examiner requires them or where additional elements would not ever be expected with the claimed combination, as in a particular composition of matter. They are usually used in chemical cases due to the unpredictability of adding a new element to a chemical combination.

FOOTNOTES:

Footnote 48. MPEP ?2111.03; *In re* Certain Slide Fastener Stringers, 216 U.S.P.Q. (BNA) 907 (Ct. Int'l Trade 1981); *Ex parte* Grasselli, 231 U.S.P.Q. (BNA) 395 (Board of Patent Appeals and Interferences 1983); Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc., 212 F.3d 1377, 54 U.S.P.Q.2d (BNA) 1841 (Fed. Cir. 2000). In *Vehicular Technologies*, the claim recited consisted of two springs, the accused device had one spring and a range of equivalents was restricted by the transition word.

Footnote 49. *Special Metals Corp. v. Teledyne Indus., Inc.*, 219 U.S.P.Q. (BNA) 953 (4th Cir. 1983).

Footnote 50. *Cf. Lampi Corp. v. Am. Power Prods., Inc.*, 228 F.3d 1365, 56 U.S.P.Q.2d (BNA) 1445, 1453 (Fed. Cir. 2000).

Footnote 51. *Am. Original Corp. v. Jenkins Food Corp.*, 216 U.S.P.Q. (BNA) 945 (4th Cir. 1982).

Footnote 52. MPEP ?2111.03.

Footnote 53. *Ex parte* Grasselli, 231 U.S.P.Q. (BNA) 395 (Board of Patent Appeals and Interferences 1983).

Footnote 53.1. *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1331, 70 U.S.P.Q.2d (BNA) 1780 (Fed. Cir. 2004).

Footnote 54. *See* section 6:2, *infra*.

Footnote 55. *PPG Indus., Inc. v. Guardian Ind. Corp.*, 156 F.3d 1351, 48 U.S.P.Q.2d (BNA) 1351, 1353-54 (Fed. Cir. 1998).

Footnote 56. *Special Metals Corp. v. Teledyne Indus., Inc.*, 219 U.S.P.Q. (BNA) 953 (4th Cir. 1983); *Dow Chem. Co. v. Am. Cyanamid Co.*, 229 U.S.P.Q. (BNA) 171, 180 (E.D. La. 1985); *AK Steel Corp. v. Sollac & Ugine*, 234 F. Supp. 2d 711, 65 U.S.P.Q.2d (BNA) 1332, 1339 (S.D. Ohio 2002).

Footnote 57. MPEP ?111.03; *PPG Indus., Inc. v. Guardian Ind. Corp.*, 156 F.3d 1351, 48 U.S.P.Q.2d (BNA) 1351, 1353-54 (Fed. Cir. 1998); *BASF Corp. v. Eastman Chem. Co.*, 56 U.S.P.Q.2d (BNA) 1396, 1404 (D. Del. 1998).

Footnote 58. *Talbert Fuel Sys. Patents Co. v. Unocal Corp.*, 275 F.3d 1371, 61 U.S.P.Q.2d (BNA) 1363 (Fed. Cir. 2002).

Footnote 59. MPEP ?2111.03.

Footnote 60. *In re* Garnero, 162 U.S.P.Q. (BNA) 221, 223 (C.C.P.A. 1969).

Footnote 61. *Water Techs. Corp. v. Calco Ltd.*, 7 U.S.P.Q.2d (BNA) 1097, 1102 (Fed. Cir. 1988); *In re* Herz, 190 U.S.P.Q. (BNA) 461, 463 (C.C.P.A. 1976).

Footnote 62. *Ex parte* Davis, 80 U.S.P.Q. (BNA) 448 (Board of Patent Appeals and Interferences 1948).

Footnote 63. *AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 57 U.S.P.Q.2d (BNA) 1776, 1780-81 (Fed. Cir. 2001).

Footnote 64. MPEP ?2111.03; *In re* Certain Slide Fastener Stringers, 216 U.S.P.Q. (BNA) 907 (Ct. Int'l Trade 1981); *Special Metals Corp. v. Teledyne Indus., Inc.*, 219 U.S.P.Q. (BNA) 953 (4th Cir. 1983).

Footnote 65. *In Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 54 U.S.P.Q.2d (BNA) 1841 (Fed. Cir. 2000), the claim recited "consisting of" two springs. Although the doctrine of equivalents still applied, the scope of equivalents was greatly narrowed by the use of "consisting of."

Footnote 66. *Ziegler v. Phillips Petroleum Co.*, 177 U.S.P.Q. (BNA) 481 (5th Cir. 1973).

Footnote 67. *See* MPEP ?2111.03.

?2:7 Body of the Claim

The body of a combination claim, meaning the part that follows the preamble and the transitional phrase, comprises:

- a. recitation of the "elements" of parts of the combination; and
- b. description of how the elements cooperate with one another structurally, physically, or functionally, to make up the operative combination recited in the preamble. Where no mode of cooperation among any element and any of the other elements is described, the claim is not to a combination, is at best to an aggregation, and is improper in form.

The body of the claim is written in narrative expository prose, following the single sentence rule. The claim must be limited to a description of the technical subject matter, and surplus or laudatory statements, such as "novel," are not permitted, nor are statements of objects or advantages. Thus a claim to "A combination steam and dry iron comprising [A, B, and C], thus to iron clothes more effectively than

heretofore" would be objectionable because of its last clause.

In terms of English grammar, the body of a combination claim is a series: A and B; A, B, and C; etc. The letters A, B, and C conventionally stand for the "elements" of the claim, by which is meant the main structures, steps, parts, or ingredients that form the machine, process, article of manufacture, or composition of matter recited in the preamble. ⁶⁸

In the rare case of a single element claim (as distinguished from a combination claim), the single element, be it a mechanism, step, article or composition, is merely described. ⁶⁹ Note also the prohibition against single "means" claims, ⁷⁰ where the only element of the claim is means performing a function. Since practically all claims are to combinations of one sort or another, this book will deal primarily with combination claims except where specifically noted.

Of course, clear and intelligible wording should be used in describing the elements and how they cooperate or function, to make sure the claim "particularly points out" the invention and "distinctly claims" it (section 1:1). Avoid "ambiguities, vague or clumsy expressions, and unnecessary repetition of language." This latter advice is from the Patent and Trademark Office's guidelines in reviewing claims written by applicants for admission to practice before the Patent and Trademark Office in a written examination known as the Agent's Exam.

Summary

The body of the claim lists the main elements of the combination (parts, steps, chemicals, etc.) and tells how they work together or are related to each other. Most claims are directed to combinations of two or more elements. Stick to technical description, and eschew unnecessary, redundant, surplus, and any laudatory statements. Tell what the invention is, not how good it is. The claim must be readily understandable, and clear as to what it covers.

FOOTNOTES:

Footnote 68. *See, e.g.*, Claim 1 in chapter 3.

Footnote 69. *See, e.g.*, Claim 5 in section 4:7.

Footnote 70. Discussed in section 3:25.

?2:8 Format and Punctuation; Subparagraph Form

Since a combination claim is a grammatical series, if three or more elements (A, B, and C) are described, which coincide with the clauses of the series, they must be set off by commas at least. Even with two-element claims, punctuation should be used unless the first element contains very few words, so that it is clear where the

description of the second element starts. As in any writings, semicolons should be used to set off the clauses whenever one or more of the clauses contains internal punctuation. Other punctuation, such as parentheses (except for reference numerals ⁷¹), dashes, etc., is not ordinarily needed or used in claims, although there is no reason expressed in the rules or in the manual why such techniques should not be used in appropriate cases.

The single-paragraph form of claim (see Claim 1A, section 3:1.1), with commas between the elements and no indentation, letters, or numerals to identify the elements, is the form that was used almost exclusively by practitioners in the past. It is still accepted by the Patent and Trademark Office, and may be preferable for very simple claims, such as a five-line claim with only two or three elements.

Because claims are often complex and difficult to follow, various other formats are being widely used today to make claims easier to follow and understand. The Patent and Trademark Office is known to favor most such attempts at clarity, and therefore it is recommended that some format other than a single paragraph be adopted.

One such format, the subparagraph or tabular form, is strongly favored by the Patent and Trademark Office and is recommended for most if not all claims). ⁷² Even further indentations within a subparagraph, like subsubparagraphs, are recommended in MPEP §608.01(m) to further segregate subcombination or related steps (see Claim 1, section 3:1.1). This form actually helps the apprentice claim drafter, since it is easier to use and he is less likely to make mistakes in recognizing and setting out the elements of the claim. In the subparagraph form, the first word of each element, or main clause, of the claim is indented so as to distinguish clearly between each of the claimed elements.

The examples of claims in this book use versions of the subparagraph form.

Preferably, each new major claim element and subassembly is made the subject of its subparagraph. A major claim element may, in turn, be comprised of a number of other claim elements. Those other claim elements may be or need not be the subject of separate subparagraphs, as the claim drafter decides.

The colon-semicolon form, in which a colon is inserted after the transitional phrase and semicolons are used between the elements, as in Claim 1, is also recommended, particularly with subparagraph claims.

Another form, termed the "outline form," involves using identifying letters, (a), (b), (c), as in an outline, before the recitation of each element, or main clause, whether or not the subparagraph form is used. Although this technique is helpful, and is recommended if the subparagraph form is not used, it ordinarily adds little to comprehension where the subparagraph form is used. Wherever the claim drafter

believes letters would help in understanding the claim, particularly in complex claims, they should be used. Sometimes letters may help in referring back to elements of previous claims. For example, given a method comprising steps (a) through (e), one might refer in a dependent claim to performing an added step "after step (c)". Finally, a period (.) appears only at the end of the claim.

Summary

Use the subparagraph form for claims. Make claims as easy as possible for readers to understand and to follow what the elements are. The examiner will appreciate it, as well as everyone else who ever reads the patent.

FOOTNOTES:

Footnote 71. MPEP §608.01(m).

Footnote 72. See MPEP §608.01(m).

§2:9 Dependent Claims

Rule 75(c) defines a dependent claim:

One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. . . . Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

This is the single dependent claim with which practitioners are most familiar. Examples include:

The shaker of claim 1, wherein . . .

The shaker according to claim 1, wherein . . .

A shaker as claimed in claim 1, wherein . . .

The shaker as in claim 1, in which . . .

The words used to establish claim dependency in the preamble of the claim are a matter of choice, so long as the dependency of the claim is clearly set forth.

The statement of dependency upon a prior claim need not be in the preamble. For example, a claim to a combination may be dependent upon a prior claim to a subcombination, and the dependency can be stated in the body of the claim:

2. A combination, comprising:

a first element having a first subpart;

and the subcombination of claim 1; the subcombination having a second subpart; the first subpart of the first element being connected to the second subpart of the subcombination.

MPEP §608.01(n) further details what a dependent claim is:

The test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim.

This is the "infringement test" to determine if a claim is dependent.

Omission from a purported dependent claim of any element that had been included in the preceding claim makes the additional claim not a dependent claim. Thus, if a preceding claim has features A, B, and C, and a subsequent claim replaces feature C with feature D, so that the subsequent claim has features A, B and D, then the latter claim could not be a dependent claim, but could only be written in the form of an independent claim. If the purported dependent claim could be written only as an independent claim, then the dependent claim would be unpatentable, or if in the patent, it would be invalid. For the fullest claim coverage of an invention, or if an invention includes several features whose inclusions are mutually exclusive (you can include one without having to include the other), it is preferable to add an independent claim, rather than try to somehow provide coverage through a dependent claim only. The latter claim could not refer to or incorporate the previous claims.

A dependent claim incorporates by reference everything in the parent claim, ⁷³and adds some further statements, limitations or restrictions. The statements added may be

(1) one or more additional elements,

(2) a further description or limitation of one or more of the elements of the parent claim, or

(3) both.

Dependent claims enable the practitioner to thoroughly cover each invention. At least some of the independent claims should be the broadest in scope, with the least detail in their limitations. Dependent claims are used to add additional features

and/or to expand upon and to detail previously claimed features. A dependent claim can only add a new element to a claim or modify and further define an element that is already present in a claim. Hence, a dependent claim is narrower in scope than the claim upon which it is dependent.⁷⁴

A dependent claim cannot subtract an element from a claim on which it is dependent. You cannot claim "The device of claim 3, without the shaft connected between the motor and the gear." To delete an element from one claim, a new claim is needed. That new claim may be an independent claim reciting all elements, but not reciting the element to be deleted. Alternatively, that new claim may be a dependent claim, not dependent upon the claim that had the element (shaft) which is to be deleted, but rather dependent upon an earlier claim which did not mention that deleted element, for example, one where no shaft had been mentioned.

When an independent claim refers to several different means, while the preferred embodiment described in the specification, or even the broad description of the invention itself, includes more specifics of each means, then instead of writing one dependent claim that expands on all of the individual separately claimed features or means of the independent claim, consider using either one or more dependent claims which is/are devoted to a progressively more detailed treatment of one particular feature at a time. It may eventually turn out that the particular feature covered in one of the dependent claims is the critical one to stop an infringer. Or, because of only later discovered prior art, it may be that only that dependent claim is distinguishable from and valid in view of the prior art. Then that dependent claim covering one feature will not be burdened with other detailed limitations which an infringer may avoid, but only with details to the particular distinguishing feature.

The main advantage of dependent claims, of course, is that they require far less time to examine, and those using them should be given a financial incentive. Note that, when any claim is allowed, all dependent claims, which are dependent upon the allowed claim, can also be allowed, without further examination for novelty or obviousness, other than to make sure they are dependent claims and satisfy 35 U.S.C. §112. In one case, *Ex parte Ligh*,⁷⁵ the Board of Appeals held that it was error to reject a dependent claim while allowing its parent. Of course, the dependent claim must be in proper form and not subject to any of the errors proscribed by the MPEP, as discussed elsewhere herein.

Section 282 of title 35 of the United States Code provides that "dependent claims shall be presumed valid even though dependent upon an invalid claim," in case there had been any doubt previously. These statutory changes have resulted in nearly universal usage of dependent claims, simplifying the jobs of everyone who must ever consider the patents.

In June 2004, the Federal Circuit rendered its decision in *Honeywell International*,

Inc. v. Hamilton Sundstrand Corporation ^{75.1} that appears to have so changed the definition of a dependent claim and to have so changed the effect of its use and its amendment during application prosecution that the practitioner should reconsider using dependent claims at all, or whether or how they should be amended. The *Honeywell* patent application, as filed, had an independent claim and a dependent claim dependent on the independent claim. Following rejection of the independent claim, but not of the dependent claim, during examination, the applicant's attorney canceled the independent claim and rewrote the dependent claim in independent form; that is, the attorney combined all of the elements of the independent claim and the dependent claim into a single new independent claim.

The Federal Circuit held that rewriting a dependent claim into independent form, coupled with the cancellation of the original independent claim, constitutes a claim scope narrowing amendment when the dependent claim included an additional claim limitation not found in the canceled independent claim or the dependent claim circumscribed a limitation found in the canceled independent claim. By definition, a dependent claim performs one of those two functions. The Federal Circuit said that there is a presumption of surrender of the broader subject matter of the original independent claim and a prosecution history estoppel arises because the amendment narrowed the scope of the original claim.

The patentee had argued that although the broad independent claim had been surrendered, there can be no presumption of surrender of the claim scope because the scope of the rewritten, now independent, but previously dependent, claim had not been narrowed. But the Federal Circuit disagreed, and said it was following the *Festo* precedent in finding that the claim amendment narrowed the overall scope of the claimed subject matter. The Court held that the patentee's clear surrender of subject matter via claim amendment presumptively barred application of the doctrine of equivalents to the new claim. The narrowing rewriting was a surrender of subject matter that had been originally claimed, for reasons related to patentability, creating a presumption of prosecution history estoppel. As a result, the patentee was presumed to have surrendered all equivalents to a claim element in the dependent claim that was never amended and never rejected by the Patent Office for any reason.

Interestingly, the Court held that the doctrine of equivalents cannot be applied to claim elements from the dependent claim that were incorporated into the previous, now cancelled, independent claim, or at least those claim elements which related to the issue of the patentability of the previous dependent claim. The Court did not bar application of the doctrine of equivalents to the unamended elements of the original, canceled independent claim.

In particular, in *Honeywell*, when the Federal Circuit applied the *Festo* cases ^{75.2} and found estoppel, the Court compared the canceled independent claim with the

rewritten independent claim, found that the canceled independent claim had not contained mention of an IGV limitation, while the formerly dependent claim had, and held that the patentee had presumptively abandoned equivalents of the IGV limitation. This was a much broader prosecution history estoppel than if the canceled independent claim had also mentioned some form of the IGV limitation. Thus, the subject of what had been the previous dependent claim will be subject to the *Festo* estoppel.

It appears to many practitioners that the holding of claim scope narrowing and a resulting *Festo* presumption of surrender and prosecution history estoppel, applies to claim limitations from the former dependent claim that were never objected to or rejected during prosecution of the application under 35 U.S.C. § 102, 103 or 112, paragraph 2, that is, for reasons of patentability, although the elements of the dependent claim were included in a claim amendment that was made possibly as a result of rejection of the independent claim. The *Festo* presumption of an estoppel applies to a claim element that was never actually amended for a reason of patentability and was never amended after objection or rejection and never narrowed in scope, at least as it concerns the words of the dependent claim.

The court holding appears to be contrary to §112, paragraph 4, which states "[a] claim in dependent form shall be construed to incorporate by reference all limitations of the claim to which it refers." It appears to practitioners that amending a dependent claim to explicitly recite elements that were already implicitly part of the claim pursuant to §112, paragraph 4 does not change the scope of the claim and thus should not be viewed as a narrowing amendment. If it is not a narrowing amendment, then the amended claim does not meet the test for the presumption of *Festo II*, and the inquiry as to whether there is a prosecution history estoppel should end.

If the *Honeywell* decision stands after a likely further appeal, it may affect how claims are initially written and how they are amended. At first look, it appears that the use of dependent claims is not to be favored, so that one expects to see use of more independent claims. Dependent claims have a smaller per claim filing fee and are easier for the Examiner to examine, as they expressly recite fewer elements. Thus, greater use of independent claims appears to be counterproductive for the prosecution process, but perhaps necessary to insulate claims from a prosecution history estoppel that may prevent their later construction using the doctrine of equivalents.

Although the following issue has not yet been addressed, for consistency, the *Honeywell* decision should be applied to two independent claims sharing a first group of claim elements of the same scope (even if different words are used), wherein the shared elements are the entirety of one of the claims, and wherein the other claim includes more elements. Cancelling the independent claim with fewer

elements, while retaining the other independent claim should be treated as a *Honeywell*-type narrowing of the retained independent claim with the same prosecution history estoppel effect. This would apply to two independent claims that differ as to elements if one of the independent claims might previously have been included in a second, dependent claim. More broadly, the *Honeywell* decision should apply in any situation where there are two claims having essentially the same elements, independent or dependent, with one of the claims having additional elements, and where the claim with fewer elements is cancelled during prosecution.

The author hereof expects that issues concerning the scope of amended claims will arise frequently so that eventually, there will be clear guidance on how to construe an independent claim that is created by amendment combining an unamended but canceled independent claim with an unamended previously dependent claim and also how to construe the surviving uncanceled one of two independent claims.

Honeywell was foreshadowed by *Ranbaxy Pharmaceuticals, Inc. v. Apotex, Inc.* ^{75.3} The application there originally included one independent claim and nine dependent claims defining particular solvents useful with the substance claimed in the independent claim. The independent claim and several of the dependent claims, but not dependent claims 3, 5 and 7, had been rejected for indefiniteness and obviousness. Claims 3, 5 and 7 were objected to because their antecedent independent claim had been rejected. But the Examiner said those claims would be allowable if they were to be rewritten in independent form. The patentee canceled all of the claims and submitted a new independent claim including a Markush Group listing the three solvents that had been recited respectively in canceled dependent claims 3, 5 and 7. As in *Honeywell*, the new independent claim was effectively no different in the elements and limitations it recited than previously indicated as allowable, dependent claims 3, 5 and 7.

The Federal Circuit held that there had been amendments to the claims which surrendered subject matter for reasons related to patentability, citing *Festo I* ^{75.4} which generally stated that an applicant for a patent who clarifies an ambiguous word, improves the translation of a foreign word or rewrites a dependent claim as an independent claim may not intend to surrender subject matter, but that the actual surrender, if it occurs, limits the application of the doctrine of equivalents through prosecution history estoppel. The mere rewriting of a dependent claim into independent form affects the scope of the subject matter substantially.

The amendments were found to further define and circumscribe an existing limitation for the purpose of putting the claims into condition for allowance. Additional claim language in the new claim narrowed the "highly polar solvent" in canceled independent claim 1 to a defined group of solvents in the Markush Group in the new independent claim. The Court held that the patentee is presumed to have surrendered the equivalents that may have been encompassed by "highly polar

solvent."

Note that in *Ranbaxy* the prosecution history estoppel prevented the doctrine of equivalents from being applied, not to any of the specific solvents that had been recited in the canceled dependent claims, but rather to the antecedent generic element, the highly polar solvent, that had appeared in the original cancelled independent claim. By this reasoning, equivalents of the three solvents in the Markush Group could also be held to fall within the scope of the new independent claim. However, it is reasonable to infer from the subsequent *Honeywell* case that equivalents of the specific solvents listed in the Markush Group have also been surrendered by a prosecution history estoppel. Equivalents of those solvents would no longer be construed as included within the scope of the new claim.

This area of patent claim interpretation is under development and cases will make its application clearer.

There is no maximum limit on the total number of claims that may be included in an application, nor on the number of dependent claims. There are practical limits on the number of claims and typically of dependent claims. Attorney time spent in writing claims increases as the number of claims increases. But valuable patent protection can result from including more claims, so that the attorney time factor is of little importance, if saving it reduces the comprehensiveness of the coverage. Another practical limit is an extra Patent and Trademark Office fee for a total of more than twenty claims. That fee is relatively small, if the additional claims are of value to cover the invention.

There is no limit to the number of claims in a chain of dependent claims headed by an independent claim.

Identically worded dependent claims may be dependent from different parent claims. ⁷⁶ In *Ex parte Primich*, ⁷⁷ it was held improper to reject a dependent claim as adding only old elements to an allowed parent claim, as long as the total number of claims was not "unduly multiplied" (section 8:3).

In general, the dependent form should *never* be used unless one is sure that he really wishes to present a claim that includes every limitation of the prospective parent claim, but adds some significant element or feature. He must satisfy himself that every limitation in the first claim is also necessary in the second. There may be a tendency among some who use dependent claims extensively to overuse them, by failing to present a second independent claim, where appropriate, that does not include all of the limitations of the first claim. United States practice has no requirements that any one claim be a "head claim," or otherwise dominate every other claim in the application. There may be as many head claims as the invention and the prior art permit, subject only to fees (section 2:12) and to restriction

requirements under 35 U.S.C. §121 and Office policy implementing that section.⁷⁸ However, once it has been determined that the claim scope desired does include all elements of a preceding claim, then it is recommended that the dependent form ordinarily be used.

A dependent claim is not improper and does not cease to be a proper dependent claim because any further limitation added by it appears to change the scope of the dependent claim from the scope of the claim from which it depends.

There is no objection per se to a claim in one statutory class (for example, product) being dependent from another claim in a different statutory class (for example, method), as long as the dependent claim does include all the limitations of the parent claim: that is, "it shall not conceivably be infringed by anything which would not also infringe the basic claim."⁷⁹ This is the Patent and Trademark Office's definition of whether a claim is in fact independent, despite the fact that an alleged dependent claim might refer to another claim by numeral. Clearly, if a claim purports to be dependent, but does not comply with the requirements of the MPEP, that claim should be rewritten as independent.

MPEP § 608.01(n) and 2173.05(f) provide examples of dependent claims crossing statutory classes. Thus, the preceding claim may recite a product, while the properly dependent claim recites a method of making that product in a particular manner, because the dependent claim could not be infringed without also infringing the preceding claim. Similarly, the preceding claim may recite a method of making a product and a product made by that method (product by process) could be a proper dependent claim. In contrast, if the preceding claim recites a method of making a product, a dependent claim to the product identified in the preceding claim would not be a proper dependent claim if the product could be made in other ways, that is, there is no restriction in the dependent claim to the product produced only by the previously claimed method.

A dependent product claim should not add mere method limitations, that is, a function or operation performed by a previously claimed feature. It should not merely make a functional recitation about something that occurs. A recitation of function does not provide a distinction over prior art.⁸⁰ Yet, it does limit the scope of the claim limitations.⁸¹ If either adding a mere method limitation or reciting a function is desired, consider framing it in means for accomplishing the function form, either introducing a completely new element as the means or indicating that the previously named element is that element for performing the function, or using 35 U.S.C. §112 language by saying that it is a means for accomplishing the particular function.

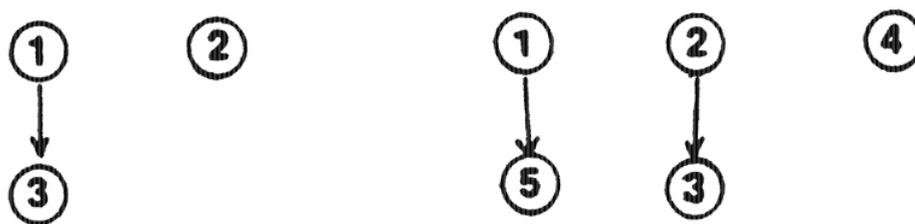
With respect to claims crossing statutory classes, dependent "product-by-process" claims (section 5:2) are very common: "A produced in accordance with the

method of claim 1." ⁸² However, a claim to "A method of making the of claim 1" would not be proper because a method claim should not be dependent upon a product claim, and vice versa except product by process. Method and product claims should be separated, as by using separate independent claims.

The preceding discussion has dealt with the typical dependent claim which follows on the preceding recited claim. A claim may refer to a preceding claim to define a limitation, for example, a product by process claim (section 5:2) or the example in MPEP ?2173.05(f): "A method of producing ethanol comprising contacting amylose with the culture of claim 1 under the following conditions. . . ." This claim crosses statutory classes and defines only one element in the claim in terms of the claim on which the later claim is dependent. The typical dependent claim further defines the earlier claim rather than being defined by it. But both types are acceptable.

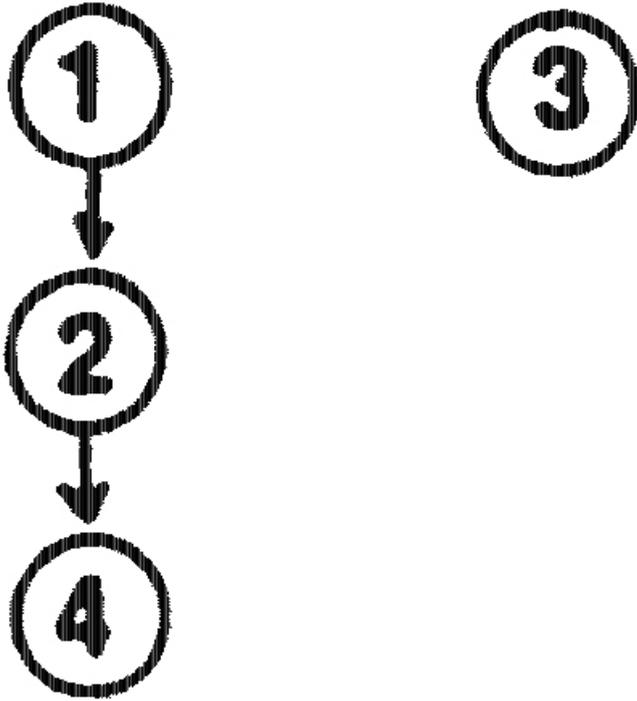
Dependent claims that are different in scope from each other may even relate to separate inventions and each may require a separate search by the examiner, or each may be separately classified and each may be subject to a requirement for restriction between inventions. Nonetheless, each could be a proper dependent claim, particularly for ⁸³ fee calculation purposes.

With respect to the numbering and order of dependent claims, the general rules set out in section 2:3 should be followed, but in addition MPEP ?608.01(n) states: "A claim which depends from a *dependent* claim should not be separated therefrom by any claim which does not also depend from said 'dependent' claim." This means that the following claim patterns are permitted (arrow indicates a claim dependent from earlier numbered claim; no arrow designates a second independent claim):



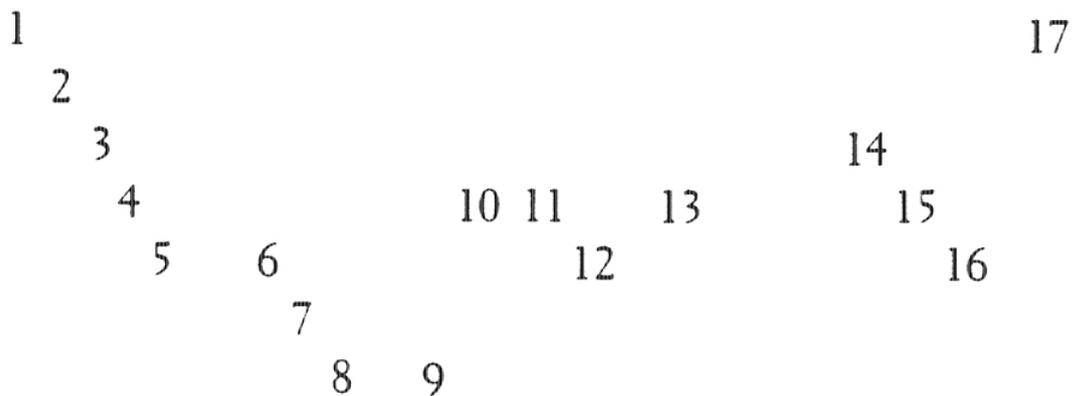
Dependent claims (3 and 5) may be separated from *an independent* parent claim (1) by any number of other claims of any kind.

The following pattern is not usually accepted:



Claim 4, here, is a claim that depends from a *dependent* claim (2), but is separated therefrom (from 2), by a claim (3), that "does not also depend from said dependent claim" (Claim 2). This is not recommended.

Also, where there is a chain of dependent claims in sequence, each dependent upon a preceding claim, that chain should (but not *must*) be run out to its last claim before returning to an earlier claim in the sequence for starting another chain. Further, although not required, return to the higher number claim first to run out its sequence before returning to a lower number claim. Note the following claim pattern in which only Claims 1 and 17 are independent:



In the above sequence, for example, note that one chain from Claim 6 to Claim 8 is run out, then the chain back from Claim 7 to Claim 9, because we returned to the

highest number claim first, then back to Claim 6, the next highest claim, then back to Claim 3, next highest and then Claim 2. If an examiner allows one claim, like Claim 6, it is easy to find the next claims, which are dependent upon Claim 6, allowable as well.

The above rules set forth a *minimum* standard on placement of dependent claims. Beyond this, claims that depend from independent claims may be placed wherever the writer thinks most logical. However, unless unusual factors are present (such as claims in different statutory classes), it is best to group all claims dependent from a single independent claim after that claim.

One simple format for dependent claims follows (refer to example in chapter 3):

14. A shaking apparatus as recited in claim 1, in which the oscillating means comprises:

(a) a motor;

(b) a rotary cam driven by the motor;

(c) a cam follower engaging the cam; and

(d) a link pivoted at one end to the cam follower and at its other end to the container, to permit oscillation of the container on the legs.

In Claim 14, one of the elements of the parent claim is defined in greater detail; specifically, the "means" element is broken down into four constituent parts. Note that the new elements must be connected and related to each other and to the elements of the preceding claim, exactly as with independent claims (section 3:19). With respect to antecedents (section 3:11), it is proper to refer to an element of a parent claim as "the" or "said"; "the container" in Claim 14 finds its antecedent in Claim 1. One must consider all preceding claims in the chain to be certain it is perfectly clear that there is only one such element that fits the definition.

When preparing dependent claims, one must be careful not to add as an apparently new element, an element already in the parent claim. This is "double inclusion" of elements (section 3:9). For example, in the previous Claim 14, the motor cam, etc., added by the dependent claim comprise the oscillating means of the parent claim. It would be improper to add those elements as new elements without relating them to the oscillating means of the parent claim.

In order to illustrate a dependent claim that adds an element to a preceding claim, refer to Example III in chapter 3, the take-up barrel. Assume that a photocell circuit (not shown) is provided to detect when the barrel 12 is full, and that this photocell

operates (1) a pair of shears positioned between the barrel and the eyelet 20 to cut the strand 11, and also (2) an accumulator positioned between the eyelet and capstan 13 to collect the strand for a short time while a new barrel is placed on the turntable. A dependent claim to this combination might read as follows:

15. A collecting apparatus as recited in claim 2, further comprising: means for detecting when a predetermined amount of strand has been collected in the barrel; a cutter, operated by the detecting means, for severing the strand when the predetermined amount has been collected; and an accumulator, operated by the detecting means, for accumulating the strand after it has been severed.

Note that "a cutter" should have a broader scope than "cutting means," so that the "means" expression, while possible, was avoided.⁸⁴ However, a photocell is not so broad as "detecting means" so that the means expression was used. A weight-responsive switch could equally well have been employed to sense the time when the barrel was full. But the alternatives must have been disclosed in the specification or have been recognized as equivalents at the time the application was ruled.⁸⁵

Another format for adding an element to a claim follows: "A collecting apparatus as recited in claim 2, wherein means are provided for detecting when . . ." There are many other acceptable styles for introducing a dependent claim.

One caution with dependent claims, particularly where elements are added, is to make certain that the larger combination is still consistent with the preamble, as discussed in section 2:4. Sometimes the extra elements add so many additional functions that the old preamble is no longer suitable. Although it is possible, and fairly common, to modify the preamble by a dependent claim, it is often best simply to use another independent claim.

For example, if the previous example also included automatic means responsive to the photocell to push the full barrel off the turntable and substitute an empty barrel, plus means for sensing the presence of the empty barrel on the turntable to reverse the accumulator and start collecting the strand in the new barrel, there is now significantly more than a *mere* "apparatus for collecting an advancing strand in a barrel." Instead, there is a much more impressive combination: "Automatic apparatus for continuously collecting an advancing strand in a succession of barrels." The continuous/automatic feature would undoubtedly be very important in such an invention, and should be written into the preamble. This is a main, overall feature of the combination claimed. As a dependent claim with a modified preamble, this could read: "A collecting apparatus as recited in claim 15, for automatically collecting an advancing strand in a succession of barrels. . . ." Where the dependent claim modifies the preamble of the parent, this should be stated in the preamble of the dependent claim.

An example of a form for a dependent method claim:

A method of, as recited in claim, wherein the separating step is performed by [or comprises] distilling the aqueous solution . . . [defining a step in more detail].

When preparing dependent method claims, the added limitations usually relate to variations in the method steps or materials used in the case of a chemical process (section 4:7). Dependent method claims now sometimes add only apparatus (machine) limitations.

An example of a dependent method claim, adding steps, which is correct:

15A. A method of collecting an advancing strand, as recited in claim 4, further comprising: detecting when a predetermined amount of strand has been collected in the barrel; cutting the strand when the predetermined amount has been collected; and accumulating the strand after it has been cut.

Note this corresponds in scope to dependent apparatus Claim 15. For a chemical process, see Claim 5 in section 4:7 as the parent claim:

5A. A process as recited in claim 5, wherein the solution is heated to a temperature of 80[degrees] to 90[degrees]C. [adding preferred process conditions].

5B. A process as recited in claim 5, wherein the solution also contains between 1 and 5% by weight of sodium chloride [telling more about the composition].

With respect to composition claims, dependent claims may add further materials to the composition or define one or more of the elements or radicals more specifically. For example, in the zinc-electroplating solution claim (Claim 11, section 6:1) one could claim:

11A. A zinc electroplating solution as recited in claim 11, wherein the pH modifying substance is ammonium hydroxide [specifying one ingredient in greater detail].

Note it would be wrong to add "further comprising ammonium hydroxide" if this is the pH modifying substance because the proscribed transition implies the ammonium hydroxide is a newly identified claim element and not further specifying the already identified pH modifying substance.

Another example:

11B. A zinc electroplating . . . , further comprising 0.5 to 1 gram per liter of boric

acid [adding a material].

One could also specify the concentrations of ingredients in more detail:

11C. . . . , wherein the concentration of zinc acetate is 50-60 grams per liter, and the citric acid 100-150 grams per liter.

In Claim 12 to the new molecule, one could specify the radicals in more detail:

12A. A compound as recited in claim 12, wherein R is methyl and X is chlorine. ⁸⁶

Warning to one who amends claims: An often occurring mistake in claim drafting is made during the claim amendment process. When the claims are initially written before the application is filed, the drafter is careful about separating separate features into respective claims. During prosecution of the application, an examiner may indicate that some dependent claim, which is in turn dependent upon a chain of preceding dependent claims, would be allowable if rewritten in independent form. Sometimes the practitioner rewrites that allowable dependent claim as an independent claim by including in it all of the limitations from all of the independent and dependent claims in the claim chain leading to the allowable dependent claim. This introduces many limitations into the resulting allowable independent claim which are directed to a preferred embodiment shown in the disclosure but which are not critical to the allowability of that rewritten independent claim. The resulting unnecessarily limited independent claim is a much less effective tool against competitors and copyists. The allowable dependent claim could have been rewritten as independent by including in the original or unamended independent claim only the one or more critical limitations from the allowable dependent claim, without also adding all of the limitations from all of the dependent claims in that chain to the dependent claim. Therefore, when drafting or redrafting independent claims, both at the time of filing and during prosecution, the independent claim should be as broad in scope as the prior art permits. Limitations from other claims, which are not limitations essential to the allowance of that independent claim, should not be added into that otherwise allowable independent claim.

Summary

Use dependent claims extensively, most of the time when you wish to present a second claim that adds elements or features to a prior claim, whether the prior claim is dependent or independent. Either tell more about elements in the previous claim, or add elements to that claim, or both. But you must further restrict a previous claim in some manner. Be careful, in practice, with dependent claims, particularly those adding detailed features, that you really need every feature of the main claim for patentability. If not, stop and write a new independent claim.

FOOTNOTES:

Footnote 73. MPEP §608.01(n).

Footnote 74. There is an apparently unresolved paradox of a structural element claim, which is dependent upon a means for performing a function element claim, receiving broader scope than the means claim. This is because the means claim element is governed by 35 U.S.C. §112, paragraph 6, while the structure claim is not, and the latter may be of broader scope (see section 3:25). *Cf.* *IMS Tech., Inc. v. Haas*

Automation, Inc., 206 F.3d 1422, 54 U.S.P.Q.2d (BNA) 1129, 1135 (Fed. Cir.

Footnote 75. *Ex parte Ligh*, 159 U.S.P.Q. (BNA) 61, 62 (Board of Patent Appeals and Interferences 1967).

Footnote 75.1. *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 71 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004), *cert denied*, 125 S. Ct. 2928 (2005).

Footnote 75.2. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 112 S. Ct. 1831, 62 U.S.P.Q.2d (BNA) 1705 (2002) and then 344 F.3d 1359, 68 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 2003) ("*Festo I*"), also citing *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 75.3. *Ranbaxy Pharms., Inc. v. Apotex, Inc.*, 350 F.3d 1235, 69 U.S.P.Q.2d (BNA) 1086 (2003).

Footnote 75.4. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 56

U.S.P.Q.2d 1865 (Fed. Cir. 2000) (*en banc*) ("*Festo I*"), *vacated*, 535 U.S. 722, 112 S. Ct. 1831, 62 U.S.P.Q.2d (BNA) 1705 (2002), *but later partially reinstated*, 344 F.3d 1359, 68 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 2003) ("*Festo II*").

Footnote 76. *See In re Flint*, 162 U.S.P.Q. (BNA) 228 (C.C.P.A. 1969) (discussed in section 62).

Footnote 77. *Ex parte Primich*, 151 U.S.P.Q. (BNA) 737 (Board of Patent Appeals and Interferences 1966).

Footnote 78. Rule 141 and MPEP §806.04 *et seq.*

Footnote 79. MPEP §608.01(n).

Footnote 80. *Clements Indus., Inc. v. A. Meyers & Sons Corp.*, 712 F. Supp. 317, 12 U.S.P.Q.2d (BNA) 1874 (S.D.N.Y. 1989).

Footnote 81. *Hollister, Inc. v. E.R. Squibb & Sons, Inc.*, 14 U.S.P.Q.2d (BNA) 2069 (Fed. Cir. 1990).

Footnote 82. See MPEP §2173.05(f).

Footnote 83. See section 2:12, *infra*.

Footnote 84. See section 3:25, *infra*.

Footnote 85. 35 U.S.C. §112, paragraph 6; see section 3:2.5.

Footnote 86. Note this is a claim to one specific compound, sometimes called an "ultimate species." See section 6:9 on genus and species claims.

§2:10 Independent Claims

Three forms of claims are used in patent applications, independent, dependent, and multiple dependent. Their use is significant for fee purposes.

An independent claim stands alone, includes all its necessary limitations, and is not dependent upon and does not include limitations from any other claim to make it complete. An independent claim is not defined in the rules or the Manual, but is part of the discussion in MPEP §608.01(n).

An independent claim can be the broadest scope claim. It has fewer limitations than any dependent claim which is dependent upon it. At least one independent claim in an application should, as much as possible, approach purely covering the inventor's invention or concept without too many structural limitations.

Sometimes an invention involves a number of different concepts. The invention simultaneously solves several different problems or has several different objectives. Sometimes different structures related to the same invention or embodiment of the invention are involved in the solution of each of the problems or achieving each of the objectives. It may not be possible to write a claim that is broad enough, in view of prior art, to be generic to and to read on the different inventive concepts in one embodiment or upon the different embodiments of one invention in one patent application. Consequently, several independent claims may be used, each covering a structure or method which solves a particular problem or achieves a particular objective within the invention or each covering a different inventive concept, possibly different cooperating sections, of one embodiment, or each covering different embodiments of one invention or inventive concept. Several independent

claims in an application may share many of their claim limitations in common. But they can differ, in that others of the limitations will be specific to the particular invention, or concept or embodiment that is the subject of the particular independent claim. For fullest protection, use the number of independent claims required to cover the solutions to all problems solved by the invention. Where possible, avoid using separate independent claims for each embodiment, if a generic independent claim covering all embodiments can be written. Then the various embodiments can be covered expressly in individual dependent claims. But do not avoid coverage of all embodiments to be claimed by failing to use independent claims when no patentable generic independent claim can be written.

For more than three independent claims, there is an elevated filing fee per independent claim. This is a practical or economic limitation on the number of independent claims. But if the claim drafter gives the client the fullest independent claim protection and one of those independent claims in the issued patent happens to be an obstacle to a competitor, the increased filing fee loses significance.

Amending claims during prosecution of an application by cancelling an independent claim and rewriting a dependent claim that had been dependent upon the cancelled claim into independent form, including all elements of the cancelled independent claim and of the dependent claim, has recently been construed as different than an original independent claim with all of the elements of the cancelled independent claim plus all of the elements of the dependent claim.^{86.1} This is discussed in detail in the preceding section 2:10 on dependent claims. Greater uses of independent claims at the initial filing of the application may be recommended.

FOOTNOTES:

Footnote 86.1. *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 71 U.S.P.Q.2d 1065 (Fed. Cir. 2004).
2:11 Multiple Dependent Claims

Multiple dependent claim practice is stated in Rule 75(c) and is described in detail in MPEP §608.01(n). Rule 75(c), in pertinent part, reads:

Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. . . . A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

The Manual subsection details these points.

The multiple dependent claim should refer to the other claims on which it is dependent in the alternative ("or" not "and") only. The Manual subsection provides examples of acceptable multiple dependent claim preamble wording, which are reproduced below.

A. Acceptable Multiple Dependent Claim Wording

Claim 5. A gadget according to Claims 3 or 4, further comprising--

Claim 5. A gadget as in any one of the preceding claims, in which--

Claim 5. A gadget as in any one of Claims 1, 2, and 3, in which--

Claim 3. A gadget as in either Claim 1 or Claim 2, further comprising--

Claim 4. A gadget as in Claim 2 or 3, further comprising--

Claim 16. A gadget as in Claims 1, 7, 12 or 15, further comprising--

Claim 5. A gadget as in any of the preceding claims, in which--

Claim 8. A gadget as in one of Claims 4-7, in which--

Claim 5. A gadget as in any preceding claim, in which--

Claim 10. A gadget as in any of Claims 1-3, 7-9, in which--

Claim 11. A gadget as in any one of Claims 1, 2 or 7-10 inclusive, in which--

If a multiple dependent claim does not refer back to previous claims in the alternative only, it is unacceptable, as shown by the examples in the Manual:

1. Claim Does Not Refer Back in the Alternative Only

Claim 5. A gadget according to Claim 3 and 4, further comprising--

Claim 9. A gadget according to Claims 1-3, in which--

Claim 9. A gadget as in Claims 1 or 2 and 7 or 8, in which--

Claim 6. A gadget as in the preceding claims in which--

Claim 6. A gadget as in Claims 1, 2, 3, 4 and/or 5, in which--

Claim 10. A gadget as in Claims 1-3 or 7-9, in which--

The multiple dependent claim, as any dependent claim, must refer back to a preceding claim, and should not refer to a claim that follows the dependent claim. Unacceptable examples of such claims appear in the Manual:

2. Claim Does Not Refer to a Preceding Claim

Claim 3. A gadget as in any of the following claims, in which--

Claim 5. A gadget as in either Claim 6 or Claim 8, in which--

Finally, the Manual section provides an example of an unacceptable multiple dependent claim, which refers to two sets of claims covering different features and provides the following example.

3. Reference to Two Sets of Claims to Different Features

Claim 9. A gadget as in Claim 1 or 4 made by the process of Claims 5, 6, 7, or 8, in which--

Such a claim is multiple dependent with respect to the gadget and then multiple dependent again with respect to the process. It would appear that a claim trying to accomplish the same purpose, but not doubly multiple dependent, may be acceptable, such as: "9. A gadget as in Claim 1 or 4 made by the process of Claim 5." It would be acceptable, as there is only one multiple dependency in that claim, either the combination of Claims 1 and 5, or the combination of Claims 4 and 5. Clearly, that Claim 9 could easily be written as only two dependent claims, namely the combination of Claims 1 and 5 and the combination of Claims 4 and 5.

A multiple dependent claim cannot depend from any other multiple dependent claim. Rule 75(c) simply prohibits it. Multiple dependent claims dependent upon other multiple dependent claims are proper in other countries, but not in the United States. An example of such an improper claim is:

Claim 1. A widget, comprising . . .

Claim 2. The widget of Claim 1, further comprising . . .

Claim 3. The widget of Claim 2, wherein . . .

Claim 4. The widget according to either of Claims 2 or 3, further comprising . . .

Claim 5. The widget of either of Claims 3 or 4, wherein . . .

Claim 5 is improper as it is a multiple dependent claim dependent upon another multiple dependent claim, namely Claim 4. One reason for not permitting such a claim is that the precise scope of a particular claim is rendered uncertain due to the wide variety of combinations of claim limitations that arise from multiple dependent claims dependent upon other multiple dependent claims. A second motivation for prohibiting such multiple dependent claims is that such claims cannot be clearly separated into individual claims for fee calculation purposes.

Where there are not an excessive number of possible claim combinations, an improper claim like Claim 5 can be replaced by two proper claims:

Claim 6. The widget of Claim 4, wherein . . .

Claim 7. The widget according to Claim 3, wherein . . .

Claim 6 is a single dependent claim dependent upon a multiple dependent claim and is proper. A series of single dependent claims depending from a multiple dependent claim is proper. Claim 7 is a single dependent claim dependent upon another such claim and is of course proper. (Note the sequencing of Claims 6 and 7. The chain of dependencies from the higher number Claim 4 is run out before returning to the chain for the earlier lower number Claim 3.)

Where the applicant presents a multiple dependent claim dependent upon another multiple dependent claim or one reciting the dependency in the conjunctive "and" rather than the alternative "or," examiners follow the practice under Rule 75 of objecting to the claim as not being in proper form. Then examiners need not, and often do not, further treat the claim on the merits, so that the claim is not examined any further on either procedural or substantive grounds⁸⁷ until it is corrected.

For purposes of examination, a proper multiple dependent claim may be treated effectively as separate claims by the examiner, so that Claim 3 dependent upon Claim 1 (that is 3/1) could be subject to one ground of rejection while Claim 3 dependent upon Claim 2 (3/2) may be allowable, because of the presence of certain limitations in Claim 2.

Summary

Multiple dependent claims may be used. Their preamble form is important. A multiple dependent claim cannot be dependent on another such claim. They have high filing fees, as compared with other claim forms, as discussed next.

FOOTNOTES:

Footnote 87. 35 U.S.C. § 112, 102, or 103.

2:12 Fees Payable for Claims

The distinctions among the three forms of claims (independent, single dependent, and multiple dependent) discussed in the preceding sections have significance because of filing fees paid by applicants to the Patent and Trademark Office. The official filing fees are dependent upon the number and nature of the claims included in the application. The precise fees payable for particular numbers and forms of claims is periodically changed by the Patent and Trademark Office. The amounts of the claim fees now appear in rule 16(b), (c), and (d).

The basic filing fee for a patent application covers a total of twenty claims, whether independent or dependent, and covers a total of three independent claims, regardless of the total number of claims. Two separate claim fee computations are therefore made. For any claim in excess of a total of twenty claims, whether it be independent or dependent, there is an additional claim filing fee. For every independent claim in excess of three, regardless of the total number of claims, there is an additional claim filing fee. Thus, if there are twenty-one claims, of which only one is an independent claim, there is an additional filing fee for one additional claim. If there are fewer than twenty claims, including four independent claims, then there is an additional filing fee for one additional independent claim. If there are twenty-one claims, including four independent claims, there are two additional filing fees due, one for the one claim beyond twenty and one for the one independent claim beyond three.

It is apparent from the fees payable that the Patent and Trademark Office wishes to encourage the use of dependent claims, as the additional filing fee for independent claims arises after only three independent claims are in the application while there is no additional fee until many more dependent claims are in the application.

Multiple dependent claims have high filing fees, which tends to discourage their use. The fee calculation for multiple dependent claims is detailed in MPEP 2608.01(n):
35 U.S.C. 41

(a) provides that claims in proper multiple dependent form may not be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim is considered to be that number of dependent claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim is also considered as the number of dependent claims as referred to in the multiple dependent claim from which it depends.

Examples of the fee calculation for all claims appear at MPEP 2608.01(n).

For example, if Claim 3 in a set of claims is dependent upon both of Claims 1 and 2, then for fee calculation purposes, Claim 3 is counted as two claims. If Claim 4 in the same set is dependent upon Claim 3, then Claim 4 is treated as the same number of

claims as Claim 3 for fee calculation purposes, whereby Claim 4 is treated as two claims for fee calculation purposes. (If a multiple dependent claim were permitted to be dependent upon another multiple dependent claim, the fee calculation process would be impossible. However, the Patent and Trademark Office charges a fee of one dependent claim for an improper multiple dependent claim, one either dependent on another multiple dependent claim or one dependent upon two other claims in the conjunctive "and," rather than the alternative "or". The improper claim is rejected and not examined on the merits.) It is apparent that with multiple dependent claims, the total number of claims for fee calculation purposes rapidly can exceed twenty claims, and additional claim filing fees will thereafter become due.

Because a multiple dependent claim is treated as more than one claim for fee calculation purposes, the computation to determine when twenty claims has been exceeded for fee calculation purposes does not refer to the total number of claims, but rather to the number of claims for fee calculation purposes, and with multiple dependent claims present, an additional filing fee is due before the total number of claims exceeds twenty.

There is a separate one-time surcharge asserted on the basic filing fee on the first occasion (at filing or upon amending the claims) that the application contains any multiple dependent claims at all, that is, any number of such claims.⁸⁸ This tends to discourage the use of multiple dependent claims, but it is not a prohibition against them. If the multiple dependent claims are present when the application is filed, the surcharge is due then. If such a claim is added after filing, the surcharge is due then. If a multiple dependent claim is present in the application as filed, it can be eliminated at filing by simultaneously filing a preliminary amendment deleting or removing the multiple dependency from the claim and by noting in the remarks to the amendment that it has been made to avoid the multiple dependent claim fee.

FOOTNOTES:

Footnote 88. Rule 16(d).

?2:13 Amending a Filed Claim

Infringement of a patent claim requires that every element recited in the claim be present in the accused product or process either literally, that is, the words of the claim element can be read precisely on a corresponding element of the accused product or process, or under the doctrine of equivalents, that is, there are insubstantial differences between the claim element and the corresponding element of the accused product or process. The presence of such differences is typically determined using the test of whether the element of the accused device or process performs substantially the same function in substantially the same way to achieve substantially the same result as the corresponding element of the claim.

Infringement and equivalence are assessed claim element by element.

The interpretation of a claim element or limitation can be affected by amendment of the claim after the claim is filed and during the prosecution of the application. In *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*,⁸⁹ the Federal Circuit, in 2000, ruled that any claim amendment that narrows the scope of a claim element and that is made for reasons related to patentability of the claim, whether it be on account of ?112, ?102 or ?103, would provide a complete bar against equivalence infringement for the amended claim element (but not for other claim elements). The Supreme Court, in 2002,⁹⁰ vacated that bright-line rule stated by the Federal Circuit and held instead that a narrowing amendment raises only a rebuttable presumption that the complete bar applies. The Supreme Court listed several circumstances that could rebut the presumption of surrendering a particular equivalent: "the equivalent may have been unforeseeable at the time of the application; the rationale underlying the amendment may bear no more than a tangential relation to the equivalent in question; or there may be some other reasons suggesting that the patentee could not reasonably be expected to have described an insubstantial substitute in question . . . The patentee must show that at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent."

On remand of *Festo*,⁹¹ the Federal Circuit held that a narrowing amendment made to comply with any provision in the Patent Act, including ?112, may invoke an estoppel, that a "voluntary" amendment may give rise to an estoppel and that there is a presumption that any narrowing amendment was made for a substantial reason related to patentability. The Federal Circuit then explained that the first question is whether an amendment narrowed the literal scope of a claim. The second question is whether the reason for the amendment was substantially related to patentability. If the prosecution history reveals no reason for the narrowing amendment, the patentee must rebut the presumption that the reason was related to patentability. If the presumption is not rebutted, the third question is the scope of the subject matter surrendered by the narrowing amendment. Numerous cases followed this reasoning.⁹² A claim amendment made to avoid prior art, coupled with attorney argument explaining the scope of the amendment, assists in construing the claim element or limitation.⁹³

The obvious way to avoid a *Festo* presumption is not to amend a claim at all. In a real application, this may be impossible. To avoid having to amend a claim in view of cited prior art, a thorough search for relevant prior art prior to the filing of an application may teach the practitioner the state of the art sufficiently that the practitioner can write claims that would be neither anticipated nor rendered obvious over prior art, avoiding the need to later amend a claim and thereby avoiding the possibility of having to narrow the claim and raise the *Festo* presumption. This may be impractical, because an Examiner may take a different view of the scope of the

prior art than the applicant's attorney, or the applicant's attorney may not have found the most relevant prior art that the Examiner eventually considers. Further, at the outset, the applicant's attorney could be restricting the scope of the applicant's claims in a manner that may deprive the applicant of a broader claim scope to which he might be entitled due to fear that the claims would be subject to the *Festo* presumption and that certain claim elements, but not the entire claim, could not be construed by application of the doctrine of equivalents due to a prosecution history estoppel. On balance, it is the author's view that if broader scope claim coverage can be obtained by claiming an element more broadly at the risk of a rejection and the need for a subsequent amendment, then the applicant benefits more from possibly obtaining a broader claim than from being precluded by the prosecution history from a range of equivalents for that element. A well-drafted claim, with claim elements appropriately broadly named and broad in scope, should be able to encompass most foreseeable equivalents of the claim element that are more specifically disclosed in the specification, without need for invoking the doctrine of equivalents.

Claim amendments can be expected. A claim amendment that broadens a claim, for example, that removes an element or a limitation or broadens its scope, is not subject to the *Festo* presumption. Further, some claim amendments are made to improve the language, replacing "said" with "the," or improving the grammar by moving words or thoughts to different locations without changing claim scope. Such amendments can be argued to fall outside the category of a scope-narrowing amendment and should successfully overcome the *Festo* presumption.

Another type of claim amendment which gives rise to the *Festo* presumption concerns canceling an independent claim and amending a dependent that had been dependent upon that independent claim to include all of the elements of the canceled independent claim, without otherwise amending the elements of either of the original independent and dependent claims. This is dealt with in *Ranbaxy Pharmaceuticals, Inc. v. Apotex, Inc.*⁹⁴ and the more recent *Honeywell International, Inc. v. Hamilton Sundstrand Corp.*⁹⁵ More detailed treatment of this claim-combining point appears in section 2:9 hereof concerning dependent claims. The amendment of a dependent claim to independent form has been held to create a *Festo* estoppel as to the scope of the elements of the previous dependent claim in the new independent claim and prevents application of the doctrine of equivalents to at least those elements on which patentability of the new independent claim is based. This issue is likely to receive further court review and is not yet a settled example of a *Festo* presumption.

Summary

Amending a claim by narrowing the scope of a claim element for a reason related to patentability, such as ¶ 102, 103 or 112, makes the amended claim element

ineligible construction under the doctrine of equivalents due to the prosecution history estoppel, with some conditions of exception.

Amending claims by cancelling an independent claim and amending a dependent claim to independent form, including the elements and limitations that had been in both claims is a claim scope narrowing amendment that precludes application of the doctrine of equivalents due to a prosecution history estoppel.

FOOTNOTES:

☛Footnote 89. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 56

U.S.P.Q.2d (BNA) 1865 (Fed. Cir. 2000) ("*Festo I*").

☛Footnote 90. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 112 S. Ct. 1831, 62 U.S.P.Q.2d (BNA) 1705 (2002).

☛Footnote 91. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 344 F.3d 1359, 68

U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 2003) ("*Festo II*").

☛Footnote 92. Talbert Fuel Sys. Patents Co. v. Unocal Corp., 347 F.3d 1355, 68 U.S.P.Q.2d

(BNA) 1691 (Fed. Cir. 2003); Pioneer Magnetics Inc. v. Micro Linear Corp., 330

F.3d 1352, 66 U.S.P.Q.2d (BNA) 1659 (Fed. Cir. 2003) wherein the presumptive surrender of equivalence was affirmed.

☛Footnote 93. Deering Precision Instruments LLC v. Vector Distrib. Sys., Inc., 347 F.3d 1314, 1324-25, 68 U.S.P.Q.2d (BNA) 1716 (Fed. Cir. 2003).

☛Footnote 94. Ranbaxy Pharms., Inc. v. Apotex, Inc., 350 F.3d 1235, 69 U.S.P.Q.2d (BNA) 1086 (Fed. Cir. 2004).

☛Footnote 95. Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp., 370 F.3d 1131, 71 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

?3:1 In General

The general rules and procedures discussed in chapter 2 will now be illustrated as they pertain to apparatus claims. The word "apparatus" is used generically to denote various machines and devices, including electrical circuits, computer-related

apparatuses, hydraulic devices, anything mechanical or electrical having cooperating parts that accomplish some useful result, usually some act or operation on itself or on an article or workpiece.

3:1.1 Example I--Shaker

Referring specifically to the form of shaker illustrated in Fig.-1 and Fig.-2 of Example I below, a sample independent claim specific to that structure (as distinguished from the structure in Fig.-3) reads as follows:

(Preamble) (Transition)	1. Apparatus for shaking articles, which comprises
	(a) a container for the articles;
	(b) a base;
(Body of Claim) (Elements in Subparagraph Form)	(c) a plurality of parallel legs, each leg is connected pivotally at one end to the container and at the other end to the base to support the container for oscillating movement with respect to the base; and
	(d) means for oscillating the container on the legs to shake the articles.

Note that the "elements" of the above claim are in italics for illustrative purposes only. The introduction "I claim" is understood and is not normally written, except just before the first claim in a patent application.

For comparison, the same claim in single paragraph form (section 2:8) reads:

1A. Apparatus for shaking articles which comprises a container for the articles, a base, a plurality of parallel legs, each leg is connected pivotally at one end to the container and at the other end to the base to support the container for oscillating movement with respect to the base, and means for oscillating the container on the legs to shake the articles.

EXAMPLE I: Shaker

SHAKER

FIG-1

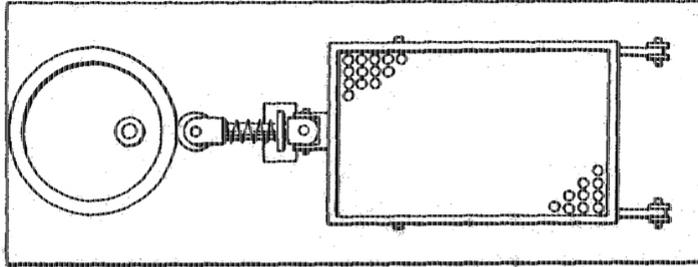


FIG-2

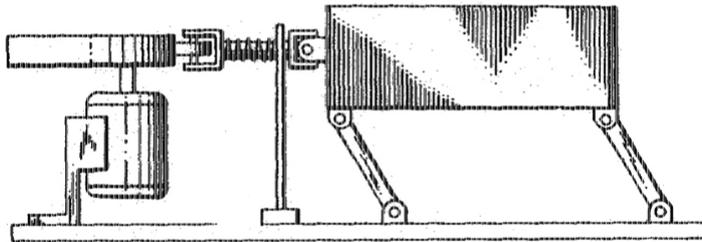
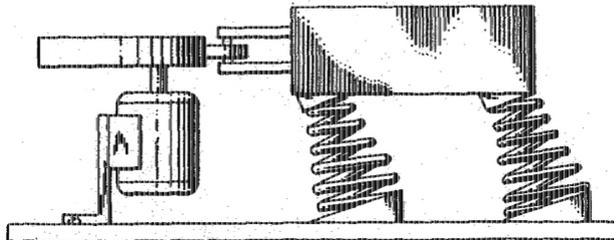


FIG-3



Note that Claim 1A is much more difficult to follow than the same claim in subparagraph form.

Summary

Use the subparagraph or outline claim form, and watch formal problems, punctuation, grammar, etc., as outlined in chapter 2.

§3:2 Preambles for Apparatus Claims

Preambles are discussed extensively above, in section 2:4.

Claim 1 illustrates one simple type of preamble, which is quite common and which can easily be used for most mechanical combination claims. Generally, this type of preamble follows the pattern: "*Apparatus for performing a specified act or operation on a particular article or workpiece, which comprises:*"

The article to be worked on, the workpiece, need not be defined in detail, unless such a description is important to the functioning of the apparatus or made necessary by the prior art.

The word "apparatus" is frequently used by patent practitioners as a sort of generic expression covering machines or other mechanical devices that perform operations on workpieces; however, phrases such as "a machine," "a device," or "a circuit" may be used where appropriate.

It should be apparent that the drafting of the body of the claim is simpler, and the claim is easier to follow, when the specific operation to be performed and the specific workpiece on which that operation is to be performed are clearly set out in the preamble.

Further examples of this type of preamble follow:

Apparatus for coating the inside of a tubular workpiece with a liquid thermoplastic resin

Apparatus for transferring articles from a first conveyor belt to a second conveyor belt running parallel to the first but in the opposite direction

A device for simultaneously attaching axial leads to opposite ends of an electrical component

A circuit for detecting discontinuities in the insulation of an insulated wire

In cases where the apparatus has a generic name, that may be used; for example:

A binary computer

A self-propelled lawn sprinkler

A carburetor

A shaker for articles [an equally acceptable preamble for Claim 1]

Use of a preamble referring to apparatus by its generic name in the preamble is preferred because it may shorten the length of the preamble and it tells the reader and the Patent and Trademark Office in what technology area the invention belongs. Later searching for the patent by subject matter, for example, by a computer search, is easier if a recognized generic name is used for the apparatus.

Other types of preambles are used for special situations (as discussed in chapter 7) and in some chemical compound cases (chapter 6).

Occasionally, one sees a claim such as "In combination, [an A, a B, and a C]." One use for this type of preamble is for inventions so broad that any attempt to name the thing to be claimed would be too narrow. Of course, if Claim 1 on the shaker started out only "In combination," that would be uselessly misleading since the claim itself was intended to be limited to an apparatus for shaking articles. Therefore, there is no reason to avoid using a normal preamble.

Another use for the preamble "In combination" is when a previously claimed subcombination is joined with the remainder of a combination in a dependent claim, dependent upon a preceding subcombination claim: "In combination, the means for oscillating a container of Claim 2, and a container, the container is connected with the oscillating means for . . ."

Also, the Manual and cases¹ have held that statements in the preamble may not be disregarded in determining patentability. All of the claim is considered, including the preamble. Usually, the preamble is or includes a statement of intended purpose. Whether a preamble of intended purpose constitutes a limitation to the claim is a matter determined on the facts of each case in view of the claimed invention as a whole.² Thus, descriptive preambles can be quite helpful in obtaining allowance of the claim. Sometimes a statement of intended purpose is included in the body of the claim, as in a "whereby" clause (section 3:23), rather than in a preamble. There the statement is considered a claim limitation. The *Duva* case is discussed in more detail in section 6:7 on new use claims; preamble limitations.

Summary

Select a descriptive preamble describing the overall function of the machine to be claimed, either a distinctive name, such as "power lawn mower," or a made-up phrase, such as "apparatus for [performing a specified function]."

FOOTNOTES:

¹Footnote 1. MPEP §2111.02; *In re Duva*, 156 U.S.P.Q. (BNA) 90 (C.C.P.A. 1967); *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 34 U.S.P.Q.2d (BNA) 1816 (Fed. Cir. 1995). See section 2:4, *supra*.

Footnote 2. MPEP §2111.02; *In re Stencel*, 4 U.S.P.Q.2d (BNA) 1071, 1073 (Fed. Cir. 1987).

§3:3 Elements of Apparatus Claims

The "elements" of an apparatus claim are the main structural parts that together make up the combination claimed. As illustrated in Claim 1, the complete description of each element forms the subject matter of a separate clause, or subparagraph, of the claim.

A workpiece is a thing that the invention uses or operates upon and perhaps changes. The workpiece ("articles" in Claim 1) should be identified in the preamble of the claim, but not made an element of the claimed combination. ³ The workpiece appears in the body of the claim, as it interacts with a claim element.

One of the most important technical "rules" of form in drafting claims is that it is never proper to introduce a new element of the claim in the middle of the clause describing another element, or to describe an operation or action upon or by a new element without its having been introduced. This is sometimes called "inferential claiming." ⁴ Each new element in a product claim and each new step in a method claim should be first introduced either as (a) the subject of its own clause ("a container," "a base," etc. in Claim 1 above), or (b) a previously introduced and named item or a step comprises it, has it or includes it, that is, its presence is indicated by using a verb that describes the state of being (having, comprising, including, being), as in "a container [subject] having (comprising, including, being, etc.) [a word suggesting later element is a part of earlier one] a plurality of legs [subjects]" rather than an action verb or a verb indicating something is being done to or with the element, as "is connected" in Claim 1 above. Being the subject of its own clause means that it is either stated in the clause that such an element or step is present or the element or step is named at the beginning of the clause and thereafter that element or step, which has been named now for the first time, does something or has something done to it. It is important that a new item mentioned for the first time in the claim not be first mentioned as an element operated upon or cooperated with by a previous element described in the same clause. A clause can have more than one element as a subject, but only as limited above.

Every new element must be introduced by "a" or "an" (the part of speech called an indefinite article) or by no article at all, especially when the element is some means for performing a function (element (d) in Claim 1 above), or the element is stated in the plural (for example, "containers" or "container means"). Every subsequent mention of the previously identified element must be preceded by the definite article "the" or by "said." To repeat the same element, preceded by the indefinite article "a" or "an," or preceded by no article at all for "means" or an element in the plural, implies that a new element is being introduced in the clause. This causes

undesired and inaccurate double inclusion of one element.

Although it may be quite natural, and good practice in the descriptive portion of the specification, to state: "a container which is connected pivotally to a plurality of parallel legs," it is improper in the claim. The legs are separate elements of the combination, and thus should be positively set out and defined in the claim, as in Claim 1.

Another example:

Wrong: A lever having a forked end pivoted on a pin mounted between the furcations of the forked end.

Note, the pin is not part of the lever; it is a separate mechanical element.

Better: (a) a lever having a forked end; and
(b) a pivot pin mounted between the furcations of the forked end

Better Still: (a) a lever having a forked end,
(b) the forked end comprising spaced apart furcations;
and (c) a pivot pin mounted between furcations

The only exception to the inferential claiming prohibition is where the indefinite article "a" is used to introduce a workpiece. Because the workpiece is not an element of the claim, but rather it is only worked upon by one of the claim elements, it would not be introduced as the subject of its own clause.

A further example of improper inferential claiming is the clause "the motor being connected with a shaft which is connected with the gear for driving the gear." In that claim limitation, the shaft is inferentially claimed. It is not the subject of the clause. If there is a subject, it is the motor or the gear. Also, the shaft is not being described in a state of being with respect to the motor or the gear, but rather it is being described in a state of action. Proper wording might be "a shaft connected with the motor and with the gear for communicating driving motion from the motor to the gear." This says the same thing, but does not inferentially claim the shaft. (Implicit in this clause, of course, is that the motor and the gear were previously introduced in the claim, since each is preceded in the clause by the definite article "the.") Referring to the other exception, if the clause reads "the motor including a shaft extending to the gear," that would not be inferential claiming. The shaft has been first introduced in the claim in a state of being with respect to the motor, so that for an inferential claiming analysis, the shaft is now properly in the claim. Thereafter, and even in the same shaft introducing clause, the shaft can be active, and it is

described as cooperating with the gear. It is no longer inferential claiming once the element with the indefinite article "a" has been properly introduced.

Four essential elements (*italicized*) were selected for the combination of Claim 1 (section 3:1.1, above):

- (a) the container,
- (b) the base,
- (c) the legs, and
- (d) the oscillating means.

Note that all of these parts are essential, within the framework of the scope of claim desired, to accomplish the shaking of the articles, and that nothing more is needed. If a narrower claim were desired, the motor, cam, and cam follower linkage (together making up the oscillating means) could be made elements of the claim.

For the writing of broad claims, one concentrates on the minimum number of elements essential to the invention. As stated in MPEP section 706.03(f): "A claim can be rejected as incomplete if it omits essential elements, steps or necessary structural cooperative relationship of elements. . . ." It is also wise, at least in the broadest claims, to concentrate on what a potential infringer might sell, and leave out such conventional elements as power supplies, water supply hoses, compressed air sources, etc., which might not be sold as part of the combination.

There are usually four important things to tell about each element:

1. What is its name?
2. What are its constituent parts, if any, or distinctive features, that is, what features are necessary for the purposes of this claim to distinguish this element from any other element of the class?
3. How are it and its parts cooperatively associated with at least one other of the other elements or parts to accomplish the desired result? Or, what is the necessary connection and cooperation between the elements and parts?
4. Where pertinent, what does each element do and how does it do it?
5. Under (3) and (4), each element must be related structurally and/or in terms of functional cooperation or both with at least one other element.

One analogy is to think of the elements as islands, the parts of elements as peninsulas, and the statements of connection and cooperation as bridges. When the claim is done, all islands must be connected by bridges. Thus one composes a claim to a complete mechanical combination, or "machine."

Summary

Find the main elements or parts of the machine to be claimed. Make each element the subject of one clause of the body of the claim. The claim must name the elements and tell how they are related to each other either physically and/or functionally and cooperatively to be the article or to do the job stated in the preamble. The following sections focus on how to do all this.

FOOTNOTES:

Footnote 3. Even if it were proper to make the workpiece an element of the combination, one would rarely wish to do so, as it would unduly narrow the claim. A machine manufacturer would rarely sell the workpiece along with the machine. Thus he would not be a direct infringer [35 U.S.C. §271(a)] of the claim.

Footnote 4. MPEP §706.03(d).

§3:4 Workpiece or Environmental Element

Most claimed apparatus operate upon something or use something, or are operated upon and/or used by something else. Similarly, most methods act on something or involve something that is acted upon. That workpiece or environmental element should be recited for a claim to be complete and make sense. Yet, it should not be claimed in a manner suggesting that it is one of the elements of the invention claimed.

Where the workpiece or environmental element is important in the claimed structure, it might appear in the preamble of the claim, as for example, "A juicer for squeezing citrus fruit, the juicer comprising . . ." or "A grinder for grinding rolls . . .," or perhaps have the workpiece as a modifier of the claimed apparatus as "A roll grinder comprising . . ."

Not every workpiece or environmental element used with a claimed apparatus or method is a major element or is desirably included in the preamble. The preamble "A juicer comprising . . ." does not require mention of the citrus fruit. The preamble "A telescope comprising . . ." does not require mention of the objects observable to be recited in the claim preamble.

But, no matter whether it is recited in the preamble, a workpiece or environmental element typically is recited in the body of the claim with reference to the element of

the claim that the workpiece cooperates with or acts upon or which acts upon the workpiece.

In contrast to an element of the claim, the workpiece or environmental element is introduced in the claim by words indicating that the workpiece is not one of the claim elements. Therefore, it is not written as the subject of a clause of the claim. Rather, the workpiece or environmental element is introduced inferentially in the claim, which is contrary to what is done with a claim element. An element is inferentially introduced in a claim if it first appears within the body of a claim clause as itself acting or being acted upon, without first having been introduced either as the subject of that clause or a preceding clause and without another element recited as having or being that workpiece or environmental element. (By "having or being," I mean reciting "the element comprising (being) (including) the workpiece.") For example, in an apparatus claim, the workpiece might be introduced in a clause: "the juicer including a crusher (an element of the claimed apparatus being introduced in this clause) for acting on a piece of citrus fruit (the workpiece) . . ." or "a grinding wheel acting on a roll (the workpiece is mentioned for the first time) supported in the vicinity of the wheel for grinding the surface (workpiece) of the roll (second mention of the workpiece). . . ." In these examples, the workpiece is first mentioned in the middle of a clause having another element as its main subject and the workpiece is introduced or for the first time mentioned using the indefinite article "a," whereby it is being inferentially claimed. Each succeeding mention of the same workpiece can be preceded by the definite article "the," but preferably not with the definite article "said" because that word has typically been used for referring back to a previous actual claim element.

Conventional and environmental elements present but not critical to the invention being claimed should not be mentioned as claim elements. For claiming an automobile, one would not claim environmental material that is present in the engine, such as fuel, as a claim element. For a telescope, one would not recite the celestial object being viewed as one of the claim elements, although its cooperation with the lenses and the image collector certainly is important.

However, some elements in a full combination may have to be recited positively, even if the claim drafter prefers they not be claim elements. Where a subcombination of a complete combination is claimed in terms of cooperation between elements of the subcombination and other elements of the combination which the claim drafter would prefer not to positively claim, the other elements of the combination may have to be positively recited claim elements to claim a complete apparatus. For example, if a seat back has a novel element for connection to a chair base, to claim the cooperation between the seat back and the base, it may be necessary to claim the elements of the chair positively, so that the claim would cover the chair with a seat back, and not merely the seat back. Claiming the subcombination is preferred for broader scope coverage, but may not be possible

for proper claim preparation.

Conventional replaceable items that would not normally be made or sold by the party who is making the claimed invention should also preferably not appear in the claim, except perhaps by inference, as an environmental element, so as not to restrict the scope of the claim. Examples of this are discussed in section 3:26 below. An electrical system might include a power supply or an antenna. An automobile includes tires, or a battery. Respective supplies are used for a particular apparatus, such as fuel used to drive an engine, gas used to fill a balloon, thread in a sewing machine, etc. These should not be claim elements at all, or if they appear, they should be claimed inferentially as workpiece or environmental elements.

One would always rather catch a direct infringer under 35 U.S.C. §271(a) than a contributory one under 35 U.S.C. §271(c). To catch the manufacturer for infringement, you do not recite the element he would not include. If you write those elements into the claims, the manufacturer becomes only a contributory infringer, and only his customer, the retailer or the ultimate consumer, becomes the actual infringer.

Summary

Inferentially claim workpieces and environmental elements and inferentially claim elements not critical to the claimed combination which are not likely to be made and/or sold by the patentee. Do not recite them as one of the claim elements. This broadens the claim scope by not including elements not supplied by the patentee.

§3:5 Negative Limitations

In the past, negative limitations, telling what an element is not instead of what it is, were generally considered improper except in unusual cases. However, MPEP section 2173.05(i) states:

The current view of the courts is that there is nothing inherently ambiguous or uncertain about a negative limitation.

There normally would be no problem that a negative limitation per se would make a claim too broad, indefinite, etc.

Under this practice, such descriptions as "halogen other than fluorine" would presumably be acceptable. Such expressions as "noncircular," "nonmagnetic" or "colorless" have always been accepted because there is no other practical way to state the concept. In view of the former antipathy, it is suggested the negative statements still be avoided except where it seems the only way, or by far the clearest way, to state the limitation. MPEP section 2173.05(i) provides as acceptable examples: "*not* in excess of 10% structure" and "incapable of forming a

dye with . . ."

In *In re Duva*,⁵ a negative limitation, "absent sufficient CN [cyanide] ions to prevent deposition . . .," was held proper even if a positive expression could have been employed, which was disputed. Further, it was held proper to claim a negative limitation even at the "point of novelty," but there were other points of novelty.

Perhaps negative limitations, under the *Duva* case and MPEP section 706.03(d), could be used in some cases to avoid the limiting language "consisting" or "consisting essentially" (section 2:6, above). For example, if one's claim covered the combination comprising A+B+C, and the examiner cited A+B+C with a large amount of D, and if it were unobvious to eliminate D, the claim could perhaps be amended to read "comprising A+B+C and absent sufficient D to . . . [hurt the combination]," as in *Duva*, rather than switching to "consisting" or "consisting essentially." Then the claim would cover A+B+C+E, where E is the absence of excess D.

The negative claim limitation must have a basis in the original disclosure, that is, the absence or negative character of the negatively claimed element must have been originally disclosed. The mere absence of a positive recitation of an element is not a basis for its exclusion in a claim.⁶

Summary

Avoid negative limitations except in unusual cases where you think they are the clearest way to state the limitations. But in general, tell what an element is, not what it is not.

FOOTNOTES:

⁵Footnote 5. *In re Duva*, 156 U.S.P.Q. (BNA) 90, 94 (C.C.P.A. 1967).

⁶Footnote 6. MPEP §2173.05(i).

§3:6 Support in Specification and Drawings

All terms and phrases used in the claims must find "clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description."⁷ A claim element without any support in the specification, the claim itself or the prosecution history fails to guide the court or anyone as to what one of ordinary skill in the art would interpret the claim to require.^{7.1} That is, the claims must clearly "read on"⁸ the remainder of the specification, with consistent terminology being used so that no ambiguities are present.

This rule traces from the statutory requirement that the claims "particularly point out and distinctly claim": If it is not followed, the claim will be rejected under 35 U.S.C. §112 of the statute as "indefinite" or "vague and indefinite." Thus, one must be able to understand what the claim means, and how it is related to the example described in the detailed description.

When the claims, specification, and drawings do not correspond, the claims can be rejected. The claims should therefore be consistent with the disclosure. ⁹

Generally, the best practice is to use the identical words of the claim somewhere in the body of the specification to ensure this requirement is met. ¹⁰ For example, if a fastener is used in the machine, comprising a rivet in the specific example illustrated in the application, but one wishes to claim it in some or all claims broadly as a "fastener," the descriptive portion of the specification should so describe it: "a fastener, such as a rivet 10. . . ." Thereafter it is proper merely to refer to it as "the rivet 10." It would be poor practice to refer to a certain element as a lever throughout the detailed description and then call it a bar in the claims. ^{10.1}

One frequently observed exception to the foregoing is the use of "means plus function" language to define a claim element (see section 3:25). The specification may give a name to the element and also define its function. The claim may instead call the element "means" and describe the function stated in the specification or clearly inherently performed thereby (specification: "hammer"; claim: "means for hammering").

Rule 81(a) requires filing of a drawing with the application where necessary for the understanding of the subject matter sought to be patented. Rule 83(a) provides that "the drawing must show every feature of the invention specified in the claims." Thus, for machines, articles of manufacture, or other inventions where an element is capable of illustration in a drawing, it must be shown; however, symbols or labeled boxes, etc., may be used if the element per se is conventional. Where an element is not shown in a drawing, it cannot be recited in a claim. Where the element is shown in the drawing and properly recited in the claim, the specification should describe or at least indicate the presence of the element in the drawing, or should be amended to add such description, in order that the specification, drawings, and claims be consistent. ¹¹

Beware of adding or amending a claim after the application has been filed which adds or relies upon new matter, that is, elements without support in the original disclosure. ¹²

On prior Agent's Exams, examples of lack of support have included:

1. Parts or features in the claims not described at all in the description;

2. Inconsistent descriptions of parts;
3. Misdescriptive wording in the claims;
4. Ambiguities, where it is not clear which of several elements in the description is intended by a word in the claim.

For special problems in block diagram disclosures in electrical cases, see sections 3:26 and 4:9 (computer programs and software). The key test is whether "a person skilled in the art could make and use the invention without undue experimentation."

¹³ In theory, that test applies equally well in all classes and types of inventions--mechanical, electrical, chemical-- but the problems most frequently arise in complex electronic circuits, particularly block diagram, means-type disclosures, and most particularly, disclosures concerned with computer software. But block diagrams can also cause "best mode problems" (under 35 U.S.C. ?112). ¹⁴

Summary

Have clear and unambiguous support in the detailed description for all words and phrases in the claim, so that anyone can understand how the claim reads on the description. Also, all structures described in the claim must be illustrated in the drawing, even old or conventional things.

FOOTNOTES:

Footnote 7. Rule 75(d).

Footnote 7.1. *Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 68 U.S.P.Q.2d

(BNA) 1023 (Fed. Cir. 2003). *See* discussion in section 3:7, *infra*.

Footnote 8. Patentese, meaning that each technical phrase in the claim must literally describe a corresponding element or connection, etc., found in the description. Frequently, the claim is literally read word by word and the corresponding things found and checked off in the specification, or in the allegedly infringing product or drawing of the product. Thus, one's client's claim "reads on" an adverse party's product.

Footnote 9. *See* Rule 117; MPEP ?2173.05(i).

Footnote 10. *See* MPEP ?2173.05(a).

Footnote 10.1. *See* *Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 68

U.S.P.Q.2d (BNA) 1023 (Fed. Cir. 2003), where the court could not find support for the term used either in the claim, the specification or the prosecution. The case is discussed further in section 3:7, *infra*.

Footnote 11. MPEP §706.03(n).

Footnote 12. MPEP §2173.05(a).

Footnote 13. *In re Scarbrough*, 182 U.S.P.Q. (BNA) 298 (C.C.P.A. 1974).

Footnote 14. *See Union Carbide Corp. v. Borg Warner Corp.*, 193 U.S.P.Q. (BNA) 1 (6th Cir. 1977) (box labeled "extruder" held not proper to disclosed best mode of practicing process that would include step "extruding").

§3:7 Naming the Elements

It is good practice to analyze the structure and select the essential elements to be claimed, with whatever scope is desired, before starting to write a claim. It is well known that absence of any one claim element from an accused device, product or method will avoid infringement of that claim.^{14.1} The fewer the number of different elements included, the broader in scope is the claim and the less likely it is that a copyist will be able to design an embodiment that will lack one of the claim elements. But make the claim too broad by claiming too few of the elements, and there may be insufficient limits to save the claim from invalidity. In *SmithKline Beecham Corp. v. Apotex Corp.*,^{14.2} the claim was a simple "(1) crystalline paroxetine hydrochloride hemihydrate." The district court incorrectly limited the claim to commercially significant amounts, avoiding coverage of trace amounts. The Federal Circuit reversed, found no such claim limitation, gave the claim its broad scope and held it invalid for prior public use, but not under section 112, paragraph 2.

The elements must be assigned names, such as base, container, legs, and means for oscillating in Claim 1 (section 3:1.1). The exact name selected for each element is often not critical, as long as the claim drafter is not mistaken. Of course, if the element is named narrowly, for example "slidably mounted," it may exclude a similarly functioning element that the patentee believes is an equivalent, but which the court finds not to be.^{14.3}

Correspondingly, be careful not to use a word that is too broad in scope, without applicable limiting words. In *In re Bigio*,^{14.4} the claim term in issue was "hair brush." Without a specific limitation in the claim, the court said, the hair might be anywhere on a person, not just on the top of the head, or even hair on an animal. In *SmithKline Beecham Corp. v. Apotex Corp.*,^{14.5} the claim element "crystalline paroxetine hydrochloride hemihydrate" was construed to encompass any such compound and was not limited to only commercially significant amounts. Precision

in language used is critical; it should be not too narrow and not broader than the drafter intended. While applicant in theory has Humpty Dumpty's privilege of making words mean what he wants them to mean, no term may be given a meaning repugnant to its usual meaning. ¹⁵ A claim term takes its ordinary meaning ^{15.1} unless the applicant for patent redefined the term in the intrinsic record, using words of "manifest exclusion or restriction." ¹⁶

In *Merck & Co. v. Teva Pharmaceuticals USA, Inc.*, ¹⁷ the court rejected the patentee's effort to redefine "about" as "exactly" by referring to a passage in the specification. The court said that the patentee's attempted lexicography must appear with reasonable clarity, deliberateness, and precision before it can affect a claim. ¹⁸ The court in *Merck* found the statement in the patent to be ambiguous, so the word was given its ordinary meaning of approximately, rather than exactly.

In different patents, their respective different intrinsic records can give the same claim term different constructions. For example, "substantially uniform" was construed differently in different cases, because of different definitions in the specification or prosecution history and because the two patents were in completely different arts, magnetic resonance imaging and a washing detergent. ¹⁹

This rule is often stated as the "applicant may be his own lexicographer." ²⁰ But this is still within limits. Of course, the words used must have "clear support or antecedent basis" in the specification, or at least in the drawing, as mentioned in section 3:6, above. It is very important to make all parts of the specification consistent with the claims. When one wishes to impart a special meaning to a word or phrase appearing in the claims, one should define that word or phrase in the specification; for example, "As used in this description and in the appended claims, the word '.....' means '.....'" However, do not use ridiculous words such as "gizmo" or "widget."

The doctrine of claim differentiation also helps to define an element named in a claim. In *SunRace Roots Enter. Co. v. SRAM Corp.*, ²¹ the term "shift actuator" in the independent claim was given a broad scope, because the dependent claim defined a cam means of which the shift actuator was comprised. Hence, the independent claim was not restricted by having the element of the dependent claim read into the independent claim. A prior claim element can be kept broader in scope by a later dependent claim defining features or limitations on the previously claimed element. This is how naming an element can be used to give the element broad scope.

A patentee may define elements in one claim with different levels of detail, some more specific, some less so. The court or the examiner cannot rewrite or construe a broadly claimed element narrowly. ²²

Also, be sure that there is a corresponding structure in the specifications and

drawings to every structure claimed. If no structure is disclosed corresponding to one claimed, the claim is indefinite. In *Honeywell International, Inc. v. International Trade Commission* ^{22.1} the Federal Circuit said:

After reviewing the entire record regarding claim construction, we . . . hold that the claims are insolubly ambiguous and hence indefinite, with respect to a required sample preparation method. As we discuss below, with respect to each proffered construction, the claims, the written description, and the prosecution history fail to give us, as the interpreter of the claim term, any guidance to what one of ordinary skill in the art would interpret the claim to require. Moreover, because the sample preparation method is critical to discerning . . .

If there is no disclosure of a claim term in any of the documents associated with the application and none is known in the relevant art as demonstrable in published documents or in some other manner, the claim term is indefinite. The unpublished confidential documents of the applicant in *Honeywell*, which used the term, could not be relied on.

If there is no disclosed structure for a claim element other than a person who performs the function ("third monitoring means for monitoring the ECG signal"), then the claim is indefinite, since it does not define elements of a machine. ²³

Frequently in mechanical apparatus, there are various expressions that could be used. For example, in Claim 1, the base could have been called "a support," "a mounting plate," or the like. The container might have been designated "a box" or "a holder." The choices available frequently are descriptive names for an important function or purpose of the element named.

In most cases, the inventor or a mechanical dictionary can supply the precise name for a part in any specific embodiment. Appendix D contains a glossary of many mechanical terms commonly used in patents. For the broader claims, a generic word is usually needed. If no concrete generic name is available, often a home-made name indicating the function of the part may be used, such as "a rotary member" or "a holder," together with as much description of the part and its function as is necessary. Also "means" clauses are often used to describe an element broadly (see section 3:25).

The claim writer must use care to avoid naming an element too narrowly. A "screw" is not a "nail," while a "fastening element" is generic to those two, plus others. It is preferable to have claim language that encompasses an accused device than to have to ask a court to apply the doctrine of equivalents to an element claimed too narrowly.

Claiming one disclosed embodiment while another embodiment is not expressly

claimed may dedicate the other embodiment to the public, and the doctrine of equivalents may not be available to bring the claim language to the unclaimed embodiment. ^{23.1} In *In re Johnson & Johnson Associates, Inc. v. R.E. Service Co.*, ²⁴ which established this disclosure dedication rule, the Federal Circuit held that a claim to an aluminum substrate could not be expanded in scope by the doctrine of equivalents to cover a steel substrate which had been disclosed but not claimed. This is not applicable to using the doctrine of equivalents to cover another embodiment which was not disclosed in the specification. Therefore if the steel embodiment had not been disclosed, the aluminum embodiment might have been expandable to cover the steel embodiment under the doctrine of equivalents. In *PSC Computer Prod., Inc. v. Foxconn International, Inc.* ^{24.1} the Federal Circuit found dedication of plastic clip parts to the public when the specification disclosed plastic or metal parts and the claims mentioned only metal parts. Thus, how the specification is written has bearing on how the claim will be construed.

New terms may be adopted by an applicant and often are used for new technology. If the claims, read in light of the specification, reasonably apprise those skilled in the art of the utilization and scope of the invention and if the language is as precise as the subject matter permits, section 112 is satisfied. ²⁵

Where practical, it is best to give two similar but different elements distinct names, such as "a holding member" and "a support member" even when in common usage those different elements might be identified by the same name. In other cases, this is not possible, in which case designations such as "first" or "second" should be used: "a first rotating member, . . . a second rotating member . . ." Be careful that "first" and "second" are not given substantive meanings beyond distinguishing one of a kind from another of the same kind. In *3M Innovative Properties Co. v. Avery Dennison Corporation*, ^{25.1} the product claim recited: "at least one surface that has a multiple embossed pattern having a first embossed pattern and a second embossed pattern." The District Court read that as requiring that the embossment steps have been done in sequence. The Federal Circuit rightly decided that two patterns were being claimed, but their sequence was not because use of "first" and "second" to modify a noun identifying an element is a common patent practitioner's convention to distinguish between repeated instances of an element or a claim limitation. "First" was misread again in "first pivot point." ^{25.2} "First" does not denote a spatial location of the pivot point. It is a word that associates one element with another. Alternatively, the distinguishing adjective may refer to another element with which the named element is associated: "a base rotating member, . . . a connector rotating member . . ." Thereafter the elements must be clearly and consistently named throughout all of the claims.

Use the same name for the element consistently throughout every claim. Do not change the noun. Do not change any adjectives. An adjective once used need not be repeated upon each subsequent appearance of its noun. But if the adjective has a

subsequent appearance, the word(s) used must remain the same. An item called a "member," as in "connecting member," is always a "member," throughout all claims dependent upon the same claim in which the element has been first named. In *Ex parte Oetiker*,²⁶ the Board of Appeals and Interferences found a claim indefinite because an element therein appeared to have been twice claimed, first as "a pan-shaped depression means" and later as "a respective depression means." Not only did the applicant change the name, he used the indefinite article "a" twice. In a claim which does not depend from one naming an element, another name may be used for the same element. For example, in one chain of claims, the element may be the broader "surface," while in another chain of claims, the element may be the narrower "anvil" of which the surface is only a part.

Within each claim chain, the name of the element may never change. The "member" cannot sometimes be an "element," that is, it cannot be a "connecting element." An "element" would be a different claimed structure. If elements are named to suggest to the reader that two of them are present when in fact there is only one, this causes double inclusion of the twice-named element and the resulting claim may be held to be indefinite.²⁷

Often, an element is described not only by the noun, for example, "member," but by adjectives which modify the noun, as "connecting member" or "left side connecting member." After any feature is first named completely with all its adjectives in a claim, subsequent mentions of the feature in that claim or in subsequent dependent claims in the claim chain, following the first naming of the element, must use the same noun for that element, but may use fewer than all of the adjectives, thereafter calling it "member" or "connecting member," without the other adjectives "left side." The only limit on this freedom to drop adjectives is that there must be no other element whose designation, when shortened either to the noun alone or to the noun plus fewer than all of its adjectives, would be identified by the same words, because that would cause confusion as to which element was meant. Further, in a chain of claims following the one that first uses an adjective, the adjective cannot change. It may be deleted, as just noted, but not changed. If it is "an upper engaging member," it cannot later be "the upper holding member" or the "top engaging member."

For clarity in claim writing, I recommend avoiding use of first, second, third, etc., as the adjective which distinguishes one element from another. This usage is proper and so long as the adjective is used consistently, it cannot be considered ambiguous. However, sometimes a more descriptive adjective, descriptive, for example, as to function or location or major characteristics (left side, elongate, etc.) might help the claim reader determine which element is being identified. On the other hand, the elements designated first, second, third, etc. may be identical in structure and function and may be distinguishable only by a nondescriptive adjective, or maybe using a descriptive adjective would, in the drafter's opinion, impermissibly narrow

the scope of the recited element. Further, reciting only the adjectives first, second, etc. is useful where there are two or more ways of arranging elements and the claim writer wishes to encompass all of the ways, so that one location or arrangement would be first and the other would be second, without specifying which is which. Each element must always be described in such a distinctive manner as to clearly distinguish it from other similar or identical elements, as covered in section 3:3, above. Use the same terminology in the specification, as in the claims, even to at least once identifying the claimed elements using their distinguishing adjective, that is, first or second, base or connector, etc.

Summary

Select a clear name for each element, based on the detailed specification description where given. Where a broad scope name is desired, functional names, such as "a fastener" or "means for moving . . . ," should be used.

FOOTNOTES:

Footnote 14.1. Novartis Pharms. Corp. v. Abbot Labs., 375 F.3d 1328, 71 U.S.P.Q.2d (BNA) 1650 (Fed. Cir. 2004); Freedman Seating Co. v. Am. Seating Co., 420 F.3d 1350, 76 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 2005).

Footnote 14.2. SmithKline Beecham Corp. v. Apotex Corp., 365 F.3d 1306, 70 U.S.P.Q.2d

(BNA) 1737 (Fed. Cir. 2004).

Footnote 14.3. Freedman Seating Co. v. Am. Seating Co., 420 F.3d 1350, 76 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 2005).

Footnote 14.4. *In re Bigio*, 381 F.3d 1320, 72 U.S.P.Q.2d 1209 (Fed. Cir. 2004).

Footnote 14.5. SmithKline Beecham Corp. v. Apotex Corp., 403 F.3d 1331, 74 U.S.P.Q.2d (BNA) 1398 (Fed. Cir. 2005).

Footnote 15. MPEP ?2173.05(b).

Footnote 15.1. W.E. Hall Co. v. Atlanta Corrugating LLC, 370 F.3d 1343, 71 U.S.P.Q.2d (BNA) 1135 (Fed. Cir. 2004); Brookhill-Wilk 1 LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 67 U.S.P.Q.2d (BNA) 1132 (Fed. Cir. 2003); Combined Sys., Inc. v. Defense Tech. Corp. of Am., 350 F.3d 1207, 68 U.S.P.Q.2d (BNA) 1933 (Fed. Cir.

2003); Int'l Rectifier Corp. v. Ixys Corp., 361 F.3d 1363, 70 U.S.P.Q.2d (BNA) 1209 (Fed. Cir. 2004).

Footnote 16. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 63 U.S.P.Q.2d (BNA) 1374 (Fed. Cir. 2002). In *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 72 U.S.P.Q.2d (BNA) 1678 (Fed. Cir. 2004), the court construed "group" as described in the specification, as there is no accepted definition in this art or in a dictionary.

Footnote 17. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 73 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 2005).

Footnote 18. *In re Paulsen*, 30 F.3d 1475, 31 U.S.P.Q.2d (BNA) 1671 (Fed. Cir. 1994).

Footnote 19. *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 74 U.S.P.Q.2d (BNA) 1184 (Fed. Cir. 2005).

Footnote 20. MPEP §2173.01; *Lear Siegler, Inc. v. Aerogrip Corp.*, 221 U.S.P.Q. (BNA) 1025, 1031 (Fed. Cir. 1984); *W.L. Gore Assocs. v. Garlock, Inc.*, 220 U.S.P.Q. (BNA) 303, 316 (Fed. Cir. 1983). *W.E. Hall Co. v. Atlanta Corrugating LLC*, 370 F.3d 1343, 71 U.S.P.Q.2d (BNA) 1135 (Fed. Cir. 2004); *Combined Sys., Inc. v. Defense Tech. Corp. of Am.*, 350 F.3d 1207, 68 U.S.P.Q.2d (BNA) 1933 (Fed. Cir. 2003); *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 69 U.S.P.Q.2d (BNA) 1050 (Fed. Cir. 2003); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 39 U.S.P.Q.2d (BNA) 1573 (Fed. Cir. 1996).

Footnote 21. *SunRace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 67 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 2003).

Footnote 22. *Resonate, Inc. v. Alteon Websystems, Inc.*, 338 F.3d 1360, 67 U.S.P.Q.2d (BNA) 1771 (Fed. Cir. 2003).

Footnote 22.1. *Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1322, 68 U.S.P.Q.2d

(BNA) 1023 (Fed. Cir. 2003).

Footnote 23. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725, 1732-33 (Fed. Cir. 2002).

Footnote 23.1. *Toro Corp. v. White Consol. Indus., Inc.*, 383 F.3d 1326, 72 U.S.P.Q.2d (BNA) 1449 (Fed. Cir. 2004).

Footnote 24. *In re Johnson & Johnson Assocs., Inc. v. R.E. Serv. Co.*, 285 F.3d 1046, 62

U.S.P.Q.2d (BNA) 1225 (Fed. Cir. 2002).

Footnote 24.1. *PSC Computer Prod., Inc. v. Foxconn Int'l, Inc.*, 355 F.3d 1353, 69 U.S.P.Q.2d 1460 (Fed. Cir. 2004).

Footnote 25. MPEP §2173.05(a); *In re Burke, Inc.*, 786 F. Supp. 1537, 22 U.S.P.Q.2d (BNA) 1368, 1372 (C.D. Cal. 1992).

Footnote 25.1. *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 69 U.S.P.Q.2d

(BNA) 1050 (Fed. Cir. 2003).

Footnote 25.2. *Free Motion Fitness, Inc. v. Cybex Int'l, Inc.*, 2005 U.S. App. LEXIS 19886, ... F.3d ..., ... U.S.P.Q.2d (BNA) ... (Fed. Cir. Sept. 16, 2005).

Footnote 26. *Ex parte Oetiker*, 23 U.S.P.Q.2d (BNA) 1651, 1655 (Board of Patent Appeals and Interferences 1992).

Footnote 27. MPEP §2173.05(o). See section 3:9, *infra*.

§3:7A Plain Meaning of Claim Terms

When an element or a limitation in a claim is construed, it is to be given its plain or ordinary meaning. A schism developed in the Federal Circuit as to the sources to which one looks for defining that plain meaning. While all judges agreed that the plain meaning was to be used, individual judges had differing views as to the sources to which one looked to find the plain meaning and the priority of one source over another.

The words used in a claim are to be interpreted in light of the intrinsic record of the patent, which includes the written description, drawings, and prosecution history.^{27.1} But the Federal Circuit has said that "in the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art."^{27.1.1} If, as a claim writer, you want an unambiguous meaning for all claim terms, provide a clear intrinsic record during application preparation and subsequent prosecution. Clearly define any element or limitation thereof which may be relevant later when the claim language may be construed by another person.

Where was one to find to find that ordinary and customary meaning?

The typical view was stated in *Combined Systems, Inc. v. Defense Technology*

Corporation of America, ^{27.2} wherein the Federal Circuit found support for its claim construction in the written description and drawings of the patent and found that the district court had not placed too much weight on dictionary definitions for its claim construction. The Federal Circuit said that had the district court relied exclusively on the dictionary or allowed the dictionary definitions to overcome the clear language in the patent itself, its methodology would have been wrong. For construing a claim term, one may not select from a dictionary a common meaning that flies in the face of the patent disclosure. A court may use what was then considered extrinsic evidence, such as dictionaries and treatises, to educate itself about the technology and the state of the art, as noted in *Markman v. Westview Instrument, Inc.*, ^{27.3} and the court is free to use dictionaries and treatises to understand the technology and to define claim terms, ^{27.4} so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent document. ^{27.5}

A dictionary definition was often viewed as less useful than the patent document in establishing the ordinary meaning of words used in a claim because patent claims should be construed from the point of view of a person of skill in the art who likely would not begin an examination of a patent claim by looking through a dictionary. ^{27.6}

But a three-judge panel of the Federal Circuit cast doubt on which sources one considers and their order of priority in construing the ordinary and customary meaning of a claim term. In *Texas Digital Systems, Inc. v. Telegenix, Inc.*, ^{27.7} the Federal Circuit panel stated that dictionaries, encyclopedias, and treatises may be the most meaningful information sources to judges in understanding technology and terminology because "such references are unbiased reflections of common understanding not influenced by expert testimony or events subsequent to the fixing of the intrinsic record by the grant of the patent, not colored by the motives of the parties and not inspired by litigation." *Texas Digital* makes clear that dictionaries should be consulted in every case and early in the claim construction process. Subsequent cases followed this precedent.

If the patentee did not act as his own lexicographer within the specification or other parts of the intrinsic record, the court must rely on the plain and ordinary meaning of the claim term. ^{27.8} If the patentee appears to have used a term in a claim in an ambiguous or inconsistent manner, a departure from the plain meaning of the term is not justified. ^{27.9} In one case, the Federal Circuit referred to the *Oxford English Dictionary* for providing definition for the term "open," a nontechnical term. ^{27.10} In another case, *Nystrom v. TREX*, the court used the *American Heritage Dictionary* to interpret "convex." ^{27.11} But *Nystrom* was reversed in 2005, following the Federal Circuit's *en banc* decision in *Phillips v. AWH Corp.* ^{27.12}

In *International Rectifier Corp. v. IXYS Corp.*, ^{27.13} the Federal Circuit said that a "polygonal" shape has an ordinary and customary meaning, without contradiction by the words in the specification, as a closed plane figure bounded by straight lines,

thereby excluding rounded corners. The court also used a dictionary to construe "annular," and considered this dictionary passage to be part of the "intrinsic" record. But because the patentee had applied his own meaning to "annular" in the specification, the patentee acted as his own lexicographer, which trumped the ordinary and customary meaning the claim term "annular" would otherwise have had.

Novartis v. Eon ^{27.14} illustrated a problem with reliance upon a dictionary. The term "hydrosol," which appeared in a claim, was not defined in the patent specification. The patentee argued unsuccessfully for a particular dictionary definition of "hydrosol." The majority of the court limited the term "hydrosol." The dissenter noted that the majority's construction of the claim element required the use of a particular dictionary and did not follow other dictionaries. Where there is no clear definition in the specification and no clear surrender of claim scope, as was the case in *Novartis*, the court was required to select a limiting definition from several available. A conventional dictionary is directed toward brevity, rather than detailed specifics, and is likely to give broader scope to the claim term. A patentee is more likely to assert that dictionary's definition, as it could in *Novartis* and did in *Phillips v. AWH Corporation*. ^{27.15} On the other hand, a technical dictionary or treatise is more likely to be specific and narrower in scope, and more likely to be asserted by an accused infringer for construing a claim term. The obvious recommendation is that, at the time of drafting the patent, the drafter should provide definitions for terms in the claims or at least definitions in the specification for terms used in the claims so that construction of a claim element from the intrinsic record of the patent specification is enabled, precluding a need to refer to extrinsic sources.

If a dictionary is to be used in construing a claim element, what type of dictionary is acceptable? In *Vandelande Industries Nederland B.V. v. International Trade Commission*, ^{27.16} the court admonished the accused infringer for relying on a general usage dictionary, *Merriam Webster's Collegiate Dictionary* (10th ed. 1998), for claim interpretation, when a technical dictionary existed that demonstrated that one skilled in the art would attach a special meaning to a claim term. The court said that if one skilled in the art would note that the claim term has the same meaning as a common usage, that is helpful in claim construction. However, where evidence like expert testimony or technical dictionaries demonstrates that persons skilled in the art would attach a special meaning or no meaning apart from the specification, a general usage dictionary is irrelevant as it cannot overcome credible art-specific evidence of the meaning of the term or its lack of meaning. The court in *Bilstad v. Wakalopoulos* ^{27.17} found definitions from several dictionaries and the specification to be consistent and made its construction. But such consistency will not always be found, and primacy of one standard is needed.

The schism in the Federal Circuit was illustrated by *C.R. Bard, Inc., Inc. v. U.S. Surgical Corp.*, ^{27.18} wherein the three-judge panel held that dictionary definitions do

not override clear evidence in the intrinsic record of a specification. The court noted that the intrinsic record is the primary source for determining claim meaning and that numerous Federal Circuit cases held that extrinsic evidence, even when it is relevant, would not support a conclusion that contradicts the intrinsic evidence. The court distinguished *Texas Digital* by stating that in some cases the court has held that, except for the claims themselves, the intrinsic record should be consulted only after the ordinary and customary meaning of the claim term is determined, emphasizing the use of technical and general usage dictionaries in determining the ordinary meaning. In those cases, the inventor's description of the invention is relevant only if it provides clear lexicography or describes the ordinary meaning. The court then stated that these cases do not stand for the proposition that the dictionary definitions trump the intrinsic record with regard to claim construction. The court said this was consistent with *Texas Digital*, which used the dictionary only with respect to some of the claim elements. Then the court discounted the dictionary definitions which were offered to the court and instead referred to the intrinsic evidence of the specification. The court went on to limit a claim term "the surface of said hollow plug [b] conformable to irregularities in the tissue or muscle wall . . ." as requiring that the surface of the plug be pleated, relying on the specification which defines the inventive plug as having or including a pleated surface. (This case is also relevant to section 3:7B, concerning importing the specification into the claims.)

The Federal Circuit panels were troubled by the schism, as shown in *Astrazeneca AB Mutual Pharmaceutical Co.* ^{27.19} In construing the word "solubilizer" in all of the claims, the opinion acknowledged the split. One approach involved reliance upon the intrinsic evidence of the specification, including the written description, as the primary source for claim element construction, whereas the extrinsic evidence was useful only if it shed light on the relevant art. The court pointed out that this was the accepted law for years. The court then noted a second approach, that of *Texas Digital*--that the intrinsic record, except for the claims, should be consulted only after the ordinary and customary meaning of the claims terms to persons skilled in the art is determined. Dictionary definitions thus would be referred to first, unless the patentee acted as his own lexicographer.

The parties asked for different approaches, with the patentee seeking the broader construction of treatises and dictionaries. The court refused to decide on the correct approach, but said it was awaiting the rehearing in *Phillips v. AWH Corporation*.

The Federal Circuit chose *Phillips* to resolve the question of which resources one refers to when construing a claim element.

In a first opinion by the Federal Circuit in *Phillips*, ^{27.20} the panel construed the claim term "baffle" as limited to baffles that are not at a ninety-degree angle, because the panel found that such an angle would not achieve the purpose of the invention. The

panel construed the element as that narrower definition of the word "baffle," despite the existence of a broad dictionary definition of the word "baffle." This was contrary to the decision of the earlier panel in *Texas Digital*. Because the Federal Circuit was established to provide uniformity in application of patent law, to end this schism on selection of the manner of construing a claim term and to prevent the standard for construction being dependent upon which judges were randomly assigned to the panel deciding a particular appeal, the court held an *en banc* rehearing of the *Phillips* appeal, and on July 12, 2005, issued its precedent *en banc* which ended the schism by defining the intrinsic record to be used in construing a claim term.^{27,21} The court's decision and opinion in *Phillips* assigned only a secondary role to dictionaries, learned treatises, and similar preexisting materials not part of the patent or its prosecution history. Extrinsic evidence, such as expert testimony, has a secondary or even tertiary role in claim construction.

In dismissing reliance upon dictionaries, the court said that "the main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent. . . ." The use of the dictionary may extend patent protection beyond what should properly be afforded by the inventor's patent.

When one is construing a claim term, the intrinsic evidence includes three elements:

(1) the words of the patent claim itself, which defines the metes and bounds of what is patented;

(2) the specification, which provides background on the claimed invention and possibly the state of the art and the use of the invention, and a description of the element in the claim (as the inventor may be his own lexicographer); and

(3) the prosecution history of the patent application in the Patent and Trademark Office, wherein the applicant, through his attorney, may have given definition to certain elements or may have surrendered scope of coverage or possibly broader scope meaning of terms in a claim during the prosecution in order to obtain allowance of the claim over prior art or in view of a requirement to clarify or give better definition to a claim term--that is, prosecution history estoppel.

The court turns to extrinsic evidence, such as dictionaries, learned treatises, or even expert evidence when the primary sources of interpretation are insufficient. The precedents that followed and relied upon *Texas Digital* followed an incorrect standard and might have been decided differently if the panels had followed the *Phillips* standard.

In reaction to *Phillips*, in *Nystrom v. TREX Co.*, the Federal Circuit reversed its pre-*Phillips* claim construction of the word "board." In an initial opinion prior to

Phillips, "board" was not limited to its ordinary meaning of pieces of material cut from logs, because dictionary definitions supported a broader meaning, the court citing *Texas Digital*.^{27.22} That earlier opinion was withdrawn after *Phillips*, and the court now said that claims are viewed in light of the intrinsic record, and therefore must be read in view of the specification of which they are a part.^{27.23} Dictionaries and treatises may help in determining a meaning, but undue reliance on such extrinsic evidence may change the meaning of the claim term. Both the specification and the prosecution history described "board" as wood decking materials cut from a log, a less expansive definition than the word previously was construed to have. The intrinsic record relying on the specification can lead to an unusual result. The intrinsic record was held to include a prior art reference listed on the face of the patent.^{27.24} The Court cites earlier precedents that "prior art cited in a patent or cited in the prosecution history of the patent constitutes intrinsic evidence."^{27.25}

In this author's view, prior art references are not part of the intrinsic record, since that record relates to text written by or to which the applicant or his attorney reacted or had the opportunity to react. That would not include the reference itself but only statements by the examiner or applicant concerning the reference. Perhaps the decision in *Phillips* defining the intrinsic record will exclude prior art therefrom.

Summary

To construe a claim element, its plain meaning is ascertained from the intrinsic record of the claims, the specification, and the prosecution history. Extrinsic evidence, like dictionaries and treatises, is secondary, and expert testimony may be tertiary.

FOOTNOTES:

Footnote 27.1. *Howmedica Osteonics Corp. v. Tranquil Prospects Ltd.*, 401 F.3d 1367, 74 U.S.P.Q.2d (BNA) 1680 (Fed. Cir. 2005), wherein the court found "transverse sectional dimension" definite by referring to its description in the specification; *ASM Am., Inc. v. Genus, Inc.*, 401 F.3d 1340, 746 U.S.P.Q.2d (BNA) 1211 (Fed. Cir. 2005), wherein the court construed the terms "reaction space" and "evacuation" by referring to the patent specification.

Footnote 27.1.1. *Brookhill-Wilk 1 LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 67 U.S.P.Q.2d (BNA) 1132 (Fed. Cir. 2003). *See Renishaw PLC v. Marposh SpA*, 158 F.3d 1248, 48 U.S.P.Q.2d (BNA) 1117 (1998).

Footnote 27.2. *Combined Sys., Inc. v. Defense Tech. Corp. of Am.*, 350 F.3d 1209, 68 U.S.P.Q.2d (BNA) 1933 (Fed. Cir. 2003).

Footnote 27.3. *Markman v. Westview Instrument, Inc.*, 52 F.3d 967, 34 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 1995).

Footnote 27.4. Nellicor Puritan Bennett, Inc. v. Masimo Corp., 402 F.3d, 1364, 74 U.S.P.Q.2d (BNA) 1351 (Fed. Cir. 2005) (in addition to considering the specification of the patent, the court referred to a definition of "filter" in a standard dictionary of electrical engineering and electronics).

Footnote 27.5. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 39 U.S.P.Q.2d (BNA) 1573 (Fed. Cir. 1996).

Footnote 27.6. Gen. Creation LLC v. Leap-Frog Enters, Inc., 232 F. Supp. 2d 661, 66 U.S.P.Q.2d (BNA) 1753 (W.D.Va. 2002).

Footnote 27.7. Tex. Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 64 U.S.P.Q.2d (BNA) 1821 (Fed. Cir. 2002).

Footnote 27.8. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 39 U.S.P.Q.2d (BNA) 1573

(Fed. Cir. 1996).

Footnote 27.9. W.E. Hall Co. v. Atlanta Corrugating LLC, 370 F.3d 1343, 71 U.S.P.Q.2d (BNA) 1135 (Fed. Cir. 2004).

Footnote 27.10. *Id.*

Footnote 27.11. Nystrom v. TREX Co., 339 F.3d 1347, 67 U.S.P.Q.2d (BNA) 1858 (Fed. Cir. 2003).

Footnote 27.12. Phillips v. AWH Corp., 415 F.3d 1303, 75 U.S.P.Q.2d 1321 (Fed. Cir. 2005) (en banc).

Footnote 27.13. Int'l Rectifier Corp. v. IXYS Corp., 351 F.3d 1363, 70 U.S.P.Q.2d (BNA) 1209 (Fed. Cir. 2004).

Footnote 27.14. Novartis v. Eon, 363 F.3d 1306, 70 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 2004).

Footnote 27.15. Phillips v. AWH Corp., 415 F.3d 1303, 75 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 2005) (en banc).

Footnote 27.16. Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n, 366 F.3d 1311, 70 U.S.P.Q. (BNA) 1696 (Fed. Cir. 2004).

Footnote 27.17. Bilstad v. Wakalopoulos, 386 F.3d 1116, 72 U.S.P.Q.2d (BNA) 1785

(Fed. Cir. 2004).

Footnote 27.18. *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 399 F.3d 1277, 73 U.S.P.Q.2d (BNA) 1011 (Fed. Cir. 2004).

Footnote 27.19. *Astrazeneca AB v. Mutual Pharm. Co.*, 384 F.3d 1333, 72 U.S.P.Q.2d (BNA) 1726 (Fed. Cir. 2004).

Footnote 27.20. *Phillips v. AWH Corp.*, 363 F.3d 1207, 70 U.S.P.Q.2d (BNA) 1417, *rev'd*, 374 F.3d 1105, 71 U.S.P.Q.2d (BNA) 1241 (Fed. Cir. 2004).

Footnote 27.21. *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 2005).

Footnote 27.22. *Nystrom v. TREX Co.*, 339 F.3d 1347, 67 U.S.P.Q.2d (BNA) 1858 (Fed. Cir. 2003).

Footnote 27.23. *Nystrom v. TREX Co.*, 2005 U.S. App. LEXIS 19748, ... F.3d ..., ... U.S.P.Q.2d (BNA) ... (Fed. Cir. Sept. 14, 2005).

Footnote 27.24. *V-Formation, Inc. v. Benetton Group SpA*, 401 F.3d 1307, 74 U.S.P.Q.2d (BNA) 1042 (Fed. Cir. 2005).

Footnote 27.25. *Kumar v. Ovonic Battery Co.*, 351 F.3d 1364, 1368, 69 U.S.P.Q.2d (BNA) 1220 (Fed. Cir. 2003); *Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 279

F.3d 1357, 1371-72, n.4, 61 U.S.P.Q.2d (BNA) (Fed. Cir. 2002); and others.

3:7B Importing the Specification into the Claims

Except where the patentee has chosen to be his own lexicographer and has given a specific meaning to a term or element of a claim, a patent claim is not necessarily limited to a preferred embodiment of the claimed invention that is disclosed in the patent.^{27.26} But where a patent specification provides its own definition for a term that is essential in the patent claim, and that definition is inconsistent with the ordinary meaning of that term, the patentee's definition is binding.^{27.27} Although a specification may state that a particular element is a "required" feature of a preferred embodiment of the invention, the court construing the claim may still give the claim term its full range of ordinary meaning as understood by persons skilled in the relevant art and need not limit the claim to the description in the preferred embodiment.^{27.28} In *Gemstar-TV Guide International, Inc. v. International Trade Commission*, the Federal Circuit interpreted the word "interrupt" in the claims and noted that the specification of the patent gave the term "interrupt" a special

definition, saying that the patentee had chosen to be his own lexicographer. The court rejected both proffered dictionary definitions and even the prosecution history in favor of the definition in the specification.

The scope of an element in a claim is not limited to an apparatus or method having a particular feature merely because all of the embodiments described in the specification share that feature.^{27.29} In *Liebel-Flarsheim Co. v. Medrad Inc.*, the court found the claim to be sufficiently broad to encompass features not described in the specification. Since there was no ambiguity in the claims, no disclaimer of certain devices in the specification or prosecution history, and no other support for restricted scope in the prosecution history, the invention was not limited to particular types of syringes with pressure jackets, merely because those jackets were common to all embodiments described. The court should interpret the claims in view of the specification without unnecessarily importing limitations from the specification into the claim. The court will not limit a claim to the disclosed preferred embodiment if the written description does not show a clear disavowal of the plain meaning of the claim term.^{27.30}

However, where the specification makes clear that the invention is narrower than the claims imply, then the claim language must be construed to include the embodiments in the specification.

In *Alloc Inc. v. International Trade Commission*,^{27.31} the court noted that the patent claims did not expressly require play between two panels but found that the specification teaches that the invention as a whole, not merely a preferred embodiment thereof, provided for play, and therefore in order to find infringement, the court construed the claims to require that play be present in the accused panel structure. The court relied upon both the specification's emphasis on the need for play and also the attorneys' discussion of this feature to overcome prior art. The patentee objected to importation of the specification into the claims, but was overruled. Other cases are to similar effect.^{27.32}

Federal Circuit panels have repeatedly imported limitations from the specification into the claims based on the emphasis on those feature in the specification.^{27.33} In *Irdeto Access Inc. v. Echostar Satellite Corp.*,^{27.34} the court found uses of a disputed term in the specification to be the basis for defining the element in the claim. Other cases import a limited specification definition of a claim term into the claim.^{27.35} Where there is no accepted meaning of a term in the art, the claim term is interpreted as broadly as the patent itself provides.

Claim language should not be limited to the preferred embodiment in the specification,^{27.36} including the patent drawings.^{27.37} As the court noted, claims of a patent may be limited to a preferred embodiment only by the express declaration of the patentee, either in the specification or in the prosecution history. Similarly to

Alloc Inc. v. International Trade Commission, ^{27.38} the Federal Circuit limited a product to a certain weight percentage of a material recited in the specification because the written description repeatedly referred to that preferred embodiment as the invention. ^{27.39}

It appears that there may be a dichotomy in the cases, some saying that one imports the specification and some not. But an effort is made by the court to determine whether the specification states that the specified way is the only way, or whether instead that way is preferred but there are alternatives, or whether the prosecution history expressly or impliedly says the same. This may be the way to harmonize what appear to be two contradictory sets of holdings.

Previously, the Abstract of the Disclosure or of the Invention, which appears on the cover page of the patent and is not included within the body of the specification itself, was not considered part of the disclosure for purposes of construing claims. The Federal Circuit found no legal principle concerning reference to the abstract as intrinsic evidence for construing the claim language. ^{27.40} However, in *Hill-Rom Co.*, ^{27.41} the Federal Circuit upheld the district court's definition of the term "cushion" as requiring support and comfort. The court referred to the abstract of the patent, which emphasized the comfort and support that would be provided. The patentee, *Hill-Rom*, had argued that the court was not permitted to use the abstract to construe claim scope under then 37 C.F.R. §1.72(b). The Federal Circuit disagreed, saying that the cited rule governs patent examiners and not the process by which the courts construe claims.

The Patent and Trademark Office has recently amended 37 C.F.R. §1.72(b) to eliminate the prohibition forbidding use of the abstract for construing patent claims. This rule change was made to be consistent with the Federal Circuit's decision in *Hill-Rom Co.* Specification drafters must be aware of this change. Neither the specification nor the abstract should state or imply that anything recited therein is compulsory when it is intended or hoped that an element so described will have broad scope when the claim is eventually construed. A tendency to include details from a preferred embodiment in the abstract may result in a construction of a claim having an element mentioned in the abstract being narrowed beyond what was contemplated.

Summary

The preferred embodiment in the specification is not a restriction on the scope of a claim element, unless the specification makes clear that the claim element is so limited or the limitation on its scope arose during the prosecution. Note also, the abstract is considered part of the specification for this purpose.

FOOTNOTES:

Footnote 27.26. *Transmatic, Inc. v. Gulton Indus., Inc.*, 53 F.3d 1270, 1277, 35 U.S.P.Q.2d (BNA) 1035 (Fed. Cir. 1995); *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 345 F.3d 1318, 68 U.S.P.Q.2d (BNA) 1439 (Fed. Cir. 2003); *Gart v. Logitech, Inc.*, 254 F.3d 1334, 59 U.S.P.Q.2d (BNA) 1290 (Fed. Cir. 2001).

In *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 70 U.S.P.Q.2d (BNA) 1827 (Fed. Cir. 2004), the Federal Circuit declined to read a limitation of the preferred embodiment into the claim as had been suggested by the patentee, because the court found that the specification identified the item as preferred embodiment, just one of a variety of conventional procedures. The broader construction of the claim language was accepted.

Footnote 27.27. *Boss Control, Inc. v. Bombardier, Inc.*, 410 F.3d 1372, 75 U.S.P.Q.2d (BNA)1038 (Fed. Cir. 2005).

Footnote 27.28. *Gemstar-TV Guide Int'l, Inc. v. Int'l Trade Comm'n*, 383 F.3d 1352, 72 U.S.P.Q.2d (BNA) 1609 (Fed. Cir. 2004).

Footnote 27.29. *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 69 U.S.P.Q.2d (BNA)1801 (Fed. Cir. 2004).

Footnote 27.30. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 72 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 2004); *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 72 U.S.P.Q.2d (BNA) 1276 (Fed. Cir. 2004).

Footnote 27.31. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 68 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 2003).

Footnote 27.32. *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 58 U.S.P.Q.2d (BNA) 1059 (Fed. Cir. 2001) (holding that a lumen in a balloon catheter was limited to coaxial lumens because the specification only described that structure and said it was in all embodiments, which was construed as an affected disclaimer of other versions); *Multi-Tech Sys., Inc. v. Microsoft Corp.*, 357 F.3d

1340, 69 U.S.P.Q.2d (BNA) 1815 (Fed. Cir.); *cert. denied*, 125 S. Ct. 61 (2004).

Footnote 27.33. *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 399 F.3d 1277, 73 U.S.P.Q.2d (BNA) 1011 (Fed. Cir. 2004).

Footnote 27.34. *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 72 U.S.P.Q.2d (BNA) 1678 (Fed. Cir. 2004).

Footnote 27.35. *Novartis Pharms. Corp. v. Eon Labs Mfg., Inc.*, 363 F.3d 1306, 70

U.S.P.Q.2d (BNA)1438 (Fed. Cir. 2004), wherein the Federal Circuit concludes that statements in the specification and prosecution history support an adoption of a more limited definition because the statements were helpful in choosing between competing dictionary definitions. *Multi-Tech Sys., Inc. v. Microsoft Corp.*, 357 F.3d 1340, 69 U.S.P.Q.2d (BNA) 1815 (Fed. Cir.), *cert. denied*, 125 S. Ct. 61 (2004).

Footnote 27.36. *Playtex, Prods., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 73 U.S.P.Q.2d (BNA) 2010 (Fed. Cir. 2005); and several earlier cases there cited for the same proposition; *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 72 U.S.P.Q.2d (BNA) 1276 (Fed. Cir. 2004) (finding no disavowal in the specification or in the prosecution history).

Footnote 27.37. *Playtex, Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 73 U.S.P.Q.2d (BNA) 2010 (Fed. Cir. 2005).

Footnote 27.38. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 68 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 2003).

Footnote 27.39. *Rhoda Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 74 U.S.P.Q.2d (BNA) 1321 (Fed Cir. 2005).

Footnote 27.40. *See Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 U.S.P.Q. (BNA) 805 (Fed. Cir. 1986), which the *Hill-Rom* court cited as an example of referring to the Abstract in construing a claim.

Footnote 27.41. *Hill-Rom Co. v. Kinetic Concepts, Inc.*, 209 F.3d 1337, 54 U.S.P.Q.2d (BNA) 1437 (Fed. Cir. 2000).

3:8 Singular and Plural Elements

The number of elements of a given type, if more than one, should also be stated where the number is material to the claim:

A pair of arms . . .

Three springs . . .

A plurality of rods . . . (used for an indefinite number, two or more). [The word "multiplicity" is often used also, but this may tend to connote a fairly large number, such as "a sieve having a multiplicity of perforations."]

At least five fingers . . . (used where there must be at least five but more would do).

The minimum (or as appropriate, maximum) number of elements necessary for the

combination to function properly should be recited. The minimum number then covers a larger number where, as is customary, the word "comprising" is used ^{27.42} (section 2:5, above). The term "a pair" will cover two or any number greater than two, but it will not cover only one. Where one or more will function, then one merely claims either "a" or "an" element (singular) and this covers one or more than one. ²⁸However, if the transition word following the claim preamble or the transition preceding "a" or "an" is closed-ended, like "consisting of" or "composed of," then "a" or "an" may be construed as closed-ended also, excluding the "one or more" broader construction accepted if the transition is open-ended, like "comprising." ^{28.1} However, the context of a disclosed and/or claimed embodiment may make the court interpret "a" following the transition word "comprising" to mean a single or only one of the elements and exclude more than one of the elements. ²⁹ In *Abtox*, the court relied on the subsequent appearance of "said" before the element as evidence that only one such element was claimed. (In this author's view, that improperly restricts the claim with a "comprising" transition word and is contrary to the usual understanding of "a" and "said" in a claim.) A more correct view is stated in *Elkay Mfg. Co. v. Ebco Mfg. Co.*, ³⁰ wherein "a" or "an" suggests "one," but can also mean "one or more than one" or "at least one," depending on the context in which the article is used, ³¹ when the claim has the open-ended transition, such as "comprising." ³² As the claims used the open term "comprising" in their transition phrases, the claims were not necessarily limited to a single feed tube or a single flow path, even though the preferred embodiment showed a single feed tube and a single flow path. ³³

The claim writer should take care in reciting plural elements and then referring to those elements in singular form, as that creates a needless ambiguity in the claim.

³⁴

In the unusual *Markush* grouping, "a" referring to a member of the group, "a" Lewis acid inhibitor referred to only one member of the *Markush* grouping, not several of them, because the *Markush* grouping was close-ended. ³⁵

Optionally, one sees "at least one" or "at least two, " or "at most three, " which are also correct. "At least one" means either one of the elements or more than one of them. ³⁶

However, unless the "at least one" clause unambiguously means fewer than all in the particular claim, it can require one among all of the groups of elements recited. In *Superguide Corporation v. Direct TV Enterprises, Inc.*, ^{36.1} the phrase was "at least one of the desired program start time, the desired program end time, the desired program service, and the desired program type" (emphasis added). The Federal Circuit said "and" in this element meant that one from each of the four categories of criteria was required to satisfy the claim element. Had the patentee used "or" rather than "and," the construction of the claim element would have been that only one

category was required. Note that the choice of conjunction becomes critical. In this case, neither the specification nor the prosecution history provided a suggestion that "or" might have been meant. Only in a properly drafted Markush Group should "and" be used if fewer than all of the items or categories are to be designated for inclusion in the claim elements joined by "and."^{36.2}

When claiming a combination, where more than one of a certain element is included in the combination (for example, conveyor means), the term "at least two" means the minimum number of a particular element required.³⁷ This interpretation gives effect to the recitation of the two distinct elements in the claimed structure. Therefore, all claims would require two or more of the conveyor structure. Since laymen are eventually considering claim language, that is, a judge or a jury, the latter option may now be preferable, since the nuanced meaning of "comprising" may not be so easily understood as "at least two . . . ," when a claim is meant to cover any number greater than one of a particular element. An alternative statement "one or more" would ordinarily be considered improper under the rule against alternative claiming discussed in section 3:13, below. However, one case³⁸ allowed a claim including "a spline or splines."

Practitioners use the term "plurality." It means two or more,³⁹ up to infinity.^{39.1} Because "plurality" can mean as few as two, even when there are more of the elements in question, the "plurality" can be fewer than all of the elements in question, but not less than two. For example, "every field" means all of the fields, while "each of a plurality of fields" can encompass all or fewer than all the fields, and therefore mean "each of at least two fields."^{39.2}

When there is a maximum number of a particular element in a claimed combination, the maximum is recited, for example, "at most three."

An open-ended numerical range is normally definite under 35 U.S.C. §112 unless it covers an apparently impossible situation. Particularly in chemical cases, where a composition including a range of one element could exceed 100% of the total quantity of ingredients, that claim with the open range is indefinite.

Where the quantity of a particular element is not material to the claim, there is no benefit to reciting that there are a plurality of that element. Recite "a finger" and leave it at that, or "at least one finger," if the plurality of fingers is obviously present.

Some practitioners advocate naming the element and then following that with the word "means," such as "finger means." The latter phrasing is indefinite as to number and yet encompasses any number. However, once the word "means" is used in naming a claim element, it may be treated as a means-plus-function element under 35 U.S.C. §112, paragraph 6 (see section 3:25). Case precedents, discussed below in the section on means clauses, may narrow the scope of means limitations,

as compared with other limitations, whereby "finger means" may be more restricted in scope than

"at least one finger," when a claim is interpreted for application to a possible infringement.

In an earlier claim, a single one of an element may be claimed. A later dependent claim may recite a plurality of those same elements, without redefining the features of the element, and the parent claim provides antecedent support for the dependent claim. ⁴⁰ For example, Claim 1 at section 3:1.1 above might have claimed "a leg . . ." or "at least one leg," while Claim 2 could then recite "a plurality of the legs" or "at least two of the legs."

Summary

State the minimum number of similar elements needed where more than one is necessary to the claim. If any number more than one will do, use the phrase "a plurality."

FOOTNOTES:

Footnote 27.42. *N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 8 U.S.P.Q.2d 1333 (Fed. Cir. 1993), where "a" meant only one because the transition was not "comprising" (or the like word).

Footnote 28. *Abtox, Inc. v. Exitron Corp.*, 43 U.S.P.Q.2d (BNA) 1545, 1548 (Fed. Cir. 1997), *modified on other grounds*, 46 U.S.P.Q.2d (BNA) 1735 (Fed. Cir. 1997); *Scanner Tech. Corp. v. ICOS Vision Sys. Corp.*, 365 F.3d 1299, 70 U.S.P.Q.2d (BNA) 1900 (Fed. Cir. 2004); *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1354, 55 U.S.P.Q.2d 1835 (Fed. Cir. 2000); *Free Motion Fitness, Inc. v. Cybex Int'l, Inc.*, 2005 U.S. App. LEXIS 19886, ... F.3d ..., ... U.S.P.Q.2d (BNA) ... (Fed. Cir. Sept. 16, 2005).

Footnote 28.1. *Scanner Tech. Corp. v. ICOS Vision Sys. Corp.*, 365 F.3d 1299, 70 U.S.P.Q.2d (BNA) 1900 (Fed. Cir. 2004).

Footnote 29. *Id.*

Footnote 30. *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 52 U.S.P.Q.2d (BNA) 1109 (Fed. Cir. 1999).

Footnote 31. *TM Patents L.P. v. Int'l Bus. Mach. Corp.*, 72 F. Supp. 2d 370, 53 U.S.P.Q.2d (BNA) 1093, 1101 (S.D.N.Y. 1999); *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 55 U.S.P.Q.2d (BNA) 1835, 1839 (Fed. Cir. 2000).

Footnote 32. *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*,

246 F.3d 1336, 1347, 57 U.S.P.Q.2d (BNA) 1953, 1958 (Fed. Cir. 2001).

Footnote 33. In *Innovad, Inc. v. Microsoft Corp.*, 260 F.3d 1326, 59 U.S.P.Q.2d (BNA) 1676, 1680-81 (Fed. Cir. 2001), "a single bi-state switch" where the main transition word after the preamble was "comprising" did not preclude the presence of other switches, even other bi-state switches, for other purposes than the stated purpose for the single bi-state switch.

Footnote 34. *Superior Fireplace Co. v. Majestic Prods. Co.*, 270 F.3d 1358, 60 U.S.P.Q.2d (BNA) 1668 (Fed. Cir. 2001).

Footnote 35. *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 67 U.S.P.Q.2d (BNA) 1191 (Fed. Cir. 2003). See *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 55 U.S.P.Q.2d (BNA) 1835 (Fed. Cir. 2000).

Footnote 36. *Rhine v. Casio, Inc.*, 183 F.3d 1342, 51 U.S.P.Q.2d (BNA) 1377 (Fed. Cir. 1999).

Footnote 36.1. *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 69 U.S.P.Q.2d (BNA)

1865 (Fed. Cir. 2004).

Footnote 36.2. See section 6:2, *infra*, "Markush" Expressions.

Footnote 37. *Lantech, Inc. v. Keip Mach. Co.*, 27 U.S.P.Q.2d (BNA) 1906 (W.D. Mich. 1993), *rev'd in part, remanded*, 32 F.3d 542, 31 U.S.P.Q.2d (BNA) 1666 (Fed. Cir. 1994), *and vacating, summary judgment granted*, 1995 U.S. Dist. LEXIS 11636 (W.D. Mich. 1995).

Footnote 38. *In re Pavlecka*, 138 U.S.P.Q. (BNA) 118 (C.C.P.A. 1963).

Footnote 39. *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 40 U.S.P.Q.2d (BNA) 1619 (Fed. Cir. 1996). Plurality does not require three or more. *Dayco Prods., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 59 U.S.P.Q.2d (BNA) 1489 (Fed. Cir. 2001); *Resquet.com Inc. v. Lansa, Inc.*, 346 F.3d 1374, 68 U.S.P.Q.2d (BNA) 1619 (Fed. Cir. 2003); *Bilstad v. Wakalopulos*, 386 F.3d 1116, 72 U.S.P.Q.2d (BNA) 1785 (Fed. Cir. 2004).

Footnote 39.1. *Bilstad v. Wakalopulos*, 386 F.3d 1116, 72 U.S.P.Q.2d (BNA) 1785 (Fed. Cir. 2004).

Footnote 39.2. *Resquet.com Inc. v. Lansa, Inc.*, 346 F.3d 1374, 68 U.S.P.Q.2d (BNA) 1619 (Fed.

Cir. 2003).

Footnote 40. *Ex parte Moelands*, 36 U.S.P.Q.2d (BNA) 1474, 1475 (Board of Patent Appeals and Interferences 1987).

3:9 Double Inclusion of Elements

One should be careful that precisely the same element is not included in the claim twice under two different names. ⁴¹ This is an error known as "double inclusion." ⁴² In non-chemical cases, the claim is rendered indefinite, and it may not be indefinite only in *Markush* groups, as discussed below.

Sometimes the problem arises in writing dependent claims (see section 2:9, above), where one might inadvertently add as an apparently new element something already in the parent claim or in one of several earlier claims in a chain of dependent claims. This is likely to occur in a complicated structure with many elements.

Sometimes the double recitation occurs because an element is recited broadly in an earlier claim and then mentioned in greater detail using a different name in a later claim. For example, Claim 1 (section 3:1.1, above) calls for "means for oscillating the container." If Claim 2 recited "A combination as recited in Claim 1, *further comprising* a motor, . . ." it would be improper since the motor is part of the means for oscillating in Claim 1. Instead, refer back to the recited element: "A combination as recited in Claim 1, wherein the oscillating means comprises a motor . . ." If two differently named elements of a claim each contain some or much common structure, but not entirely common structure, it is not double inclusion to give those elements different names so long as at least some structure is different. ⁴³

Sometimes the double recitation occurs because the same element is mentioned a second time in the same claim or in a series of claims introduced by the indefinite article "a" or "an," rather than by a definite article "the" or "said," which refers the reader back to the first appearance of the element in the claim or series of claims.

⁴⁴

MPEP section 2173.05(o) describes the unique situation in a *Markush* group (section 6:2) wherein there may be some overlapping in the members of the group. A group including "halogens" and "chloro" appears to overlap where alternatives are recited ("or"). But decisions reported in the MPEP section suggest opposite outcomes on the indefiniteness issue.

Summary

Do not put the same element in the claim twice under two different names. Watch

dependent claims so as not to add as a further element something already included in a previous claim from which the new claim depends.

FOOTNOTES:

Footnote 41. See section 3:7, *supra*, about a consistent name for each element.

Footnote 42. MPEP ?2173.05(o).

Footnote 43. See further comments on this, with respect to "means" clauses, in section 3:25.

Footnote 44. See section 3:3, *supra*, relating to how to avoid inferential claiming of elements.

?3:10 Use of Reference Numerals in Claims

Reference numerals corresponding to the specific elements or parts shown in the drawings may be used in claims. This practice, common in some foreign countries,⁴⁵ has been very rare in the United States. MPEP section 608.01(m) provides for this practice on an optional and nonlimiting basis:

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims.⁴⁶

Although this technique may seem helpful in interpreting claims as long as the claim scope is not limited by the parenthetical numerals, it is almost never used at present, and many attorneys probably consider the practice unsafe. For example, when the claim is being interpreted for equivalents by a court, the court may still limit the scope of claim breadth due to the presence of numbers referring to drawings of an embodiment, despite the Manual's recommending (for examiners but not for judges) that the reference characters have no effect.

Summary

Do not use reference characters from the drawings in claims, but it is not wrong to do so (if placed in parentheses).

FOOTNOTES:

Footnote 45. For example, some countries may require numerals throughout the claim and other countries may require numerals only in the body of the claim after

the preamble and transition. In the latter countries, the preamble includes material known in the art and numerals are not there required.

Footnote 46. See also MPEP §2173.05(s).

§3:11 Antecedents; Indefiniteness

MPEP section 2173.05(e) describes how one claims new elements or refers back to elements already named. The first time an element or part is mentioned, it should not be preceded by a definite article ("the") or by "said." Instead the indefinite article ("a" or "an") should be used, as in Claim 1: "*a* container," "*a* base," etc. ⁴⁷ This practice merely follows normal rules of grammar. Plural elements are not preceded by articles, as there is no plural indefinite article. Thus "containers." Sometimes an element is preceded by a numerical adjective when it is introduced in a claim, as "two containers." A "means for" clause requires no article: "means for oscillating . . ." Note that none of these uses a definite article. When each previously identified element or part is referred to again, the definite article should be used, as "*the* container," "*the* base," or "*the* oscillating means" in Claim 1; or "*the* two containers," or simply "*the* two containers." ⁴⁸

If the definite article is not used for each subsequent appearance of the element and if an indefinite article is used, this will suggest to the reader that a new element is being identified, rather than the previously named element, and this will cause improper double inclusion of the element. ⁴⁹

The word "said" is used by many practitioners rather than "the" to refer back to previously recited elements, sometimes to a previously recited anything. This practice is unobjectionable, although perhaps overly legalistic. If "sais" or "thes" are used, one should be consistent in the usage and not alternate between those words in repetitions of the same element or among different elements. (However, one often sees alternation between "said" and "the" within a claim without any apparent reason, and there is usually no objection as to this form by an Examiner at the Patent Office.) One common style is to use "said" only for the elements themselves, and "the" for everything else. The expression "the said" which one sometimes sees is a patent redundancy and should be avoided.

When referring back to an element, it must be perfectly clear which element. The claim must be consistent within itself. For example, if two different levers or gears have been individually described in the claim, it is improper to refer back to "said lever" or "said gear"; ⁵⁰ refer to "said first gear," "said drive gear," etc., and correspondingly to the lever.

Similarly, if a motor has been recited, do not refer back to "said drive means," that is, never change the name that was first given to an element.

In another example, the claim recited "a handle" and then something connected to "a handle"; thus it was not clear whether the first handle was meant or a different one. Such descriptions are "indefinite." It is also improper to describe additional details of an element when referring back to that element as an antecedent; for example, if "a gear" has been recited, it would be improper to refer to "said *plastic* gear." This is also called an "indirect limitation." To introduce the "plastic" nature of the gear, use a describing clause, "the gear is plastic" or "the gear is comprised of plastic."

MPEP section 2173.05(e) states that inherent components of elements have antecedent basis in the recitation of the components themselves. An example cited is "the outer surface of said sphere." The sphere inherently has an outer surface so one need not specifically recite that surface as an element. Other examples exist: A rod has ends, a pivot bearing has a pivot axis. But it is not always clear as to what is inherent. Does an engine always have a drive shaft? Does a bicycle always have wheels? Can we say these are inherent features that need not be introduced first as claim elements, for example, the engine having a drive shaft or the bicycle having wheels? Perhaps it is preferred for certain definiteness that any feature of a claimed element, no matter how likely to be inherent, should be positively recited if required in a claim, for example, the sphere having an outer surface, the bicycle having wheels. Examiners at the U.S. Patent and Trademark Office have often been requiring antecedents for every element introduced with "the" or "said." Providing antecedents always is thus preferable.

Claim limitations are often of such length that an attempt to refer back to an earlier mentioned element may introduce an ambiguity: "a handle connected to the gear, which is supported on the axis to pivot about it." To what does "which" and "it" refer, the handle, the gear, or the axis? Better would be "a handle connected to the gear, the handle is supported on the axis to pivot about the gear"--no ambiguity there. Do not hesitate to repeat the name of an element each time it appears in a clause (the handle). Avoid using indefinite words to refer back (which or that) or pronouns that do not mention the name of the element (it) unless there can be no doubt which element is being indicated. Wherever there is a second element between a first mentioned element and a later word referring back, as occurred in the above handle/gear/axis example, use of an indefinite reference back should be avoided, as ambiguity is virtually unavoidable.

In dependent claims also, one must be careful to avoid confusion between elements in any parent claims (or claims) and elements added by the dependent claim.

All such rejections or objections on matters of claim form are based upon claim "indefiniteness" of the claim and trace from 35 U.S.C. §112, that is, the subject matter has not been "particularly pointed out and distinctly claimed," meaning that

the examiner cannot tell what the claim covers. ⁵¹ In *In re Miller*, ⁵² the court held that an "indefiniteness" rejection must be based on section 112, ⁵³ and held that the Patent and Trademark Office could not reject the claim under section 103 (obviousness) by ignoring the allegedly indefinite words. ⁵⁴ The *Miller* court said: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

This question arises in many contexts, such as preamble limitations (section 6:7), mental steps (section 4:9), functional language (section 3:22), printed matter (section 8:6), and others.

Ex parte Schaefer ⁵⁵ holds that:

Omission of some elements of the device [the complete device described in the specification, through the use of the preamble "comprising"--Section 7] makes the claim broad, but not vague, indefinite or misdescriptive.

In other words, the court and Board are saying to the examiner: "reject broad claims on prior art, if you can find any, but not under section 112 as 'indefinite,' etc. Section 112 applies only where you cannot understand what the claim covers." ⁵⁶ However, a claim that omits essentials can be rejected as incomplete under section 112. MPEP section 2173.05(I) recites:

A claim can be rejected as incomplete if it omits essential elements, steps or necessary structural cooperative relationship of elements, such omission amounting to a gap between the elements, steps or necessary structural connections. . . . Greater latitude is permissible with respect to the definition in a claim of matters not essential to novelty or operability than with respect to matters essential thereto.

Summary

Use "a" or "an" the first time you mention an element or part in a claim, where grammatical rules dictate. Use "the" or "said" after that, when referring again to the same element or part. Make sure the claim is consistent with itself, that each "the" or "said" element has one and only one clear antecedent in the claim, and that consistent, definite phraseology is used throughout the claim. In general, make sure the claim is definite and clearly understandable as to what it covers and how it reads on the detailed description and drawing.

FOOTNOTES:

Footnote 47. See *Abtox, Inc. v. Exitron Corp.*, 43 U.S.P.Q.2d (BNA) 1545, 1548 (Fed. Cir. 1997), *modified on other grounds*, 46 U.S.P.Q.2d (BNA) 1735 (Fed. Cir. 1997).

Footnote 48. See section 3:3, *supra*, relating to inferential claiming.

Footnote 49. MPEP §2173.05(e); *Ex parte Oetiker*, 23 U.S.P.Q.2d (BNA) 1651, 1655 (Board of Patent Appeals and Interferences 1992).

Footnote 50. In *Superior Fireplace Co. v. Majestic Prods. Co.*, 270 F.3d 1358, 60 U.S.P.Q.2d (BNA) 1668 (Fed. Cir. 2001), the claim first introduced "rear walls" and the next limitation referred to "the rear wall." The latter limitation is in the singular, the former is in the plural, and the claim is ambiguous.

Footnote 51. See MPEP §706.03(d); *In re Venezia*, 189 U.S.P.Q. (BNA) 149, 151 (C.C.P.A. 1976).

Footnote 52. *In re Miller*, 169 U.S.P.Q. (BNA) 597, 600 (C.C.P.A. 1971).

Footnote 53. MPEP §706.02.

Footnote 54. Citing *In re Wilson*, 165 U.S.P.Q. (BNA) 494 (C.C.P.A. 1970).

Footnote 55. *Ex parte Schaefer*, 171 U.S.P.Q. (BNA) 110 (Board of Patent Appeals and Interferences 1970).

Footnote 56. See also "incomplete" claims, section 8:7, *infra*.

§3:12 Relative Terminology

Comparative words are also indefinite, that is, they are unbased comparisons, unless those words have been clearly defined in the disclosure or specification and/or the basis of the comparison, what is being compared, is stated and/or one of ordinary skill in the art, in view of the prior art and the status of the art, would be apprised of the scope of the claim.⁵⁷ Typically, a comparative word expresses a measure or magnitude, but has no meaning in a claim unless expressly defined in the specification: ". . . a predetermined distance of under three meters. . . ." Usually, those comparative words can mean virtually anything. If a distance is "predetermined" or a quantity is "sufficient," how much or how great are these amounts? It is best not to use such terms at all in the claims. "A claim may be rendered indefinite by reference to an object that is variable."⁵⁸ The Manual section provides examples decided by the Board of Appeals.

In *Norton Co. v. Bendix Corp.*,⁵⁹ a claim was held invalid for indefiniteness for inclusion of the phrases "closely spaced" and "substantial distance." Apparently, these features or relationships were important to novelty, and the specification did not define them. The testimony showed that a potential infringer could not tell, nor could the patentee, just what infringed and what did not.⁶⁰

Not only words like "more" or "less" or the like are comparative. In *In re Cruciferous Sprouts Litigation*,⁶¹ the words were "rich in glucosinolates" and "high Phase 2 enzyme-inducing potential." The words "rich" and "high" are comparative. They were not indefinite, as the specification explained them. But they were also not limited in scope to the values stated in the specification, and instead those terms, which had ordinary meanings, were given what the court said are their ordinary meanings.⁶²

In *Minnesota Mining & Mfg. Co. v. Chemque, Inc.*,⁶³ the claim term "effective amount" was defined by the court with reference to the arguments found in the prosecution history.

On the other hand, if the comparative word is not clearly defined in the specification, but is instead compared with something else and the relationship between them is in the claim element, then the claim element may not be indefinite.⁶⁴ For example, if the container of Claim 1 in section 3:1.1 were capable of being filled with a "predetermined" quantity of articles, that would not say how many and the limitation would be indefinite if patentability hinged on that capability. But if the predetermined quantity were defined as less than the quantity the legs could support, then for the critical aspect of that predetermined quantity, there is adequate definition. The claim, or one dependent on it, might recite: "the plurality of legs being adapted to support up to a predetermined quantity of the articles; the container being shaped to contain up to fewer than the predetermined quantity of the articles." Whatever is a "predetermined" quantity, its meaning as a comparative term is explained. Numerous other words suggesting magnitude can be definite in a claim if used comparatively: "more than the minimum . . . ," "shorter than the preset value . . ." MPEP section 2173.05(b) provides an example of an acceptable comparative, wherein something was "dimensioned as to be insertable through the space between the doorframe . . . and one of the seats." The comparative here had a measurable standard.⁶⁵

MPEP section 2173.05(b) also discusses precedents relating to other comparative words, "about": yes and no; "essentially": definite; "similar": indefinite; "substantially": usually definite (and often used in claims); "type" when added to a definite expression made it indefinite. Also held indefinite were: "relatively"; "on the order of"; "or like material"; "comparable"; "superior."⁶⁶ Definiteness requires it be explained in the specification, be compared with something else specifically, or be a term known to one of skill in the art. But "relatively" has also been held definite.⁶⁷

In *EMI Group North America Inc. v. Intel Corp.*,⁶⁸ a "relatively thicker layer of oxide" was not indefinite because the court found the applicant for patent had used that term to distinguish from prior art during application prosecution and the court was able to use the same distinction to find noninfringement of the claim.

However, if patentability of the claim will not depend on the actual or comparative magnitude of the element described with a comparative term, then the claim will not be indefinite. It is not useful to claim that the container is fillable with a predetermined quantity of articles, as one does not know how many are in that predetermined quantity. But, it is not harmful, because patentability is not premised on that quantity.

The cases on indefiniteness can be confusing and may turn on specific facts adduced at trial, long after the claim was written and patented.

Summary

Avoid use of comparative words, unless defined in the specification or the critical aspect of the comparison is also claimed.

FOOTNOTES:

Footnote 57. MPEP §2173.05(b).

Footnote 58. *Id.*

Footnote 59. *Norton Co. v. Bendix Corp.*, 171 U.S.P.Q. (BNA) 449 (2d Cir. 1971).

Footnote 60. See *Ex parte Oetiker*, 23 U.S.P.Q.2d (BNA) 1651, 1654-56, 1658-60 (Board of Patent Appeals and Interferences 1992), for phrases held not to define relationships, discussed in 3:16, *infra*.

Footnote 61. *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 64 U.S.P.Q.2d (BNA) 1202 (Fed. Cir. 2002).

Footnote 62. See *Innovad, Inc. v. Microsoft Corp.*, 260 F.3d 1326, 59 U.S.P.Q.2d (BNA) 1676, 1680 (Fed. Cir. 2001).

Footnote 63. *Minn. Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 64 U.S.P.Q.2d (BNA)

1270, 1276 (Fed. Cir. 2002).

Footnote 64. *Cf. Moore U.S.A., Inc. v. Standard Register Co.*, 229 F.3d 1091, 56 U.S.P.Q.2d (BNA) 1225, 1238-39 (Fed. Cir. 2000).

Footnote 65. In *Innovad, Inc. v. Microsoft Corp.*, 260 F.3d 1326, 59 U.S.P.Q.2d (BNA) 1676, 1680 (Fed. Cir. 2001), the court upheld the term "small volume" as meaning smaller than prior art telephone dialers. The court found no definition of

"small" in this specification, but found a relationship between the "small volume" and its purpose, without relationship to any specific size. (Here, a perhaps insufficient disclosure of a claim that included an unbased comparison was saved by a court's detailed analysis. Had the actual relationship desired been claimed, the issue would not have arisen.)

Footnote 66. *Ex parte Oetiker*, 23 U.S.P.Q.2d (BNA) 1651, 1655, 1658-60 (Board of Patent Appeals and Interferences 1992).

Footnote 67. *Allergan Sales, Inc. v. Pharmacia & UpJohn, Inc.*, 42 U.S.P.Q.2d (BNA) 1560 (S.D. Cal. 1997).

Footnote 68. *EMI Group N. Am., Inc. v. Intel Corp.*, 157 F.3d 887, 48 U.S.P.Q.2d (BNA) 1181

(Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 1756 (1999).

3:13 Alternative Expressions

Alternative expressions are not per se indefinite. Instead, they are permitted if they present no ambiguity with respect to the question of scope or clarity of the claims.

69

Use of "or" to state an alternative is acceptable under 35 U.S.C. §112, second paragraph. ⁷⁰*In re Gaubert*⁷¹ found acceptable "made entirely or in part of" and "iron, steel or any other magnetic material." In *Kustom Signals, Inc. v. Applied Concepts, Inc.*⁷² the patent claimed searching for the strongest or the fastest signal in radar processing. The court held that the alternative expressions "or" or "either" excluded a device that did both without operator selection of one alternative. The dissent said that the "or" expression should be construed as "one or another or both," but the majority held otherwise.

The primary example of an acceptable alternative is a *Markush* group (section 6:2).

If you do not intend to claim a *Markush* group, but want to express alternatives, it must be done carefully or the alternatives will be treated effectively as a *Markush* group and, for example, prior art as to one member of the group may anticipate the entire group. In *Brown v. Air Products and Chemicals, Inc.*,⁷³ the patent claimed setting year data in a computer clock in "at least one of two-digit, three-digit, or four-digit representations." The patentee intended that the apparatus be able to perform all three alternatives. But the language used did not encompass all three, because it was merely stated alternatively in a *Markush* group. If the patentee meant the capability was as to all three alternatives, that should have been said, that is, without "at least" and here, too, without "or."

It is ordinarily improper to use alternative expressions for a single element or part in a claim. Thus, it is improper to state: "a spring or a weight for urging the carriage against the stop [assuming the carriage and stop had been defined]." In effect, that would be two claims. Also, it is indefinite in that the reader does not know which one, the spring or the weight, infringes the claim, based on the claim language. Some case precedents suggest alternative language may sometimes be acceptable: "made entirely or in part of . . ." ⁷⁴ But better practice says to avoid that.

The way to avoid alternative expressions is to find or invent some expression that is generic to both embodiments or species, such as "means for biasing" in the above example. (See section 6:2 on *Markush* expressions for a limited exception in certain types of chemical cases where an element is selectable from a list of similar ones.)

Old section MPEP section 706.03(d) appeared to permit some limited use of alternative expressions:

Alternative expressions such as "brake or locking device" may make a claim indefinite if the limitation covers two different elements. If two equivalent parts are referred to such as "rods or bars," the alternative expression may be considered proper.

Since the precise boundaries of equivalent parts often are not clear, and since alternatives were previously considered improper per se, it is suggested that this device not be used. Note the *Pavlecka* case ⁷⁵ sanctioning "a spline or splines."

Similarly, attempted alternative or hedged expressions (for example, "a drive means, such as a motor," or "a holder, preferably a perforated box") are considered improper. ⁷⁶ "Description of examples or preferences is properly set forth in the specification rather than the claims." ⁷⁷ These expressions are alternative and really an attempt to present two different claims--one broad, one narrower--at the same time. If it is not clear whether the claimed narrower range is a claim limitation, it is improper. ⁷⁸ The MPEP gives examples: "R is halogen, for example, chlorine"; "material such as rock wool or asbestos"; "hydrocarbons such, for example, as the vapor"; "normal conditions, such as while in the container." ⁷⁹ But note, while "material such as rock wool or asbestos" is improper for it is not limiting, "rock wool or asbestos" would be a proper alternative. Each claim must cover a single combination with an ascertainable scope, not several combinations of different scope.

The solution, of course, is to use the broader term for the first claim and, if important, the narrower term or alternative structure in other claims.

In *In re Wolfrum & Gold*, ⁸⁰ the court expressly held that a *Markush* claim (section

6:2) to "patentably distinct" species A and B could not be rejected under 35 U.S.C. §112.⁸¹ The claim in question was very definitely an alternative claim to groups of compounds A or B, but the court held that section 112 would not support such a rejection, because it was clear what the applicant intended to claim, and that is all section 112 requires. Note, there would never be any indefiniteness problem per se in an alternative claim: applicant would clearly intend to claim combination A or combination B, assuming each alternative was clearly defined.

In *In re Haas*,⁸² the court held that such claims could not be rejected under 35 U.S.C. §101, defining the statutory classes of patentable subject matter.⁸³

It is not clear what other statutory clause might support a rejection of an alternative claim, and if all rejections of claims must be based on specific sections of the statute, the *Wolfrum* case might open up claim drafting practices to any and all definite forms of alternative claims (for example, "a spring or a weight for biasing"). There would be no question as to what the applicant regards as the invention, the spring or the weight. By extension, one might be allowed to claim a lawn sprinkler or a popcorn popper, totally different inventions, assuming each was defined clearly, so far as section 112 is concerned. But these products are so independent that they could not appear in one claim.

Even under a doctrine permitting express alternatives, such alternative expressions as "a spring or the like" might be barred because it would not be definite what "or the like" might be.

"Optionally," as in "containing A, B and optionally C" is not considered indefinite as there is no ambiguity as to the alternatives covered in the claim.⁸⁴ If the list of potential alternatives can vary, leading to ambiguity, the claim is indefinite under section 112, paragraph 2. This is quite a change, in the view of an experienced practitioner. But it illustrates how far MPEP section 2173.05(h) goes in permitting alternatives.

Summary

Avoid alternative expressions, particularly names of parts. Make what claims cover definite.

FOOTNOTES:

⁸¹Footnote 69. MPEP §2173.05(h).

⁸²Footnote 70. MPEP §2173.05(h)II.

⁸³Footnote 71. *In re Gaubert*, 524 F.2d 1222, 187 U.S.P.Q. (BNA) 664 (C.C.P.A. 1975).

Footnote 72. *Kustom Signals, Inc. v. Applied Concepts, Inc.*, 264 F.3d 1326, 604 U.S.P.Q.2d (BNA) 1135 (Fed. Cir. 2001).

Footnote 73. *Brown v. Air Prods. & Chems., Inc.*, 229 F.3d 1120, 56 U.S.P.Q.2d (BNA) 1456 (Fed. Cir. 2001); *Brown v. 3M*, 265 F.3d 1349, 60 U.S.P.Q.2d (BNA) 1375 (Fed. Cir. 2001).

Footnote 74. MPEP §2173.05(h).

Footnote 75. *In re Pavlecka*, 138 U.S.P.Q. (BNA) 118 (C.C.P.A. 1963).

Footnote 76. MPEP §2173.05(d).

Footnote 77. *Id.*

Footnote 78. *Id.*

Footnote 79. *Id.*

Footnote 80. *In re Wolfrum & Gold*, 179 U.S.P.Q. (BNA) 620 (C.C.P.A. 1973).

Footnote 81. See further discussion of *Wolfrum* in section 8:8, *infra*.)

Footnote 82. *In re Haas*, 179 U.S.P.Q. (BNA) 623 (C.C.P.A. 1973).

Footnote 83. See discussion of that *Haas* in section 6:2.

Footnote 84. MPEP §2173.05(h)III. *Ex parte Cordova*, 10 U.S.P.Q.2d (BNA) 1949 (Board of Patent Appeals and Interferences 1989); *Ex parte Wu*, 10 U.S.P.Q.2d (BNA) 2031

(Board of Patent Appeals and Interferences 1989).

§3:14 Parts or Features of Elements

It is necessary to describe everything about each element that is pertinent to a claim of the scope to be drafted.⁸⁵ That is, where material to the claim, one must describe such features as

(1) the constituent parts of the element and how they are related;

(2) details of construction such as apertures, rounded ends, etc.;

(3) the size, shape, and geometry of the element or any of its parts; and

(4) the materials of construction used.

If the orientation of an element (horizontal, vertical) or its location (above or below some other element) is important, that should be stated.

The foregoing list is illustrative, not exclusive. The rule is to describe everything about the element *that is necessary to the claim* and no more. Of course, the claim drafter must distinguish between the elements of the claim and the parts of the elements; sometimes an item of structure may be made either a separate element or a part of an element, depending on how the elements are defined. In case of doubt, make the item a separate element.

One problem comes with unbased comparatives, such as "thick," "heavy," "small." These will frequently be considered vague and indefinite by the examiner.⁸⁶ The remedy here usually is to relate the property to some other element or to an external standard, such as "smaller than the" or "having a specific gravity greater than one." In this area, there is a "rule of reason," and such qualifiers as "resilient," "flexible," etc., are usually accepted without question.

If many features of elements are essential to the claim, they should be described in some logical order, usually a matter of choice, using subordinate clauses as necessary. But watch out for grammar, particularly verb tenses, and make sure the claim continues to read as a proper sentence (section 2:2, above). One example of a description of a moderately complex element follows:

. . . a carriage on which the bending fingers and the article holder are mounted, the carriage being mounted in the guideway of the base for sliding movement between the first and second stops, the carriage having a transverse guide slot in its upper surface in which the article holder is mounted for relative sliding movement toward and away from the bending fingers, . . . [Note the "the bending fingers," etc., would have been described in previous clauses.]

As much detail is stated as is necessary, in the easiest way possible.

It is ordinarily best to describe all of the salient features of each element in the clause pertaining to that element, even though the purpose for a feature of the element does not appear until later in the claim. This is preferred over reciting features of one element at different points throughout the claim. It is easier to develop a mental picture of an element, and when there is a drawing, to see all of the features of the element at one time in the drawing, when the claim recites all of the features of that element before moving on to describe another element. However, this is not mandatory, and sometimes other techniques make the claim

easier to understand and should be used.

Similarly, it is usually best to tell how an element moves or cooperates with other elements at the point where all of the background has been described, rather than waiting until the end of the claim.

The paragraphing of a claim is useful for this describing of the salient features, since a paragraph can recite all of the features of an element before moving on to the next element in the next paragraph.

It should be noted that Claim 1 (section 3:1.1) does not include any features of elements, as this was not necessary to describe the simple shaker claimed. However, assume that the shaker is a popcorn popper and is to be so claimed, and that the holes in the container (Example I, Fig.-1) are important and must be defined.

Clause (a) of Claim 1 might read:

A container for receiving kernels of corn to be popped, the container having a perforated bottom with apertures smaller in size than the kernels;

Other examples of expressions defining features of elements:

a disc of resilient material having a peripheral groove . . .

a relay having two windings . . .

a level having a forked end and a rounded end . . . [If only the forked end is important to the combination being claimed, do not mention the rounded end.]

a gear of electrically insulating material . . .

If an element by definition inherently includes a certain feature, that feature need not be recited and it is proper to refer, without previous mention, to such features as: "the end of the lever . . ."; "the periphery of the disc . . ."; "the tines of the fork . . ." In case of doubt about inherent inclusion, positively describe the feature or part.

Summary

Select those parts or features of each element that are essential to the combination being claimed. Then describe them in a logical order, preferably following the main description of the element and in the same clause of the claim. How many features need to be described and how broadly each should be recited is a matter of the claim scope (based largely on the prior art and the need to avoid an incomplete structure missing an essential component), but the principles are the same as used in

selecting the elements and naming them.

FOOTNOTES:

Footnote 85. See sections 3:11 and 8:7 for discussions on incomplete claims.

Footnote 86. See MPEP §2173.05(b). This was discussed in section 3:12, *supra*.
§3:15 Claiming Holes

In past practice, in a claim where a hole was to be described, it was not recited positively. That is, instead of stating "a hole, groove, aperture, recess, slot, etc., in the lever," one claimed "the lever having a hole, groove, etc." The object was claimed, and then the feature of significance was recited, the hole, etc. Thereafter, one could refer to "the hole" or "said hole." This can also lead to an odd inquiry as to whether a particular feature is a claimed "hole." For example, is "a chamber in the lever" claiming a hole? Other words denoting empty space (gap, space, opening, hollow, etc.) might be subject to the same rejection. This "rule" may seem to make little sense, but it is another founded in antiquity like the single sentence rule. Perhaps someone thought that a hole, etc., is nothing--and people should not claim nothing. The author has seen objections to claiming holes, received from Examiners even in recently prosecuted patent applications.

Another approach to describing holes is an expression such as "the level having portions defining a hole, groove, etc." The hole is thus defined in terms of the structure that forms it.

However, that previous prohibition against claiming holes has not been honored, and the author has only very rarely seen a rejection of a claim for claiming a "hole," or an equivalent. One case⁸⁷ held that it was proper to claim a hole and its function as a means for performing a function, specifically "means for providing fluid communication between . . . [two members]."

Summary

You may claim holes positively and make them claim elements. Better practice is to claim "a [member] having a hole, groove, slot, aperture, etc."

FOOTNOTES:

Footnote 87. *In re Newton*, 163 U.S.P.Q. (BNA) 34 (C.C.P.A. 1969).

§3:16 Words of Approximation--"Substantially" et al.

There is scarcely a magnitude or quantity, a condition, or a comparison (in this section, simply called a term) that does not benefit from some softening at its edge

when recited in a patent claim. A claim limitation that includes such a term often can be satisfied by a slight difference between the prior art or accused element, on the one hand, and the claimed element on the other hand. ^{87.1} Patent practitioners use words of approximation as adjectives or adverbs for claim terms--words like "substantial," "substantially," "generally," "approximately," "about," "almost," "essentially," and the like. ⁸⁸ The Federal Circuit defined "substantially" as having its ordinary meaning of "largely but not wholly that which is specified," ⁸⁹ and again defined "substantially" as a term of degree that should not be interpreted as having a strict numerical limitation, implying "approximate" rather than "perfect." ^{89.1}

"About" has also been held to not be per se indefinite, because the term is dependent on the particular case and the patent disclosure. ⁹⁰

MPEP section 2173.05(b) discusses various relative terminology to say what is or is not definite as to "about" (should be defined in the specification, prosecution history, or prior art as related to the claim element); "essentially" (defined in specification was a definite term); "similar" (not defined in specification, indefinite); "substantially" (definite if defined in specification); "type" (makes a definite term indefinite); "relatively" and "of the order of" (indefinite if not defined in specification); "or the like" (indefinite); "comparable" (indefinite); "superior" as to characteristic or property (indefinite). Guidance for any such term must be found, or it is indefinite.

So long as the claim element being modified does not require a precise edge or dividing line (the speed of sound is not substantially anything, it is precisely 333 meters per second at sea level), the patentee is better served by giving the claim element some degree of imprecision or fuzziness at its edge or limit.

If a claim limit were to recite 6 inches, or 6 cms, or 6 degrees, or 6 pieces, or a pH of 6, etc., would 5 of the same units meet the claim limit literally, or would 5.8 of those units meet it literally? The simple answer is "no," because the number of units is below 6. The claim limitation would not be literally satisfied. The Doctrine of Equivalents was developed to deal with this situation. But application of that Doctrine imposes considerable extra testing and comparisons, both during examination of the claim in the Patent Office (*In re Donaldson*) ⁹¹ and during an infringement trial (*Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*), ⁹² to find equivalence and for application of the doctrine of prosecution history estoppel, as discussed in section 3:25 below.

However, add the modifier "substantially" or "approximately," etc., before the number 6, and, unless the precision of 6 is critical, the claim limit will likely be met literally by 5.8 units and, under the particular circumstances, possibly by 5 units. ⁹³ Proof of literal infringement of a claim limitation and of the claim which includes it is possible without also or alternatively having to prove equivalence.

Every time a claim limitation is written, whenever the claim term of magnitude, quantity, condition, or comparison need not be precise, and where that claim term would not inherently always be present in the combination (something is always to the left or the right of something else, and usually is not substantially to the left of it), then that limitation should include a word of approximation.

Terms that define one out of two or more limits or restrictions in a narrow range, for example, terms such as "at least," "at most," "more than," "less than," "over," "under," etc., are not words of approximation since they define the end point of their particular limit quite sharply. Those limits, too, can be softened by modification with a word of approximation, for example, "substantially at least," etc.

However, when a word of approximation is used, it must be definite as used. Either the specification explains⁹⁴ that term or provides a standard, or one sees a definition in the prosecution history⁹⁵ or one of ordinary skill in the art, in view of the prior art and the status of the art will understand the term.⁹⁶ If not, that effort made to "soften" the sharp edge of a term may render the claim indefinite, an undesirable outcome. This undesired result occurred in *Ex parte Oetiker*⁹⁷ as to "major portion," "at least nearly flat," "non-reinforced condition," "relatively small," "generally parallel," "of the order of 5 mm," "relatively large," "relatively shallow," and "substantial part." Throughout, the court noted there were no passages in the specification to serve as a standard or guideline for ascertaining the scope of each limitation, nor any evidence that one skilled in the art would know the scope of each limitation.⁹⁸ Of course, if the court can ascertain the ordinary meaning of a term, like "closely adjacent"⁹⁹ or "about,"^{99.1} then the term is not indefinite. In *Anchor Wall Systems, Inc. v. Rockwood Retaining Walls, Inc.*,^{99.2} the court found "a bottom face generally parallel to the top face" definite as words of approximation are commonly used in claims like "approach each other," "close to," "substantially equal" and "closely approximate." Therefore, exact parallelism was not necessary to satisfy "generally parallel." This is a more recent precedent and in the Federal Circuit and more correctly states applicable law today. Similarly, "substantially flattened" did not require either a perfectly flat surface or one that is flat within a manufacturing tolerance, based on the intrinsic record.^{99.3} There was no need to limit the term to the flatness in the preferred embodiment. "Substantial" implies "approximate," rather than "perfect."

If the specification does not define the "substantial" claim element, a court may have to construe it later and may do so in a manner that makes at least one party dissatisfied.¹⁰⁰

Compare *Exxon Research & Engineering Co. v. United States*,¹⁰¹ wherein the Federal Circuit referred to the specification to interpret "to increase substantially" and found a definition there of an increase of at least 30%, which the court interpreted as to

increase substantially.

Make sure your specification supports your words of approximation.

FOOTNOTES:

Footnote 87.1. *Liquid Dynamics Corp. v. Vaughan Co.*, 355 F.3d 1361, 69 U.S.P.Q.2d (BNA) 1595 (Fed. Cir. 2004).

Footnote 88. *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 67

U.S.P.Q.2d (BNA) 1865 (Fed. Cir. 2003). A claim reciting that the claimed method "does not substantially inhibit the activity of the antimicrobial agent" is not invalid for indefiniteness. *Bausch & Lomb, Inc. v. Alcon Labs., Inc.*, 79 F. Supp. 2d 252, 53 U.S.P.Q.2d (BNA) 1682 (W.D.N.Y. 1999). The word "substantially" gives some definitional leeway. *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 829 (Fed. Cir. 1984). The word avoids undue limits to the word that "substantially" modifies. *C.E. Equip. Co. v. United States*, 13

U.S.P.Q.2d (BNA) 1363 (Ct. Cl. 1989). *See Alcon Labs., Inc. v. Allergan, Inc.*, 17 U.S.P.Q.2d (BNA) 1365, 1369 (N.D. Tex. 1990); *In re Hauserman, Inc.*, 15 U.S.P.Q.2d (BNA) 1157, 1158 (1989); *Deering Precision Instruments LLC v. Vector Distrib. Sys., Inc.*, 347 F.3d 1314, 68 U.S.P.Q.2d (BNA) 1716 (Fed. Cir. 2003); *cert. denied*, 124 S. Ct. 1426 (2004). "About" is similar to "approximately." *Syntex, Inc. v. Paragon Optical, Inc.*, 7 U.S.P.Q.2d (BNA) 1001, 1038 (D. Ariz.

1987). *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61

U.S.P.Q.2d (BNA) 1470 (Fed. Cir. 2002); *Glaxo Group Ltd. v. Ranbaxy Pharms.,*

Inc., 262 F.3d 1333, 59 U.S.P.Q.2d (BNA) 1950 (Fed. Cir. 2001) ("essentially" means "fundamentally"); *On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386 F.3d 1133, 73 U.S.P.Q.2d (BNA) 1116 (Fed. Cir. 2004) ("substantially spherical" encompasses a toroidal shape). *But see* section 3:12, *supra*.

Footnote 89. *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 60 U.S.P.Q.2d (BNA) 1173 (Fed. Cir. 2001). *See also Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 65 U.S.P.Q.2d (BNA) 1051 (Fed. Cir. 2002); *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298 (Fed. Cir. 2003); *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 70 U.S.P.Q.2d (BNA) 1696 (Fed. Cir. 2004).

Footnote 89.1. *Playtex Prods., Inc. v. Procter & Gamble Co.* 400 F.3d 901, 73 U.S.P.Q.2d (BNA) 2010 (Fed. Cir. 2005).

Footnote 90. *Chem. Separation Tech., Inc. v. United States*, 51 Fed. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114, 1123 (Fed. Cl. 2002) (see cases in note 4).

Footnote 91. *In re Donaldson Co.*, 16 F.3d 1189 (Fed. Cir. 1994).

Footnote 92. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 35 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995), *rev'd on other grounds*, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 93. In *Hilton Davis*, the court spent considerable time discussing whether a pH of 5 was the equivalent of a claimed pH range of 6 to 9 and performed the detailed equivalence analysis.

Footnote 94. *Zoltek Corp. v. United States*, 48 Fed. Cl. 290, 57 U.S.P.Q.2d (BNA) 1257, 1265 (Fed. Cl. 2000) ("about 1,300 degrees C." was claimed, and the specification explained that was a temperature at which a particular change was complete). See *Glaxo Group Ltd. v. Ranbaxy Pharms., Inc.*, 262 F.3d 1333, 59 U.S.P.Q.2d (BNA) 1950 (Fed. Cir. 2001) ("essentially free from crystalline material" had restrictive limits applied from a dictionary and from the patent specification); *BJ Servs. Co. v. Halliburton Energy Servs., Inc.*, 338 F.3d 1368, 67 U.S.P.Q.2d (BNA) 1692 (Fed. Cir. 2003), *cert. denied*, 124 S. Ct. 1878 (2004); *Chem. Separation Tech., Inc. v. United States*, 51 Fed. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114, 1123 (Fed. Cl. 2002). In *AK Steel Corp. v. Sollac & Ugine*, 344 F.3d 1234, 68 U.S.P.Q.2d (BNA)

1280 (Fed. Cir. 2003) the claim said "the coating metal consisting essentially of aluminum," the patentee argued that the claim element was broad enough to cover aluminum coating baths containing up to 10% silicon impurity. But the court interpreted it to cover only up to about 0.5% silicon. The court found support for that view in a statement in the specification. "Essentially" and the like are dangerous unless defined as the patentee wants. See *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 73 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 2005).

Footnote 95. *Viskase Corp. v. Am. Nat'l Can Co.*, 261 F.3d 1316, 59 U.S.P.Q.2d (BNA) 1823

(Fed. Cir. 2001).

Footnote 96. *Id.* In *Viskase*, the claim read "below about 0.91 g/cm³." The district court used the standard scientific convention of rounding from the next decimal place, and interpreted the range as between 0.905 and 0.914. The Federal Circuit reviewed the prosecution history and narrowed the scope to 0.91, as that had been required to distinguish from prior art. In *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 65 U.S.P.Q. (BNA) 1051 (Fed. Cir. 2002), "substantially constant wall thickness" was held definite, even though the specification did not define it, because

the term would be understood by persons skilled in the art, *i.e.*, extrinsic evidence. In *BJ Servs. Co. v. Halliburton Energy Servs., Inc.*, 338 F.3d 1368, 67 U.S.P.Q.2d (BNA) 1692 (Fed. Cir. 2003), *cert. denied*, 124 S. Ct. 1878 (2004) "about 0.06" was not invalid for indefiniteness because one skilled in the art would understand that "about" encompasses the range of experimental error that occurs in a measurement. Also, the specification defined the operational result of the claimed concentration level.

Footnote 97. *Ex parte Oetiker*, 23 U.S.P.Q.2d (BNA) 1651, 1654-56, 1658-60 (Board of Patent Appeals and Interferences 1992).

Footnote 98. *Verve, LLC v. Crane Cams, Inc.*, 145 F. Supp. 2d 862, 60 U.S.P.Q.2d (BNA) 1219 (E.D. Mich. 2001). *See Deering Precision Instruments LLC v. Vector Distrib. Sys., Inc.*, 347 F.3d 1314, 68 U.S.P.Q.2d (BNA) 1716 (Fed. Cir. 2003), wherein the court acknowledged that "substantially" was ambiguous since it could mean significantly, considerably, largely or essentially. In dictionaries, the court then looked at the intrinsic record, the specification. Although there was no explicit definition of "substantially" in the specification, the description there sufficiently provided context for "substantially." *On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386 F.3d 1133, 73 U.S.P.Q.2d (BNA) 1116 (Fed. Cir. 2004), wherein the court found support in the specification for construing "substantially spherical" to include for ovoidal or donut shaped.

Footnote 99. *Chem. Separation Tech., Inc. v. United States*, 51 Fed. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114, 1123 (Fed. Cl. 2002).

Footnote 99.1. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 73 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 2005).

Footnote 99.2. *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 67 U.S.P.Q.2d (BNA) 1865 (Fed. Cir. 2003); *see Liquid Dynamics Corp. v. Vaughan Co.*, 355 F.3d 1361, 69 U.S.P.Q.2d (BNA) 1595 (Fed. Cir. 2004) approving "substantial" as a meaningful modifier implying approximate, rather than perfect.

Footnote 99.3. *Playtex Prods., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 73 U.S.P.Q.2d (BNA) 2010 (Fed. Cir. 2005); *Cardis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1361, 67 U.S.P.Q.2d (BNA) 1876 (Fed. Cir. 2003).

Footnote 100. *See Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 60 U.S.P.Q.2d (BNA) 1173 (Fed. Cir. 2001).

Footnote 101. *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 60 U.S.P.Q.2d (BNA) 1272 (Fed. Cir. 2001).

3:17 Numerical Ranges and Amounts

MPEP section 2173.05(c) states that specific numerical ranges in a claim are not indefinite.

Combining a narrow range into a broader range in a single claim is often indefinite: "20 mm to 50 mm, and preferably 30 mm to 40 mm," or "a predetermined quantity, for example X," both recitals are examples. Use two claims, either both related back to a common parent or the narrower range claim dependent upon the broader range claim. Just do not place both ranges into one claim.

Be careful with open-ended ranges, such as "at least 20% sodium," and then in the same claim a recitation of other elements that together total over 100%, which would make the claim indefinite. But a range with only one specified end is not indefinite. Ranges might have terminal ends that together exceed the possible, for example, the upper end of ranges of several components exceed 100 percent. For example: 10%-20% of X plus 10%-50% of Y, plus 10%-40% of Z. Even if the top end of one of the ranges is present, a lower part of the other ranges may be present, so that the total present is 100%.

"An effective amount" is not indefinite if defined in the disclosure (specification), if not otherwise uncertain as to just what is that amount. Similarly, "stem cells" "in an amount sufficient to effect hemopoietic reconstitution of a human adult" is not indefinite merely because it does not state an exact quantity. ^{101.1}

Similarly, examples of a claim element following another usually broader scope element are indefinite: "halogen, for example, chlorine," "material such as X," or "material, for example, X." MPEP section 2173.05(d) makes examples in one claim indefinite. To include the contents of an example in a claim, make the example the subject of another claim dependent upon the same parent claim or make it dependent upon the claim with the broader scope element.

Claims may include ranges of numbers of units, like temperature quantities, percentages, etc. Those specific claim elements may be expanded under the doctrine of equivalents, if there is no prosecution history estoppel. ¹⁰² Also, as noted in section 3:16 hereof, both numerical ranges and numerical amounts may be "softened" at the ends with a word of approximation, such as about, approximately, almost, substantially, etc.

However, in the case when a claimed numerical range overlaps (at least in part) a prior art range, the claimed range must show unexpected results over the entire claimed range, not over only part of that range. ¹⁰³

FOOTNOTES:

Footnote 101.1. *Pharmastem Therapeutics, Inc. v. ViaCell, Inc.*, 2004 U.S. Dist. LEXIS 18638, ... F. Supp. 2d ..., ... U.S.P.Q.2d (BNA) ... (D. Del. Sept. 15, 2004).

Footnote 102. *See R.F. Del., Inc., v. Pac. Keystone Techs., Inc.*, 326 F.3d 1255, 66 U.S.P.Q. (BNA) 1593, 1598 (Fed. Cir. 2003).

Footnote 103. *In re Petersen*, 315 F.3d 1325, 65 U.S.P.Q. 1379 (Fed. Cir. 2003).
3:18 Order of Elements

The elements of the claim should be presented in some logical order. Often, there are several orders that make sense, and any one may be selected. The order used in Claim 1 (section 3:1.1) is a "functional" order, starting with the element that first has contact with the workpiece (the container) and proceeding along functional lines to describe the remaining elements.

Another order that is often used is a "structural" order, starting first with the base, or the source of power, and proceeding along structural lines to describe the remaining elements. In structural order, Claim 1 would read:

1B. Apparatus for shaking articles, which comprises:

(a) a base;

(b) a plurality of parallel legs, each of which is connected pivotally at one end to the base;

(c) a container for the articles connected pivotally to the other ends of the legs, so that the legs support the container for oscillating movement with respect to the base; and

(d) means for oscillating the container on the legs to shake the articles.

It should be noted that exactly the same structure and movements have been described, only more words are required. The structural order is very common, and is a fairly easy order to follow. It may be used always, or preferably, whenever no more logical order occurs to the claim drafter.

With long mechanical drives, and various electrical circuits, it is often preferable to start with the motor or power source and work toward the end of the drive or circuit, describing the elements significant to various motions or functions that must be performed by that apparatus, and describing them in the sequence in which one proceeds through the apparatus from one element to the next. In the claim, follow the action through the apparatus. Starting at the drive, for example, move through the apparatus, stopping to claim each element essential to performing the ultimate

operation which the claimed apparatus performs. It is equally proper, and sometimes convenient, to start at the output and work backwards.

In many types of apparatus, a number of elements act simultaneously or in parallel. Following either the functional or structural approaches, deal with one of the elements in the proper sequence, then deal with the other elements or elements acting simultaneously, and thereafter continue the claim with other elements in sequence. When the claim writer selects one of the simultaneous or parallel action elements to recite, claim it completely and then follow the action from that element to the end point. Then return to the other simultaneous or parallel action element and claim it and then follow the action from that element to its end point.

It should be noted that Claim 1 would be illogical and difficult to follow if one attempted to start with the legs or with the means for oscillating.

Summary

Describe the elements in some logical order, either along the series of actions performed by the claimed apparatus or by the sequential arrangement of its elements in the apparatus.

§3:19 Tying the Elements Together

It is very important that the essential cooperation between each element of the claim and the other elements with which it cooperates be specified. "A claim can be rejected as incomplete if it omits essential elements, steps or necessary structural cooperative relationship of elements, such omission amounting to a gap between the elements. . . ." ¹⁰⁴ When complete, the claim must define the direct or indirect cooperation of each element with every other element of the combination. If no such cooperation is stated, the claim will usually be rejected for that reason alone; for example, as being drawn to "a mere catalog of elements" or, more graphically, as "reading on so many parts lying in a box." This is sometimes called an "aggregation," ¹⁰⁵ but what is really meant in such a rejection is that the combination is aggregative *as claimed*. A real "aggregation" relates to a defect in the structure (the parts do not cooperate) rather than any problem in claim drafting. ¹⁰⁶ The claim must be to an assembled, operable combination, not to a mere parts list such as one might find in the corner of a production drawing. But see *In re Venezia*, ¹⁰⁷ allowing a special form of claim to a kit of unassembled parts. The words of connection, cooperation, etc., may well be regarded as the glue that must hold the claims together.

This rule follows from court decisions construing the word "machine" in 35 U.S.C. §101, setting out the classes of things that can be patented, as explained in

section 1:3 above: machines can be; parts in a box cannot (unless the invention is the unconnected parts, as in a kit).

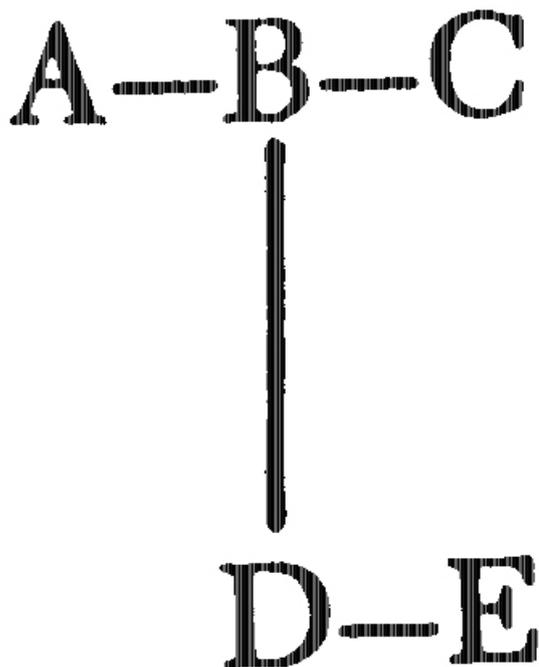
Of course, if one part were novel, it could be patented by itself, but not in aggregation with other parts. A "machine" is an assembled, operative combination of parts or machine elements in place ready to do a job.

Example--Claim 1 drafted as an aggregation or catalog of elements:

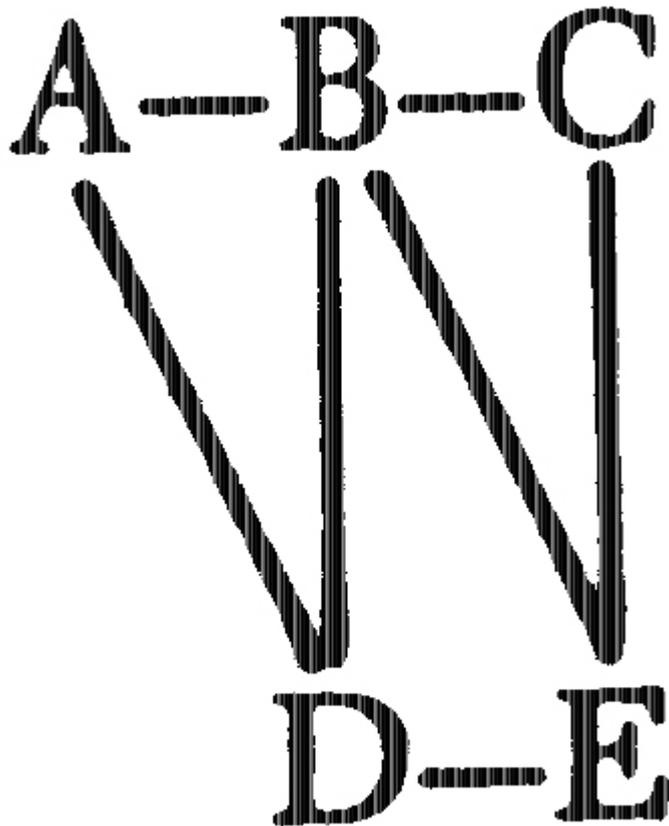
Apparatus for shaking articles, which comprises: a container, a base, a plurality of legs, and means for oscillating the container.

A proper claim includes and starts with a parts list, as above, involving the selection and naming of the elements, as described in above in sections 3:3 through 3:18; but it must also tie the elements together so as to make up a complete, operable machine. See the *Adams* case and others cited in section 8:5 on aggregation to the effect that the necessary cooperation need not be "direct mechanical interconnection"; the elements may function independently "so long as the over-all result has utility and is unobvious."

Although it is difficult to set out ground rules for writing machine claims in vacuo, a good general rule might be that each element or part of an element must be recited as physically connected, or as related functionally, or both, to at least one other element or part, and all elements must tie together in a unit through one or more such individual connections between elements. Thus, one might have five elements, A to E, connected many ways, such as



In this example, it is necessary to connect the group D-E to the previous group A-B-C, such as by connecting D to B as well as to E. There are often many connections, such as



Do not leave even one element or part hanging in the air with no apparent connection to anything else, and no apparent function in the combination. For example, do not describe "a lever having a forked end," and then fail to recite either something connected to the lever or the forked end and/ or something operating on either of them or either of them operating on something else. Further, if there is no recited purpose or function for the forked end, do not recite it. It is better to err on the side of stating too much connection and cooperation between elements, rather than running the risk of defining an unintegrated or incomplete structure. Think of the elements as islands, the parts of elements as peninsulas, and statements of structural or functional connection or cooperation as bridges; then, make sure when the claim is done that each island and peninsula is connected directly or indirectly to every other island or peninsula by bridges.

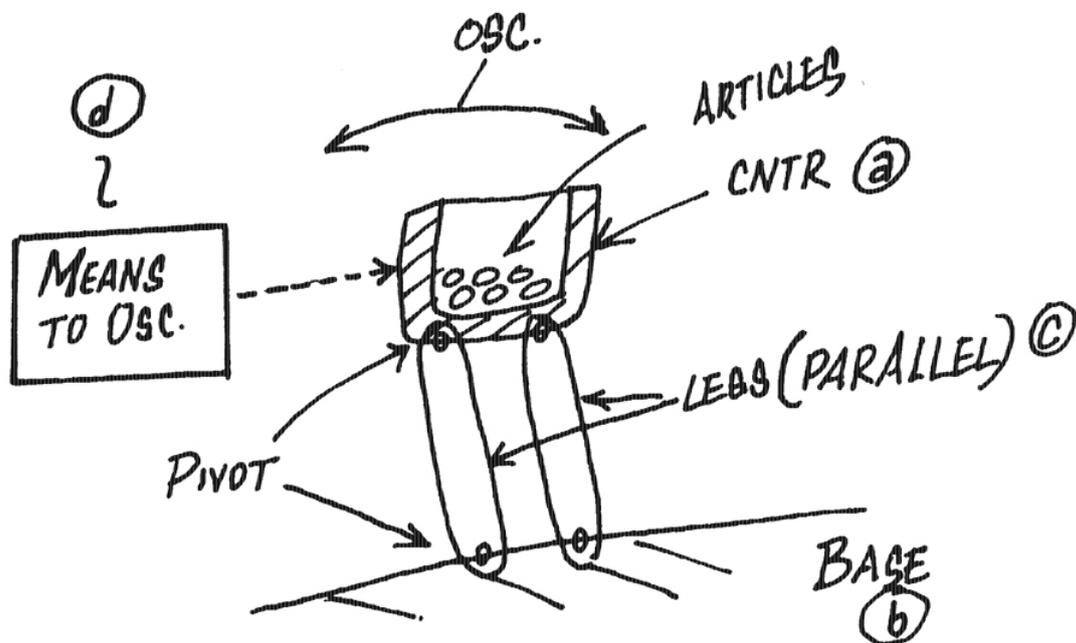
One trick in making sure the elements are tied together is to draw a diagrammatic sketch, or "stick picture," of what the claim states, and only that. Make the picture

as different from the specific example in the drawings as the words permit. The picture should depict more clearly than words if some element, feature, or "glue" is missing, ¹⁰⁸ if necessary features have been omitted, if unnecessary features are included, etc.

For example, consider the following stick picture of Claim 1 (section 3:1.1) to the shaker:

EXAMPLE II:

Shaker Sketch



This crude sketch diagrams one simple example of the elements of Claim 1 and shows how they are connected.

Summary

Tie the elements together in the claim; claim machines, not parts. Do not leave even one element with no connection to another, or with no apparent purpose in the claimed combination. If it has no purpose in the combination claimed, it can probably be left out.

FOOTNOTES:

¹⁰⁸Footnote 104. MPEP ?2173.05(/).

Footnote 105. MPEP §2173.05(k).

Footnote 106. See section 8:5, *infra*.

Footnote 107. *In re Venezia*, 189 U.S.P.Q. (BNA) 149 (C.C.P.A. 1976).

Footnote 108. The Patent and Trademark Office also suggests that the examiners do this in making their search. See MPEP §904.01(a), (b), and (c) in appendix C3. They must search for undisclosed structures that the claim also covers. Most apparatus claims cover many, usually an infinite number of, possible structures.

§3:20 Structural Connection

A structural connection between the elements (a), (b), and (c) of Claim 1 is found in the expression "each of which is connected pivotally. . . ." This ties the first three elements together mechanically.

A "means" clause automatically carries its own inherent structural and operational connection with whatever element is the object of the means clause.¹⁰⁹ Thus, it is implicit in the recitation "means for oscillating the container" that some part of such means must engage the container or something connected to the container to accomplish the function.¹¹⁰ This need not be stated expressly, such as "means engaging the container for oscillating. . . ."

Some examples of structural connection statements:

a turntable on which the barrel is *mounted*;

a rotary cam *fixed to* one end of said shaft;

a cam follower *engaging* said cam . . .

a capacitor *electrically connected* to the emitter of said transistor . . .

a coil spring *positioned between* said clutch plate and said base . . .

means for mounting the bending fingers on the base *for lateral movement* with respect to the first and second clamps . . . [Note the means-for clauses inherently contain and define the necessary physical connections, particularly conventional connections, such as mounting, guiding, fastening, etc.]

a worm gear *in mesh with* the drive gear . . .

Normally, statements of physical or mechanical connection are fairly easy to write.

A problem, as with elements or parts of elements, is how broadly to claim the connection, and this, of course, depends largely on the prior art. In most apparatus cases, the precise manner--or structure--of a connection is not critical to novelty or unobviousness, in which case relatively broad words are used to state the connection, such as "connected to" or "mounted on" rather than "fixed to" or "bolted to," etc. Very often, means clauses (section 3:25) are used for conventional mountings, connections, etc., in both machine and electrical circuit cases (section 3:26). But the restrictions on the breadth of means clauses causes the author to recommend avoiding means clauses where naming an element. Using another noun than "means" and describing its function relative to another element can be done while maintaining sufficient claim breadth.

If the claim elements lack a recited cooperation of structure and/or function, they may be an indefinite aggregation of elements.¹¹¹ Hence, recite the cooperation in the claim.

Summary

Connect the claim elements structurally, as required to make up a complete and operable combination. Use relatively broad words of connection where the prior art permits.

FOOTNOTES:

Footnote 109. See section 3:24, *infra*.

Footnote 110. 35 U.S.C. §112, [para] 6.

Footnote 111. MPEP §2173.05(k).

§3:21 Functional or Operational Expressions

A functional limitation attempts to define something by what it does rather than by what it is, that is, its structure or ingredients. Functional language does not render a claim improper.¹¹²

In addition to the structural cooperation, it is good practice also to specify the functional or operational cooperation between the elements, where this can be done without unduly limiting the claim. When this is done, the claim not only tells what the parts are and how they are mechanically interconnected or associated, it tells how they function together and operate on the workpiece to accomplish the result stated in the preamble.¹¹³ "Operatively connected" and "associated"^{113.1} are but two of the myriad examples that might be cited of functional or operational expressions that are considered structural and proper in a claim. The way in which claimed elements cooperate is frequently claimed and properly structural,^{113.2} not improper

function and not converting the claim element somehow to a product by process element. A functional limitation is evaluated like any other for what it fairly conveys to a person of ordinary skill in the art. Like any claim element, the functional element should not be too restricted, as that could cause a finding of noninfringement. ^{113.3}

Functional or operational connectives in Claim 1 are such expressions as "for the articles" in clause (a), "to support the container for oscillating movement with respect to the base" in clause (c), and "to shake the articles" in clause (d). Examples in MPEP section 2173.05(g) include: "incapable of forming a dye within . . ."; "members adapted to be positioned. . . ."

Try to make each independent claim a complete, self-contained unit, comprehensible by itself. The connectives enable that.

The reader may have heard statements disparaging functional expressions, and may wonder if they should be avoided altogether. The answer is--definitely no! When properly used, statements of function or operation are usually welcomed by the Patent and Trademark Office. When not used to excess or to introduce unnecessary limitations into the claim, they make the claim more definite and easy to understand without having to refer to the specification.

Most problems with so-called functional statements arise when an attempt is made to predicate patentability on a purely functional statement, or to present extremely broad claims.

There is never any objection to functional statements that merely set forth the movements, actions, or results that necessarily follow from the structure previously recited. Thus, in Claim 1, the capability of the container for oscillating movement follows once the double pivoted mounting of the container on the base has been stated. No magic words are necessary for functional statements. Such expressions as "so that," "for," "in order to" are typical. However, as paragraph 6 of section 112 of the statute says, means for accomplishing a function are structure claims, use of the preposition "for," as in [an article] "for" [accomplishing a function], is least likely to be an objectionable functional statement. The words "whereby" and "thereby" are often used, but have assumed stylized meanings described in section 3:23. Also, "means for" accomplishing a function clauses are very commonly used (section 3:25).

Some examples of straightforward, noncontroversial functional or cooperative statements:

a container *for* the articles . . . ["for" is very commonly used] to *support* the container *for oscillating movement* . . .

a turntable [element] on which the barrel [workpiece] is mounted [structural connection] *for rotation therewith* [cooperation or function] . . .

means for *reciprocating* the strand guide *so that* it moves . . . [in a stated way].
[means clauses are very common in stating cooperative relations (section 3:22)]

a pulse counter *responsive* to each pulse of current . . . *for counting* . . .

There are many different forms for this. Some special forms will be covered in the following sections and further examples. As usual, and as with virtually *every word in the claim*, the scope should be checked carefully. Make sure every word is really needed, particularly in the broader claims.

Watch vague and indefinite statements of cooperation, particularly the phrase "adapted to," which is likely to be objected to by the examiner as "insufficient structure to support functional statement." MPEP section 2173.05(g) cites "adapted to" favorably by listing a precedent. ¹¹⁴ One precedent says "adapted for" is not a limitation ¹¹⁵ and one says it is a limitation. ¹¹⁶ But "adapted to" clauses were expressly sanctioned by the court. ¹¹⁷ Alternatively, use a "means for" clause under the guidelines in section 3:25, below. In *Ex parte Roggenburk*, ¹¹⁸ the Board held that a functional expression, "sealingly engaging," was an improper function statement, but that a "means for" clause of exactly the same scope would have been all right.

Summary

Relate the claim elements functionally to each other. That is, tell how the parts move or cooperate with each other to accomplish the overall result stated in the preamble. Tell the following things where applicable about each element:

- a. What is it? (name, sections 3:3 and 3:7; and parts, section 3:14);
- b. Where is it? (physical cooperation or location, sections 3:29- 3:20);
- c. What does it do? (sections 3:20-3:25.1); and
- d. How does it do what it does? (sections 3:21-3:25.1).

Beware, however, of functional statements that make the claim overly broad (sections 3:22, 3:23, 3:25) or violate other rules, as by being vague and indefinite (section 3:11).

FOOTNOTES:

Footnote 112. MPEP §2173.05(g); *In re Swinehart & Sfiligoj*, 439 F.2d 210, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971).

Footnote 113. *In re Swinehart & Sfiligoj*.

Footnote 113.1. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 72 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 2004).

Footnote 113.2. *See Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 76 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 2005).

Footnote 113.3. *Id.*

Footnote 114. *In re Venezia*, 530 F.2d 956, 189 U.S.P.Q. (BNA) 149 (C.C.P.A. 1976).

Footnote 115. *In re Hutchinson*, 69 U.S.P.Q. (BNA) 138 (C.C.P.A. 1946).

Footnote 116. *In re Laud & Rogers*, 151 U.S.P.Q. (BNA) 621 (C.C.P.A. 1966).

Footnote 117. *In re Venezia*.

Footnote 118. *Ex parte Roggenburk*, 172 U.S.P.Q. (BNA) 82 (Board of Patent Appeals and

Interferences 1970).

§3:22 Claiming Desired Results; Overly Broad Functional Statements

MPEP section 2173.05(g) defines and also permits functional statements in a claim: A functional limitation is an attempt to define something by what it does, rather than by what it is (*e.g.*, as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step.

The main problem with so-called functional statements comes when one attempts to use them to present ultrabroad claims. One example of this is when one is trying

to claim a desirable end result broadly detached from the specific mechanisms or steps for achieving that result. An example ¹¹⁹ that had been cited by the Patent and Trademark Office is a claim reading: "A woolen cloth having a tendency to wear rough rather than smooth," meaning that it will not become shiny as a result of wear! This tells what the cloth does, the desirable end result, but not how the result is accomplished (decreasing the animal grease content and adding silk threads). The court held, "This claim . . . describes, imperfectly and too broadly. . . . It is also functional, describing a result only and not a process." This type of claim may be variously rejected as being "functional," "too broad," or "nonstatutory" (it does not "particularly point out and distinctly claim" under 35 U.S.C. ?112).

It may be unfortunate that the phrase "functional" is sometimes used for this type of rejection, which really concerns overclaiming and not anything wrong with the functional statement itself. For example, if the claim to the woolen cloth had first described its physical structure or novel properties, or even the process of manufacture, particularly if the physical structure could not be defined or the process is significant, ¹²⁰ there would have been no objection to the functional statement about "wearing rough" following afterward. In fact, that statement would have been most helpful to understanding the claim and, most likely, in showing nonobviousness.

Another example: in *Knapp v. Morss*, ¹²¹ the Supreme Court stated:

The use and purpose sought to be accomplished by the Hall patent was the radial expansion of the dress form, but it is well settled by the authorities that the end or purpose sought to be accomplished by the device is not the subject of a patent. The invention covered thereby must consist of new and useful means of obtaining that end. In other words, the subject of a patent is the device or mechanical means by which the desired result is to be secured.

Thus, the problem is not with functional statements per se, but with claiming too broadly. In particular, in mechanical claims, the examiner will usually argue that the recited structure itself must contain novelty over the prior art. Unquestionably, functional recitations help to sell the claim in many cases once novel structure has been described.

MPEP section 2173.05(q) now specifically deals with "use" claims, that is, the use of the invention without reciting structure. The claim: "A process for using monoclonal antibodies of claim 4 to isolate and purify . . . interferon" was held indefinite for reciting a use without any active positive steps of how the use is practiced. ¹²² A use can be patented in a new use claim if the new use is nonobvious (see section 6:7).

Probably the classic case in claiming too broadly, and claiming only desired results, is *O'Reilly v. Morse* ¹²³ on the printing telegraph. Morse's Claim 8 covered

. . . the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed, for making or printing intelligible characters, letters, or signs, at any distances. . . .

This was held invalid by the Supreme Court; one cannot merely claim the desired end result to be accomplished, divorced from the means for accomplishing the result.

A more recent example of this doctrine, decided by the Board of Appeals, is *Ex parte Slub*.¹²⁴ In the *Slub* case, the expression "a liquefiable substance having a liquefaction temperature from about 40[degrees]C. to about 300[degrees]C. and being compatible with the ingredient in the powdered detergent composition" (broadly stated in the claim as "a powdered detergent composition") was rejected as "too broad," "functional," and also "vague and indefinite," citing cases.

While this was a process claim involving a key functional description of a composition of matter used in making a new composition of two elements, the principles of the case apply to any kind of claim: that is, any kind of technology and any class of claim. The board held this bad for several reasons:

1. Improper to recite compounds by what they do rather than what they are (*cf.* C.C.P.A. cases cited later in this section);
2. Reads on inoperative species--materials that would not work in the composition, such as low-melting metals (see section 6:1); and
3. Claim not supported by the disclosure, since only ten limited examples of compounds were given.

A good example of the difference between claiming a function added to a system and claiming merely the desired end result is given by Donald R. Johnson in *The Art of Drafting Patent Claims*:¹²⁵

I will illustrate by referring to the precipitation of solid wax from an organic solution. This precipitation of the wax is accomplished by cooling the solution in a heat exchanger. However, a problem is involved in the deposition of solid wax on the heat exchanger surfaces and in some cases the plugging up of the apparatus.

What the inventor conceived as a solution to the problem was an incorporation into the system of a surface active agent which would form a film on the heat exchanger surface and prevent the deposition of wax. The inventive concept here was in the form of a function to be added to the system. . . .

However, the prior art situation in this case did not show the use of any surfactant in the particular system claimed. The art did show a surfactant in a related system, in which solid wax was precipitated from a liquid by cooling, but in which there were two immiscible liquid phases, and in which the surfactant and the solid wax were concentrated at the interface between the two liquid phases. In this circumstance it was, of course, necessary for the inventor to distinguish the system to which the surfactant was added from that disclosed in the art. Once this was done, it was possible to claim the surfactant generally, as one capable of forming a film on the heat exchange surface.

This illustrates a proper case of functional claiming. It also illustrates a case where the inventive concept is initially in terms of a function to be added to the system. This is a strong argument in favor of defining the added material functionally. However, it is necessary to distinguish between a function of this sort and the ultimate desired effect. In this case the ultimate desired effect was preventing the deposition of wax, and it certainly could not be claimed in this fashion, i.e., as simply a means for preventing such deposition.

Within these general rules of ultrabroad or indefinite claims, claiming only end results or desired principles, the law is not very clear as to just what kinds of broad functional statements can be permitted (patentable), and what cannot.¹²⁶ Examiners tend to reject broad "functional" claims for any of several reasons. General "catchword" rejections, such as "too broad," "unduly functional," "not fairly based on the disclosure," etc., will no longer suffice.

In *In re Echerd*,¹²⁷ the court held that "there is nothing inherently wrong in defining something by what it does rather than what it is." The key limitations in question were:

having sufficient flexibility and wet strength to permit . . .

and

having sufficient adhesive characteristics to firmly bond . . .

There are several cases to the same effect.¹²⁸ The Court of Appeals for the Federal Circuit has been holding that no limitation or wording anywhere in the claim can be ignored in determining patentability.¹²⁹ In the *Echerd* case,¹³⁰ as was typical of a great many cases in the past, the Patent and Trademark Office rejected a claim as anticipated by prior art, or as obvious, where all of the specific *structure* claimed was old and the novelty resided solely in a functional (or otherwise objectionable) statement, such as negative limitations (section 3:5), or mental steps (section 4:9). The Federal Circuit is now holding such rejections improper as not consistent with

the statute. ¹³¹

In the *Ludtke* case, ¹³² the claim was directed to a parachute canopy comprising old elements A and B, with:

. . . said plurality of lines [B] *providing* a radial separation between each of said panels [A] upon deployment [of the parachute] *creating* a region of high porosity between each of the said panels *such that* the critical velocity . . . will be less than

. . . *whereby* said parachute will sequentially open and *thus* gradually deaccelerate.

[Note the claim form uses almost all of the functional expressions known (except "means for") one after the other (in paraphrase):]

[said B]

providing . . . [a stated physical relationship, in operation],

creating . . . [a physical property]

such that . . . [a functional relationship is achieved]

whereby . . . [an effect happens]

and thus . . . [a desired end is achieved].

This may be a classic in functional language.

The court held that there was nothing wrong with the functional language, citing the *Swinehart* case, ¹³³ but affirmed a different (anticipation) rejection that applicants had not proven that the same functions did not happen in a prior art reference. Thus, even with broad functional language acceptable under these cases, the claim must still pass other tests, particularly prior art tests, and one must be prepared to prove that the new functions are novel in view of the prior art; that is, not inherently present in the prior art. ¹³⁴

In *In re Halleck*, ¹³⁵ a chemical-new-use type of case, the phrase "an effective amount of [compound X] for [performing a desired function]" was held proper. ¹³⁶

In the *Kockum Industries* case, ¹³⁷ cited in section 3:25, the court held that functional expressions were proper at the point of novelty, so long as the specification was clear as to what the words meant and how the function was achieved. ¹³⁸

Summary

Beware of overly broad functional statements, particularly those claiming only desired results. In practice, scrutinize the claim language and the prior art carefully, as many kinds of functional statements may not be permissible under recent Federal Circuit cases, particularly defining an element or feature by what it does rather than by what it is.

FOOTNOTES:

☛Footnote 119. From *In re Fuller*, 388 Off. Gaz. Pat. Office 279, 35 F.2d 62 (C.C.P.A. 1929).

☛Footnote 120. See section 5:2, *infra*, on product-by-process claims.

☛Footnote 121. *Knapp v. Morss*, 150 U.S. 221, 227 (1893).

☛Footnote 122. *Ex parte Erlich*, 3 U.S.P.Q.2d (BNA) 1011 (Board of Patent Appeals and Interferences 1986). See *Ex parte Dunki*, 153 U.S.P.Q. (BNA) 678 (Board of Patent

Appeals and Interferences 1967).

☛Footnote 123. *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 86 (1853).

☛Footnote 124. *Ex parte Slub*, 157 U.S.P.Q. (BNA) 172 (Board of Patent Appeals and Interferences 1967).

☛Footnote 125. *The Art of Drafting Patent Claims* 111-12 (J. Jackson & G. Morris eds. 1966). This excellent book was an edited transcript of a PLI seminar on claim drafting in 1962, representing the combined effort of twenty-nine skilled patent attorneys. It is out of print.

☛Footnote 126. See MPEP ?2173.05(g).

☛Footnote 127. *In re Echerd & Watters*, 176 U.S.P.Q. (BNA) 321 (C.C.P.A. 1973).

☛Footnote 128. *In re Hallman*, 210 U.S.P.Q. (BNA) 609, 611 (C.C.P.A. 1981); *In re Ludtke & Sloan*, 169 U.S.P.Q. (BNA) 563 (C.C.P.A. 1971); *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971); *In re Fuetterer*, 138 U.S.P.Q. (BNA) 217 (C.C.P.A. 1963).

☛Footnote 129. *In re Stencel*, 828 F.2d 751 (Fed. Cir. 1987).

Footnote 130. *In re Echerd & Watters*, 176 U.S.P.Q. (BNA) 321 (C.C.P.A. 1973).

Footnote 131. *See In re Stencel*, 828 F.2d 751 (Fed. Cir. 1987).

Footnote 132. *In re Ludtke & Sloan*.

Footnote 133. *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971).

Footnote 134. *See also* section 8:8, vague and indefinite claims, and discussion of *In re Wolfrum & Gold*, 177 U.S.P.Q. (BNA) 481 (5th Cir. 1973).

Footnote 135. *In re Halleck*, 164 U.S.P.Q. (BNA) 647 (C.C.P.A. 1970).

Footnote 136. *See* new use claims, section 6:7.

Footnote 137. *Kockum Indus., Inc. v. Salem Equip., Inc.*, 175 U.S.P.Q. (BNA) 81 (9th Cir. 1972) (discussed in section 3:25).

Footnote 138. *See* discussion of "functional at the point of novelty" rejections in section 3:25, on means claims.

3:23 "Whereby" Clauses

"Whereby" and "thereby" clauses have come in for quite a bit of judicial construction. They are entirely unobjectionable when properly used, and are really quite helpful. A whereby clause is proper when it merely describes a function, operation, or result that *necessarily* follows from the previously recited structure or method. On the other hand, the whereby clause is given no weight if it expresses only a necessary result of the previously described structure or method.¹³⁹ Therefore, equate "whereby" with "it follows from the foregoing that . . ."

Words other than "whereby" may be used for the same purpose. In *Griffin v. Bertina*,¹⁴⁰ a "wherein" clause was given a limiting effect and treated as a claim element because it related back to and clarified what the claim required. The court rejected the patentee's argument that the clause starting "wherein" merely stated the inherent result of performing the series of steps claimed.

Use of such clauses should be avoided if the function does not necessarily follow, as in such a case, the claim drafter is reciting a new structural or cooperative relationship. Some cases have held that the function stated in a whereby clause cannot be considered to determine patentability of the claim.¹⁴¹ Those cases and their view of "whereby" clauses have been rejected, so that the better view is that the "whereby" clause is part of the structure or method.¹⁴² But because the usefulness of "whereby" clauses as structural has been doubted, avoid them for

claiming a new structure or method limitation.

A useful test for whereby clauses is to delete the clause and substitute a period; then ask, does the claim still have structural novelty and adequate cooperation among elements? If so, the clause is probably good. If needed, the claim should be amended to add structural elements that are antecedents to the "whereby" clause. Since the "whereby" clause likely will state some objective of the invention, the fact that no element is present which would serve as an antecedent to the "whereby" clause should raise a question as to the sufficiency of the structural limitations of the claim.

A "whereby" clause that merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim. ¹⁴³ But, it may help the reader understand the claimed structure, sums it up and makes the claim more readable. Use the clause as appears appropriate. On the other hand, when a "whereby" clause states a condition that is material to patentability, it cannot be ignored to change the invention. ^{143.1} In this case, the "interactive element" is described in the specification and the prosecution history as integral to the invention.

Writing claims where the description of elements of the claims includes a statement of their function or cooperation with other elements may make a "whereby" clause unnecessary, because all of the functions that might be recited in the "whereby" clause have already been recited in the descriptions of operations performed by various claim elements. However, sometimes descriptions of the functions of individual elements do not show how they fit together and function as a complete structure, and only a "whereby" clause does that.

One example of a whereby clause, used in connection with the popcorn popper discussed in section 3:14, above:

A container for the articles, having apertured walls, the apertures of which are smaller in size than the articles to be shaken *whereby the articles are retained in the container as they are shaken;*

The retaining function necessarily follows, *whereby* the clause is proper. Contrast the foregoing clause with the following: "An apertured container for the articles *whereby the articles are retained in the container as they are shaken.*" Even though the same whereby clause has been used, it is now improper because it attempts to define a structural relationship in purely functional terms, that is, a statement of desired result without reciting structure for performing the function.

Whereby clauses, and other functional clauses, can be used (or avoided) equally well in method claims; see Claim 6 in section 4:8 for an example of a "method whereby."

The Patent and Trademark Office should not object to "structure implying wherebys." One sees them fairly often in issued patents. A structure implying "whereby" clause was allowed in *In re Venezia*.¹⁴⁴

In another example of an improper use of a whereby clause, the invention involved the discovery that a metal article would stick to a sheet of a particular resin, if pressed against the sheet, by a vacuum effect not clearly understood. The claim recited: "Placing the article against the sheet of . . . (X resin) whereby the article adheres . . ." Note "whereby the article adheres . . ." Note that "whereby" implies the manner of placing, which implies pressing or some similar positive step. "Placing the article against the sheet . . . in such manner that . . ." would be an equivalent functional expression. The latter expression might conceivably be objected to as too broad or functional, but at worst it would be no more objectionable on that score than the same type of expression via a whereby clause.

This "rule" seems entirely a matter of form not substance, based on an arbitrary definition of the word "whereby."

The same claim scope as obtained by a "whereby" clause can usually be obtained by a claim drafter using such other expressions as "for" or "means for," which have the sanction of the sixth paragraph of 35 U.S.C. §112. Referring to the previous example, the "whereby" clause may be replaced with a no problem clause:

A container . . . articles to be shaken *for retaining* the articles in the container as they are shaken;

But, beware of the stricter scope applied by the courts to means plus function limitations, as discussed in section 3:25.

Since avoiding the use of a "whereby" clause for a substantive limitation is so easy, there is no point in generating controversy where none is needed.

Summary

Either avoid whereby clauses completely, or make sure the function stated as the object of the whereby clause necessarily follows from the previously recited structure in the claim. Other words and particularly "means for" limitations will do the same job, and do it as well or better in most instances.

FOOTNOTES:

¹⁴⁴Footnote 139. *In re Certain Pers. Computers*, 224 U.S.P.Q. (BNA) 270, 283 (Ct. Int'l Trade 1984). See *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1355, 57 U.S.P.Q.2d (BNA) 1747 (Fed. Cir. 2001).

Footnote 140. *Griffin v. Bertina*, 289 F.3d 1029, 62 U.S.P.Q.2d (BNA) 1431 (Fed. Cir. 2002).

Footnote 141. *In re Fisher*, 135 U.S.P.Q. (BNA) 22 (C.C.P.A. 1962); *In re Mason*, 114 U.S.P.Q. (BNA) 127, 129 (C.C.P.A. 1957).

Footnote 142. *Plastic Container Corp. v. Cont'l Plastics*, 203 U.S.P.Q. (BNA) 650 (10th Cir. 1979); *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971); *In re Fisher*, 166 U.S.P.Q. (BNA) 18 (C.C.P.A. 1970), *rev'g* 135 U.S.P.Q. (BNA) 22 (C.C.P.A. 1962). *See Eltech Sys. Corp. v. PPG Indus., Inc.*, 710 F. Supp. 622

(W.D. La. 1988), *aff'd*, 903 F.2d 805 (Fed. Cir. 1990).

Footnote 143. *Tex. Instruments, Inc. v. United States Int'l Trade Comm'n*, 988 F.2d 1165, 26 U.S.P.Q.2d (BNA) 1018 (Fed. Cir. 1993); *see Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1355, 57 U.S.P.Q.2d (BNA) 1747 (Fed. Cir. 2001); *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 74 U.S.P.Q.2d (BNA) 1481 (Fed. Cir. 2005).

Footnote 143.1. *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 74 U.S.P.Q.2d (BNA) 1481 (Fed. Cir. 2005).

Footnote 144. *In re Venezia*, 189 U.S.P.Q. (BNA) 149 (C.C.P.A. 1976).

3:24 Location of Functional Clauses

As to claim form, cooperative or functional clauses (such as "so that," "for," "whereby" clauses) may be used either

1. At the end of the description of a particular element, provided everything necessary to the functional clause has then been set out; or
2. At the end of the claim where all that is necessary to the statement has not been set out until the last element has been described.

Type 1 is preferred, where applicable, as it makes the claim easier to follow. Also, one is less likely to be accused of functional claiming when the functions are set out one at a time, rather than, for example, when a long whereby clause is placed at the end.

Summary

Put functional clauses where you think most logical.

3:25 The "Means" or "Step" Clauses

A "means" clause or "step" clause defines an element or feature in a product or a method claim by what it does, that is, function, rather than by what it is, that is, its structure. ¹⁴⁵

Use of a means-plus-function clause is governed by 35 U.S.C. §112, paragraph 6, as follows:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claims shall be construed to cover the corresponding structure, material, or acts described by the specification and equivalents thereof.

The effect of "means-plus-function" language is to incorporate into that element and limitation of the claim the embodiment disclosed in the specification, ¹⁴⁶ that is, all or any of the disclosed embodiments, ^{146.1} and all equivalents of that embodiment ¹⁴⁷ both during *ex parte* examination by the examiner and for an infringement analysis after a patent is granted. ¹⁴⁸ Thus, the scope of the claim element is as broad as the invention. ¹⁴⁹ But the scope of the means-plus-function clause is not broader than the claim language limits of the function in the means-plus-function claim element. ¹⁵⁰ However, the same statutory language limits the scope of a means limitation, to exclude from it all equivalents not known at the time of the invention; ¹⁵¹ that is, section 112, paragraph 6 narrows claim scope, while the doctrine of equivalents broadens the scope since the doctrine extends to equivalents known at the time a claim infringement issue is considered. ¹⁵² The converse of use of "means-plus-function" is also true: "Method and apparatus claims not written in means-plus-function format are not necessarily limited to that disclosed in the specification, but rather are defined by the language of the claims themselves." ^{152.1} Thus, such claims, meaning claim elements, are broader in scope, based on the "plain meaning" of the words of the claim element. Therefore, the claim writer must decide if he wants the restriction of section 112, paragraph 6.

The *Donaldson* decision affects only the manner in which the scope of a "means or step plus function" limitation in accordance with section 112, paragraph 6, is interpreted during examination of a patent application, ¹⁵³ making consistent the way courts and the Patent Office interpret means clauses. Consequently, the means clause covers the structure disclosed and its equivalents, ^{153.1} as discussed in the section hereof on naming a claim element. ¹⁵⁴ For the means-plus-function limitation to read on an accused device, the accused device must (1) perform the identical function recited in the means limitation, and (2) perform that function using the

structure disclosed in the specification or an equivalent structure. ¹⁵⁵For an accused structure to be an equivalent under section 112, paragraph 6, it must both have an identical structure and also perform the identical function as recited in the claim limitation. ¹⁵⁶

The Patent Office did not accept that it was bound by the same interpretation of section 112, paragraph 6, ¹⁵⁷ and instead examiners cited prior art, including any element at all that performed the claimed function irrespective of the disclosed embodiment in the application. ¹⁵⁸ For a detailed pre-*Donaldson* history, see *Ex parte Isaksen*. ¹⁵⁹ In the past, there had been a difference between the Patent and Trademark Office's view of how to interpret "means-plus-function clauses" when examining a claim for patentability and the Federal Circuit's view on how the examiner should interpret a means-plus-function clause. The Patent and Trademark Office had disregarded 35 U.S.C. §112, paragraph 6 by applying an all inclusive analysis when interpreting a "means for" limitation. When determining equivalency, the Patent and Trademark Office would decide whether there was any element in the prior art which is capable of performing the function described in a "means for" limitation. If such an element was found, equivalency was presumed to exist. The burden would then shift to the applicant to show that the prior art element is not equivalent to the element disclosed in the specification for performing the function.

The Federal Circuit has resolved the conflict by holding that the "means" language in a means-plus-function claim is limited to the corresponding structure disclosed in the specification and equivalents thereof and that the Patent and Trademark Office must comply with 35 U.S.C. §112, paragraph 6 and construe means-plus-function claims by looking to the application's specification for structures and their equivalents. ¹⁶⁰ This does not require imputing limitations from the specification into the claim, but rather requires construing a limitation already in the means-plus-function clause by properly referring to the specification for the meaning of a particular word. ^{160.1}

Of course, if the specification and/or the drawings lack any disclosure of a structure corresponding to the means, the claim is invalid as indefinite ("third monitoring means for monitoring the ECG signal"). ¹⁶¹

In response to *In re Donaldson*, the Patent and Trademark Office issued Guidelines in May 1994 for interpreting means-plus-function claims. They are in MPEP section 2181. The 1994 Guidelines said it was not necessary to use the specific phrases "means for" or "step for" in order for a claim limitation to fall within the scope of section 112. It had only to be clear that the element in the claim is set forth, at least in part, by the function it performs as opposed to the specific structure, material, or acts that perform the function. The same comment applied to a step for accomplishing a function limitation. For the means or step-plus-function limitation to read on an accused device, the accused device must (1) perform the identical

function recited in the means or step limitation, and (2) perform that function using the structure or process step disclosed in the specification or an equivalent structure or process. ¹⁶² This does not require imputing limitations from the specification into the claim, but rather requires construing a limitation already in the means-plus-function clause by properly referring to the specification for the meaning of a particular word. ¹⁶³ The 1994 Guidelines said that there is no specific claim language to which section 112, paragraph 6, applies, but case precedents discussed below have construed specific language as in or out of section 112. As of 1999, the PTO's Supplemental Examination Guidelines ¹⁶⁴ on applying section 112, paragraph 6 are controlling and overrule the 1994 Guidelines to the extent they are inconsistent. A claim limitation will be interpreted to invoke section 112, paragraph 6 if it meets the following three-pronged analysis:

- (1) the claim limitation must use the phrase "means for" or "step for";
- (2) the "means for" or "step for" must be modified by functional language, that is, a specified function must be recited; and
- (3) the phrase "means for" or "step for" must not be modified by structure, material, or acts for achieving the specified function.

As contrasted with the 1994 Guidelines, these controlling 1999 Guidelines are clear and precise. At present, the Guidelines control only Patent Office Examiners, and not the Federal Circuit or other courts. Court precedents discussed below determine whether the applicant intended to invoke section 112, paragraph 6 from the words chosen by the claim writer. But the 1999 Guidelines, if followed by courts interpreting claims examined under those Guidelines, will make it relatively easy to determine whether a limitation is under section 112, paragraph 6.

Under the 1999 Guidelines, if the claim writer wants section 112, paragraph 6, he must use "means for" or "step for." If he does not use those phrases, he intends that a claim limitation not be under section 112, paragraph 6.

If he wants to invoke section 112, paragraph 6, he should recite a function for the means. If no function is recited, for example, the "means" element appears, but without a function being recited, he intends that a claim limitation not be under section 112, paragraph 6. ¹⁶⁵

Finally, if the claim writer does not want the means element to be treated under section 112, paragraph 6, he should also recite the structure that performs the function; for example, "means for redirecting air flow, comprising a surface in the path of air from the exit, the surface shaped for redirecting air toward the top side." When a claim recites a function and then elaborates sufficient structure within the claim to entirely perform the function, it is not in the means-plus-function form. ¹⁶⁶

Even better is when the means element describes the structure, function, and location of that means element. ^{166.1}

A structural feature of a claim that "performs" the function recited in the means plus function claim element limits the claim, but a structure that "enables" the function does not limit the claim. ¹⁶⁷

To avoid section 112, paragraph 6 and at the same time to rely on it, perhaps submit two independent claims, one using the means-plus-function recital and one naming an element and structure without reciting means for performing a function.

Alternatively, the Federal Circuit has acknowledged that if an independent (or preceding dependent) claim is in means-plus-function form, a later dependent claim reciting the structure that performs the function would not be subject to section 112, paragraph 6. ¹⁶⁸ Hence, filing two independent claims is not required to avoid section 112, paragraph 6. The dependent claim would simply recite: ". . . wherein the means for . . . comprises . . ."

But the easiest way to avoid section 112, paragraph 6 is just not to use "means" in a product claim or "step" in a method claim. The presence of the word "means" triggers a presumption that the inventor meant to invoke section 112, paragraph 6, ¹⁶⁹ but the recitation of structure at the means rebuts that presumption. ¹⁷⁰

Prior to the 1999 Guidelines and subsequently, the Federal Circuit had held that use of the word "means" creates a presumption in favor of invoking section 112, paragraph 6 and that not using the word "means" creates the opposite presumption. ¹⁷¹ Both presumptions are rebuttable, ¹⁷² for example, by the remaining words in the claim limitation. The 1999 Guidelines provide rules that are clearer and easier to follow, but do not require that presumption. The Federal Circuit may not adopt the Guidelines test and may follow its precedents on the use of "means." The Federal Circuit continues to use the presumptions from the presence or the absence of the word "means." The presumption determines which party has the burden of proving that a claim element is or is not under section 112, paragraph 6. ^{172.1} In *Linear Technology Corp. v. Impala Linear Corp.*, the court held that the elements "circuit" and "circuitry" in the claims were not under section 112, paragraph 6. The court said that the burden was not on the patentee to show that those elements are not under section 112, paragraph 6. Instead, the burden was on the accused defendant to show that those elements either lacked sufficient structure or recited function without reciting sufficient structure to perform the function. In other words, the burden of proof followed the presumption of section 112, paragraph 6.

Under both the 1994 Guidelines and the 1999 Guidelines, if the identical function specified in the claim is found in the prior art, the examiner has the initial burden of proving that the prior art structure or step is the same as or equivalent to the

structure, material or acts described in the specification which have been identified as corresponding to the claimed means or step plus function. The examiner should interpret the limitation according to the definitions in the specification including any definition of equivalents. If there is no definition, the examiner may determine the scope of the limitation.

If the claimed function is performed by a prior art element and the specification does not exclude that prior art element with an explicit definition for an equivalent, the examiner should infer that the prior art element is an equivalent and conclude that the claim limitation is anticipated.¹⁷³ The burden then shifts to the applicant to show that the element shown in the prior art is not an equivalent of the structure, material, or acts disclosed in the application.

However, even if the applicant shows that a prior art element is not equivalent to the structure, material, or acts described in the specification, the examiner must still make an obviousness analysis of the means-plus-function limitation, because the exact scope of an "equivalent" may be uncertain, and an anticipation/obviousness rejection would be appropriate where the balance of the claim limitations are anticipated by the prior art.

Means claims should be rejected when the function is not clearly stated, as they do not comply with section 112, paragraph 2.

Means-plus-function claim language is construed to refer to an indefinite structure, in that the language defines the structure only by the function it will perform.¹⁷⁴ "Means-plus-function" language may be present despite the appearance of structural language so long as the structural language merely defines the function.¹⁷⁵ The court in *AMP, Inc. v. Fujitsu Microelectronics, Inc.*¹⁷⁶ determined that certain claims are not "means-plus-function" claims, despite the fact that the term "means" is used and function is described, because the patent in suit contained claim language which referred to very specific structure and then described the structure's function. Means-plus-function claim language refers to indefinite structure and defines the structure only by the function it will perform. This is consistent with the 1999 Guidelines.

The court in *AMP, Inc.* held the language of Claim 5 is not indefinite because it requires "bus solder tail means" rather than just any means to accomplish the function of "mounting the bus to the printed circuit board" and "securing the housing to the printed circuit board." The language of Claim 9 is even more definite, requiring "the electrically conductive element" to "constitute an additional means for establishing an electrical coupling between the printed circuit boards" and "solder tails" to "constitut[e] both the means for securing the housing to the printed circuit boards. . . ." Despite the use of the term "means" and the subsequent description of a function, neither Claim 5 nor Claim 9 was held to contain "means

plus function" language as contemplated by 35 U.S.C. §112, paragraph 6. ¹⁷⁷

Similarly, in *British Telecommunications PLC v. Prodigy Communications Corp.*, ¹⁷⁸ the court held that "remote terminal means" was not a means-plus-function element because the claim also described the component parts of the terminal, as well as describing its function.

In *Apex, Inc. v. Raritan Computer, Inc.*, ¹⁷⁹ the claims included several elements defined by the noun "circuit" and preceded by functional adjectives. Because each claim term recited sufficiently definite structure, each "circuit" was not under section 112, paragraph 6. The court noted that while "circuit" alone may or may not connote sufficient structure to be outside section 112, paragraph 6, the adjectival identifiers made the circuit elements structural. They included: "first interface circuit," "on-screen programming circuit," "first signal conditioning unit," "computer-side interface," "user-side interface," and "analog video overlay circuit."

In *Linear Technology Corporation v. Impala Linear Corporation*, ^{179.1} the word "circuit" was coupled with the circuit operation giving that word sufficient structural meaning that section 112, paragraph 6 would not apply. The element was "a first circuit for monitoring a signal from the output terminal to generate a first feedback signal." The court found that "persons of ordinary skill in the art would understand the structural arrangements of circuit components from the term "circuit" coupled with the qualifying language of claim 1. . . ." Thus, "circuit for" is not under section 112, paragraph 6.

The Patent Office 1994 Guidelines provided several examples of limitations that fall within the scope of section 112, paragraph 6. Some were not in strictly "means for" or "step for" format. But the 1994 Guidelines said that they invoked section 112, paragraph 6. This would produce uncertainty in claim interpretation, in my view. However, the 1999 Guidelines simply and without uncertainty exclude limitations without "means for" or "step for" recitations from invoking section 112, paragraph 6. Precedents that suggest the contrary ¹⁸⁰ are not likely to be followed by the Patent Office and, for consistency, should not be followed by the courts. One sees that trend in the Federal Circuit opinions. Without the word "means," a claim element is presumptively outside and it seems almost never within section 112, paragraph 6. ^{180.1}One pre-*Donaldson* precedent would apply here. *In re Chandler* ¹⁸¹ held that a "means for doing something . . . so that" clause is proper and patentable where the sole point of novelty follows the expression "so that." In other words, the general idea of means for doing the thing was old, but not for doing it in the specified way.

The clause in question read:

. . . and *means* responsive to said movement *for regulating* the propulsive power of said engine, in accordance with said movement, so *that* said aircraft is propelled at

a definite, selected speed, corresponding to the position of said engine relative to said aircraft, throughout the speed range of said aircraft. ¹⁸²

In holding the claims patentable, the court stated,
The examiner held that the words beginning with 'so that' in the quoted expression were merely a functional expression equivalent to the "whereby" clause considered in *In re Lamb*, 64 U.S.P.Q. 241 (C.C.P.A. 1944), and hence could not have patentable significance. [Note section 3:23.]

We are of the opinion that the expression beginning with "so that" is not merely functional, but constitutes a part of the definition of the "means responsive to said movement." . . . Such a definition conforms to the provision of 35 U.S.C. section 112 that an element in a claim for a combination "may be expressed as a means or step for performing a specified function without the recital of structure, material or acts in support thereof." The instant situation differs from that presented in *In re Lamb*. There the "whereby" clause did not constitute a part of the definition of any means but merely stated a function which did not necessarily follow from the apparatus recited in the claim. [Note how this decision highlights the difference between "means" and "whereby."] ¹⁸³

Examples in the Patent Office 1994 Guidelines are instructive:

2) "printing means" and "means for printing" would have the same connotations. ¹⁸⁴

However, the terms "plate" and "wings," as modifiers for the structureless term "means," specify no function to be performed, and do not fall under the last paragraph of section 112.

In other words, a noun naming an object or a step that is not followed by the recitation of a function does not fall under section 112, paragraph 6, merely because it is supplemented with the word "means." ¹⁸⁵

3) "force generating means adapted to provide" falls within section 112, paragraph 6. ¹⁸⁶

4) "call cost register means, including a digital display for providing a substantially instantaneous display for . . ." falls within section 112, paragraph 6. ¹⁸⁷

Other cases describing means-plus-function limitations include: *In re Bond* ¹⁸⁸ (claim language "delay means included in said control means for delaying the seizure of said telephone line by said second circuit means for a predetermined time interval. . . ." held to be "means plus function" language); *Interspiro U.S.A. v. Figgie*

*International*¹⁸⁹ (claim language "means for establishing gauge pressure" held to be "means plus function" language); but see *Quantum Corp. v. Mountain Computer*¹⁹⁰ (claim language ". . . and correction signal generator means connected to said sample and hold circuit for generating an offset signal . . ." held not to be "means plus function" language). This case would, in this author's view, be decided differently now by the Federal Circuit. Although the claim limitation in *Quantum* describes where the means are, it does not describe structure of the means. Therefore, it appears to satisfy the 1999 Guidelines.

Recent cases show a trend in deciding what language falls within section 112, paragraph 6. *Greenberg v. Ethicon Endo-Surgery, Inc.*¹⁹¹ involved the claim language: "a cooperating detent mechanism defining the conjoint rotation of said shafts . . ." The Federal Circuit held that the detent mechanism was not a means-plus-function limitation, not because it lacks the word "means," but merely on the ground that the detent mechanism was defined in terms of what it does, that is, in function terms. Here, the term "detent mechanism" had a meaning as a structure which was known in the art. The court cited other words having known meaning in the art, such as filters, brakes, clamps, and screwdrivers. "Digital detector"¹⁹² and "electronic circuit"¹⁹³ and "control signal generator"¹⁹⁴ are sufficiently definite.

Sometimes the words known in the art that define a structure are recited in words suggesting function, rather than being a noun or name for an element. In *Watts v. XL Systems, Inc.*,¹⁹⁵ the court interpreted the term "sealingly connected" in the clause "dimensioned such that one such joint may be sealingly connected directly with another such joint" as not falling under 35 U.S.C. §112, paragraph 6, because the word "means" was not used and based on the specification. But the court ultimately limited the clause to what was shown in the specification in interpreting the limitation.

The presumption is that when the word "means" is not used for the claim element, then the element is not construed under section 112, paragraph 6.^{195.1} In *Lighting World, Inc. v. Birchwood Lighting, Inc.*, the claim term "connector assembly" was held to recite sufficient structure to avoid section 112, paragraph 6. The court said that the "claim element is not required to denote a specific structure, but is sufficient if the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term covers a broad class of structures and even if the term identifies the structures by their function."

Conversely, if the term used in the claim does not have a generally understood meaning, use of that term in a "means" or "step" limitation might place it under section 112, paragraph 6. In *Mas-Hamilton Group v. LaGard, Inc.*,¹⁹⁶ the claim element was "lever moving element" and the court construed it as under section 112, paragraph 6 because it could be any device that can cause the lever to move

and there was no structure in the claim limitation to remove it from section 112, paragraph 6.^{196,1} Contrast that with *CCS Fitness, Inc. v. Brunswick Corp.*,¹⁹⁷ wherein the court found a dictionary definition of "member" in the term "reciprocating member" and thus "member" defines a structure. The test of whether the word used, for example, detent *mechanism*, has a known meaning in the art has been supplanted by the test in the 1999 Guidelines. But the Federal Circuit has not indicated it will rely on similar rules of interpretation. The court cautioned that the use of the word "means" is not required to qualify under section 112, paragraph 6. The Patent Office Guidelines disagree. Yet in an analysis in an actual case, the Board of Appeals and Interferences found "a destroying member for destroying said thermally processed film after said film is scanned" to fall under section 112, paragraph 6, as the term "a destroying member" is provided in a functional context. The presumption that nonuse of "means" places a claim element outside that statute was here rebutted.¹⁹⁸

Usually, use of "means" invokes section 112, paragraph 6; but not always. The 1999 Guidelines define when use of "means" invokes section 112, paragraph 6 and when it does not.

*Cole v. Kimberly-Clark Corp.*¹⁹⁹ involved the claim limitation: "perforation means . . . for tearing the outer impermeable layer means, for removing the training brief. . . ." The court said it was not under section 112, paragraph 6 because it recited a definite structure that performs the function. Here the claim referred to "perforation" means, not "means for tearing . . ." or "means for enabling tearing. . . ." Like a detent or a filter, a perforation is a definite structure. *Waterloo Furniture Components, Ltd. v. Haworth, Inc.*²⁰⁰ had claim wording which began "means for," but which was found to thereafter describe structure, rather than function, namely: "first means being mounted on said carriage means for pivotal movement relative thereto about substantially vertical hinge axis means for enabling the link means . . ." The "first means" were not a means plus function element. Had it read "means for enabling the link means," it might have been under section 112, paragraph 6.

To be sure you are under section 112, paragraph 6, use the pure "means for . . ." Other words lead to ambiguity and the need for a court to decide.²⁰¹ Use of clear structure words avoids ambiguity.

The statute recites "means . . . for" performing a function. But is "for" needed to invoke section 112, paragraph 6? "Spring means tending to keep the door . . . closed," without "for," was held to invoke section 112, paragraph 6 because the "tending" phrase pertains solely to function of the element, not its structure.²⁰² "Ink delivery means" was held to fall under section 112, paragraph 6 as means plus function language and "for" was not used.²⁰³ "Means to" rather than "means for" as in "data communication means to receive information" was held an inconsequential difference and both fall under section 112, paragraph 6.^{203,1} "Means" or "step" is the

key.

The 1999 Guidelines suggest that "for" is also required. Perhaps the Federal Circuit may in the future agree.

It should be apparent that treatment under section 112, paragraph 6 applies only to the "means" within such a limitation, not to other elements or parts identified by non-means nouns within the "means for" claim limitation. In *O.I. Corp. v. Tekmar Co., Inc.*,²⁰⁴ the claim limitation was "means for passing the analyte slug through a passage." The court found that the limitation invoked section 112, paragraph 6, but that section 112, paragraph 6 could not be applied to "passage" although it was in the means limitation. The same would apply to "analyte slug" in the claims limitation.

²⁰⁵

Under section 112, paragraph 6, one looks to the specification for what is disclosed, plus equivalents, to determine what is covered in a "means for accomplishing a function" limitation. What is precisely disclosed in the specification is found by reading the specification and the drawings.²⁰⁶ What is equivalent must have an equivalent structure and also perform the identical function as claimed.²⁰⁷

The Federal Circuit says that means-plus-function elements may be interpreted under the doctrine of equivalents.^{207.1} In that case, the element is construed by and limited by the written description in the specification and by the prosecution history affecting the claim elements, as applying the doctrine of equivalents to any claim element is controlled by the prosecution history.²⁰⁸

If the specification of the patent does not provide adequate disclosure of the section 112, paragraph 6 element, this could invalidate under section 112, paragraph 2 or make the disclosure insufficient and the patent invalid under section 112, paragraph 1.²⁰⁹

A court deciding infringement will look to the specification to determine what is covered by the "means for" element. The court may exclude an infringer's design if it decides that the features of that design are not encompassed in the means shown in the patent specification.²¹⁰ In *Chiuminatta*, the court studied the specification and drawings of the patent to find those elements of the disclosed product that satisfied "means connected to the saw for supporting the surface of the concrete. . . ." The court found that to be a skid plate, and the court expressly excluded other features of the skid plate which, while present, did not cooperate in performing the function. [S]tructure disclosed in the specification is "corresponding" structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the quid pro quo for the convenience of employing ?112, [para] 6.²¹¹

Therefore, be sure the specification identifies which structure is performing the claimed function. If the specification fails to disclose the structure ("third monitoring means for monitoring the ECG signal")²¹² or ("theoretical win profile")^{212.1} the claim is invalid as indefinite.

To assure that certain elements are or are not to be considered part of a claimed "means for" element, consider reciting in the specification the components which perform that claimed function,²¹³ and perhaps indicate other components that are present which do not participate in the function. In that way, for example, you could include a more limited number of components or elements within the "means" limitation, making it easier to have the limitation satisfied by an accused infringing product, since it needs fewer features to fall within the claim limitation.

If it is unclear whether a claim limitation falls within the scope of section 112, paragraph 6, a rejection under section 112, paragraph 2, may be appropriate.

To broaden the scope of a "means" limitation in a claim at the time the specification is being prepared, the claim writer should expressly recite in the specification various alternatives which may be considered for features to be claimed in "means" limitations.²¹⁴ This makes those alternatives fall within the "means" limitation because they are in the specification. In effect, section 112, paragraph 6 imports the specification and drawings into the means for performing a function element.²¹⁵ Your specification is preferably broad enough to cover known and future alternatives. But including those alternatives also opens up the "means" limitation to the possibility that numerous equivalent alternatives exist, making easier a later argument by the Patent Office examiner examining the claim to find equivalent prior art (*In re Donaldson*) or a still later argument by the patentee that an accused device/process has an equivalent to the claim limitation.

Another technique for broadening the scope of a "means" limitation is to describe in the specification the part or element of an object that performs the function claimed, possibly also indicating that part is a means for performing a function. Other elements are deemed a separate subassembly or not part of the claimed means.²¹⁶ Instead of merely describing an anvil having a surface on which the workpiece is worked in the specification, the drafter describes a surface on which the workpiece is worked, that surface being on an anvil. That gives the claim drafter the argument that the means referred to in the means for limitation in the claim is not the entire anvil, but just the workpiece supporting surface. This perhaps provides a wider range of equivalents because the means in the disclosure is the surface, rather than the entire anvil.

On the other hand, the 1999 Guidelines point out that when means plus function

language is employed, the specification must adequately disclose what is meant by that language. Failure to adequately disclose the means in the specification results in a failure to satisfy section 112, paragraph 2, requiring that you particularly point out and distinctly claim the invention.²¹⁷ Adequate disclosure, in my opinion, means what is adequately disclosed to one of ordinary skill in the relevant art. For example, the claim may recite a "means for" and the disclosure may simply show an undetailed box described as a "microprocessor." For one skilled in the art, the disclosure of a "microprocessor" and a description of what it does may be an adequate disclosure under section 112, paragraph 1, and therefore an adequate claim limitation under section 112, paragraph 2. The 1999 Guidelines instruct examiners about clarifying the disclosure if it originally would have been understood by one skilled in the art. Best is when the specification describes the "means" elements and what disclosed features they include, such as "means for assigning" or "means for randomly selecting one of said plurality of assigned numbers."²¹⁸

However, a "black box" disclosure in the specification of an element described as a means in the claim may fail to satisfy section 112, paragraph 2 because an insufficient disclosure of a specific structure has been provided, making a determination of the structure and especially equivalents impossible. This is especially the case with software patents, where claim elements are defined in device or means-plus-function form, and the specification and drawings may not have much detail, if any.²¹⁹ The only way to save such a claim is to be able to demonstrate that the "black box" is well known in the art, for example, a computer, a microprocessor.²²⁰ Better practice would be to disclose the computer more thoroughly in the specification, and to cover equivalents, to provide disclosure of alternative structures that can by now be contemplated.²²¹

The 1999 Guidelines set forth a process for an examiner to determine equivalence of a prior art element to a means for performing a function element during *ex parte* examination:

In implementing the change in examination practice necessitated by *Donaldson*, the PTO set forth a two-step process for making a *prima facie* case of equivalence of a prior art element during *ex parte* examination. First, the examiner must find that the prior art element performs the function specified in the claim element, and, second, the examiner must find that the prior art element is not excluded by any explicit definition provided in the specification for an equivalent. This two-step process is not superseded by these interim supplemental guidelines, and is consistent with the requirement that the PTO give claims their broadest reasonable interpretation. The specification need not describe the equivalents of the structures, materials, or acts corresponding to the means- (or step-) plus-function claim element. Where, however, the specification is silent as to what constitutes equivalents, the burden is placed upon the applicant to show that a prior art element which performs the claimed function is not an equivalent of the structure, material, or acts disclosed in the specification.²²²

The Patent Office 1994 Guidelines for "means" ²²³claims also guide examiners as to how to determine whether a prior art disclosure is "equivalent" to what is claimed in a claim limitation:

- 1) Whether the prior art element performs the function specified in the claim in substantially the same way and produces substantially the same result (the equivalents for infringement test of *Graver Tank v. Linde* ²²⁴ which is applied to Patent Office determinations as well, ²²⁵*i.e.*, they are functional equivalents.
- 2) Whether one of ordinary skill in the art would recognize interchangeability of the prior art element for the corresponding element in the specification. Clearly, the broader the scope of the disclosure in the specification, the more likely an equivalent will be found.
- 3) Whether the prior art element is a structural equivalent of the element disclosed in the specification, ²²⁶ again applying the function/way/result test as described in 1); or
- 4) The structure, materials or acts disclosed in the specification represent an insubstantial change which adds nothing significant to the prior art element. ²²⁷

The Federal Circuit's en banc decision in *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.* ²²⁸ and its reversal on other grounds by the Supreme Court ²²⁹ did not negate the substance of the Patent Office guidelines, but it did change their emphasis. The test for equivalents is to determine the substantiality of the differences between the claimed and accused products and processes. ²³⁰ The function/way/result test and the interchangeability test may provide evidence on the substantiality of the differences.

Equivalency under 35 U.S.C. §112 differs from the doctrine of equivalents as to how each is determined. ²³¹ The doctrine of equivalents equitably *expands* exclusive patent rights, as *Hilton Davis* makes it easier to find equivalence. One is not restricted to a specific structure that may be claimed or to any or all of the structures in the specification, but can find equivalents anywhere, using the *Hilton Davis* tests. Equivalence is assessed as of the time that the infringement issue is considered. In contrast, section 112, paragraph 6, limits the broad language of means-plus-function limitations in combination claims to what is disclosed, plus equivalents of the structures, materials, or acts in the specification. ²³² Equivalence under section 112 is assessed as of the time that the application for patent was filed, not at the later time for application of the Doctrine of Equivalents. ²³³ Therefore, not everything that could perform the same function or that might satisfy any *Hilton Davis* tests would, with certainty, be a limitation under section 112, paragraph 6.

See *In re Donaldson*. As noted above, if the claim drafter recognizes the possible equivalency issue early enough, the specification can be written to express enough alternatives to give broad scope to a section 112, paragraph 6 limitation. Although section 112, paragraph 6 restricts scope, as a practical matter, in view of *In re Donaldson* and the Patent Office guidelines, there should be no difference remaining in scope between the two types of equivalence.

Structural equivalents under section 112, paragraph 6 are included within literal infringement of means-plus-function claim elements. The court must find identity of claimed function for the structure and equivalent structure.^{233.1} The inquiry for equivalence of structure under section 112, paragraph 6 is whether the equivalent structure performs the identical function in substantially the same way to achieve substantially the same result as the corresponding structure in the specification.^{233.2}

A means clause is used to describe the function of a particular element, as discussed herein. However, before deciding to argue patentability based on a means-plus-function limitation in response to an examiner's rejection, remember that including a means-plus-function clause may create a prosecution history estoppel which limits the patentee's protection. The examiner will argue that the prior art of record teaches an equivalent of the disclosed means-plus-function structure and the claim writer's responsive argument will create an estoppel.

Means clauses should not be used as a vehicle to present ultrabroad or functional claims. One Patent and Trademark Office example of an overbroad means clause is the claim: "In a device of the class described, means for forcing a flow of air while preventing injury to the operator."²³⁴ The device disclosed was a fan with soft rubber blades. This claim does not particularly point out and distinctly claim the invention. It is attempting to claim the desirable result only, not the way in which the result is accomplished. This type of case is less an adverse decision on means clauses than on overly broad claims generally. In general, one cannot use a means clause to do what one cannot do otherwise, obtain fantastic claims far broader than the invention.

Means clauses had been widely used to describe generally conventional elements of a combination. However, the more recent restrictive interpretation of clauses under section 112, paragraph 6 makes dangerous the use of such clauses even to recite conventional elements, since the claim element may be restricted in scope to what is shown in the preferred embodiment. The outer periphery of permissible uses for means clauses is somewhat uncertain, and new cases on the subject appear frequently.

Because 35 U.S.C. §112, paragraph 6 recites:

An element in a claim for a combination may be expressed as a means or step for . . .

A single-element claim such as the following does not claim a "combination" and cannot employ means-plus-function language:

Apparatus for shaking articles in a container, which comprises: means for oscillating the container to shake the articles.

Note that the "means for forcing air" claim was also a "single means" claim, and would also be objectionable on that score. See discussion of *In re Hyatt*, below. But adding "a base" or other conventional element would not have helped that claim.

The Federal Circuit still rejects "single means" claims, because they cover every conceivable means for achieving the desired result. ²³⁵ In *Hyatt*, the claim held unpatentable under section 112 recited:

35. A Fourier transform processor for generating Fourier transformed incremental output signals in response to incremental input signals, said Fourier transform processor *comprising* incremental *means* for incrementally generating the Fourier transformed incremental output signals in response to the incremental input signals. [Emphasis ours.]

It was a "single means" claim.

In re Donaldson ²³⁶ does not affect the holding of *In re Hyatt* ²³⁷ to the effect that a single means claim does not comply with the enablement requirement of section 112, first paragraph. ²³⁸ *Donaldson* only applies to an interpretation of a limitation drafted to correspond to section 112, paragraph 6, which by its terms is limited to "an element in a claim to a combination," as it does not affect a limitation in a claim which is not directed to a combination.

"Apparatus which shakes the container," for example, is narrative and functional, whereas "apparatus for shaking the container" would be comfortably seen as a "means . . . for."

Most mechanical claims are, or can be made to be, directed to a combination of elements, in which case there is no problem on this score. A possible problem in this area is with an improvement or a *Jepson*-type claim (see section 6:8), where, in the body of the claim, a single new element might be claimed that cooperates with several old elements in the preamble to make up a complete machine or apparatus. As noted in section 6:8, it is thought that such a claim is truly a claim to a combination, so that the body of the claim following the *Jepson* transition phrase could properly consist of a single means expression. However, there may be some difference of opinion on that score, so it might be good tactics to put at least one

other element, means or otherwise, in the body of the claim.

As to overly broad claims, the Supreme Court held in 1946 that a claim was invalid as indefinite and too broad where it used broad means-plus-function language at what the Court considered to be "the precise point of novelty" of the claim. ²³⁹

The clause in question read:

means associated with said pressure responsive device for tuning said receiving means to the frequency of echoes from the tuning collars of said tuning section to clearly distinguish the echoes of said couplings from each other.

Although the stated function apparently was technically novel, the Court felt the patentee should be limited to claiming his specific means (a tuned acoustical pipe) rather than all possible means, some of which might be later invented.

Note that this case came up before the 1952 statute, and was undoubtedly one of the items that led to the new paragraph 6 of section 112 dealing with means clauses. Means clauses were common before the statute, as a matter of practice that had grown up, but the *Halliburton* case cast doubt as to their worth. Commentators believe that the statute was intended to overrule the *Halliburton* case.

In *In re Lundberg and Zuschlag*, ²⁴⁰ the C.C.P.A. came close to holding that 35 U.S.C. §112 overruled the *Halliburton* decision, though that was not necessary to the decision: "As correctly stated by appellants in their brief, this paragraph was designed, at least in part, to modify or overrule such decisions as *Halliburton*. . . ."

In *Ex parte Ball and Hair*, ²⁴¹ the Board indicated, vaguely, that "some measure of greater liberality in the use of functional expressions in the definition of elements in the proper combination claims is authorized by section 112 than has been permitted by some of the stricter decisions of the courts in the past." Some means-plus-function claims were allowed, where the function stated in the claim was "distinctly unlike any function which is or could possibly be performed" by the reference. This seems to be allowance of a means-plus-function claim at the precise point of novelty.

In *Ex parte Mayer*, ²⁴² the Board expressly held that there is no objection to a means-plus-function clause "merely because it is at exact point of novelty in a combination claim . . . ," citing the *Ball & Hair* case. In this case the acceptable clause was:

means responsive to said residual of potential to disable said discharge means for a period greater than the interval between pulses and sufficient to permit normal voltage on said network to be restored before said network is again discharged by said discharge means. ²⁴³

Note that the statute gets around what seems to be the Supreme Court's main reason for objecting to the broad clause: that it would cover nonequivalent structures, in that the coverage under 35 U.S.C. §112 is expressly limited to the specific means shown, plus equivalents.

Means clauses are routine where it is the function of the element that is important *and* where various other specific constructions could be used. Thus, in Example I above, the oscillating means illustrated includes a motor, cam, and cam follower linkage, but it is obvious that various other common arrangements would be equally suitable, such as a piston and cylinder. It should be clear that the essential thing to the combination is *that* the container be oscillated, not how. Since many common structures could be employed to do that job, this is the ideal place for a means clause.

In this example, it is difficult to draw a generic expression other than a means clause, covering both the motor-cam arrangement and a piston-cylinder arrangement, as well as any other conventional arrangement for oscillating a member. As was mentioned in section 3:13, an alternative expression, such as "cam or cylinder," cannot be used, even if that were considered broad enough. A generic expressions must be found. Other attempted generic expressions, such as "a mechanism for oscillating . . .," or "a mechanical device for oscillating . . .," which perhaps might have been viewed as unacceptable functional expressions, now are accepted ways of claiming apparatus, and because they are not claimed using the statutory word "means," under the 1999 Guidelines, they should not be interpreted under section 112, paragraph 6.²⁴⁴ This raises the then unresolved question of the scope to be accorded such a non-means claim element. The doctrine of equivalents would apply, and that application is likely to produce a result the same as classifying the claim limitation under section 112, paragraph 6.

In writing means clauses, as many qualifying words or expressions should be employed in the means clause as are necessary to limit the claim to the scope desired. Thus, one might recite such expressions as:

resilient means, connected between the carriage and the base, for urging the carriage against the stop;

or

means, actuated by the carriage at the end of its forward movement, for moving the bending fingers into contact with the carriage.

In these fragmentary expressions, it should be noted that such elements as "the

carriage" and "the bending fingers" must have been recited in previous elements of such claims, as mentioned in section 3:11 on antecedents. Where no such qualifying expressions are important, none should be used. But, as noted above, recitation of a structural element that performs a function, instead of means for performing the function, is outside section

112, paragraph 6. ²⁴⁵Perhaps too much of the qualifiers noted above will remove the claim from section 112, paragraph 6, and will particularly remove the claim limitation. This occurred, for example, in *Waterloo Furniture Components, Ltd. v. Haworth, Inc.*, ²⁴⁶ discussed above.

It is recommended that one use the exact statutory language "means for . . . (performing an act or accomplishing a result)" or "step for . . ." rather than possibly equivalent expressions that do not include "means for . . ." or "step for . . ." Especially based on the 1999 Guidelines, limitations without "means" or "step" do not fall under section 112, paragraph 6. ²⁴⁷Further, the statute recites only "means" or "step." A court interpreting a claim should follow the statutory words and, especially as to claims pending after the 1999 Guidelines, should follow the Patent Office Guidelines. This should not be an issue during prosecution of the application claims, because examiners should be governed by the Guidelines.

Although one should avoid the practice where possible, it is permissible to claim "means for [doing thing A], including means for [doing thing B]" if B is a part of A. For example, in patent 1,971,193, we find:
means for causing oscillations to be produced in said polyphase circuit having a frequency dependent on the tuning in said polyphase circuit said means [assume no unclarity] including means for producing a magnetic field between said anodes and cathode.

This may be necessary to avoid double inclusion of elements (section 3:9) where they are partially overlapping or where one means includes another.

In referring back to a previously recited means element, later in the claim (see section 3:11, antecedents), one merely gives it a convenient distinctive name, such as "the reciprocating means" or "the container-reciprocating means" or "the means for reciprocating the container" or, less desirably, "first means," "second means." The exact choice is not critical as long as there is no possible confusion with other means elements. The use of the definite article "the" (or "said") is also required, to avoid a double inclusion of the same element in the claim language. Wherever possible, it is best to avoid identifying a means only as "first means," "second means," etc.

It is recommended that means expressions be avoided where there is a definite

generic word of the same scope available and particularly where "means" is placed after the descriptive generic word. Thus, in example 1, "a base" is fully generic, and there is no need to say "base means," "means for supporting," or the like. Also "a container" is generic, so there is no need for "container means" or "means for containing." Note that, in these situations, the word "means" does not add a thing; "container means" is not a bit broader than "a container" but instead may be interpreted as narrower in scope, as invoking section 112, paragraph 6.

Sometimes there may be one or more than one, or more than two of the same type of elements disclosed, usually cooperating with each other, for example, legs supporting the container, and the claim writer does not wish to limit the claim to a particular number, by claiming "a leg" or "a plurality of legs." Some practitioners claim "leg means" as the generic expression of any number of legs. Use of the noun "means" (or "step") following what then becomes the descriptive adjective, "leg," may ease the reader's reference to the claimed means.²⁴⁸ But use of "means" in that clause is not needed. The word "comprising" or the equivalent in the claim preamble encompasses the full range of numbers of the recited elements, for example, from one leg through many of them. Placing the generic word before "means" is not helpful, does not broaden claim scope, and may be harder to understand (as, how does a container differ from the container means?). Further, as noted above, in the Patent Office guidelines, merely adding "means" before a noun, without reciting a function of that means, does not convert the claim element, like "leg means," into an element governed by 35 U.S.C. §112, paragraph 6.²⁴⁹

There are occasions where use of the word "means" following the noun is not only sensible, it is the only apparent way to cover the full range of elements that accomplish the objective. For example, if some means reflects a light beam from a source to a detector, calling the reflective device a reflector or mirror might be misdescriptive. The arrangement of disclosed elements might require two or more reflectors or mirrors, although certain angling of the light source or the detector may make only a single reflector or mirror necessary. Here, the noun "reflector" or "mirror" does not cover all apparent possibilities. The noun, for example, "reflector" or "mirror," is now made an adjective, followed by the noun "means," and that covers the alternatives including one or more reflectors.

In addition, use of an adjective before "means" like "rod means" eases the reference, and it is a means-plus-function clause²⁵⁰ if the other requirements of the Patent Office Guidelines are satisfied. But if the adjective causes a definite structure to be recited, like "perforation means," and the other Guidelines requirements are not met, then the limitation may be outside section 112, paragraph 6.²⁵¹ This is one technique the claim drafter can use to avoid section 112, paragraph 6 treatment even if he uses the "means for" format. However, use of the word "means" in a claim does not always constitute a "means-plus-function" clause. The term "means," as opposed to "means for," may be used in a non-means-plus-function claim, as when

indicating a tool or device having a particular structure (recited in the claim) to carry out its intended function. ²⁵² In *Surgical Laser Technologies, Inc. v. Laser Industries Ltd.*, ²⁵³ Claim 1 contained the terms "tip means" and "securing means." The term "tip means" was determined not to be a means-plus-function term, while the term "securing means" was determined to be a means-plus-function term primarily because the term "tip means" was followed by a phrase which describes its composition, whereas the term "securing means" was followed by the phrase that describes its function. Furthermore, later claim language was "said tip means to be positioned to perform a surgical procedure on or within a patient." The jury concluded that this phrase was meant to describe the position of the tip rather than its function. Saying where the "means" is located will not invoke section 112, paragraph 6, while saying what the "means" does will invoke the statute. Additionally, the phrase "to perform a surgical procedure on or within a patient" appeared only in Claim 1 while the term "tip means" appeared in other independent claims as well. The jury inferred from this that the term "tip means" was not linked to the phrase "to perform . . ." in Claim 1. All these factors contributed to the jury's determination that the term "tip means" was not a means-plus-function clause.

In the shaker example, the reader will note that the following "means" clause has been used in Claim 1 (section 3:1.1): "means for oscillating the container on the legs to shake the articles." As for the recitation of "legs" in Claim 1, a problem in scope of claims is presented. As noted above, no benefit would have been obtained by adding "means" to the word "leg." The legs could still have been more broadly expressed as "means for mounting the container on the base for oscillating movement with respect thereto." This expression is, of course, much broader than merely claiming pivoted legs for doing the same thing. It is interesting to note that the claim now reads on the spring mounting of Example I, Fig.-3, above. However, a line was drawn for purposes of illustration to include the pivoted legs as elements of the claim. Fig.-3 shows a simple mechanism by which the wording of Claim 1 may be circumvented.

As to what specific elements are included in a means clause, the clause includes whatever elements or parts of elements are disclosed in the specification to perform the recited function, plus equivalents (35 U.S.C. ?112). ²⁵⁴The "means for oscillating" clause stated in Claim 1 covers the motor, the cam, and the cam follower attached to the container. A means clause may read on a single element or a part of an element, even a hole (section 3:16), or a train of fifty cooperating elements--whatever is needed to perform the recited function.

There is a limit on what "means" may encompass. In *In re Prater & Wei*, ²⁵⁵ the court held that a means clause did not cover a human being (a possibly mental step in that case), but that it may properly cover a programmed general purpose computer. In the *Prater* case, the clause in question of the apparatus claim was:

means for determining that one of said scalar functions of greatest magnitude for identification of . . . [a desired mathematical relationship].

This holding was affirmed.²⁵⁶ It was also amplified in the subsequent case of *In re Bernhart and Fetter*.²⁵⁷

In *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*,²⁵⁸ the court found that the only "means" that could perform the two functions claimed was a physician and held the claim invalid because the physician cannot be a "corresponding structure" under section 112, paragraph 6.

Further, there is no objection to having one or more specific elements of structure included as a part of two different means clauses, as long as the entire train of parts to perform each function is not identical.

For example, in *Reed v. Edwards*,²⁵⁹ the court held that different parts of a single element could support two means clauses, quoting with approval the following language from the Board of Appeals decision:

It has long been recognized that one element of a claim may be relied on for performing different functions . . . [W]e can see no reason why one side of a tongue or a groove in the Edwards device may not be regarded as the means for advancing the cutter, and why the other side may not be regarded as the means for limiting the rate of travel.

If the disclosure has truly one completely indivisible element for performing both functions, then classic textbook law is that the inventor cannot make the claim to separate means because of double inclusion, or double reading of elements. For example, in *Holdsworth v. Goldsmith*,²⁶⁰ the court stated:

[There is] . . . fairly well settled law on the question. If a patent disclosure shows two elements to perform two different functions and the patent claim is drawn to define both as separate elements, a disclosure which has only one element performing both functions, will not be regarded as supporting the count. (Citing cases.)

While there was never an issue as to whether a method limitation falls within section 112, paragraph 6, there are fewer precedents on it. *O.I. Corp. v. Tekmar Co.*²⁶¹ and *Caterpillar, Inc. v. Detroit Diesel Corp.*²⁶² hold that an element of a method claim falls within section 112, paragraph 6.²⁶³ The statute applies when a step or a series of steps plus a function is recited, and without reciting definite acts.

A step-plus-function limitation describes the result to be achieved, not specific acts which may achieve that result.²⁶⁴ The presence of a purpose in the claim preamble,

but not at the claim limitation itself, does not make the claim limitation within the claim into one under section 112, paragraph 6.²⁶⁵ That a claim preamble recites "the method comprises the steps" does not convert every step in the claim into one under section 112, paragraph 6.^{265.1}

Merely claiming a step of a series of steps without reciting a function is not a step-plus-function recital. Under section 112, paragraph 6, the statute is implicated only when steps plus function, without acts for achieving the function are claimed.²⁶⁶ A preamble statement of purpose does not necessarily supply a function for a "step-plus-function" claim form.²⁶⁷ A "function" says what the claim element accomplishes, while an act explains how the function is accomplished.²⁶⁸

Neither *O.I. Corp. v. Tekmar Co.* nor *Caterpillar, Inc. v. Detroit Diesel Corp.* included a method claim limitation that used the words "step for." The method claim in *O.I.* is quoted in the note below.²⁶⁹ The Federal Circuit held the claim to be under section 112, paragraph 6 because of the broad recital of purpose in the preamble. The court then concluded that the individual steps within the method claim were not governed by section 112, paragraph 6 because the "passing" step was not related to functions performed by the step.

In *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*,²⁷⁰ and in *Masco Corp. v. United States*,²⁷¹ the Federal Circuit sought an indication that section 112, paragraph 6 was implicated by indicating there were no words indicating "step-plus-function" form, such as "step for." In *Epcon*, the method claim recited a step without also reciting a function, so it was not under section 112, paragraph 6. In *Masco*, "steps of transmitting force to drive" was a "step of," not a "step for," recital, and the claim element was not under section 112, paragraph 6, because it recited an act not a function. Without the words "step for," or at least "for," in a method element, it is not clearly under section 112, paragraph 6.

In *Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc.*,^{271.1} the Federal Circuit ruled that the preamble and transition reciting "method comprising the steps of" did not invoke section 112, paragraph 6 for each step following the transition, that is, each step was not thereby step-plus-function. Instead, the absence of "step for" at each step element created the presumption that each step was not step-plus-function.

The author believes that the court's decisions are correct, especially in view of the 1999 Guidelines, which, while they do not control here, provide clear guidance as to when a claim limitation invokes section 112, paragraph 6. Similarly, the *Caterpillar* court viewed the individual steps in the process, "providing," "determining," "retrieving," and "using," as not describing the achieved results but as acts in themselves. These limitations thus did not invoke section 112, paragraph 6. However, the Federal Circuit has sometimes found the absence of a phrase that says "step for" raises the presumption that the claim is not a step-plus-function claim and

not under section 112, paragraph 6. ²⁷²

In *Serrano v. Telular Corp.*, ²⁷³ the Federal Circuit found that a "determining" element did not invoke section 112, paragraph 6 because the claim element did not recite a function. ²⁷⁴

Practical advice to a claim writer who wants to avoid section 112, paragraph 6 is not to use claims with "means" or "step" in them. Alternatively, supply two sets of claims, one with "means" or "step" limits and one using generic nouns and verbs. As to the former group of claims, this will demonstrate an intent to invoke section 112, paragraph 6, and the contrary for the latter group of claims.

Summary

Means clauses are proper in combination claims. They are a simple way to define functions performed broadly. They are governed by 35 U.S.C. §112, paragraph 6. To invoke that statute, you need use only the statutory language "means" or "step" for performing a specified function; that is, an act or operation such as "means for reciprocating the container." A "means" or "step" clause may cover one element, 10,000 elements, half of one element, or even a hole; it covers whatever is described in the specification, plus equivalents. However, because the scope of the means or step may be restricted, as just indicated, it is recommended that the claim writer avoid these claim limitations and instead give the element or step an appropriate descriptive name not including the words "means" or "step."

§3:25.1 Example III--Take-Up Barrel

In the take-up barrel in Example III below, the object is to collect an advancing strand 11 in a barrel 12. The strand is advanced toward the barrel by a conventional advancing means known as a "capstan" 13. The barrel is rotated on a turntable 14 by a motor 15, pulley 16, belt 17, and pulley 18. This operates to vary the point of strand collection circularly with respect to the bottom of the barrel, as shown in figure 2. An eyelet 20 is reciprocated by the same drive motor 15, a pulley 21, a belt 22, a pulley 23, a cam 24, and a cam follower 25 on a shaft 26 of the eyelet 20. This varies the collection point radially with respect to the barrel bottom. The particular strand is a flexible "tinsel" conductor, which forms itself into loops, as shown, as it hits the bottom of the barrel; however, the invention would be useful with other types of strand, which would form other patterns.

A fairly broad claim to the combination follows:

2. Apparatus for collecting an advancing strand in a barrel, which comprises:

(a) a *turntable* on which the barrel is mounted for rotation therewith;

(b) *a strand guide* positioned above the barrel for guiding the advancing strand into the barrel;

(c) *means for rotating the turntable* so that the point of collection of the strand varies circularly with respect to the bottom of the barrel; and

(d) *means for reciprocating the guide* so that the point of collection varies radially with respect to the bottom of the barrel.

This claim illustrates the use of two means clauses having some common elements, that is, both the rotating means (c) and the reciprocating means (d) include the motor 15 and its shaft. However, they also include many different elements, starting with the two pulleys 16 and 21 on the motor shaft. For this reason, two separate clauses are proper.

From a function standpoint, the elements (c) and (d) could equally well have been driven from separate motors. Therefore, the claim would be unnecessarily limited if a single drive motor for both were recited. The invention obviously is not in using a single drive motor to drive two moving parts synchronously--that is a common industrial expedient. The invention must relate to the fact of simultaneous rotation and reciprocation. Note how that is accomplished.

Claim 2 further illustrates such general principles of mechanical combination claims as preparing the preamble, selecting the essential elements (including means expressions), listing them in a logical order, and tying them together structurally and functionally to accomplish the result stated in the preamble.

These are the most important elements of mechanical claim drafting. ²⁷⁵

EXAMPLE III:

Take-Up Barrel

TAKE-UP BARREL

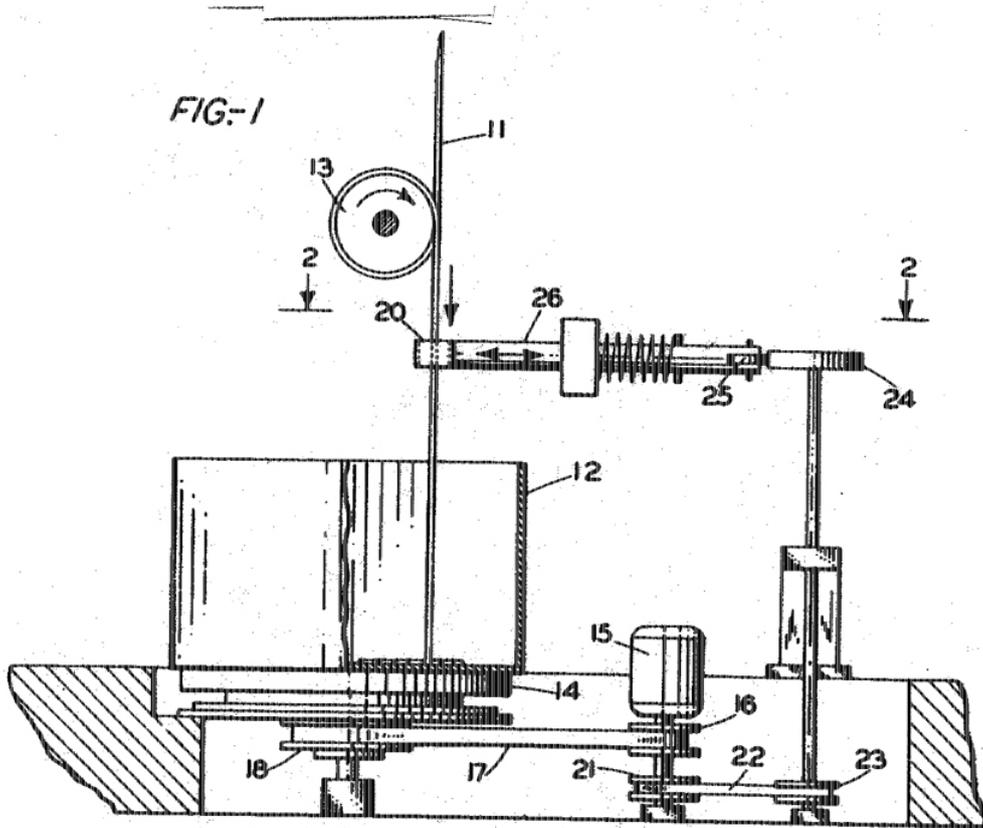
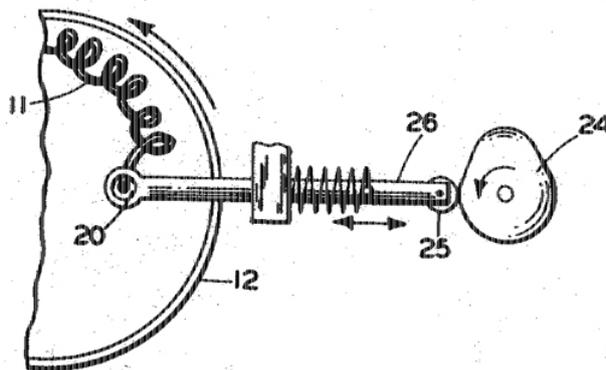


FIG-2



FOOTNOTES:

Footnote 145. *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1536, 19 U.S.P.Q.2d (BNA) 1367

(Fed. Cir. 1991). See *Johnston v. IVAC Corp.*, 885 F.2d 1574, 12 U.S.P.Q.2d (BNA)

1382 (Fed. Cir. 1989).

☛Footnote 146. *Chem. Separation Tech., Inc. v. United States*, 51 Fed. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114 (Fed. Cl. 2002) (court construed pipes that performed the recited function in the disclosed preferred embodiment as the claimed "influent pipe means"); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1308, 46 U.S.P.Q. 2d (BNA) 1752, 1755-59 (Fed. Cir. 1998); *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 66 U.S.P.Q.2d (BNA) 1341 (Fed. Cir. 2003); *Nomos Corp. v. Brainlab USA, Inc.*, 357 F.3d 1364, 69 U.S.P.Q.2d (BNA) 1853 (Fed. Cir. 2004) said the claimed means was limited to the only embodiment disclosed in the specification.

☛Footnote 146.1. *Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 73 U.S.P.Q.2d (BNA) 1191 (Fed. Cir. 2004) (disclosing only one structure in detail, but saying that the specific structure is not required and briefly describing an alternative); *Serrano v. Telular Corp.*, 111 F.3d 1578, 42 U.S.P.Q.2d (BNA) 1538 (Fed. Cir. 1997) (in support of a finding of infringement of a means-plus-function claim element, the court cited the passage in the patent specification that a microprocessor-based system could be used).

☛Footnote 147. *In re Donaldson Co.*, 16 F.3d 1189, 29 U.S.P.Q.2d (BNA) 1845 (Fed. Cir. 1994) (en banc).

☛Footnote 148. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987); *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1574 (Fed. Cir. 1985).

☛Footnote 149. *Hale Fire Pump Co. v. Tokai, Ltd.*, 614 F.2d 1278, 1283 (C.C.P.A. 1980).

☛Footnote 150. *Lockheed Martin Corp. v. Space Sys./Loral Inc.*, 324 F.3d 1308, 66 U.S.P.Q.2d (BNA) 1282, 1290 (Fed. Cir. 2003).

☛Footnote 151. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 117 S. Ct. 1040, 1048 (1997).

☛Footnote 152. *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d (BNA) 1161, 1167 (Fed. Civ. 1999).

☛Footnote 152.1. *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 69 U.S.P.Q.2d (BNA)

1865 (Fed. Cir. 2004). *See SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d

1107, 227 U.S.P.Q. (BNA) 577 (Fed. Cir. 1985).

Footnote 153. MPEP ¶2181; Interim Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. 112 [para] 6 (issued by the Patent and Trademark Office effective July 30, 1999), 64 Fed. Reg. 41,392 (1999), 58 Pat. Trademark & Copyright J. (BNA) 443-45 (Aug. 5, 1999).

Footnote 153.1. Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc., 389 F.3d 1370, 73 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

Footnote 154. Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 25 U.S.P.Q.2d (BNA) 1451 (Fed. Cir. 1993); Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850 (Fed. Cir. 1991).

Footnote 155. Carroll Touch, Inc. v. Electro Mech. Sys., Inc., 15 F.3d 1573, 27 U.S.P.Q.2d (BNA) 1836 (Fed. Cir. 1993); Jackson v. Casio Phonemate, Inc., 105 F. Supp. 2d 858, 56 U.S.P.Q.2d (BNA) 1081, 1084 (N.D. Ill. 2000).

Footnote 156. Smiths Int'l Med. Sys., Inc. v. Vital Signs, Inc., 51 U.S.P.Q.2d (BNA) 1415 (Fed. Cir. 1999).

Footnote 157. *Cf. In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989).

Footnote 158. *See* MPEP ¶2181; *see also In re Lundberg & Zuschlag*, 113 U.S.P.Q. (BNA) 530, 534 (C.C.P.A. 1957).

Footnote 159. *Ex parte Isaksen*, 23 U.S.P.Q.2d (BNA) 1001, 1007-15 (Board of Patent Appeals and Interferences 1992).

Footnote 160. *In re Donaldson*, 16 F.3d 1189, 29 U.S.P.Q.2d (BNA) 1845 (Fed. Cir. 1994); MPEP ¶2181.

Footnote 160.1. Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc., 389 F.3d 1370, 73 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

Footnote 161. Cardiac Pacemakers, Inc. v. St. Jude Med., Inc., 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725, 1732-33 (Fed. Cir. 2002); Default Proof Credit Card Sys., Inc. v. Home Depot USA, Inc., 412 F.3d 1291, 75 U.S.P.Q.2d (BNA) 1116 (Fed. Cir. 2005) ("means for dispensing").

Footnote 162. *Ishida Co. v. Taylor*, 221 F.3d 1310, 55 U.S.P.Q.2d (BNA) 1449, 1453 (Fed. Cir. 2000).

Footnote 163. Carroll Touch, Inc. v. Electro Mech. Sys., Inc., 15 F.3d 1573, 27 U.S.P.Q.2d (BNA) 1836 (Fed. Cir. 1993).

Footnote 164. Interim Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. § 112 [para] 6 (issued by the Patent and Trademark Office effective July 30, 1999), 64 Fed. Reg. 41,392 (1999), 58 Pat. Trademark & Copyright J. (BNA) 443-45 (Aug. 5, 1999).

Footnote 165. See *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61 U.S.P.Q.2d (BNA) 1470 (Fed. Cir. 2002); *Masco Corp. v. United States*, 303 F.3d 1316, 64 U.S.P.Q.2d (BNA) 1182 (Fed. Cir. 2002).

Footnote 166. *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1427-28 (Fed. Cir. 1997); *TurboCare Div. of Demag Delaval Turbomachinery, Inc. v. Gen. Elec.*, 264 F.3d 1111, 60 U.S.P.Q.2d (BNA) 1017 (Fed. Cir. 2001); *Reiffin v. Microsoft Corp.*, 64 U.S.P.Q.2d 1107, 1119 (N.D. Cal. 2002); *Allen Eng'g Corp. v. Bartell Indus., Inc.*,

299 F.3d 1336, 63 U.S.P.Q.2d (BNA) 1769, 1775 (Fed. Cir. 2002); *British Telecomms. PLC v. Prodigy Communications Corp.*, 189 F. Supp. 2d 101, 62 U.S.P.Q.2d (BNA) 1879 (S.D.N.Y. 2002) ("central computer means"); *T1 Group Auto. Sys. v. VDO N. Am.*, 375 F.3d 1126, 71 U.S.P.Q.2d (BNA) 1328 (Fed. Cir. 2004).

Footnote 166.1. *T1 Group Auto. Sys. v. VDO N. Am.*, 375 F.3d 1126, 71 U.S.P.Q.2d (BNA) 1328 (Fed. Cir. 2004).

Footnote 167. *Axcelis Techs., Inc. v. Applied Materials, Inc.*, 66 U.S.P.Q.2d (BNA) 1039, 1041 (D. Mass. 2002); *Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 60 U.S.P.Q.2d (BNA) 1567 (Fed. Cir. 2001).

Footnote 168. *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 58 U.S.P.Q.2d (BNA) 1607 (Fed. Cir. 2001).

Footnote 169. *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420 (Fed. Cir. 1997); *Kemco*

Sales, Inc. v. Control Papers Co., 208 F.3d 1352, 54 U.S.P.Q.2d (BNA) 1308 (Fed. Cir. 2000).

Footnote 170. *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 40 U.S.P.Q.2d (BNA) 1619 (Fed. Cir. 1996); *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996), *cert. denied*, 522 U.S. 812 (1997); *Envirco Corp. v. Clestra Cleanroom, Inc.*, 209 F.3d 1360, 54 U.S.P.Q.2d (BNA) 1449, 1452 (Fed. Cir. 2000); *Rodime PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 50 U.S.P.Q.2d (BNA) 1429, 1435 (Fed. Cir. 1999), *cert. denied*, 528 U.S. 1115 (2000); *Lighting World*,

Inc. v. Birchwood Lighting, Inc., 382 F.3d 1354, 72 U.S.P.Q.2d (BNA) 1344 (Fed. Cir. 2004).

Footnote 171. Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 U.S.P.Q.2d (BNA) 1367 (Fed. Cir. 1991); York Prods., Inc. v. Cent. Tractor Farm & Family Ctr., 99 F.3d 1568, 40 U.S.P.Q.2d (BNA) 1619 (Fed. Cir. 1996); Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 39 U.S.P.Q.2d (BNA) 1783 (Fed. Cir. 1996); Ethicon, Inc. v.

United States Surgical Corp., 135 F.3d 1456, 1463, *cert. denied*, 119 S. Ct. 278 (1998); Hester Indus., Inc. v. Stein, Inc., 142 F.3d 1472 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 372 (1998); CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d

1359, 62 U.S.P.Q.2d (BNA) 1658 (Fed. Cir. 2002).

Footnote 172. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed. Cir. 1996), *cert. denied*, 118 S. Ct. 56 (1997).

Footnote 172.1. Linear Tech. Corp. v. Impala Linear Corp., 379 F.3d 1311, 72 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

Footnote 173. Clearstream Wastewater Sys., Inc. v. Hydro-action, Inc., 206 F.3d 1440, 54 U.S.P.Q.2d (BNA) 1185 (Fed. Cir. 2000).

Footnote 174. Haney v. Timesavers, Inc., 29 U.S.P.Q.2d (BNA) 1605 (D. Or. 1993).

Footnote 175. AMP, Inc. v. Fujitsu Microelectronics, Inc., 853 F. Supp. 808, 31 U.S.P.Q.2d (BNA) 1705 (M.D. Pa. 1994).

Footnote 176. *Id.*

Footnote 177. Waterloo Furniture Components, Ltd. v. Haworth, Inc., 25 U.S.P.Q.2d (BNA) 1139, 1142-44 (N.D. Ill. 1992).

Footnote 178. British Telecomms. PLC v. Prodigy Communications Corp., 189 F. Supp. 2d 101, 62 U.S.P.Q.2d (BNA) 1879 (S.D.N.Y. 2002).

Footnote 179. Apex, Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 66 U.S.P.Q.2d (BNA) 1444 (Fed. Cir. 2003).

Footnote 179.1. Linear Tech. Corp. v. Impala Linear Corp., 371 F.3d 1365, 71 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 2004).

Footnote 180. *See In re Roberts & Burch*, 470 F.2d 1399, 176 U.S.P.Q. (BNA) 313 (C.C.P.A. 1973); *Ex parte Zimmerly*, 153 U.S.P.Q. (BNA) 367 (Board of Patent Appeals and Interferences 1966).

Footnote 180.1. *See Phillips v. AWH Corp.*, 363 F.3d 1207, 70 U.S.P.Q.2d 1417 (Fed. Cir. 2004).

Footnote 181. *In re Chandler*, 117 U.S.P.Q. (BNA) 361 (C.C.P.A. 1958).

Footnote 182. *Id.* at 361 (emphasis added).

Footnote 183. *See also In re Oelrich & Divigard*, 212 U.S.P.Q. (BNA) 323, 326 (C.C.P.A. 1981).

Footnote 184. *Ex parte Klumb*, 159 U.S.P.Q. (BNA) 694 (Bd. App. 1967).

Footnote 185. *See Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61 U.S.P.Q.2d (BNA) 1470 (Fed. Cir. 2002); *Masco Corp. v. United States*, 303 F.3d 1316, 64 U.S.P.Q.2d (BNA) 1182 (Fed. Cir. 2002).

Footnote 186. *De Graffenreid v. United States*, 20 Ct. Cl. 458, 16 U.S.P.Q.2d (BNA) 1321 (Ct. Cl. 1990).

Footnote 187. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 21 U.S.P.Q.2d (BNA) 1383 (Fed. Cir. 1992).

Footnote 188. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d (BNA) 1566 (Fed. Cir. 1990).

Footnote 189. *Interspiro U.S.A. v. Figgie Int'l*, 18 F.3d 927, 30 U.S.P.Q.2d (BNA) 1070 (Fed. Cir. 1994).

Footnote 190. *Quantum Corp. v. Mountain Computer*, 5 U.S.P.Q.2d (BNA) 1103 (N.D. Cal. 1987).

Footnote 191. *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580 (Fed. Cir. 1996).

Footnote 192. *Personalized Media Communications, LLC v. United States Int'l Trade Comm'n*, 161 F.3d 696, 48 U.S.P.Q.2d (BNA) 1880 (Fed. Cir. 1998).

Footnote 193. *Harmonic Design, Inc. v. Hunter Douglas, Inc.*, 88 F. Supp. 2d 1102, 54 U.S.P.Q.2d (BNA) 1273, 1275 (C.D. Cal. 2000).

Footnote 194. *Id.*, 54 U.S.P.Q.2d at 1276.

Footnote 195. *Watts v. XL Sys., Inc.*, 232 F.3d 877, 56 U.S.P.Q.2d (BNA) 1836, 1838-39 (Fed.

Cir. 2000).

Footnote 195.1. *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 72 U.S.P.Q.2d (BNA) 1344 (Fed. Cir. 2004).

Footnote 196. *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 48 U.S.P.Q.2d (BNA) 1010 (Fed. Cir. 1998).

Footnote 196.1. In *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 72 U.S.P.Q.2d (BNA) 1344 (Fed. Cir. 2004), the court said that *Mas-Hamilton Group v. LaGard, Inc.* was the last case to hold a claim element without "means" to be under section 112, paragraph 6.

Footnote 197. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 62 U.S.P.Q.2d (BNA) 1658, 1665 (Fed. Cir. 2002).

Footnote 198. *Sanada v. Reynolds*, 67 U.S.P.Q.2d (BNA) 1459 (Board of Patent Appeals and Interferences 2003) (nonprecedential).

Footnote 199. *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524 (Fed. Cir. 1996).

Footnote 200. *Waterloo Furniture Components, Ltd. v. Haworth, Inc.*, 25 U.S.P.Q.2d (BNA)

1139, 1142-44 (N.D. Ill. 1992). See *B.F. Goodrich Flight Sys., Inc. v. Insight Instruments Corp.*, 22 U.S.P.Q.2d (BNA) 1832, 1836 (S.D. Ohio 1992).

Footnote 201. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 62 U.S.P.Q.2d (BNA) 1658, 1665 (Fed. Cir. 2002) (discussing whether "member" in "reciprocating member" was definable, and it was defined in a dictionary). See *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568 (Fed. Cir. 1996) (which appended structure after the "means," not function, the claim language reciting: "means formed on the upwardly extending liner sidewall portions including a plurality of spaced apart vertically extending ridge members protruding from the liner sidewall portions and forming load locks").

Footnote 202. *Unidynamics Corp. v. Automatic Prods. Int'l Ltd.*, 157 F.3d 1311, 48 U.S.P.Q.2d (BNA) 1099 (Fed. Cir. 1998).

Footnote 203. *Signtech USA Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 50 U.S.P.Q.2d 1372 (Fed. Cir. 1999).

Footnote 203.1. *Lava Trading, Inc. v. Sonic Trading Mgmt., LLC*, 2004 U.S. Dist. LEXIS 9169,

72 U.S.P.Q.2d (BNA) 1270 (S.D.N.Y. 2004).

Footnote 204. *O.I. Corp. v. Tekmar Co., Inc.*, 42 U.S.P.Q.2d (BNA) 1777 (Fed. Cir. 1997).

Footnote 205. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1308, 46 U.S.P.Q. 2d (BNA) 1752, 1755-59 (Fed. Cir. 1998); *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 66 U.S.P.Q.2d (BNA) 1341 (Fed. Cir. 2003).

Footnote 206. *Chem. Separation Tech., Inc. v. United States*, 51 Ct. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114 (Fed. Cl. 2002).

Footnote 207. *Smiths Int'l Med. Sys., Inc. v. Vital Signs, Inc.*, 51 U.S.P.Q.2d (BNA) 1415 (Fed. Cir. 1999).

Footnote 207.1. *Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc.*, 389 F.3d

1370, 73 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

Footnote 208. *J&M Corp. v. Harley-Davidson, Inc.*, 269 F.3d 1360, 60 U.S.P.Q.2d (BNA) 1746 (Fed. Cir. 2001).

Footnote 209. *Personalized Media Communications, LLC v. United States Int'l Trade Comm'n*, 161 F.3d 696, 48 U.S.P.Q.2d (BNA) 1880 (Fed. Cir. 1998); *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725, 1732-33 (Fed. Cir. 2002).

Footnote 210. *Chiuminatta Concrete Concepts, Inc.*, 46 U.S.P.Q.2d (BNA) 1752, 1755-56; *Globetrotter Software, Inc. v. Elan Computer Group, Inc.*, 236 F.3d 1363, 57 U.S.P.Q.2d (BNA) 1542, 1545 (Fed. Cir. 2001); *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 57 U.S.P.Q.2d (BNA) 1679, 1684 (Fed. Cir.

2001); *J&M Corp. v. Harley-Davidson, Inc.*, 269 F.3d 1360, 60 U.S.P.Q.2d (BNA) 1746 (Fed. Cir. 2001); *Northrop Grumman Corp.*, 325 F.3d 1346, 66 U.S.P.Q.2d (BNA) 1341.

Footnote 211. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

Footnote 212. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725, 1732-33 (Fed. Cir. 2002).

Footnote 212.1. *Harrah's Entm't, Inc. v. Station Casinos, Inc.*, 321 F. Supp. 2d 1175, 71 U.S.P.Q.2d (BNA) 1439 (D. Nev. 2004).

Footnote 213. *See Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 52 U.S.P.Q.2d (BNA) 1258, 1263 (Fed. Cir. 2000); *Harmonic Design, Inc. v. Hunter Douglas, Inc.*, 88 F. Supp. 2d 1102, 54 U.S.P.Q.2d (BNA) 1273, 1276 (C.D. Cal. 2000).

Footnote 214. *Ishida Co. v. Taylor*, 221 F.3d 1310, 55 U.S.P.Q.2d (BNA) 1449 (Fed. Cir. 2000).

Footnote 215. *Multiform Dessicants, Inc. v. Medzam Ltd.*, 45 U.S.P.Q.2d (BNA) 1429, 1433-34 (Fed. Cir. 1998).

Footnote 216. *Kegel Co. v. AMF Bowling, Inc.*, 44 U.S.P.Q.2d (BNA) 1123, 1128-29 (Fed. Cir. 1997); *Chiuminatta Concrete Concepts, Inc. v. Cardinal*, 145 F.3d 1308, 46 U.S.P.Q.2d (BNA) 1752 (Fed. Cir. 1998); *Micro Chem.*, 1194 F.3d 1250 (Fed. Cir. 2000).

Footnote 217. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d

(BNA) 1725 (Fed. Cir. 2002).

Footnote 218. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 51 U.S.P.Q.2d (BNA) 1385, 1391-92 (Fed. Cir. 1999).

Footnote 219. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447, 1452 (Fed. Cir. 1999). *See Isogon Corp. v. Amdahl Corp.*, 47 F. Supp. 2d 436 (S.D.N.Y. 1998) (for computer software claim elements in ¶112, paragraph 6 form, take "event detector for detecting," "collector for obtaining," "recorder for recording," and "correlator for correlating").

Footnote 220. *In re Dossel*, 115 F.3d 942 (Fed. Cir. 1997).

Footnote 221. *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1551-52 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 266 (1997).

Footnote 222. Interim Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. §112 [para] 6 (issued by the Patent and Trademark Office effective July 30, 1999), 64 Fed. Reg. 41,392, 41,393 (1999), 58 Pat. Trademark & Copyright J. (BNA) 443, 444 (Aug. 5, 1999) (footnotes omitted).

Footnote 223. MPEP §2184.

Footnote 224. *Graver Tank v. Linde*, 339 U.S. 605 (1950).

Footnote 225. *Polumbo v. Don-Joy Co.*, 762 F.2d 969, 975 (Fed. Cir. 1985).

Footnote 226. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d (BNA) 1566 (Fed. Cir. 1990).

Footnote 227. *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 25 U.S.P.Q.2d (BNA) 1451 (Fed. Cir. 1993).

Footnote 228. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 35 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995).

Footnote 229. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 230. *See Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 25 U.S.P.Q.2d (BNA) 1451 (Fed. Cir. 1993).

Footnote 231. *Id.*

Footnote 232. *Id.*, 25 U.S.P.Q.2d at 1455.

Footnote 233. *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d (BNA) 1161, 1167 (Fed. Cir. 1999); *Ishida Co. v. Taylor*, 221 F.3d 1310, 55 U.S.P.Q.2d (BNA) 1449, 1453 (Fed. Cir. 2000).

Footnote 233.1. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 4 U.S.P.Q.2d (BNA) 1737 (Fed. Cir. 1987).

Footnote 233.2. *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 51 U.S.P.Q.2d (BNA) 1225 (Fed. Cir. 1999); *Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc.*, 389 F.3d 1370, 73 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2004).

Footnote 234. From the August 1963 Agent's Exam.

Footnote 235. *In re Hyatt*, 708 F.2d 712, 712-13 (Fed. Cir. 1983).

Footnote 236. *In re Donaldson*, 16 F.3d 1189 (Fed. Cir. 1994).

Footnote 237. *In re Hyatt*.

Footnote 238. MPEP ¶2181.

Footnote 239. *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1 (1946).

Footnote 240. *In re Lundberg & Zuschlag*, 113 U.S.P.Q. (BNA) 530 (C.C.P.A. 1957).

Footnote 241. *Ex parte Ball & Hair*, 99 U.S.P.Q. (BNA) 146, 148 (Board of Patent Appeals and Interferences 1954).

Footnote 242. *Ex parte Mayer*, 111 U.S.P.Q. (BNA) 109 (Board of Patent Appeals and Interferences 1956).

Footnote 243. *See Ex parte Roggenburk*, 172 U.S.P.Q. (BNA) 82 (Board of Patent Appeals and Interferences 1970).

Footnote 244. *See Watts v. XL Sys., Inc.*, 232 F.3d 877, 56 U.S.P.Q.2d (BNA) 1836, 1839 (Fed. Cir. 2000).

Footnote 245. *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580 (Fed. Cir. 1996); *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524 (Fed. Cir. 1996); Interim Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. §112 [para] 6

(issued by the Patent and Trademark Office effective July 30, 1999), 64 Fed. Reg. 41,392 (1999), 58 Pat. Trademark & Copyright J. (BNA) 443 (Aug. 5, 1999).

Footnote 246. *Waterloo Furniture Components, Ltd. v. Haworth, Inc.*, 25 U.S.P.Q.2d (BNA) 1139, 1142-44 (N.D. Ill. 1992).

Footnote 247. *See Harmonic Design, Inc. v. Hunter Douglas, Inc.*, 88 F. Supp. 2d 1102, 54 U.S.P.Q.2d (BNA) 1273, 1276 (C.D. Cal. 2000); *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 U.S.P.Q.2d (BNA) 1308 (Fed. Cir. 2000). *See CCS*

Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 62 U.S.P.Q.2d (BNA) 1658 (Fed. Cir. 2002).

Footnote 248. *Manville Sales Corp. v. Paramount Sys., Inc.*, 14 U.S.P.Q.2d (BNA)

1291 (E.D. Pa 1989), *modified*, 917 F.2d 544, 16 U.S.P.Q.2d (BNA) 1587 (Fed. Cir. 1990). *See* Surgical Laser Techs., Inc. v. Laser Indus. Ltd., 29 U.S.P.Q.2d (BNA) 1533 (E.D. Pa. 1993) (wherein the court supported the jury's determination that "probe tip means" does not constitute means-plus-function language).

Footnote 249. *Ex parte Klumb*, 159 U.S.P.Q. (BNA) 694 (Bd. App. 1967).

Footnote 250. *Manville Sales Corp. v. Paramount Sys., Inc.*, 14 U.S.P.Q.2d (BNA) 1291 (E.D. Pa. 1989), *modified*, 917 F.2d 544, 16 U.S.P.Q.2d (BNA) 1587 (Fed. Cir. 1990); *Ultrak, Inc. v. Radio Eng'g Indus., Inc.*, 52 U.S.P.Q.2d (BNA) 1526, 1528 (Fed. Cir. 1999); *Signtech USA Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1372, 1374-75 (Fed. Cir. 1999); *J&M Corp. v. Harley-Davidson, Inc.*, 269 F.3d 1360, 60 U.S.P.Q.2d (BNA) 1746 (Fed. Cir. 2001).

Footnote 251. *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524 (Fed. Cir. 1996); *Envirco Corp. v. Clestra Cleanroom, Inc.*, 209 F.3d 1360, 54 U.S.P.Q.2d (BNA) 1449 (Fed. Cir. 2000). *See* *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 66 U.S.P.Q.2d (BNA) 1341 (Fed. Cir. 2003) (adjectives preceding "circuit" removed those claim elements from being within section 112, paragraph 6).

Footnote 252. *See Cole and Envirco Corp., supra* note 251.

Footnote 253. *Surgical Laser Techs., Inc. v. Laser Indus. Ltd.*, 29 U.S.P.Q.2d (BNA) 1533, 1535

(E.D. Pa. 1993), *subsequent appeal*, 32 U.S.P.Q.2d (BNA) 1798 (Fed. Cir. 1994).

Footnote 254. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 46 U.S.P.Q.2d (BNA) 1752, 1755-56 (Fed. Cir. 1998); *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 54 U.S.P.Q.2d (BNA) 1129, 1135 (Fed. Cir. 2000); *Chem. Separation Tech., Inc. v. United States*, 51 Ct. Cl. 771, 63 U.S.P.Q.2d (BNA) 1114 (Fed.

Cl. 2002).

Footnote 255. *In re Prater & Wei*, 162 U.S.P.Q. (BNA) 541 (C.C.P.A. 1969) (on rehearing).

Footnote 256. *See In re Johnston*, 183 U.S.P.Q. (BNA) 172 (C.C.P.A. 1974), *rev'd on other ground (obviousness) sub nom.* *Dann v. Johnston*, 209 U.S.P.Q. (BNA) 257 (U.S. 1976).

Footnote 257. *In re Bernhart & Fetter*, 163 U.S.P.Q. (BNA) 611 (C.C.P.A. 1969).

Footnote 258. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d

(BNA) 1725 (Fed. Cir. 2002).

Footnote 259. *Reed v. Edwards*, 40 U.S.P.Q. (BNA) 620, 622 (C.C.P.A. 1939).

Footnote 260. *Holdsworth v. Goldsmith*, 54 U.S.P.Q. (BNA) 90, 94 (C.C.P.A. 1942).

Footnote 261. *O.I. Corp. v. Tekmar Co.*, 42 U.S.P.Q.2d (BNA) 1777 (Fed Cir. 1997).

Footnote 262. *Caterpillar, Inc. v. Detroit Diesel Corp.*, 41 U.S.P.Q.2d (BNA) 1876, 1880-82 (N.D. Ind. 1996).

Footnote 263. *Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 172 F.3d 836, 50 U.S.P.Q.2d (BNA) 1225, 1233 (Fed. Cir. 1999).

Footnote 264. *Id.*

Footnote 265. *O.I. Corp.*, 42 U.S.P.Q. 2d (BNA) 1777; *Masco Corp. v. United States*, 303 F.3d 1316, 64 U.S.P.Q.2d (BNA) 1182 (Fed. Cir. 2002).

Footnote 265.1. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 72 U.S.P.Q.2d (BNA) 1333 (Fed. Cir. 2004), *cert. denied*, 125 S. Ct. 2254 (2005).

Footnote 266. *Epcor Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61 U.S.P.Q.2d 1470 (Fed. Cir. 2002); *Masco Corp. v. United States*, 303 F.3d 1316, 64 U.S.P.Q.2d (BNA) 1182 (Fed. Cir. 2002).

Footnote 267. *Id.*

Footnote 268. *Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 172 F.3d 836, 50 U.S.P.Q.2d 1225 (Fed. Cir. 1999) (Rader, J. concurring).

Footnote 269. 9. A method for removing water vapor from an analyte slug passing between a sparge vessel, trap and gas chromatograph, comprising the steps of:

(a) passing the analyte slug through a passage heated to a first temperature higher than ambient, as the analyte slug passes from the sparge vessel to the trap; and

(b) passing the analyte slug through the passage that is air cooled to a second temperature below said first temperature but not below ambient, as the analyte

slug passes from the trap to the gas chromatograph.

Id. at 1779.

Footnote 270. *Epcon Gas Sys.*, 279 F.3d 1022, 61 U.S.P.Q.2d (BNA) 1470.

Footnote 271. *Masco Corp.*, 303 F.3d 1316, 64 U.S.P.Q.2d (BNA) 1182.

Footnote 271.1. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 63 U.S.P.Q.2d (BNA) 1725 (Fed. Cir. 2004) (this is a different stage in the same suit described above).

Footnote 272. *Generation II Orthotics, Inc. v. Med. Tech., Inc.*, 263 F.3d 1356, 59 U.S.P.Q.2d (BNA) 1919 (Fed. Cir. 2001).

Footnote 273. *Serrano v. Telular Corp.*, 42 U.S.P.Q.2d (BNA) 1538 (Fed. Cir. 1997).

Footnote 274. *Cf. Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 172 F.3d 836, 50 U.S.P.Q.2d (BNA) 1225, 1233 (Fed. Cir. 1999).

Footnote 275. Further examples of mechanical claims of various kinds are presented in appendix A.

§3:26 Electrical Circuit Claims n276

n276. This section was prepared by Bryan W. Sheffield, John L. Landis, and Robert Faber.

Substantially all of the precepts discussed in this chapter on apparatus claims apply to electrical circuits. The major difference is that the elements, or some of them, are electrical devices instead of mechanical parts, and the association or cooperation is or may be electrical, not mechanical. One simple example follows:

3. A circuit for counting the number of faults in the insulation on an insulated wire, which comprises:

(a) means for applying a test potential between a selected portion of the insulation and the underlying wire;

(b) means for moving the insulated wire relative to the potential-applying means; and

(c) a pulse counter, associated with the potential-applying means and responsive to

each pulse of current between the insulation and the underlying wire, for counting the number of faults in the insulation.

Means clauses are frequently used in electrical cases, both for the electrical elements and for associated mechanical structure, even to cover portions of a programmed general purpose computer. Note that the above claim covers a combination of electrical and mechanical structure. This is quite common and normally presents no problem.

In writing broad claims in electrical cases, it is desirable where possible to focus on what combination a prospective infringer might sell, and to avoid including as elements conventional items, such as power sources or batteries, that such a person might not include with the device. This theory applies to all types of cases.

Thus, in Claim 3, above, element (a) is recited as:

means for applying a test potential between a selected portion of the insulation and the underlying wire.

and not, for example,

a d.c. battery for applying a test potential between a selected portion of the insulation and the underlying wire.

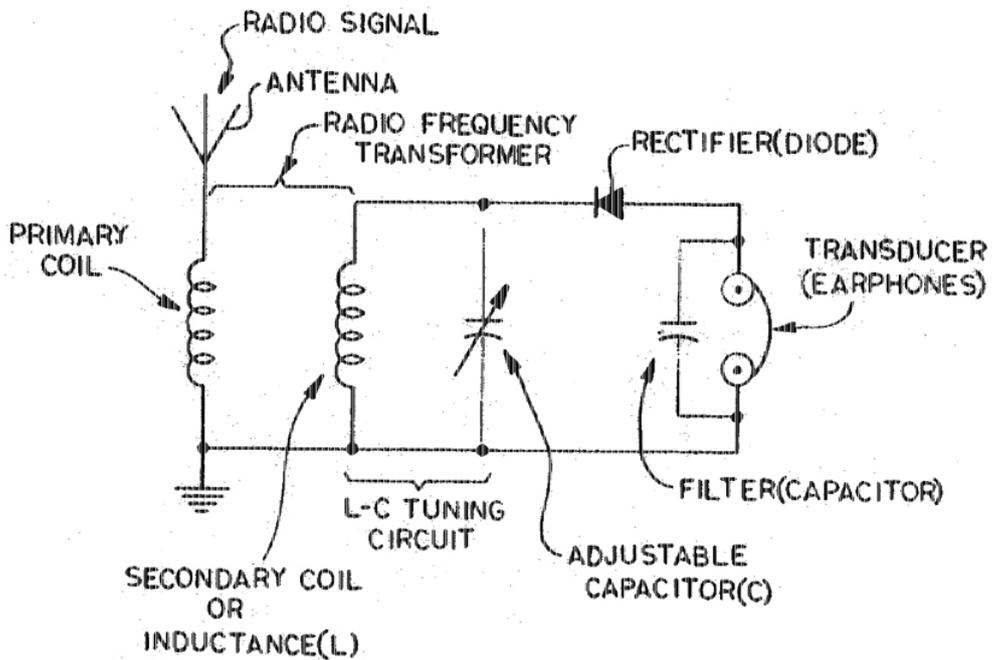
But even the element (a) means for applying might suggest to a reader the inclusion of the actual power source. To avoid that possibility, recite the means for receiving or connecting to the conventional means, so it is clear you are not claiming that conventional means. For example, claim it as:

means for receiving and applying a test . . .

clearly avoiding any implication of inclusion of the power source there.

EXAMPLE IV: Radio Signal

RADIO SIGNAL



As another example, if one were writing a broad apparatus claim to the simple radio receiver shown in Example IV above, one should not write:

an antenna connected to the tuning coil of said receiver . . .

because ordinarily such a receiver would not be sold with an antenna attached. It

would be better practice to claim:

means for supplying the radio frequency signals to be detected . . .

and would be even better, to avoid any undesirable interference to claim:

means for receiving the radio frequency signals to be detected and for supplying the radio frequency signals to the . . .

which, of course, reads on the antenna input terminals, etc., without an antenna attached, as well as reading on the complete, operating combination with the antenna attached.

The importance of not positively reciting conventional elements, or elements that are not customarily sold with the claimed apparatus, cannot be overstressed. Not claiming power supplies, signal sources, and other conventional elements is in many respects analogous to not claiming the workpiece in a machine claim (see section 3:3).

A Cautionary Note--In complex electrical cases, for example, in telephone switching or computer applications, it is customary to use block diagrams of the claimed circuitry rather than describe in detail each resistor, capacitor, etc. ²⁷⁷

This is a practice of long standing and is perfectly acceptable, provided that the requirements of 35 U.S.C. ?112 are at all times satisfied. The patent attorney who uses such block diagrams must always be prepared to demonstrate to the examiner that what is contained within each block is per se known in the art, for example, by reference to another issued patent or to a publication, such as a textbook or to a supplier's data sheet or catalog. Also see the final portion of section 3:6 with reference to block diagrams, since block diagrams must themselves be or be coupled with adequate disclosures for supporting a claim limitation.

Of course, a block diagram should *never* be used as the sole disclosure of the contents of a block when what is inside the block is novel and comprises the claimed invention or a subelement thereof.

Another problem arises when what is inside the block is a programmable logic element or computer, admittedly old, but the novel program itself is not disclosed. Such was the case in *In re Brandstadter*, ²⁷⁸ which dealt with a message retrieval system for a "store and forward" communications system. A key element of the invention, which was recited in each of the apparatus claims, was a programmable control circuit, which the specification stated could be the stored program-controlled structure disclosed in an also pending "jumbo" patent application.

The Patent and Trademark Office rejected the claims, under 35 U.S.C. §112, stating:

. . . How and by what means (specifically) are the rectangles shown . . . caused to perform their functions, and (to) do so at the appropriate time? . . . A review of the instant disclosure reveals little more than a system diagram consisting of three sheets of labeled rectangles, accompanied by statements of a myriad of desired results. . . .

The instant disclosure is completely devoid of any . . . program or even a flow chart to indicate the functions to be performed, the sequence in which they are to be performed, and the conditions which must be present at the time of performance. . . .

The applicants submitted affidavits from three experts stating that, in their opinion, it would be readily apparent to systems and circuit designers of ordinary skill in the art how to build *and program* the disputed control unit. Importantly, the applicants failed to supply the missing software, stating that, "More information regarding these programs is not submitted herewith because the detailed information is considered proprietary."

Nor surprisingly, the C.C.P.A. affirmed the rejection of all claims, stating:
The Affidavits . . . do not convince us that the examiner's challenge to enablement was unreasonable or has been met. Appellants have not submitted to the examiner even flow charts of the programs which they admit . . . (they have) developed for the practice of their invention, and the examiner correctly observed that he (has) been given no circumstances pertaining to this accomplishment . . . such as the number of programmers involved, the number of man-hours involved and the level of skill of the programmers involved.

Thus, to satisfy the standards laid down in *Brandstadter*, any application involving a programmable logical element or computer should include a flow chart and, preferably, the entire program listing if the claim, apparatus, or method is to satisfy section 112.

See also section 4:8 on electrical methods and section 4:9 on computer programs for further discussion of questions and problems in electrical claims.

Further Examples--Other examples of typical electrical circuit elements and connections:

--first and second field effect transistors having gate, source, and drain electrodes;

means for connecting the drain electrode of the second transistor to the gate electrode of the first transistor; means for connecting a source of clock pulses to the gate of the second transistor;--[Note, these claim elements are specific circuit components.]

This claim part illustrates an important point, made elsewhere about mechanical elements claims, that applies to electrical apparatus claims. No matter how broadly the elements are claimed, they should be recited to interact with, cooperate with, or be connected to each other, so that unconnected elements are not claimed.

Other examples of electrical circuit element claims are:

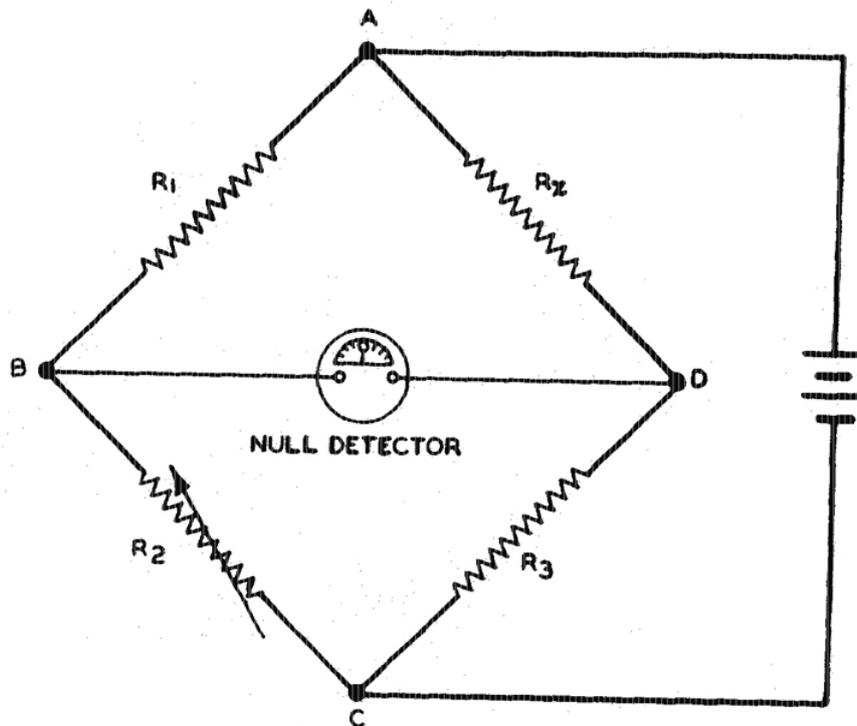
--a shift register connected to [or responsive to] said data input signal--; [Note, the shift register is a complex element, like a "means for."]

--means for sensing a difference between the output voltage from the capacitor under test and that from the reference capacitor, and for providing an error signal proportional to the difference [Note, a double means plus function for a complex element]; a servomotor responsive to the error signal for . . .;

--means, responsive to a change in light intensity between the light source and the photocell, for generating an output signal related to the--[electro-optical cooperation].

EXAMPLE V: Wheatstone Bridge

WHEATSTONE BRIDGE



Considering the familiar Wheatstone Bridge circuit of Example V, above, a fairly specific claim to the circuit illustrated reads as follows:

3A. Apparatus for measuring the electrical resistance of an unknown resistor R_x , which comprises:

a four-terminal electrical network (A, B, C, D) including a first resistor having a known resistance R_1 connected between the network terminals (A) and (B), a second resistor having a known resistance R_2 connected between the network terminals (B) and (C), the resistance of the second resistor being selectively variable in value up to the maximum resistance R_2 , a third resistor having a known resistance R_3 connected between the network terminals (C) and (D), and the unknown resistor being connected across the network terminals (A) and (D) for measurement;

means for impressing a source of potential from an external source across the network terminals (A) and (C); and

means, connected across the network terminals (B) and (D), for detecting when the voltage developed there across falls to zero, as the resistance of the variable second resistor is adjusted, whereby the resistance of the unknown resistor is determined from the equation:

$$R_x = \frac{R_1 R_3}{R_2}$$

Note the specific language connecting the four resistors into the bridge circuit, combined with the broad "means for impressing" and "means for detecting" language for conventional circuit elements such as batteries and meters. Note the "whereby" clause is proper (section 3:23) because the functional relationship and equation necessarily follows from the previously recited structure and connections. Note the use of reference characters (A), (B), etc. from the drawing (section 3:10). These must be placed in parentheses.

Finally, note the presence of an equation in the claim, which is acceptable when accurate. Formulas, equations, and the like frequently appear in claims, and especially in chemical claims (section 49) and in claims to a computer program or software where an algorithm is recited (section 4:9). Remember, you usually do not claim the formula, just the product, composition, apparatus, or method using the formula.

A sample claim to the basic radio receiver (crystal set) shown in Example IV, above, follows:

3B. A radio receiver, which comprises:

a radio-frequency transformer having a primary and a secondary winding, said primary winding being connected between an external antenna and ground to receive (or "for receiving") radio frequency signals transmitted through the other;

a variable capacitor connected across said secondary winding to form a tuned L-C circuit which rejects (or "for rejecting") all but the particular radio frequency signal to which the circuit is tuned;

means, connected to said tuned L-C circuit, for rectifying said particular radio frequency signal;

transducing means, serially connected with said rectifying means, for rendering audible audio frequency signals priorly modulated on said radio frequency signal; and

a capacitor, connected in parallel with said transducer, to prevent (or "for preventing") the a.c. component in said rectified radio frequency signal from passing therethrough.

This claim further illustrates the selection of elements, broad ("transducing means") or narrow ("a capacitor"), and connecting the elements together both structurally ("connected to said tuned L-C circuit) and functionally ("for rectifying") to do the job stated in the preamble. Note the frequent use of language other than in "means for" words which have the same effect (see section 3:25).

Further examples of electrical circuit and structure claims are given in appendix A.

Summary

Electrical circuit claims follow the same rules as machine claims. The claim elements can be circuit components, or partly circuit components, partly mechanical structure. Means clauses are used frequently. For broader claims, focus on the combination as it would likely be sold. The connection or cooperation between elements can be electronic, electromagnetic, electrooptical, mechanical, or any mixture. Be careful of block diagrams in the drawings, and attendant lack of description in the specification--the man skilled in the art must know how to build each block, without exercising ingenuity and without undue experimentation. On support in specification (section 3:6) for block diagram, means-type disclosures, see *In re Scarbrough*,²⁷⁹ and cases cited in section 4:9 on computer programs.

As with mechanical claims, one recites in broad claims the minimum number of elements that will work in the combination, defining each element and the necessary connections as broadly as the prior art will permit.

FOOTNOTES:

Footnote 277. See section 3:16, *supra*, on support for claim elements in the specification and drawings.

Footnote 278. *In re Brandstadter*, 179 U.S.P.Q. (BNA) 286 (C.C.P.A. 1973).

Footnote 279. *In re Scarbrough*, 182 U.S.P.Q. (BNA) 298 (C.C.P.A. 1974).

4:1 In General

Method, or process, claims are generally easier to write than mechanical claims. The reason for this is that method claims by their very nature do not require as much structural "connecting up" nor as many detailed statements of the mechanical cooperation of parts as do mechanical claims. Also, selecting the elements (steps) is easier, and there is less problem in giving the elements names, broad or narrow.

As to form, the body of a method claim is rarely much more difficult to write than a cookbook recipe:

Preheat an oven to 350[degree]F; sift 1 1/2 cups of sugar; sift 1 cup of cake flour; sift together the sugar and the flour; add 1/2 teaspoon of salt to the sifted sugar and flour; beat . . . eggs . . . ; add the beaten eggs; . . . ; bake in the preheated oven for 45 minutes.

As easy as pie (or angel cake)!

The words "method" and "process" are interchangeable in the patent law, although "process" is perhaps more frequently used in chemical cases, while "method" is more usual in mechanical and electrical cases. To provide uniformity, this statutory class is now called "process" in 35 U.S.C. §100(b) and is defined therein to mean "process, art or method."

Most of the general rules previously given apply also to method claims. They may be broad or narrow; may be chemical, mechanical, or electrical; and may have most of the other variations (for example, genus/species) found in mechanical claims. The terms in the claim must find support in the specification; reference numerals may be used; appropriate antecedents are necessary; logical order is also necessary; steps must be "tied" together; "whereby" clauses may be used. However, even if a drawing of the invention is part of the disclosure, the steps of the method need not be shown in the drawing, in contrast to elements of a product claim. It is not necessary to provide a flow diagram of the claimed steps in the drawings, although such a diagram might be helpful in some cases for making a process more easily understandable.

A very important rule to remember is that the "elements" of a method claim, instead of being structural parts, are, and must be, *acts* or manipulative steps that are performed upon an article, workpiece, or chemical substance. It is the transformation or reduction of the article, workpiece, or chemical substance to a

different state or thing that is the essence of a method claim--and the key to its patentability. This is especially true when the claimed method includes no particular machine or apparatus. ¹

There is no per se objection to claiming a single-step method, ² except where a broad functional step is claimed, as noted in section 3:25. However, most claimed methods do involve combinations of steps, as is the case with machines and circuits. Of course, the claim must *particularly point out and distinctly claim* what the applicant regards as his invention (section 1:1), which is the basic requirement of 35 U.S.C. §112 (see section 3:22).

In re Kuehl ³ announced a liberal philosophy toward granting method or process claims of various kinds, even where the point of novelty appears to the examiner to reside in other statutory classes (new compound in that case), so long as the process is unobvious to one of ordinary skill in the art. This was further defined in *In re Durden*. ⁴

A process claim may be patentable if an otherwise conventional process *uses* either a novel material or an old material whose use in the claimed process would have been unobvious. ⁵ In either case, the test is whether the process is found to be unobvious. *Durden* held that use of a novel or unobvious starting material or producing a novel or unobvious end product was not enough. The process had to be unobvious to one of skill in the art. Thus a claim:

A process for making a soap comprising mixing water with compound X.

would be a patentable claim if compound X is as above. ⁶ But a process claim for *making* a novel material using a conventional process and conventional materials is not patentable. ⁷ Finally, *making* a known material but in an unobvious manner is a patentable process. ⁸ Some aspect of the making, not of the result, must be novel.

There is a peculiar exception to process protection. Public Law 104-208 enacted in 1996 denies patent owners the right to enforce patents claiming medical or surgical procedures that do not involve patented pharmaceuticals or patented devices. One can claim the process in the usual way methods are claimed. But the claim is now without value, since it cannot be enforced in a court. The claimed process should include reference to a patented drug or to a patented device in one of the claim elements if the claim is to have hope for enforcement. But then the accused infringer must also have used the patented drug or device in performing the process accused of infringing.

Summary

Method claims involve one or more acts or steps performed on an article, workpiece,

or chemical substance to achieve some result in the useful or technical arts. The elements of a method claim must be steps or acts, expressed as verbal statements or phrases.

FOOTNOTES:

Footnote 1. *Gottschalk v. Benson*, 409 U.S. 63 (1972) (discussed in section 44).

Footnote 2. *Ex parte Kelly & Ford*, 173 U.S.P.Q. (BNA) 743 (Board of Patent Appeals and Interferences 1971); *Ex parte Britton*, 154 U.S.P.Q. (BNA) 321 (Board of Patent Appeals and Interferences 1967); *Ex parte Macy*, 132 U.S.P.Q. (BNA) 545 (Board of Patent Appeals and Interferences 1960).

Footnote 3. *In re Kuehl*, 475 F.2d 658, 177 U.S.P.Q. (BNA) 250 (C.C.P.A. 1973).

Footnote 4. *In re Durden*, 763 F.2d 1406 (Fed. Cir. 1985).

Footnote 5. *In re Ochiai*, 71 F.3d 1565 (Fed. Cir. 1995).

Footnote 6. *Ex parte MacAdams, Wu, & Joyner*, 206 U.S.P.Q. (BNA) 445, 447 (Board of Patent Appeals and Interferences 1978); *In re Maucy*, 182 U.S.P.Q. (BNA) 303, 306 (C.C.P.A. 1974).

Footnote 7. *Id.*

Footnote 8. *In re Hirao*, 190 U.S.P.Q. (BNA) 15 (C.C.P.A. 1976).

4:2 Elements of Method Claims

Generally, the verbs in a method claim need not be phrased in any particular voice or tense as long as there is no ambiguity and the requirements of section 112 are met. Nevertheless, it must be remembered that the elements of a method claim are method *steps*, which should usually be verbal (gerundial) phrases, introduced by a gerund or verbal noun (the "-ing" form of a verb), such as (the gerunds are italicized):

(a) *reciprocating* the guide . . .

(b) *punching* a series of holes . . .

(c) *impressing* a signal . . .

(d) *coating* the sheet with an adhesive . . .

(e) *heating* the mixture to a temperature of . . .

(f) *separating* the alcohol from the aqueous solution . . .

(g) *distilling* the aqueous solution to separate the alcohol therefrom . . .

(h) *fractionally crystallizing* the aqueous solution to separate the alcohol therefrom . . .

(i) *permitting* the mixture to cool . . .

The three steps ("separating," on the one hand, and "distilling" or "crystallizing," on the other) illustrate, respectively, generic and two species method steps (see section 6:9).

One should be aware that as to the format of step (g), examiners sometimes express a preference for language similar to the following: (g') *separating* the alcohol from the aqueous solution *by distilling* the solution. . . ." The argument favoring such wording is along these lines: "Regarding the phrase 'distilling . . . to separate,' [as in step (g)] one *could* distill the solution, yet never achieve alcohol separation. Such separation being the ultimate goal of the step, it (separation) should be *more positively recited* by being made the introductory gerund of the clause ["separating . . . by distilling," as in step (g')] which sets forth the step."

It is believed that this is fallacious reasoning. First, steps (g) and (g') may be seen to cover exactly the same territory logically and semantically. Second, an objection to the *form* of a step written as step (g) ignores the expressly stated *substantive* limitation therein of "distilling . . . to separate." This limitation *requires* that the distillation effect the separation. Third, an administrative preference for one or the other form of the step ignores the reasonable latitude permitted by decisions such as *Lewin*,¹⁰ cited at the beginning of this section. Fourth, seemingly ignored are the principles set forth in the next paragraph.¹¹

The choice of which word (gerund) to use for introducing a method step is similar to the choice of which word to use for describing elements in apparatus claims. Generally, one chooses the broadest word the prior art will allow. Thus, in step (g), "distilling" is narrower than step (f) "separating." One may recite a generic or broad step, such as "separating," that is really a function or result of a more specific act such as "distilling" or "crystallizing." Moreover, it is permissible for a method step to recite some condition or property without reciting in the claim every step necessary to obtain or achieve that condition or property.¹² For example, "distilling" alone in step (g) should be sufficient. There should usually be no need, in place of "distilling," to recite "*placing* the aqueous solution in a (certain) container . . ."; "*heating* the solution to a (certain) temperature . . ."; "*condensing* the alcohol vapors . . ."; etc. Of course, the terms used must find some antecedent in the disclosure. Preferably,

therefore, the word appearing in the claim can be found in the specification, where it will have also been defined or explained or how it relates to the subject of the invention will have been described. Often, the word used is itself so clear in its meaning, like "heating" or "separating," that explanation of the word is not needed and its simple or mere mention by use of the precisely same word or a clearly equivalent word in the supporting specification is a sufficient antecedent. However, where the step or process procedure is not clear from the word used (for example, distilling in a particular context, like wine or petroleum, needs more explanation), the mere word "distilling" is not detailed enough, and its component parts, heating and separating, may also have to be recited.

Pragmatically, the choice of what gerund to use is really of little moment as to the form of the claim. Moreover, 35 U.S.C. §112 states (in the same paragraph sanctioning "means plus function" clauses) that:

An element in a claim for a [method] combination may be expressed as a . . . step for performing a specified function without the recital of . . . acts in support thereof, and such claim shall be construed to cover the corresponding . . . acts described in the specification and equivalents thereof.

Thus, the statute expressly sanctions the use of broad functional steps, such as "separating," where the prior art permits, rather than the specific *act*, "distilling." The interpretation of this language is similar to that described under "means claims" in section 3:25: the claim "*shall* be construed to cover the corresponding . . . acts described . . . and equivalents. . . ." Consequently, as with means clauses, the scope of protection afforded is exactly as broad as "the invention" disclosed in the specification, plus equivalents. Although "step of" clauses may be used whenever the prior art permits, their scope may be more restricted under applicable precedent than a clause with more specific language on the method step. For example, in (f) or (g) above, one could recite "the step of separating" or "performing a step separating" or other equivalent language which could be governed by section 112. Better now would be to use the actual recital of a process step, "separating" or perhaps "distilling to separate" or "distilling for separating." The latter two phrases would now likely be governed by section 112, and might be restricted merely to the steps disclosed in the specification and their equivalents (see section 3:25).

The distinction between acts and steps is probably more academic than real, as very few, if any, cases focus on the difference in concept between a functional step and the act done to perform the step. As with "means claims," such functional step clauses must be limited to claims to *combinations*. In concept, a single-step method claim is all right (see section 4:1) only when the step is an act.

The preamble of a method claim may be almost the same as that of a mechanical claim. Generically, the following preamble format is usually appropriate: "A *method*

of (or process for) performing a specified act (or operation) on a particular article (or workpiece or chemical substance) which comprises: . . ." Except for the words "a method" this format is identical to the format proposed in section 3:2 for apparatus claim preambles. Note that the workpiece is properly placed in the preamble, just as it is in the apparatus claims (see section 3:3). In the broader claims, avoid describing the workpiece or article any more narrowly than the prior art requires, which would be an "unnecessary article limitation" in the words of the Patent and Trademark Office comments on grading Agent's Exam method claims. The preamble is not locked into a particular format, and can be shorter than the above suggestion, as the invention warrants.

Another similar preamble format ends with the transition words "which comprises *the steps of*: . . ." The choice between these and equivalent forms is a matter of style. Equivalent terms of "comprises" are used: "includes," "has." The words "the steps of" or equivalents might not be used (see Example III in chapter 3).

Referring again to the take-up barrel of Example III (see section 3:25.1, above) a method claim relating thereto might read:

4. A method of collecting an advancing strand in a barrel, which comprises:

(a) *guiding* the advancing strand into the barrel;

(b) *rotating* the barrel so that the point of collection of the strand varies circularly with respect to the bottom of the barrel; and

(c) *reciprocating* a guide point above the barrel so that the point of collection varies radially with respect to the bottom of the barrel.

Note the similarity in form to the apparatus claim in section 3:25. If the title of Claim 4 were changed to "Apparatus for . . ." and the phrase "means for" were inserted before each step, one would have a proper apparatus claim (at least as to form). This is typical of most method claims: Add the words "means for" to transform a method step into an apparatus element. Similarly, where an apparatus element is expressed in "means for" fashion, deletion of that phrase usually results in a proper (as to form) method step. Thus, method and apparatus claims can be of comparable scope and equally broad or narrow. Where the practitioner elects to include both apparatus and method claims in a specification, it would not be unusual to have at least some of the two types of claims analogous, that is, the method steps in a method claim become "means for" clauses in the analogous apparatus claim. As is elsewhere recommended, where an invention permits, different classes of claims should be used to cover an invention. Where an apparatus accomplishes something in a series of operations, the series can be claimed in a series of steps in a method claim.

Further examples of method claims of many kinds are given in appendix A.

Summary

The elements of a method claim are acts or steps, customarily phrased as gerunds ("heating"). They can be broad or narrow, depending on the prior art, and functional step clauses ("separating") can be used, corresponding to means clauses where the function performed, not the act used to do it, is the important thing. Single step method claims are permitted where the step is an act, not a functional step.

FOOTNOTES:

Footnote 9. *Ex parte Lewin*, 154 U.S.P.Q. (BNA) 487 (Board of Patent Appeals and Interferences 1966).

Footnote 10. *Id.*

Footnote 11. If the two formats, (g) and (g'), however, truly *are* the same, one would usually be foolish to "fight" the examiner on the point. There are usually more important issues present, and a firm stand by the applicant on one particular format may not, in the words of Cicero, "render the audience [here, the examiner] benevolent" as to more substantive issues.

Footnote 12. *In re Roberts & Burch*, 176 U.S.P.Q. (BNA) 313 (C.C.P.A. 1973); *In re Alul & McEwan*, 175 U.S.P.Q. (BNA) 700 (C.C.P.A. 1972); *In re Rainer*, 134 U.S.P.Q. (BNA) 343 (C.C.P.A. 1962). Of course, either the specification must disclose, or a person skilled in the art must know, how to achieve the condition or property.

?4:3 Order of Steps

The elements (steps) of a method claim must, of course, also be set forth in some logical order. The order of listing the elements in method claims is usually clearer than in mechanical claims. The elements of a method claim are typically recited in the sequence in which the steps are performed. If the claim does not expressly indicate that steps are performed simultaneously or in a different order than the sequence in which the elements appear, the reader of the claim will assume the steps are performed in the sequence of their appearance. But unless the sequence of steps is expressed in the claim, the sequence is not being claimed¹³ and another sequence may be either prior art to the claim or an infringement of the claim.¹⁴ If the nature of the method requires a sequence different than the order of the elements, then the reader will not read the claim in the usual way. (Of course, mechanical claims have their logical sequence of elements too, as noted above at section 3:18.)

In the method of Claim 4, all three steps ("guiding," "rotating," and "reciprocating") occur simultaneously, each to accomplish its respective result and all to accomplish the intended result stated in the preamble so that, as written, either clause (b) or (c) could immediately follow step (a). It would be illogical to put step (a) last or in the middle. Steps (b) and (c) each modify the activity described in step (a). If one step modifies what is being done in or what has been accomplished by another step, the step modified should precede the modifying step. While a reader familiar with Claim 4 herein and the disclosure in the specification supporting that claim would realize that steps (b) and (c) should be performed simultaneously, better claim form would be to tell the reader, by reciting at the beginning of element (c) "while rotating the barrel, . . ." or "simultaneously" or beginning element (b) with "simultaneously," but finishing element (b) without the ";" so as to connect it with element (c) rather than element (a).

Quite often, the steps, or some of them, must be performed in a given sequence. In this event expressions indicative of the order should be used, such as: "first," "second," "then," "subsequently," "after the embossing step," "between steps (c) and (d)," etc. ¹⁵

Where all of the steps must be performed in a specific order, then all should be tied in chronologically, either by sequence words associated with the description of each step, as previously discussed, or by a preamble statement such as: "A method of, comprising the following steps in the order named: . . ." or ". . . in the sequence set forth: . . ." These are useful ways of stating a necessary order of steps, particularly for claims with many steps.

Sometimes the description of a particular step inherently implies the order, such as "(a) depositing a film of zinc on a substrate; (b) depositing a film of platinum *on the zinc film*." In this case, the order need not be further expressly stated, because step (a)'s precedence in time over step (b) is *required* by the phrase "on the zinc film" in step (b). Step (b), therefore, cannot, within the wording of the claim, be performed until the zinc film is deposited by step (a).

Where the claim does not expressly state or necessarily imply the sequence of all or some steps, it would cover the steps performed in any order or simultaneously. ¹⁶ In *Altiris, Inc. v. Symantec Corp.*, the Federal Circuit looked at the preamble of the claim and at the specification and found no requirement for a specific consequence, even though the specification had a sequence in the preferred embodiment description. (For example, the patentability of the claim or the question of its infringement would not be determined by an unspecified sequence of the steps.) Then, as with the barrel take-up method, the order of description is a matter of logical convenience. However, where a required sequence of steps is not stated, it is conventional among practitioners, and logical to claim readers, to assume that steps are performed in the order of their appearance in the claim, unless the claim

language indicates otherwise (rotating the barrel and reciprocating the guide point, and then only as to that step).

Summary

Where the steps, or some of them, must be performed in sequence, one after the other, the sequence should be described. Otherwise, the steps should be set out in any logical order in which they should be performed, but with no sequence precisely stated. As with all other limitations in any claim of any kind, make sure every word and every phrase is necessary in the broader claims. Consequently, do not expressly state the sequence unless it is important to the claim.

FOOTNOTES:

Footnote 13. *Bio-Tech. Gen. Corp. v. Duramed Pharms., Inc.*, 325 F.3d 1356, 66 U.S.P.Q.2d

(BNA) 1360 (Fed. Cir. 2003) (sequence of taking a regimen of pharmaceuticals could be changed and still be within a method claim reciting a different sequence without requiring it).

Footnote 14. *Altiris, Inc., v. Symantec Corp.*, 318 F.3d 1363, 65 U.S.P.Q.2d (BNA) 1865 (Fed Cir. 2003).

Footnote 15. Note that use of the outline form of claim, with each step labeled with a number or letter, permits reference back to, for example, "step (c)," instead of to "the mixing step."

Footnote 16. *Altiris, Inc., v. Symantec Corp.*, 318 F.3d 1363, 65 U.S.P.Q.2d (BNA) 1865 (Fed Cir. 2003).

§4:4 Obvious Method Using Novel Starting Material or Producing Unobvious Product

It is possible to obtain a United States patent claim to a process, even though the general process steps are obvious, when the process uses a novel or unobvious starting material or is for producing an unobvious product.

*In re Ochiai*¹⁷ holds that the United States Patent and Trademark Office (PTO) had misinterpreted a prior Federal Circuit decision, *In re Durden*¹⁸ to establish a rule of per se obviousness, that an obvious chemical process can never be patentable even when it uses a novel starting material or produces an unobvious product. The Federal Circuit in *Ochiai* rejected the Patent Office argument that a process is obvious if prior art references disclose the same general process using "similar" starting materials.

Ochiai sought to patent a process for converting an acid into a cephem compound. Both the acid and cephem were subjects of other Ochiai patents. The examiner rejected the application claims on the ground that they claimed conventional process and that the only difference from the prior art was the selection of a slightly different starting material to make a slightly different final product. The Board of Patent Appeals and Interferences of the PTO affirmed the examiner based on controlling prior decisions *In re Larsen*,¹⁹ *In re Albertson*,²⁰ and *In re Durden*.²¹

The Patent Office took an expansive view of the 1985 *Durden* decision. If a claimed process involved prior art steps and merely used reactants which were "similar" to the prior art reactants, examiners held such a process unpatentable based on *Durden*.

*In re Pleuddemann*²² was another case involving the so-called *Durden* rule. The court held that the *Durden* case did not concern patent claims covering a method of using a material, but only concerned claims covering a method of making the material.

In 1995, Congress enacted 35 U.S.C. §103(b), which allowed an obvious biotechnical process of using or making an unobvious biotechnical product to be patented so long as the claims to the obvious process co-existed with valid claims to the unobvious product in the same patent. This law is limited to biotechnology patents.

In *Ochiai*, the Federal Circuit reversed the examiner. It found that the acid starting material was not known to the prior art and that a person having no knowledge of the acid could hardly find it obvious to make a product using this acid as a reactant. The court pointed out that the test of obviousness is statutory and requires the comparison of the claimed "subject matter as a whole" with the prior art. It pointed out that this inquiry is highly fact specific, regardless of whether the claimed invention is directed to a process of making, a process of using, or some other process. The Federal Circuit found that the PTO examiner had used Ochiai's disclosure of the acid starting material in his own application as if the acid was in the prior art and this was not correct. The court also held that no prior decision had established a per se rule of unpatentability and noted that its prior decision in *Durden* had expressly cautioned "not to generalize or make rules for other cases."

The Patent Office argued that the courts' prior decisions in *Durden*, *Pleuddemann*, and other cases had been inconsistent. The Federal Circuit rejected this argument and pointed out that all of the prior decisions were based on fact-intensive comparisons of the claimed processes with the prior art, as required by the patent statute.

The Federal Circuit concluded by stating that when "any applicant properly presents

and argues suitable method claims, they should be examined in light of all . . . relevant factors, free from any presumed controlling effect of *Durden* or any other precedent." In other words, after considering what is being claimed, what exists in the prior art and the level of skill of those practicing in the art, the obviousness or nonobviousness of the method claimed should be determined.

Summary

Method claims to a known method starting with a novel or unobvious starting material or producing an unobvious product may be patentable if the subject matter of the claim as a whole is unobvious.

FOOTNOTES:

Footnote 17. *In re Ochiai*, 37 U.S.P.Q.2d (BNA) 1127 (Fed. Cir. 1995).

Footnote 18. *In re Durden*, 226 U.S.P.Q. (BNA) 359 (Fed. Cir. 1985).

Footnote 19. *In re Larsen*, 130 U.S.P.Q. (BNA) 209 (C.C.P.A. 1961).

Footnote 20. *In re Albertson*, 141 U.S.P.Q. (BNA) 730 (C.C.P.A. 1964).

Footnote 21. *In re Durden*, 226 U.S.P.Q. (BNA) 359 (Fed. Cir. 1985).

Footnote 22. *In re Pleuddemann*, 15 U.S.P.Q.2d (BNA) 1738 (Fed. Cir. 1990).

?4:5 Claims to Both Method and Apparatus; Method is Function of Apparatus

Until 1968, there was a fundamental principle that, to be patentable, a method must be more than the "inherent function of the apparatus" that was disclosed to effect the method. As stated in the first *Guidelines of Patentability* memorandum: ²³
A rejection on this ground is proper where the disclosed machine will inherently carry out the steps of the process set forth in the process claims regardless of whether an apparatus claim is allowed, unless it appears that the process claimed can be carried out by some machine which is not the functional equivalent . . . or by hand. . . . ²⁴

The Patent and Trademark Office instead now relies on *Tarczy-Hornoch*, cited in MPEP section 2173.05(v), which reads:

2173.05(v) Mere Function of Machine

In view of the decision of the Court of Customs and Patent Appeals in *In re Tarczy-Hornoch*, 397 F.2d 856, 158 U.S.P.Q. 141 (C.C.P.A. 1968), process or method claims are not subject to rejection by Patent and Trademark Office

examiners under 35 U.S.C. 112, second paragraph solely on the ground that they define the inherent function of a disclosed machine or apparatus.

The Federal Circuit has left no doubt that *Tarczy-Hornoch* is controlling law.²⁵

The inherent function was of the disclosed apparatus, whether or not it was claimed at all and, if claimed, whether or not the apparatus itself was unobvious and patentable. In *Tarczy-Hornoch*, the method was unpatentable, although the disclosed device used therein was not.

In any event, the previous claim 2 (section 3:25) would easily satisfy even the old rule, because the strand could be manually guided, the barrel could obviously be turned by hand, the guide could be similarly reciprocated, any two steps could be manual, or all three steps could be.

Summary

Method claims cannot be rejected as merely drawn to the inherent function of a machine. Where possible, detach the method from the machine so far as possible and try to define novelty in the steps performed.

FOOTNOTES:

Footnote 23. 792 Off. Gaz. Pat. Office 3 (June 17, 1963).

Footnote 24. See *Fed. Sign & Signal Corp. v. Bangor Punta, Inc.*, 177 U.S.P.Q. (BNA) 737 (S.D.N.Y. 1973).

Footnote 25. *Union Carbide Corp. v. Am. Can Co.*, 220 U.S.P.Q. (BNA) 584, 591 (Fed. Cir.

1984); see *In re King*, 801 F.2d 1324 (Fed. Cir. 1986).

?4:6 Apparatus Limitations

Of necessity, there will be product or apparatus limitations in a method claim. The method is usually performed upon, acts in conjunction with or is performed by the product, apparatus or composition of matter.^{25.1} This is analogous to reciting the functions performed by the various elements of an apparatus (as in the article shaker example claim) which frequently appear in a product or apparatus claim. Thus, the apparatus elements in a method claim are not recited without somewhere describing the cooperation between the apparatus element and the method being claimed. An apparatus element that is not recited in the claim as participating with the method, and usually with an element in the method, should not be recited.

Although there is no per se objection to including structural (mechanical, electrical, or both) apparatus limitations in the elements (steps) of method claims, when the steps are properly phrased in method language, the use of such limitations should be avoided insofar as possible for at least two reasons.

First, apparatus limitations will often unduly limit the claim. If a method step can be performed by hand and without a cooperating apparatus, avoid reciting the apparatus, at least in the earlier of the claims. If the practitioner nonetheless wants to claim the non-cooperating apparatus element, save it for a following dependent claim. Second, and more important, the "black letter" law is that the patentability of a method claim cannot be predicated *solely* on the structure of a mechanism used in practicing the method. ²⁶ Obviously, a structure associated with a claimed method will be selected because the structure is of some aid to performance of the method, and such structure and its mode of cooperation may be claimed. But patentability of the method claim will still turn on the method steps, perhaps performed with the cooperating apparatus, and patentability of a method claim will not turn on the presence of an apparatus that is not associated with a method element. ^{26.1} Accordingly, there is usually no point in including the structure except where the method necessarily involves manipulation of apparatus. There is no objection to including composition-of-matter or chemical limitations in method claims, and in fact these are frequently relied on for patentability, as noted in section 4:7.

See *In re Kuehl*, ²⁷ where the claim was to an old method of cracking gasoline, so far as the steps were concerned, using a new catalyst. ²⁸

In dependent method claims (section 2:9), avoid adding *only* apparatus limitations. Limitations added in dependent method claims are preferably phrased as method steps, except where further defining compositions of matter or chemicals (section 6:1). Thus, it would be poor form to depend a claim from the take-up method in Claim 4 setting forth: "A method . . . as recited in claim 4, further comprising a *turntable*. . . ." One example of proper form along this line would be: "A method . . . as recited in claim 4, wherein the step of rotating the barrel includes mounting the barrel on a turntable and rotating the turntable."

Note that this is primarily a matter of form, not substance. Although the claim drafter is entitled to include the turntable in the claim, there is no good reason to do so in a broad claim, because it is not essential to the method. Thus, Claim 4 might have included:

rotating *a* turntable on which the barrel is mounted . . .

reciprocating *a* strand guide positioned above the barrel . . .

Note the form (inferential) for bringing in apparatus limitations, where they are used, such as "rotating a turntable. . . ."

As in apparatus claims (section 3:8), antecedents are important. Support for "*the* guide" must have been provided in a previous clause of the claim (in the clause above). However, because the claim is to a method that is a series of steps, the product or apparatus or composition, etc., with which a method step is practiced may be inferentially claimed in that step. Therefore, that product, etc. may have been introduced as the object ("a guide") on which a previous step was performed, usually in the middle of a clause, and that product, etc. should not have been made the subject of a clause.

See also section 6:7 on new use claims, for method claims where the novelty resides in a new use for an old material.

Summary

Avoid apparatus limitations (machine or circuit) in method claims if the apparatus element does not cooperate with the method (or at least one of the method claim elements) or when reciting an apparatus limitation recite that cooperation with the method. When necessary, bring them into the claim inferentially, that is, "rotating a turntable." There is no problem with chemical or materials limitations; they can be relied on for patentability, and frequently are, in "new use" claims, such as killing insects by exposing them to DDT.

FOOTNOTES:

☛Footnote 25.1. *See* TopPharm Inc. v. Ranboxy Pharm. Inc., 336 F.3d 1322, 67 U.S.P.Q.2d (BNA) 1511 (Fed. Cir. 2003).

☛Footnote 26. *See Ex parte* Dammers, 155 U.S.P.Q. (BNA) 284 (Board of Patent Appeals and

Interferences 1961), which nevertheless points out that structural apparatus limitations are not per se objectionable, and, to the extent necessary to carry out the claimed method, are permissible in a method claim.

☛Footnote 26.1. Application of (*In re*) Brouwer, 175 F.2d 564 (C.C.P.A. 1949). Where piercing a hole in a resilient washer with a needle was patentable in part because the hole in the washer closed after withdrawal of the needle, cleaned dirt from the needle upon insertion and injected lubricant from the needle upon its removal.

☛Footnote 27. *In re* Kuehl, 177 U.S.P.Q. (BNA) 250 (C.C.P.A. 1973).

Footnote 28. See *In re Schneider*, 179 U.S.P.Q. (BNA) 46 (C.C.P.A. 1973).

4:7 Chemical Processes

An example of a chemical process claim follows:

5. A process for treating a surface of a polyethylene article to increase its receptivity to printing ink, which comprises:

exposing the surface of the article to a saturated solution of sodium dichromate in concentrated sulfuric acid.

As previously noted in section 4:1, there is no objection to a single-step method. Claim 5 illustrates the rare case of a claim that is not to a combination.

With chemical processes, it is proper to include a dependent process claim adding only details of the materials used. For example, if Claim 5 had recited "an acid," a dependent claim could cover: "A process . . . as recited in claim 5, wherein the acid is sulfuric acid."

It is standard in chemical process cases that the process may distinguish by the compositions recited, as well as the actual manipulative step, which is often trivial per se. In the example of Claim 5, the manipulative step "exposing" an article to a reagent is of course prehistoric; the sole novelty resides in the composition of the reagent. Eminently logically, it is considered that exposing to reagent X is not the same step as exposing to reagent Y. ²⁹

Where the process can be practiced, or used, with more than one related material or chemical, *Markush* phraseology may be used under the rules set out in section 6:2. Also, alternative expressions (A or B--section 3:13) may sometimes be permitted in describing different chemical substances that can be used in the process. In *Ex parte Pantzer and Feier*, ³⁰ during prosecution, Claim 16 was rejected under 35 U.S.C. §112, without the citation of any references. Claim 16 recited a method of dyeing fibers wherein the dye used to prepare the dyeing solution was defined as the product of the reaction of "one or both of [A'] and [B'] with [C] under [certain] alkaline conditions." Other claims used the phrase "one or more of." Claim 1, from which all of the claims ultimately depended, recited A and B, certain amino phenols, of which A' and B' were species. Claim 1 was not limited to only one of A or B, because it called for a method that "comprises" dispersing A and B in an aqueous medium. The board reversed the rejection, holding that the phrases "one or both" and "one or more" were not so broad as to be indefinite and did not encompass "an infinite number," ³¹etc.

Chemical processes can be to methods of making chemical compounds (new or old); methods of using chemicals, as in Claim 5 above or such as killing insects or treating baldness; or any other process or subject having industrial utility.

A typical method of use claim:

5A. The method of treating baldness, which comprises applying to the scalp an aqueous solution of sodium chloride ³² having a concentration of 30-40 percent by weight ³³ of sodium chloride.

A typical claim to a method of making a chemical compound:

5B. The method of manufacturing sodium hydroxide, which comprises electrolyzing an aqueous solution of sodium chloride at a current density sufficient to decompose the sodium chloride into elemental chlorine and sodium, the sodium reacting with the water present in the solution to form sodium hydroxide and hydrogen gas.

Note this process is one of the oldest, and still most common, ways to make sodium hydroxide, as well as chlorine and hydrogen gas. Since the circuit parameters would not be critical, they can be stated broadly (section 3:22).

The Federal Circuit has held in *In re Ochiai*, ³⁴ that the patentee/applicant may premise patentability of a chemical process claim on the use of a novel and unobvious starting material or on the novel and unobvious product obtained by the process. ³⁵ The process may be new or novel and also unobvious due to the choice of either starting material or final product. An obviousness determination for the claim as a whole is required. ³⁶

In re Kuehl, ³⁷ a predecessor of *In re Ochiai*, held that patentability of a process can reside in the use of a novel and unobvious material in the process, though the single process step (section 4:1), contacting X with catalyst Y, is notoriously old per se. In *Kuehl*, one of the claims in question read:

A hydrocarbon conversion process which comprises contacting a hydrocarbon charge under catalytic cracking conditions with the composition of claim 6.

Claim 6, a composition of matter claim to a group of new zeolites, had been allowed. The court held it would be unobvious to crack gasoline with the new zeolite, even though cracking with other, generally similar, zeolites was very well known in the prior art and would have been obvious *after* one knew about applicant's new zeolite. However, the court held that to one of ordinary skill in the art, selection of the particular zeolite for cracking hydrocarbons would not have been obvious. The Federal Circuit in *In re Durden* affirmed and distinguished *In re Kuehl*. In *Durden*, use of the novel starting material would have been obvious, while in *Kuehl*, use of

the novel starting material would not have been obvious. Guidance in drafting a particular claim is difficult to obtain from these precedents. Since the claim drafter cannot know for certain that the process will be found non-obvious, try to also protect the novel starting material and, if applicable, the final product. The patentee is entitled to both types of claim when one invents (a) a new compound and (b) an unobvious process for using that compound.

Summary

Chemical process claims are the same as other method claims as to claim-drafting techniques. Often the novelty is in the chemicals used, not the act itself (treating, exposing). Use of a novel and unobvious starting material and/or producing a novel and unobvious end product is enough to make a process unobvious.

FOOTNOTES:

Footnote 29. *See also* section 6:7, on new use claims.

Footnote 30. *Ex parte* Pantzer & Feier, 176 U.S.P.Q. (BNA) 141 (Board of Patent Appeals and

Interferences 1971, 1972).

Footnote 31. *See, e.g., Ex parte* Pontius, Endres, & Van Akkeren, 169 U.S.P.Q. (BNA) 122 (Board of Patent Appeals and Interferences 1970).

Footnote 32. Salt water.

Footnote 33. This avoids reading on ocean bathing.

Footnote 34. *In re* Ochiai, 37 U.S.P.Q.2d (BNA) 1127 (Fed. Cir. 1995).

Footnote 35. *In re* Durden, 763 F.2d 1406 (Fed. Cir. 1985).

Footnote 36. *See* section 4:1. Other examples of chemical process claims are given in appendix A, cases 13, 18, 20, 21, and 24.

Footnote 37. *In re* Kuehl, 475 F.2d 658; 177 U.S.P.Q. (BNA) 250 (C.C.P.A. 1973).

?4:8 Electrical Methods n38

n38. This section was prepared by Bryan W. Sheffield and John L. Landis.

As an example of electrical method, consider the following claim which covers the

use of the Wheatstone Bridge shown in Example V in section 3:26, above, to measure an unknown resistance.

6. A method of measuring the electrical resistance of an unknown resistor Rx, which comprises:

connecting the unknown resistor Rx between terminals (A) and (D) of a four-terminal electrical network (A, B, C, D), said network including a first known resistor R1 between terminals (A) and (B), a second known resistor R2 between terminals (B) and (C), and a third known resistor R3 between terminals (C) and (D), at least one of said known resistors being a variable resistor;

impressing a potential across terminals (A) and (C) of said network;

detecting the voltage developed across terminals (B) and (D) of said network as a result of said impressed potential; and

varying the resistance of at least one of said known resistors until the voltage detected across terminals (B) and (D) falls to zero, whereby ³⁹ the resistance of the unknown resistor Rx is determined from the equation:

Claim 6A is another example of an electrical method claim and covers use of the crystal radio illustrated in Example IV (see section 3:26, above).

6A. A method of demodulating a radio frequency carrier wave priorly modulated with an audio frequency signal, which comprises:

applying said modulated carrier wave to a resonant L-C circuit;

adjusting the resonant frequency of said L-C circuit until it equals the frequency of said carrier wave;

rectifying the voltage developed across said resonant L-C circuit to recover said audio frequency signal;

passing said rectified voltage through a transducer to render said audio frequency signal audible; and

filtering out the radio frequency components present in said rectified voltage to prevent same from entering said transducer.

Summary

Electrical methods present no special problems so far as claim drafting techniques

are concerned. The only difference from mechanical methods is that the steps, or some of them, are electrical rather than mechanical. Typical steps or acts are "amplifying," "charging," "connecting," "impressing a potential," "detecting," "rectifying," "sensing," etc. The acts (amplifying) need not be do-able by a human being; circuit components do nicely.

FOOTNOTES:

Footnote 39. Note the proper "whereby" clause (section 3:23), since this function indubitably follows from the previously recited steps. Whereby clauses can be used as well in method claims as in apparatus claims.

4:9 Claims to a Computer Program or Software-Related Invention

Computer programs or software stated either as a series of means for performing function elements (apparatus) or as a number of method steps (process) are patentable. ⁴⁰ The tests for the presence of patentable subject matter under section 101 in a computer program, formerly applied under prior precedents of the Federal Circuit and the district courts, have been made unnecessary by the Federal Circuit in the *State Street Bank* case (see section 4:10). So long as the apparatus or method is transformative in some manner--so long as it accomplishes something other than merely appropriating an algorithm or manipulating numbers--the elements in means-plus-function form, or the steps for performing a function, provide statutory subject matter under section 101, and the patentability of such claims is to be judged under sections 102, 103, and 112.

A computer program or software-related invention is an apparatus or process that employs a computer or that is adapted for employing a computer as an operative component of the device or process. In particular, it relates to an invention in computer software, the program that drives the computer to perform a series of steps. The invention lies in the series of steps, not in the program itself. It has become well settled that a computer related invention can be a useful process or machine and a patentable invention under 35 U.S.C. §101. Computer related inventions often include a series of steps. When those steps result in the solution of a problem, or there is a procedure, process, or rule for the solution of a problem in a finite number of steps, that is, an algorithm. Thus, a statement of a step-by-step procedure for solving a problem is an algorithm, and one for solving a mathematical problem, which might be or include a mathematical formula, is a mathematical algorithm.

Courts have excluded certain subject matter areas from patent protection under section 101, including principles or laws of nature, ideas and mathematical expressions of scientific truths. See *Gottschalk v. Benson* ⁴¹ and see *Diamond v. Diehr*, ⁴² which stated that an "algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent." ⁴³ As many computer-related

inventions, and particular computer programs and software, employ mathematical principles and mental thought processes, it became necessary to define how such programs and software could be protected when they constituted an invention.

Although there had been doubt as to the patentability of a computer related invention that included an algorithm, that doubt has been dispelled through a long series of decisions by the United States Supreme Court, the United States Court of Customs and Patent Appeals and its successor, the United States Court of Appeals for the Federal Circuit, by the district courts and by the Patent Office Board of Interferences and Appeals.

This section is devoted to explaining how claims to a computer-related invention might be written. The Patent and Trademark Office established guidelines in 1995 to instruct examiners how to examine applications drawn to "computer-implemented inventions." The examiner's guidelines have been modified through August 2001 in MPEP section 2106 and are instructive for writing claims for computer-implemented inventions. Before writing such a claim, reading MPEP section 2106 is recommended.

MPEP section 2106.II.C. requires the examiner to correlate each claim element to a relevant portion of the written description. Each element of the claim must have antecedent support in the specification. Further, elements of such an invention may be defined in the means plus function format.

Different classes of claims that may be written on such inventions. A computer or other programmable apparatus whose actions are directed by a computer program or other software is a "machine."

Consider a computer-readable storage medium and a specific physical configuration of the substrate of that medium that represents data, for example, the program where that storage medium causes the computer to operate in a specific and predefined manner. The composite of these two elements is a storage medium with a particular physical structure and function, for example, it will impart the functionality that is represented by the data onto the computer. That is an "article of manufacture."

A "process" is a series of steps that is performed on or with the aid of a computer. A claim that defines a computer-implemented process but which is neither cast as an element of a computer-readable memory or implemented on a computer should be classified as a process. For example, a claim that is cast as "a computer program" but which recites specific steps to be implemented on or to be performed using a computer is classified as a process. On the other hand, a claim to a "computer program" that does not define the invention in terms of steps is not a process. A "process" requires reciting at least one physical element recited that would place the invention in one of the two product categories, machine or article of

manufacture ((c)(iii)). That element might be unnecessary in view of *State Street Bank*, so long as the process steps together are transformative.

The guidelines also identify claims that would be nonstatutory. In light of the *State Street Bank* decision, this list should be shortened. These include

- (1) a compilation or arrangement of data, independent of any physical element;
- (2) a known machine-readable storage medium which is coded with creative or artistic expression, because they represent the expression of the program and are literary creations;
- (3) a "data structure" independent of a physical element, that is, not implemented on a physical component of a computer, such as a memory, because it is necessary to render the component capable of causing a computer to operate in a particular manner (not correct under *State Street Bank*); or
- (4) a process that merely manipulates abstract ideas or concepts; an example of this is a series of steps for solving a mathematical problem, that is, a mathematical algorithm.

A claim to a method consisting solely of steps necessary to converting one set of numbers to another set of numbers would be nonstatutory if it is not transformative.

The claim must be written in recognizable English language. Computer program code, in either source or object format, cannot be included in the claim as a limitation. A claim which attempts to define elements using computer program code, rather than English language description of actual functional steps which are to be performed, is rejected under 35 U.S.C. §112. If there is no other way to define a claim element except by reference to code, then code should be used. This is analogous to situations where special trademarks, coined names, etc. (sections 6:3 through 6:6 hereof) are used for elements not claimable using normal English language.

But then the specification should make clear the terms or code used in a claim element.

Nonstatutory subject matter, that is, abstract ideas, laws of nature, or natural phenomena, does not become statutory merely through claiming it in a different manner.

The Federal Circuit in *State Street Bank* has swept away the former requirement that a claim to a computer apparatus or process be subjected to a two-part test. Under that test, the claim was first tested to see whether it appropriated an

algorithm. Next, if a mathematical algorithm was found, the claim as a whole was further analyzed to determine whether the algorithm was applied in any manner to physical elements or process steps, and if it was so applied, the claim was under section 101. ⁴⁴ One determined if there was any significant pre- or post-algorithm solution activity, that is, whether the invention involved (as the district court in *State Street Bank* put it) the transformation or conversion of subject matter that is representative of or that constitutes physical activities or objects. ⁴⁵

The district court in *State Street Bank* held that the claim in suit was directed to a nonstatutory computer implemented invention because it compiled, processed, and stored business data, ⁴⁶ and that changing one set of numbers into another set of numbers without more is insufficient for patent protection. It is the mere solution of a mathematical algorithm. ⁴⁷

In reversing the district court, the Federal Circuit stated that claim 1 of the patent in *State Street Bank* concerned a machine and was proper statutory subject matter under section 101.

The court agreed that certain mathematical algorithms, standing alone, would fall into the category of unpatentable abstract ideas until and unless the algorithms were reduced to some type of practical application, that is, a useful, concrete, and tangible result. ⁴⁸ However, an algorithm can be patentable if it is applied in a useful way. ⁴⁹ The court extended its holdings of previous cases:

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes. . . . ⁵⁰

The court rejected the two-part test that had been followed in practice.

The court continued by stating that after *Diamond v. Diehr*⁵¹ and *In re Alappat*,⁵² the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a useful, concrete, and tangible result.

Those portions of the Guidelines in the MPEP, which state that converting one set of numbers into another set of numbers does not manipulate appropriate subject matter and thus cannot constitute a statutory process, were held to be incorrect practice.

The *State Street Bank* decision removes the requirement for physical

transformation. Physical transformation is merely one example of how a mathematical algorithm may bring about a useful application.⁵³ Even a transformation of numbers with practical result appears to fall within section 101, based upon the holding of and the fact pattern of the case. It is necessary, however, that the claimed product or process produce some transformation--not a mere manipulation of numbers, but some transformation in something, even if it be data only.

Decisions following on *State Street Bank* will further explain its scope and limits. At present, however, if an invention in connection with computer software is stated either as a machine with a series of means for performing a function limitations or as a process as a series of manipulative steps, and if the machine or process transforms something into something else, even if the transformation is wholly within the computer and nothing physical outside the computer is involved, that is, no pre- or post-solution activity is in a claim element, so long as the claimed software or process is transformative in some manner, it will be statutory subject matter under section 101.⁵⁴

The court in *AT&T* focused its inquiry on "whether the mathematical algorithm is applied in a practical manner to produce a useful result."⁵⁵ The court criticized some of the earlier decisions because the panels of the court did not look to see if a practical result had been obtained.

A good example of a computer software claim stated in means-plus-function language is claim 1 of U.S. Patent 5,193,056 in the *State Street Bank* case:⁵⁶

1. A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:

(a) computer processor means [a personal computer including a CPU] for processing data;

(b) storage means [a data disk] for storing data on a storage medium;

(c) first means [an arithmetic circuit configured to prepare the data disk to magnetically store selected data] for initializing the storage medium;

(d) second means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases or decreases based on specific input, allocate the results on a percentage basis, and store the output in a separate file] for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the fund's, assets and for allocating the percentage share that each fund holds in the portfolio;

(e) third means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;

(f) fourth means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the results on a percentage basis and store the output in a separate file] for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and

(g) fifth means [an arithmetic logic circuit configured to retrieve information from specific files, calculate that information on an aggregate basis and store the output in a separate file] for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.

The patent claim is generally directed to a data processing system for implementing an investment arrangement. A hub party is an administrator and an accounting agent for several mutual funds, which are the spokes. In the patented hub-and-spoke system, mutual funds pooled their assets in an investment portfolio. The patented system provided means for daily allocation of assets for the spokes that invested in the mutual fund hub.

In the opinion of this author, the court in *State Street Bank* has interpreted the law to avoid the need for elements (a) and (b) of this claim. Apparatus (a system) starting with element (c) meets the transformative criterion of *State Street Bank*.

These claims are likely to be treated as invoking 35 U.S.C. §112, paragraph 6, since they claim "means," plus the function it performs, not recognized structures. In *Isogon Corp. v. Amdahl Corp.*,⁵⁷ the court found claim terms which used a descriptive noun followed by a function in a patent claim to software to be under section 112, paragraph 6, even though "means" was not expressly recited. Those terms were "event detector for detecting," "collector for obtaining," "recorder for recording," and "correlator for correlating." One should expect that the usually used means-plus-function style claim limitations will be interpreted under that statute⁵⁸ (see section 3:25). The disclosure in the specification will govern.⁵⁹ It should be sufficient to teach one skilled in the art what the claimed elements are.⁶⁰ Then the claim will not be indefinite under 35 U.S.C. §112, paragraph 2.⁶¹

Another example of a claim that would be statutory now, in the opinion of this author, is the process claim previously held nonstatutory by the Federal Circuit in *In re Schrader*.⁶² The court had found that the claim failed the now discarded two-part

test for patentability of an algorithm. But the claim is transformative and statutory according to the holding of *State Street Bank*.

Summary

A claim to a computer program or software, either as a series of means for performing function elements or as a number of method steps, is patentable under section 101, so long as the program or the method is transformative of something, in some manner--that is, it accomplishes something other than merely appropriating an algorithm or manipulating numbers.

FOOTNOTES:

☛Footnote 40. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 47 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1093 (1999); *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447 (Fed. Cir. 1999).

☛Footnote 41. *Gottschalk v. Benson*, 409 U.S. 63 (1972).

☛Footnote 42. *Diamond v. Diehr*, 450 U.S. 175, 186 (1981).

☛Footnote 43. *See AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d

(BNA) 1447, 1450 (Fed. Cir. 1999).

☛Footnote 44. 47 U.S.P.Q.2d (BNA) at 1601.

☛Footnote 45. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 38 U.S.P.Q.2d (BNA)

1530, 1541 (D. Mass. 1996).

☛Footnote 46. *Id.*

☛Footnote 47. *Id.*

☛Footnote 48. 47 U.S.P.Q.2d (BNA) at 1600-01.

☛Footnote 49. *Id.* at 1601.

☛Footnote 50. *Id.*

Footnote 51. *Diamond v. Diehr*, 450 U.S. 175 (1981).

Footnote 52. *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994).

Footnote 53. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447, 1452 (Fed. Cir. 1999).

Footnote 54. *Id.*

Footnote 55. *Id.*, 50 U.S.P.Q.2d at 1453.

Footnote 56. Bracketed material is the court's explanation of the claim.

Footnote 57. *Isogon Corp. v. Amdahl Corp.*, 47 F. Supp. 2d 436 (S.D.N.Y. 1998).

Footnote 58. *S3, Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 59 U.S.P.Q.2d (BNA) 1745, 1746-47 (Fed. Cir. 2001).

Footnote 59. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 U.S.P.Q.2d

(BNA) 1447, 1452 (Fed. Cir. 1999).

Footnote 60. *S3, Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 59 U.S.P.Q.2d (BNA) 1745, 1747 (Fed. Cir. 2001); *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381, 53 U.S.P.Q.2d (BNA) 1225, 1229 (Fed. Cir. 1999).

Footnote 61. *S3, Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 59 U.S.P.Q.2d (BNA) 1745 (Fed. Cir. 2001).

Footnote 62. *In re Schrader*, 22 F.3d 290 (Fed. Cir. 1994) ("A method of competitively bidding on a plurality of items comprising the steps of identifying a plurality of related items in a record, offering said plurality of items to a plurality of potential bidders, receiving bids from said bidders for both individual ones of said items and a plurality of groups of said items, each of said groups including one or more of said items, said items and groups being any number of all of said individual ones and all of the possible combinations of said items, entering said bids in said record, indexing each of said bids to one of said individual ones or said groups of said items, and assembling a completion of all said bids on said items and groups, said completion identifying a bid for all of said items at a prevailing total price, identifying in said record all of said bids corresponding to said prevailing total price.").

4:10 Business Methods

Although there had been no statutory prohibition against patent claims directed to business methods, until the United States Court of Appeals for the Federal Circuit ruled that patent claims to business methods are within the statutory classes of invention under 35 U.S.C. §101 and could be patented, in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,⁶³ claims to business methods were rejected as nonstatutory. In *State Street Bank*, the court held that a process will receive statutory protection "if it is limited to a practical application of the abstract idea or mathematical algorithm in the technological arts (that is, involves some species of physical transformation of input data)." The physical transformation need not produce a physical product. In a business method, it may simply involve the manipulation of data and information according to an algorithm entirely within a computer or the like apparatus.

After the *State Street Bank* decision, the issue of whether an invention is patentable is whether it transforms intangible or tangible material to produce a practical or useful result. A system or process that transforms information itself produces a practical and useful result. Only an abstract idea that lacks any useful transformation remains unpatentable.

To further dispel doubt as to the patentability of a business method, the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*⁶⁴ pointed out that the inquiry is whether a useful, concrete, and tangible result is obtained, rather than a physical act being performed. In the *AT&T* case, the invention related to the generation of information in an electronic record for long-distance telephone calls to permit differential billing treatment of subscribers. Prior to the *State Street Bank* decision, the district court in *AT&T* had granted summary judgment of invalidity under 35 U.S.C. §101, holding that the method claims implicitly recited a mathematical algorithm. Following the *State Street Bank* decision, the Federal Circuit on appeal held that the claims, which were directed to a method for generating a particular data field in an electronic record, were not invalid under section 101 and that business method claims are patentable.

Following these two court decisions, the patentability of claims to business methods is determined by the same tests as for any other process or apparatus.

The Patent Office has issued a "White Paper" on business method patents, which attempts to place them in historical context and provides patenting statistics.⁶⁵ The White Paper notes that business method patents are now classified by the Patent Office in U.S. inventions subject matter classification class 705 (although one finds those patents also classified in other classes). That class includes a collection of over twenty financial and management data processing areas including insurance, securities trading, health care management, reservation systems, postage

metering systems, and certain general enterprise functions such as electronic shopping, auction systems, and business cryptography. Groupings of patents include identifying the potential customers of a business and determining their need for its products and services; informing customers that the business exists and trying to get them to buy its products and services; exchanging money and credit related to a business transaction; and tracking resources, money, and products. These are the typical types of business methods. Numerous other business methods in use or to be developed may be claimed.

Since business methods have been held patentable, the number of filings for them has increased. The White Paper indicates that for fiscal year 1999, they represented only about 1% of the total patent applications filed, and that 2,658 applications filed were classified in class 705. Nearly 600 such patents were issued in that year. An increase in the number of filings and the patents granted is expected due to the continuing growth and development in electronic commerce. Not only are electronic and data processing hardware and software now claimed, but the business method performed with them is claimed as well.

The prevalence of method claims that relate to some data storage and manipulation apparatus results from e-commerce, because e-commerce inventions are typically directed to systems or methods that use a computer and/or software. But not every patentable business method is directed to e-commerce and not every business method involves computers.

A business method should be claimed like any other method, in a series of method steps. The rules and practices for method claiming apply to methods of doing business. Expanding on what appears to be claimable, any method involving several steps that brings about a practical result would appear to be able to satisfy the requirements of Title 35 of the U.S. Code.

From a claim-drafting viewpoint, it is possible also to claim some business methods using an apparatus claim for apparatus that performs the method. The claim elements may most likely be stated as means for performing particular functions. This would be especially the case where the apparatus inputs certain information or materials in order that the process be performed and/or outputs certain information or materials following performance of the process. This is analogous to computer-related or computer-implemented inventions discussed in section 4:9. The Federal Circuit in *State Street Bank* ⁶⁶ said that machine claims having "means" clauses are viewed as process claims if there is no supporting structure in the written description that corresponds to the claimed "means" elements. The court found claim 1 to be to a machine, with the terms "computer processor means" and "first means for initializing the storage medium."

Even a method of preparing a patent application is covered by a patent, as

illustrated by U.S. Patent 6,049,811. Its broadest method claim recites:

10. A method by computer for drafting a patent application having at least sections including claims, a summary of the invention, an abstract of the disclosure, and a detailed description of a preferred embodiment of the invention, said method comprising the steps of:

requesting and storing primary elements (PE) of the invention that define the invention apart from prior technology before drafting the claims;

drafting the claims before drafting the summary of the invention, abstract, and the detailed description of a preferred embodiment of the invention; and

drafting the sections in a predetermined order prohibiting jumping ahead to draft a latter section.

This claim covers preparation of a conventional patent application using a computer and then recites a series of steps. In the opinion of this author, these are standard steps and standard sequencing of steps performed in preparing an application. They differ in that some part of the method is performed using a computer. Dependent method claims of the patent indicate that the computer, rather than the person, is performing some steps. Presumably, every practitioner has prepared patent applications using the claimed steps in the claimed sequence. But if we now perform the known steps using a computer that causes the practitioner or the computer to perform the claimed steps in the particular manner claimed, the patent claim would reach them.

Preparing a patent application is not "business" because it does not involve a monetary or business transaction. Nonetheless, in this author's opinion, the patent falls with the broad method-of-doing-business category.

As is typically found in many business method patents, this patent also includes machine claims, and the first machine claim is quoted below. The machine claims may be machine analogs to the method elements of the method claim, and vice versa:

1. A machine for drafting a patent application having at least sections including claims, a summary of the invention, an abstract of the disclosure, and a detailed description of a preferred embodiment of the invention, said machine comprising:

one or more input devices, one or more output devices, and a computer with memory for receiving and storing data from the input devices, transmitting data to the output devices, and storing program steps for program control and manipulating data in memory;

the computer, through input and output devices, requests and stores primary elements (PE) of the invention that define the invention apart from prior technology before the claims are drafted;

the claims are drafted before the summary of the invention, abstract, and the detailed description of a preferred embodiment of the invention is drafted; and

the computer requires drafting the sections in a predetermined order prohibiting jumping ahead to draft a latter section.

Yet another example of a method that appears to be a computer-accomplished series of steps that one could otherwise perform manually, and that possibly were performed manually before the patent was granted, is claimed in U.S. Patent 4,890,228, which provides a loan to a taxpayer based upon his or her anticipated tax refund. The claim is quoted below:

7. A method of operating at least one programmable electronic data processing machine comprising the programmed steps of:

(a) receiving inputted tax preparer data, tax return data and loan application data;

(b) creating electronic tax return data files from said tax return data;

(c) creating deposit/loan account files related to said tax return data and said loan application data at an unauthorized financial institution;

(d) transmitting said electronic tax return data files to at least one tax collecting authority;

(e) processing said tax return data files and said deposit/ loan account files and authorizing payment by said authorized financial institution from said deposit/loan account files of a tax refund loan amount based on said tax return data prior to completion of tax return processing and refund payment by said tax collecting authority; and

(f) authorizing receipt by said authorized financial institution of tax refund electronic fund transfers, based on said tax return data, from said tax collecting authority.

A patent practitioner or a tax specialist might say that a process or apparatus that performs the steps that the practitioner regularly performs in his or her practice should not be protected by grant of a business method patent. One frequently hears such a comment from business people confronted with a business method patent claim, which includes claims often tied to a computer or other machinery in the

claim, and which accomplishes, via computer, a process that had previously been done without reliance upon a computer. Nonetheless, such a claim is statutory and its validity must be determined under sections of the Patent Act other than section 101, namely section 102 for anticipation or section 103 for obviousness, as well as section 112.

In an interesting essay on the patenting of business methods, ⁶⁷ James Gleick correctly points out that business method patent claims are possibly too expansive in scope. He illustrates his point by citing U.S. Patent 5,965,809, issued in 1999, which is entitled "Method of Bra Size Determination" and involves a measuring step followed by a fabrication step, and U.S. Patent 5,453,036, issued in 1995, for a "Method of Exercising a Cat" using a laser. One must look to the prior art for restrictions on the scope of claims in those patents. Unless the claims are anticipated or obvious in view of the prior art, they are valid as much as claims to any other invention.

Amazon.com acquired a high-profile method-of-doing-business patent on its "one click" system for ordering goods, U.S. Patent 5,960,411. The claims of this patent were interpreted in *Amazon.com, Inc. v. Barnesandnoble.com, Inc.* ⁶⁸ Claim 1 of the patent is a method claim with a series of steps, tied to some electronic means. Again, the patent has product claims that are analogs of the method, and vice versa. The independent method claim and the independent product claim of the patent are reproduced:

1. A method of placing an order for an item comprising:

under control of a client system, displaying information identifying the item; and

in response to only a single action being performed, sending a request to order the item along with an identifier of a purchaser of the item to a server system;

under control of a single-action ordering component of the server system;

receiving the request;

retrieving additional information previously stored for the purchaser identified by the identifier in the received request; and

generating an order to purchase the requested item for the purchaser identified by the identifier in the received request using the retrieved additional information; and

fulfilling the generated order to complete purchase of the item whereby the item is ordered without using a shopping cart ordering model.

6. A client system for ordering an item comprising:

an identifier that identifies a customer;

a display component for displaying information identifying the item;

a single-action ordering component that in response to performance of only a single action, sends a request to a server system to order the identified item, the request including the identifier so that the server system can locate additional information needed to complete the order and so that the server system can fulfill the generated order to complete purchase of the item; and

a shopping cart ordering component that in response to performance of an add-to-shopping-cart action, sends a request to the server system to add the item to a shopping cart.

A method of doing business does not require inclusion of a computer, or a server, or the like apparatus in the method claim. The method may include a series of steps that without the computer, or server or apparatus, would be a set of novel and unobvious steps. A hypothetical claim that is not tied to an apparatus, data processor, computer, server, etc., might read:

A method for performing a financial transaction comprising:

obtaining information concerning the financial transaction from several sources;

comparing and sorting the information according to an algorithm;

selecting displayable information that has been sorted according to the algorithm;

displaying the selected displayable information; and

making a financial transaction based upon the displayable information displayed.

As written above, the claim would be unpatentable under sections 102 and 103. It is provided as one form to show how a method of doing business claim might be written without reference to any apparatus. Depending upon the type of financial transaction being performed, the information gathered, the algorithm, and the criteria of the algorithm for selecting information, the claim could be novel, unobvious, and patentable under sections 102, 103, and 112.

That method should, where possible, also be claimed in a product claim. A product analog claim to the method claimed above might be:

Apparatus for performing a financial transaction comprising:

means for storing inputted information from several sources concerning the financial transaction;

means for comparing and sorting the information according to an algorithm consisting of . . . ;

means for selecting displayable information that has been sorted according to the algorithm;

means for displaying the selected displayable information; and

means for making the financial transaction based upon the displayable information displayed.

For nearly every business method, the various classes and types of claims should be considered for use.

When the practitioner drafts claims on a business method invention, the claims can include the method itself, a system or apparatus employing the method, signal claims, data structure claims, program claims directed to the software program and even claims to the graphical user interface. Claim each novel aspect of the business method, which means that the method may be claimed in various ways, for example, directed to novelties in the information gathering, the information assembly or sorting and selecting, and the information presentation. There may be different approaches, like different groups of steps, available to perform the method. All of these approaches may be claimed in separate independent claims if the approaches are to an extent mutually exclusive, that is, at least one step is not generically used in all approaches, or may be claimed in dependent claims, if appropriate.

Many new business enterprises in any field involve some novel activity when the developer seeks to differentiate the business from competitors or existing business models. Each such activity may be a patentable business method, if it avoids sections 102 and 103 of the Patent Act.

Summary

Business methods are patentable as are any other methods. Consider also claiming the method using apparatus claims.

FOOTNOTES:

Footnote 63. 149 F.3d 1368, 47 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1998).

Footnote 64. AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447 (Fed. Cir. 1999).

Footnote 65. White Paper, available at <www.uspto.gov/web/menu/busmethp>.

Footnote 66. 149 F.3d at 1371, 47 U.S.P.Q.2d (BNA) at 1599. See *Ex parte* Donner, 53 U.S.P.Q.2d (BNA) 1699, 1701 (Board of Patent Appeals and Interferences 1999) (unpublished).

Footnote 67. James Gleick, *Patently Absurd*, N.Y. Times, Mar. 12, 2000, Magazine, at 44.

Footnote 68. Amazon.com, Inc. v. Barnesandnoble.com, Inc., 73 F. Supp. 1228, 53 U.S.P.Q.2d (BNA) 1115, 1126-28 (W.D. Wash. 1999).

§ 5:1 In General

Claims to an article of manufacture (termed a "manufacture" in 35 U.S.C. § 101) ¹ differ little in principle from apparatus claims, and most of the general rules previously given apply. Basically, the article will ordinarily be a combination of elements, which must be named and tied together as with the elements of a mechanism. However, *In re Venezia* ² allowed a carefully drawn claim to a kit of unassembled parts as a properly claimed article of manufacture. Articles of manufacture usually have no moving parts--examples are an ashtray, a hammer, or an electric battery--whereas machines (even though they *are* manufactured articles) generally have moving parts, as well as some "rule of operation"--examples are a stapler or a typewriter. In some borderline cases, it may be hard to tell whether a specific structure is an article of manufacture or a machine. Which (an article or a machine) is a pair of scissors? Fortunately, the difference is academic only, as no one ever questions whether an invention is in the class "machine" or the class "manufacture" for claim purposes.

Ordinarily, the preamble of an article claim merely names the product to be claimed, such as:

A resistor

A soap dish

A girdle

If there is no generic name, one can use a functional preamble such as "A device for, " similar to machine claims.

The elements of an article claim are the constituent parts that go to make up the article being claimed. One simple article claim follows:

7. A resistor which comprises:

(a) a ceramic core;

(b) a coating of carbon on the core; and

(c) a stripe of conductive material at each end of the core in electrical contact with the carbon coating.

Further examples of article claims are given in appendix A, cases 22 and 23.

Means-plus-function clauses (section 3:25) may also be used in article claims, such as "means for attaching element A to element B . . . [in some particular manner, or perhaps so that some function is accomplished]." ³ There is nothing intrinsically wrong in defining something by what it does (that is, functionally) rather than by what it is (that is, structurally). ⁴ The sixth paragraph of 35 U.S.C. §112 specifically allows the use of such functional language as a claim limitation in defining an invention to distinguish over prior art. The Patent and Trademark Office may, however, properly require proof that the functional limitations are not inherent in the prior art. ⁵ Otherwise, the claim could be unpatentable under 35 U.S.C. § 102 or 103, even if proper under §112. Moreover, the means-plus-function language, to be "accorded structural significance," must encompass a means "which possesses a *presently existing* function [*in the article*] or a *presently existing capability to* perform [the stated] function [*in the article*]." ⁶

An article claim may distinguish from the prior art by the shape or arrangement of parts, by the materials used in construction ⁷ and sometimes even by the manner in which it was made, ⁸ as discussed in the next section. Special considerations apply when it is attempted to distinguish an article from the prior art by printed matter appearing on the article (see section 8:6).

Summary

Article of manufacture claims list the parts of the article and connect them where applicable. Means clauses and other permissible function descriptions may be used.

FOOTNOTES:

³Footnote 1. "Manufacture" and "article of manufacture" mean the same thing. *In re Hruby*, 153 U.S.P.Q. (BNA) 61 (C.C.P.A. 1967); *In re Hadden*, 20 F.2d 275 (D.C. Cir. 1927).

Footnote 2. *In re Venezia*, 189 U.S.P.Q. (BNA) 149 (C.C.P.A. 1976).

Footnote 3. *In re Roberts & Burch*, 176 U.S.P.Q. (BNA) 313 (C.C.P.A. 1973) (Claim 1: "Corrugated polyethylene terephthalate film having a surface coefficient of friction of less than about 0.40 *as determined by the Bill test.*"); *In re Echerd & Watters*, 176 U.S.P.Q. (BNA) 321 (C.C.P.A. 1973) (Claim 12: "A . . . pipe lagging material . . . having sufficient flexibility and wet strength to permit [it] to be wrapped when wet around insulated pipe surfaces . . . and having sufficient adhesive characteristics to firmly bond itself to such surfaces upon subsequent drying"); *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 26 (C.C.P.A. 1971); *In re Ludtke & Sloan*, 169 U.S.P.Q. (BNA) 563 (C.C.P.A. 1971). Moreover, such functionality may be expressed *negatively*, such as in "formed by mixing together [A and B] at a temperature whereat [A and B] are *incapable* of forming [certain undesirable compounds]. . . ." *In re Barr, Williams, & Whitmore*, 170 U.S.P.Q. (BNA) 330 (C.C.P.A. 1971). See also section 3:5 and MPEP 706.03(c). One should be aware, however, of the many non-C.C.P.A. infringement decisions that seem to state that the patentability of apparatus and article claims depends on structural limitations and not on "mere" statements of function, whatever that means. See, e.g., *Bowles Fluidics Corp. v. Mossinghoff*, 228 U.S.P.Q. (BNA) 512 (D.D.C. 1985); *Scott Paper Co. v. Fort Howard Paper Co.*, 167 U.S.P.Q. (BNA) 4 (7th Cir. 1970); *Galland-Henning Mfg. Co. v. Dempster Bros.*, 165 U.S.P.Q. (BNA) 688 (E.D. Tenn. 1970). To avoid this problem, use the §112-approved means for accomplishing a function claim format.

Footnote 4. *In re Hallman*, 210 U.S.P.Q. (BNA) 611 (C.C.P.A. 1981). See section 3:22.

Footnote 5. *In re Hallman*, 210 U.S.P.Q. (BNA) 611 (C.C.P.A. 1981); *In re Ludtke & Sloan*,
169 U.S.P.Q. (BNA) 563 (C.C.P.A. 1971); *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971).

Footnote 6. *In re Bozek*, 163 U.S.P.Q. (BNA) 545 (C.C.P.A. 1969). In *Bozek*, a "rib means" in a pulltab-type can top was claimed as performing the function of absorbing excess metal resulting from the formation, during the manufacture of the can top, of the score line defining the pulltab. The score line formation was effected by pressing the can top between two dies, which extruded metal (*i.e.*, caused it to flow) out and away from the formed score line--thus the excess. The only function served by the rib means *in the completed top* was to strengthen the top; the prior art showed similar strengthening ribs in can tops. The function of excess metal absorption was accorded no structural significance because the rib neither performed its absorbing function *in the completed top* nor had the capability of *presently* performing that function. *Int'l Tel. & Tel. Corp. v. Union Carbide Corp.*,

210 U.S.P.Q. (BNA) 496, 512 (D.S.C. 1981), similarly found unpatentable a claim whose distinguishing feature was "means providing means for retaining liquid insulating compound about said terminal means during the in site solidifying" because it referred to manufacturing history, not a present structural feature or existing function.

☛Footnote 7. See further discussion in section 6:5 on new use claims. In *In re Andrews*, 168 U.S.P.Q. (BNA) 360 (C.C.P.A. 1971), the court held that the rejection of a claim because it set forth a "device according to Claim 1 . . . made from CR-MO-W steel material" was impermissible where the specification asserted that the use of such materials gave the device improved properties, and where the examiner had neither questioned the assertion nor shown the obviousness of the improved properties.

☛Footnote 8. Article claims are not indefinite simply because they include process limitations. *In re Certain Steel Rod Treating Apparatus & Components Thereof*, 215 U.S.P.Q. (BNA) 237, 251 (Ct. Int'l Trade 1981); *In re Brown & Saffer*, 173 U.S.P.Q.

(BNA) 685 (C.C.P.A. 1972) ("In order to be patentable, a product must be novel, useful and nonobvious. In our law, this is true whether the product is claimed by describing it, or by listing the process steps used to obtain it."); *Ex parte Clark & Summering*, 174 U.S.P.Q. (BNA) 40 (Bd. App. 1971); *In re Garner*, 162 U.S.P.Q. (BNA) 221 (C.C.P.A. 1969); *In re Pilkington*, 162 U.S.P.Q. (BNA) 145 (C.C.P.A. 1969). Moreover, to the extent such process limitations distinguish the article from the prior art, they must be given the same consideration relative to patentability as traditional limitations. And that is true even though what the process uses or operates on is not present in the final article. *In re Luck & Gainer*, 177 U.S.P.Q. (BNA) 523 (C.C.P.A. 1973). Accordingly, where an article claim includes elements A and B "bonded together by being contacted in the presence of X at a temperature of 200[degrees]F," the process limitation ("by being contacted . . .") is entitled to patentable significance even though X is not present in any form in A, B, or the A/B bond.

Although the existence of an old or obvious method of producing an article does not *necessarily* negate the article's patentability, such a method is a factor to be considered along with similarities in and differences between the structure and properties of the article and the prior art. *In re Lewis*, 172 U.S.P.Q. (BNA) 238 (C.C.P.A. 1972); *In re Hoeksema*, 158 U.S.P.Q. (BNA) 596 (C.C.P.A. 1968). On the other hand, the general rule is that an article must *itself* meet the tests of 35 U.S.C. § 102 and 103 to be patentable. It is usually insufficient for patentability that the article is manufactured by a novel or unobvious method. *In re Pilkington*, 162 U.S.P.Q. (BNA) 145 (C.C.P.A. 1969); *Thomson Indus., Inc. v. Nippon Thompson Co.*, 160 U.S.P.Q. (BNA) 318 (E.D.N.Y. 1969); *Ex parte Edwards*, 162 U.S.P.Q. (BNA) 64 (Bd. App. 1968). But the development of a new process, especially in the face of

previous unsuccessful efforts by others, is evidence of nonobviousness of the product eventually developed. *Phillips Petroleum Co. v. U.S. Steel Corp.*, 6 U.S.P.Q.2d (BNA) 1065, 1096 (D. Del. 1987).

?5:2 Product-by-Process Claims

A product-by-process claim is one where an article or at least one element of an article is claimed by reciting the process for fabricating the article or its element.⁹ Typically, the article or element is recited in the form of a method claim or a method limitation, preferably by using the gerund form for the process step in which the product or its element is formed. However, a claim which recites both apparatus and a method (judged by its preamble, usually) would be indefinite, because it embraces two statutory classes.¹⁰ This is to be distinguished from inclusion of method descriptions or limitations in a product claim or product limitations in a method claim, which are proper as the claim itself does not attempt to embrace the two statutory classes of claims.

The simplest form of such a claim might be:

5C. Sodium hydroxide produced according to the process of claim 5B

Using a dependent claim form to refer back to an earlier claim and to cross statutory classes is proper here.¹¹

As an example of product-by-process, assume that in the resistor of Claim 7 the carbon coating was deposited on the ceramic core by decomposition of a hydrocarbon gas. In this instance, Claim 7 might read:

7A. A resistor which comprises:

(a) a ceramic core;

(b) a coating of carbon *deposited on the core by decomposition of a hydrocarbon gas in the presence of the core*; and

(c) a stripe of conductive metal . . . etc.

or, preferably, (b) . . . *by decomposing a hydrocarbon gas in the presence of the core. . . .*

(Italics indicate typical product-by-process phraseology.)

This type of process description of a product element would be necessary to define the novel feature if carbon-coated resistors were old with the carbon applied in some other way, such as by lacquering. It would be permissible as to form *if* the

carbon coating produced by decomposition of the hydrocarbon gas were different mechanically or electrically than the prior art coating, and if the nature of the mechanical or chemical differences was not known or could not be stated.

This type of claim covers the product *only* when made by the specified method, so the claims are not so broad as regular or "pure product" claims. Prior to April 1974, a product-by-process claim was permissible as to form only where the product "cannot be described in any other manner" than by the process by which it was made.¹² The applicant was not allowed such claims where he also presented regular product claims. This seems unreasonable in that one might have a patentable invention on two levels: one on a generic level, covering the article produced by any method, and one on a specific level, covering the article produced by the particular method. For example, in the carbon resistor example, one might have invented the basic carbon-coated resistor of Claim 7 and also the deposited-carbon resistor of Claim 7A. This would be one typical example of generic and species inventions (section 6:9). In any event, no such restriction exists now.

In addition, the old Patent Office manual permitted only one product-by-process claim, with rare exception. No such restriction exists now.

In *Leutzinger v. Ladd*,¹³ the court allowed both a straight product claim and dependent product-by-process claim, such as:

7. The subject matter of claim 1, in which the linseed oil is heated to 200[degrees]F.; the waxes are then added and the temperature is held for four to nine days.

The court found that the product of Claim 7 was not the same as the generic product of claim 1, and both were patentable.

The product-by-process claim must satisfy both 35 U.S.C. §102 and 35 U.S.C. §103.¹⁴ As to unobviousness of a product-by-process claim, it must reside solely in the final product, not the process that produced it.¹⁵ The process is immaterial except as it affects the characteristics of the product. This means that the process can be patentable while the product made by the patentable process may be unpatentable. *In re Pilkington*,¹⁶ quoting from *In re Dilnot*,¹⁷ says:

"The addition of a method step in a product claim, which product is not patentably distinguishable from the prior art, cannot impart patentability to the old product." Citing *In re Moeller*, 48 U.S.P.Q. 542; *In re Lifton*, 89 U.S.P.Q. 641; *In re Shortell*, 81 U.S.P.Q. 359; and *Tri-Wall Containers, Inc. v. United States*, 161 U.S.P.Q. 116.

¹⁸

Referring to Claims 7 and 7A above as to a resistor, prior art resistor having its coating deposited by applying a lacquered-on layer of carbon, rather than by

decomposing a hydrocarbon gas, would make unpatentable or invalid, under section 102 or section 103, both of Claims 7 and 7A. Claim 7A, while involving performing a process not known in the art to deposit the coating, produced a resistor known in the art. The process used to make the resistor would be patentable and valid over the prior art, while the resistor made using that process would not be patentable or valid.

Steppan,¹⁹ cited in *Pilkington*, involved a claim to:

25. An acid phosphate of *a condensation product* of formaldehyde with a salt of a compound selected from the group consisting of . . . [A and B], the acid phosphate having the general formula²⁰. . . [C].²¹

Pure product (structural formula) claims were also presented, but were held obvious by the court, affirming the examiner and the board.

As to Claim 25, the court held it was not a product-by-process claim at all. Words such as "condensation product," while telling the process (condensation) are not purely process limitations; they are also structural. (Obviousness was not considered, as the claim was rejected only as being an "improper" product-by-process claim.)

Some apparent process limitations, such as "etched," "welded," "interbonded by interfusion," are considered structural limitations not subject to the product-by-process rules. See *In re Garner*,²² where the following claim was considered:

A composite, porous, thermal insulation panel characterized by dimensional stability and structural strength consisting essentially of expanded perlite particles which are *interbonded to one another by interfusion* between the surfaces of the perlite particles *while in a pyroplastic state* to form a porous perlite panel. (Emphasis added to stress limitations in question.)

The court held that:

. . . the recitation of the particles as "interbonded one to another by interfusion between the surfaces of the perlite particles" is as capable of being construed as a structural limitation as "intermixed," "ground in place," "press fitted," "etched," and "welded," all of which at one time or another have been separately held capable of construction as structural, rather than process, limitations.

The court found it unnecessary to consider the further process limitation, "while in a pyroplastic state," because the claim was already held unobvious in view of the

"interbonded" limitation. However, with respect to process limitations generally, the court remarked:

. . . the mere presence of a method limitation in an article claim which is otherwise allowable would not so poison the claim as to render it unpatentable. *Ex parte Lindberg*, 157 U.S.P.Q. 606, 607 (P.O. Bd. App. 1967).²³

Similarly, "chemically engraved," read in context, described the product more by its structure than the process used to obtain it.²⁴

Another example where a product-by-process claim could be used is the treated polyethylene article of Claim 5 (section 4:7), where the surface was treated with a solution of sodium dichromate in sulfuric acid. One might claim:

8. A polyethylene article having a surface treated in accordance with the process of claim 5.

This claim also illustrates claims in two statutory classes for the same invention, and a dependent claim that crosses statutory classes (see section 2:9).

How many claims applicant wants to present, and how many different types of claims, are covered by the general rule set out in sections 8:2 and 8:3, not by any special rules for product-by-process.

Every method claim which produces or modifies any object should be considered for preparation of a corresponding product-by-process claim, including independent and dependent method claims. There is no restriction on the quantity of product-by-product process claims permitted in one application.

Therefore, the examiner should consider whether the product is novel as made by *X* process and, if so, then whether such a new product would have been obvious. Of course, these are merely the standard statutory tests for patentability of any claim on the merits, once the formal barriers have been passed.

The basic rule remains, however, that the product itself must be novel and unobvious, when made by process *X*, and the fact that process *X* may be patentable is not material to patentability of the product per se. This conforms to the basic rule that there must be novelty and unobviousness in each statutory class of subject matter in which claims are sought.

In 1991, a Federal Circuit panel stated that "the correct reading of product-by-process claims is that they are not limited to product prepared by the process set forth in the claims."²⁵ The claim read:

Highly purified and concentrated human or porcine VIII:C prepared in accordance with the method of claim 1.

The court held that sufficiently purified VIII:C would infringe even if not prepared by the method of Claim 1.

One year later, in *Atlantic Thermoplastics Co. v. Faytex Corp.*,²⁶ another Federal Circuit panel ruled that "process terms in product-by-process claims served as limitations in determining infringement." The claim at issue in *Atlantic* read:
The molded innersole produced by the method of claim 1.

The court held that the same innersole would not infringe unless the method of claim 1 were used in its manufacture. To the author, *Atlantic* seems to be the better law. Why have claim language if it is to be ignored? The Federal Circuit has yet to issue a clarification. As a result, at least one district court has felt constrained to follow the earlier *Scripps* precedent, despite the district court's apparent disagreement with it.²⁷

Summary

Product-by-process claims may be obtained whenever the product has novelty and is unobvious over prior art products. These are claims reciting a product or composition of matter or its elements by the process by which it was made, rather than by its structural or chemical characteristics. Mixed claims are also permitted, defining some features in "regular product" phraseology, and one or more features in product-by-process language. It is up to the applicant to describe what he thinks his invention is, and he can use product-by-process language whenever he thinks necessary or best for a particular claim.

FOOTNOTES:

²⁶Footnote 9. MPEP ¶ 2113, 2173.05(p).

²⁷Footnote 10. *Id.*

²⁸Footnote 11. See section 2:9, *supra*, and MPEP ¶2173.05(f).

²⁹Footnote 12. See *Ex parte* Donahey, 126 U.S.P.Q. (BNA) 61 (Bd. App. 1959); *In re* Moeller, 48 U.S.P.Q. (BNA) 542 (C.C.P.A. 1941); see also *In re* Dreyfus, 24 U.S.P.Q. (BNA) 463 (C.C.P.A. 1935).

³⁰Footnote 13. *Leutzinger v. Ladd*, 139 U.S.P.Q. (BNA) 196 (D.D.C. 1963).

Footnote 14. *In re Brown & Saffer*, 173 U.S.P.Q. (BNA) 685, 688 (C.C.P.A. 1972).

Footnote 15. MPEP §2113; *In re Thorpe*, 277 U.S.P.Q. (BNA) 964, 966 (Fed. Cir. 1985).

Footnote 16. *In re Pilkington*, 162 U.S.P.Q. (BNA) 145, 147 (C.C.P.A. 1969).

Footnote 17. *In re Dilnot*, 133 U.S.P.Q. (BNA) 289, 292 (C.C.P.A. 1962).

Footnote 18. *See In re Brown & Saffer*, 173 U.S.P.Q. (BNA) 685 (C.C.P.A. 1972).

Footnote 19. *In re Stepan*, 156 U.S.P.Q. (BNA) 143 (C.C.P.A. 1967).

Footnote 20. A general formula tells what elements are involved and in what proportions, but not how connected.

Footnote 21. *In re Pilkington*, 162 U.S.P.Q. (BNA) 145, 147 (C.C.P.A. 1969) (emphasis added).

Footnote 22. *In re Garner*, 162 U.S.P.Q. (BNA) 221, 223 (C.C.P.A. 1969).

Footnote 23. *In re Certain Steel Rod Treating Apparatus & Components Thereof*, 215 U.S.P.Q. (BNA) 237, 252 n.88 (Ct. Int'l Trade 1981).

Footnote 24. *Hazani v. U.S. Int'l Trade Comm'n*, 126 F.3d 1473, 44 U.S.P.Q.2d (BNA) 1358, 1363 (Fed. Cir. 1997).

Footnote 25. *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1583 (Fed. Cir. 1991).

Footnote 26. *Atl. Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 835, 846-47 (Fed. Cir. 1992).

Footnote 27. *Columbia Univ. v. Roche Diagnostics GmbH*, 126 F. Supp. 2d 16, 57 U.S.P.Q.2d (BNA) 1825, 1837-38 (D. Mass. 2000). *See Tropix, Inc. v. Lumigen, Inc.*, 825 F.

Supp. 7, 27 U.S.P.Q.2d (BNA) 1475 (D. Mass. 1993).

§5:3 Design Claims

For design patents (35 U.S.C. § 171-73), only one claim, in formal terms, is permitted: "The claim shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described. More than one claim

is neither required nor permitted" (Rule 153).²⁸

Thus, a design claim attempting to describe the article verbally is improper. The claim may only incorporate the specification (drawing) by reference.

When the name of the article is specified, it should be the title of the invention as stated in the title of the specification. (Further, that same term should be used in the description of figure 1 in the specification.)

The claim ends with "as shown" when the specification only describes the direction of view of each drawing figure.

The claim ends with "as shown and described" when there is a special description of the design in the specification or a showing of a modified form of the design, or there is other descriptive matter.²⁹

For example, when the specification describes more than the direction of view for every drawing figure. For example, the description of one figure may note that it is a view of one side, and that the opposite view is a mirror image; or the specification may say that the side not illustrated is plain or may say that the application is a continuing one.

One example, from Design Patent No. 215,546:

9. The ornamental design for a cover for data communications apparatus, substantially as shown and described.

However, use of "substantially" in the claim is not the best form. Thus, the claim is better written:

9. The ornamental design for data communications apparatus, as shown and described.

As with any other claimed invention, a claimed design must be novel and unobvious. The overall aesthetic effect (*tout ensemble*) of the design must be viewed as a whole in determining whether these qualities are present.

A design may be embodied in an entire article or only in part of it. *In re Zahn*³⁰ found patentable a design embodied only in the shank portion of a drill. Further, a design is not "of" an article, but "for" an article and includes ornamental designs of all kinds, including surface ornamentation as well as configuration of the goods.³¹ It has been held that a portion of a water fountain that is composed entirely of water in continuous motion (that is, the spray!) is an "article of manufacture" within 35 U.S.C. §171 and may be the subject of a design patent.³²

Further, a design patent claim covers every feature shown in every drawing figure, including the rear or the underside.³³ Broken lines may be used in drawings to show environmental elements not part of the design. The specification may include an appropriate recital about what is not included in the claimed design.

FOOTNOTES:

Footnote 28. MPEP §1503.03.

Footnote 29. *Id.*

Footnote 30. *In re Zahn*, 204 U.S.P.Q. (BNA) 995, 998 (C.C.P.A. 1980).

Footnote 31. *Id.*

Footnote 32. *In re Hruby*, 153 U.S.P.Q. (BNA) 61, 64 (C.C.P.A. 1967):

[T]he permanence of any design is a function of the materials in which it is embodied and the effects of the environment thereon. Considering the fact that the Romans and the French built now-famous fountains hundreds of years ago which still produce the same water designs today, the notion that a fountain is "fleeting" [and, therefore, not an article of manufacture] is not one which will "hold water. . . ."

Footnote 33. *Door-Master Corp. v. Yorktowne, Inc.*, 256 F.3d 1308, 59 U.S.P.Q.2d (BNA) 1472 (Fed. Cir. 2001); *Contessa Food Prods., Inc. v. Conagra, Inc.*, 282 F.3d 1370, 62 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2002).

§5:4 Plant Patent Claims

A rule similar to that for design claims holds for a plant patent claim (35 U.S.C. § 161-64). Only one claim is permitted, except that "the principal distinguishing characteristics" may be recited (Rule 164),³⁴ and usually are, in rather flowery language. The following example is from plant patent 2,866 (Feb. 25, 1969):

10. A new and distinct variety of chrysanthemum plant of the thick decorative class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a hardy and free habit of growth, a large bloom size, a very durable flower petalage, and a distinctive and attractive general color tonality of the flowers corresponding to Apricot Yellow, very lightly overcase with Light Cadmium.

Plant patent claims frequently appear to violate the general rule that laudatory statements are not permitted therein.

The disclosure of a plant patent may not fully comply with 35 U.S.C. §112, but yet be adequate under 35 U.S.C. §162. For example, plant patents require no "how-to-make" disclosures.³⁵ Nevertheless, there must be a sufficient disclosure (for example, of alleged characteristics present in the plant that are absent in closely related varieties of the prior art) to establish the inventive characteristics.³⁶

The plant invention must be novel in conception, rather than novel in use: must be not only new, but not existing in nature; and cannot merely be newly found; must be nonobvious;³⁷ and, finally, must have been asexually reproduced.³⁸ The scope of a plant patent differs from that of other patents, because an infringer must not merely copy; he must use stock obtained from, presumably directly or indirectly, the patentee.³⁹

FOOTNOTES:

Footnote 34. MPEP 1605.

Footnote 35. *Jessel v. Newland*, 195 U.S.P.Q. (BNA) 674, 677 (Patent and Trademark Office Board of Patent Interferences), 195 U.S.P.Q. (BNA) 678, 683-84 (Comm'r 1977); *Yoder Bros. v. Cal.-Fla. Plant Corp.*, 193 U.S.P.Q. (BNA) 264, 290 (5th Cir. 1976); *In re LeGrice*, 133 U.S.P.Q. (BNA) 365 (C.C.P.A. 1962).

Footnote 36. *In re Greer*, 179 U.S.P.Q. (BNA) 301 (C.C.P.A. 1973).

Footnote 37. *Yoder Bros. v. Cal.-Fla. Plant Corp.*, 193 U.S.P.Q. (BNA) 264, 293 (5th Cir. 1976).

Footnote 38. *Id.*

Footnote 39. *Ex parte Weiss*, 159 U.S.P.Q. (BNA) 122 (Board of Appeals 1967) (particularly cases cited at 124); *Yoder Bros. v. Cal.-Fla. Plant Corp.*, 193 U.S.P.Q. (BNA) 264, 293 (5th Cir. 1976).

§5:5 Provisional Applications

A provisional application receives a filing date when a written description, necessary drawings, and the names of the inventors have been supplied to the Patent and Trademark Office. No claim is required.⁴⁰ Because the applicant must file a nonprovisional application within one year of filing the provisional application, the applicant may first file the claim when the nonprovisional application is filed.

As a provisional application filed without a cover sheet identifying it as a provisional application is treated as nonprovisional,⁴¹ some practitioners recommend including a claim in the provisional specification. Also, preparing a claim may aid in preparing the specification of the provisional application, as it will help the claim drafter be sure that the disclosure of the provisional application provides antecedent support

for every element in the claim.

Further, the provisional application may serve as the basis of Paris Convention priority claims for filing applications in other countries. Some other country Patent Offices, like the European Patent Office, plan to strictly view all priority claims for compliance with regulations and support for the application in that Patent Office. A claim or even a set of claims will show that Patent Office that the provisional application is a basis for a priority claim, not a simple non-patent disclosure. There is no requirement that the U.S. provisional application include any claims. This recommendation is merely precautionary until it is seen how U.S. provisional applications are actually accepted by other country Patent Offices.

A claim in the provisional application can be in any form, since the provisional application claim is not required and therefore is not examined for compliance with any statutory section, section 112 or section 102 or 103. Some practitioners use a simple omnibus claim: "A [invention title] as shown and described." But that is a matter of choice.

FOOTNOTES:

Footnote 40. MPEP §601.01(b).

Footnote 41. MPEP §506.

§6:1 In General

Compositions of matter are products where the chemical nature of the substances or materials used, rather than the shape or form of a product, is the distinguishing characteristic. As with machines versus manufactures, there is no need to determine the statutory pigeonhole between manufacture and composition. If one had a situation where both the form and composition of a material were required for novelty, or otherwise to be claimed, it would not be necessary to designate into which class the claim fell.

As in the other classes, most composition claims are combination claims, except where a new compound or molecule per se is claimed. Even those involve combinations of the chemical elements, and groups of elements, or radicals. Composition claims are usually fairly easy to prepare, as to formulating a claim; the main problems relate to the allowable scope of the claims, such as: How many examples are needed to support a generic claim? ¹ How close can one come to the prior art? Problems in broad functional definitions of materials (section 3:22) are especially acute. ²

One simple example of a composition claim to a combination of materials follows:

11. A zinc electroplating solution, comprising:

(a) an aqueous solution of zinc acetate, from 30 to 90 grams per liter;

(b) citric acid, from 1.5 to 3 times the zinc acetate concentration; and

(c) an alkaline pH-modifying substance in an amount sufficient to adjust the pH³ to a value of from 4 to 5.5.

Note that the "elements" of a composition claim are chemical elements or compounds, described either broadly (element c) or narrowly (elements a and b), depending on the prior art. Note that the "pH modifying substance" clause is very similar to a "means clause" in that it tells what function the element performs, not what it is. Presumably, any alkaline substance would work in the combination, and the point of invention concerned establishing the stated pH range, not how to establish it. Means clauses are not often if ever used in composition claims, but the author sees no theoretical reason why they could not be, as: "means for adjusting the pH of the solution to a value of from 4 to 5.5. or perhaps "a substance for . . ." because it is not necessary to use only the word "means" to meet 35 U.S.C. §112, paragraph 6 (section 3:25). As described in section 3:25, the statute says "an element in a claim for a combination"; it does not limit this to any particular type of combination.

In a composition claim, it is usually not essential to state the intended use for the composition in the preamble. Under classic rulings, a label such as "zinc electroplating solution" will not save the claim if the composition per se is old for another use. (See further comments in section 6:7, new use claims.)

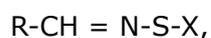
A composition of matter, claimable under the patent law, may be a new molecule, compound, solution, mixture, and even a living being, etc., although, in the case of a mere physical mixture of materials, an obviousness question is very likely to be raised. However, the test should be whether it would have been obvious to associate the materials, not *how* they are associated. *Ex parte Dubsky & Stark*⁴ is one case allowing claims to a physical mixture. Although the components of the mixture (a polymerizable compound and a chelate) were intended to react to form a compound, the mixture had a substantial shelf life and thus could be claimed. The Board implied that, if the reaction were instantaneous, the mixture could not be claimed because it would have no substantial existence.

Special problems come up in the metallurgical arts in claiming new alloys, usually nowadays including changes in proportions of known ingredients to achieve new properties or advantages. Also, as discussed in section 6:6, it is often permissible to refer to an area of a component diagram shown in the drawings to define proportions of ingredients in metallurgical cases.

In the early 1960s, the Board of Appeals settled a long-standing philosophical debate by allowing claims to new atoms. Claim 1 of patent 3,156,523 reads "Element 95" (now called americium) and Claim 1 of patent 3,161,462 reads "Element 96" (curium).⁵ The Board of Appeals held that the claims were directed to proper statutory subject matter, but that both elements were anticipated as having been inherently produced in the prior art (Enrico Fermi *et al.* patent), etc. The C.C.P.A. held the elements were neither anticipated nor obvious in view of the prior art, and that any prior production was minuscule and unknown. (Many might question the basic conclusion as to the obviousness of a new atom per se.⁶)

A typical type of claim to a new organic molecule:⁷

12. A compound having the formula:



wherein

R is an alkyl group selected from the group consisting of methyl, ethyl and isopropyl;
and

X is a halogen selected from the group consisting of chlorine and bromine.

Note that the foregoing claim covers a total of six specific compounds, for any use to which they can be put. This illustrates the very common class of inventions in which new molecules are claimed by structural formula. It also illustrates the use of what is termed "*Markush*," or alternative, terminology to cover several different compounds with a single claim (see section 6:2).

See section 2:9 for comments on dependent composition claims, and section 6:8 on *Jepson*-type claims in this area.

Summary

Composition of matter claims list the chemical ingredients (compounds, elements or radicals) making up the composition or compound. The ingredients or elements may be claimed narrowly (specific named components), with intermediate scope (a group of similar elements functionally equivalent), or broadly as to function performed, where the prior art permits. Where necessary to novelty, etc., the proportions or other conditions or parameters of the compound are stated, usually in ranges of concentration of ingredients. The intended use for the composition (rust inhibition, antibiotic) may or may not be stated in the preamble. (See section 6:7 for details on the effect of preamble limitations.) The problems in chemical practice

come primarily with obviousness questions over prior art and how much disclosure is needed in the specification, not primarily in the techniques of drafting claims.

FOOTNOTES:

Footnote 1. See *In re Marzocchi*, 169 U.S.P.Q. (BNA) 367 (C.C.P.A. 1971); *Ex parte Laiderman*, 175 U.S.P.Q. (BNA) 575 (Bd. App. 1971). Note also the possibility of "reading on inoperative species." *In re Cook & Merigold*, 169 U.S.P.Q. (BNA) 298 (Bd. App. 1971). Although *Cook* was not a "chemical case" (optical lens), the problem most often arises in chemical-type cases.

Footnote 2. See *Ex parte Slub*, 157 U.S.P.Q. (BNA) 172 (Bd. App. 1967) (discussed in section 31); *In re Koller*, 204 U.S.P.Q. (BNA) 702 (C.C.P.A. 1980).

Footnote 3. A measure of acidity, numbers below 7 being acid.

Footnote 4. *Ex parte Dubsky & Stark*, 162 U.S.P.Q. (BNA) 567 (Bd. App. 1968).

Footnote 5. See *In re Seaborg*, 140 U.S.P.Q. (BNA) 659 (C.C.P.A. 1964); *In re Seaborg*, 140 U.S.P.Q. (BNA) 662 (C.C.P.A. 1964).

Footnote 6. See also *In re Bergstrom*, 166 U.S.P.Q. (BNA) 256 (C.C.P.A. 1970).

Footnote 7. See also section 6:2 for further examples of formula claims to organic molecules and groups of molecules.

6:2 "Markush" Expressions

Markush expressions are alternative expressions described in MPEP section 2173.05(h):

. . . a *Markush* group, recites members as being 'selected from the group consisting of A, B, C.' *Ex parte Markush*, 1925 C.D. 126; sanctions claiming a genus expressed as a group consisting of certain specific materials. Inventions in metallurgy, refractories, ceramics, pharmacy, pharmacology and biology are most frequently claimed under the *Markush* formula but purely mechanical features or process steps may also be claimed by using the *Markush* style of claiming, see *Ex parte Head*, 214 U.S.P.Q. 551 (Bd. Appl's 1981); *In re Gaubert*, 187 U.S.P.Q. 664 (C.C.P.A. 1975) and *In re Harnisch*, 206 U.S.P.Q. 300 (C.C.P.A. 1980).

Further, as to the form of language for a *Markush* grouping MPEP section 2173.05(h) states: "It is improper to use the term 'comprising' instead of 'consisting of'." In other words the group must be recited as closed ended.

Rather than using "selected from the group consisting of," one can simply list the

group members, with "or" preceding the final member (see below in this section). Although "a" used as an article to introduce a claim element could mean one or more in an open-ended patent claim, "a" used with "consisting of" indicates only one member of a *Markush* group. The claim at issue⁸ included a list of Lewis acid inhibitors in a *Markush* group. It later referred to "a" Lewis inhibitor. This was held not to refer to more than one inhibitor, but to indicate only one of those inhibitors. That is because a *Markush* group is close-ended.

Furthermore, *Markush* grouping can lead to possible double inclusion of a claimed element. An example in the MPEP section 2173.05(h) is a *Markush* group: "selected from the group consisting of . . . halogen . . . chloro . . ." The group is acceptable although "halogen" is generic to "chloro." The claim itself must be evaluated for indefiniteness.

The *Markush* expression is commonly used in chemical cases as it deals with naming a selected group of materials. However, practitioners sometimes use them in nonchemical, for example, mechanical and electrical cases, where the rationale for the use of such an expression will equally apply.^{8,1} The Manual section says it may be used for "purely mechanical features," like simple screws or staples, or even individual large, complex structures. It may be used for "process steps," for example, gluing or stapling.

A *Markush* group is a sort of homemade generic expression covering a group of two or more different materials (elements, radicals, compounds, etc.), mechanical elements, or process steps, any one of which will work in the combination claimed.

There are two requirements to satisfy a *Markush* group: (1) the generic field must be present and (2) one of the specified members of the group must be in the generic field. In *Biovail Laboratories, Inc. v. TorPharm, Inc.*,^{8,2} the claim was "a wetting agent" "from the group consisting of" several chemicals. To meet this claim element, a material must be both the generic "wetting agent" and one of the group members. The "wetting agent" was not defined merely by being a member of the group. The court separately construed the term "wetting agent" from the prosecution history, dictionaries, and treatises. In addition, it had to be a group member. But a group member that is not also a wetting agent would not satisfy the generic term "wetting agent."

Treatment of a claim element as a *Markush* group occurs even if that treatment was not intended.⁹ For example, prior art teaching one member of the group will be prior art as to the entire *Markush* group. If you do not intend to claim a *Markush* group, do not use alternative language for a series of related alternative elements.

A typical example, from the previous section, Claim 12:

. . . a halogen selected from the group consisting of chlorine and bromine.

Note that this covers either chlorine or bromine, either of two specific elements out of five in the halogen group, in apparent violation of the "rule" against alternative claiming discussed in section 3:13. The *Markush* doctrine originated out of necessity. In the previous example, there is no generic word for the specified group of two halogens out of five. To refuse a generic claim because of a paucity of language seems unreasonable. Thus, *Markush* language is used to create an artificial generic expression.

Mr. Markush's claim in question involved: "a material selected from the group consisting of aniline and halogen substitutes of aniline."

Markush terminology may be used in claims in any of the statutory classes of utility patents; wherever several alternative types of material are involved. Thus, although the claim may be to a mechanical structure, an article of manufacture, the particular element of that structure that is described by a *Markush* expression may be a chemical type limitation. As an example of an article of manufacture, in the resistor of section 5:1, if the only materials that would work for the terminal stripes were copper, silver and aluminum, or if for any other reason a claim limited to those three materials were desired, clause (c) of Claim 7 could read as follows: "a stripe of *a conductive metal selected from the group consisting of copper, silver and aluminum at each end of the core in electrical contact with the carbon coating.*"

For a process claim including a series of materials or elements that may be used as alternatives, consider the example in section 4:7 of treating polyethylene articles, and suppose that the acid could be only concentrated sulfuric, nitric, or phosphoric acid.

The claim would then read:

5A. A process for treating the surface of a polyethylene article to increase its receptivity to a printing ink, which comprises:

exposing the surface of the article to a saturated solution of sodium dichromate in *an acid selected from the group consisting of concentrated sulfuric, nitric and phosphoric acids.*

Markush group claiming can be extended to alternative process steps. In a process limitation, the *Markush* group consists of a group of steps: ". . . weakening the bond by a process selected from the group consisting of heating, freezing, and pulling the pieces apart. . . ." In Claim 5A above, the exposing step may be written as an additional *Markush* grouping, "wherein the exposing is performed by a process . . . ," or "wherein the exposing step is selected from the group consisting of

dipping, spraying and painting" or even "wherein the exposing is done by dipping, spraying or painting," since the "or" alternative is also permitted, see below.

In the foregoing examples, the italics indicate the *Markush* phraseology. The precise format should, but not must, be followed exactly. The *Markush* expression preferably has the form "a selected from the group consisting of and" Note that the word "consisting" limits the claim to the named group, as mentioned in section 2:6.

An interesting example is from Stebbings patent 3,234,948 on a cheese filter cigarette: "2. A cigarette filter according to claim 1, in which the cheese comprises grated particles of cheese selected from the group consisting of Parmesan, Romano, Swiss and cheddar cheeses." This illustrates the use of a *Markush* expression to define one element of an article of manufacture claim.

The claim in which the expression appears may have the transition word "comprising" after the preamble, but the *Markush* expression of the claim may never include "comprising." Instead, the *Markush* expression must begin only with "the group consisting of."

Further, the group members are listed separated by commas. Where the *Markush* expression is introduced by "selected from the group consisting of," the final member of the group is preceded by the conjunction "and." ¹⁰ Proper practice also permits claiming in the alternative using "or," if a *Markush* group would have been proper, but then you omit the formulaic "selected from the group consisting of": When materials recited in a claim are so related as to constitute a proper *Markush* group, they may be recited in the conventional [Markush] manner, or alternatively. For example, if "wherein R is a material selected from the group consisting of A, B, C and D" is a proper limitation, then "wherein R is A, B, C or D" shall also be considered proper. ¹¹

Under this modification, in the example of Claim 7, one could recite a "stripe of copper, silver or aluminum. . . ." This is much simpler and covers the same thing as the regular *Markush* form.

Improper use of the Markush form, even if unintentional, may have an unexpected result. In *Superguide Corporation v. DirecTV Enterprises,*

Inc., ^{11.1} the patentee claimed ". . . information which meet at least one of the desired program start time, the desired program end time, the desired program service, and the desired program type. . . ." The Federal Circuit said that language required one member of each category be present in order to meet the claim element. Had "or" been used in place of "and," there might have been only need for

one element from one category to meet the claim element. Alternatively, had the expression begun "information which meet at least one of the group consisting of the desired program . . . ," that would have become a properly recited Markush Group and the patentee's construction might have prevailed.

There once was a policy against *Markush* claims of diminishing or varying scope (Claim 1--the group A, B, C, and D; Claim 2--A, B, and C), but this is now considered proper *unless* ". . . such a practice renders the claims indefinite [this would be rare] or if it results in undue multiplicity." ¹²

Markush claims also may be allowed as subordinate ("subgenus") claims under a broader ("genus") claim not naming particular materials ¹³ (see section 6:9 on generic and species claims). Under this liberalized practice, for example, Claim 1 could cover conductive materials broadly; Claim 2, a *Markush* group of five materials; claim 3, a limited group of three preferred materials; etc.

When claiming specific compounds per se (that is, molecules), questions have arisen in how closely related the members of the *Markush* group must be for the claim to be proper: could one claim such disparate things as air, earth, fire, or water? Polypropylene, benzene hexafluoride, tantalum sesquinitride, or undiscovered element 117? MPEP section 2173.05(h) requires that the materials in the *Markush* group must ordinarily "belong to a recognized physical or chemical class or an art-recognized class." Air, earth, fire, and water would not suffice.

Unlike *Markush* groupings that recite materials or a compound, *Markush* groups in a claim reciting a process or a combination need not belong to one class. ¹⁴ MPEP section 2173.05(h) says "it is sufficient if the members of the group are disclosed in the specification to possess at least one property in common which is mainly responsible for their function in the claimed relationship, and it is clear from their very nature or from the prior art that all of them possess this property." This lends itself to making a broad range of mechanical equivalents, sharing one common property, part of a *Markush* grouping: "a resting surface selected from the group consisting of a chair, a bench and a stool." The *Markush* grouping is more easily explained if the clause including it includes the property that the members of that group possess, for example, "a resting surface." Alternatively, that property may be recited in a preceding claim without the *Markush* group and the specified group may then be recited in a following dependent claim, as "wherein the resting surface is selected. . . ."

In mechanical cases, there would usually be some generic word available, often a "means for" clause, avoiding the need for *Markush* claiming and making its use optional. Yet, the *Markush* claiming is also available. For example, the *Markush* grouping a "fastener selected from the group consisting of nail, rivets and screws" may instead be preceded by the generic claim reciting "a fastener" or a "means for

fastening."

MPEP section 803.02 concerns restriction requirements for *Markush* groups and permits such requirements when members of a group present independent and distinct inventions. Then the examiner may require provisional election of a single species. As MPEP section 803.02 states:

Broadly, unity of invention exists where compounds included within a Markush group (1) share a common utility and (2) share a substantial structural feature disclosed as being essential to that utility.

The above appears to relate only to claims for two different compounds. When claiming a process or a combination of materials, standard Patent and Trademark Office practice is more liberal:

it is sufficient if the members of the group are disclosed in the specification to possess at least one property in common which is mainly responsible for their function in the claimed relationship and it is clear from their very nature or from the prior art that all of them possess this property. ¹⁵

Also, where a *Markush* expression is applied only to a portion of a chemical compound (for example, Claim 12, a radical such as methyl, ethyl, etc.), the propriety of the grouping is determined by consideration of the compound as a whole, and does not depend on there being a community of properties in the members of the *Markush* expression per se. ¹⁶

Summary

Markush claims define alternative chemical ingredients that can be used in a compound, composition, alternative steps in a process, or alternative choices for an article. Where claiming alternative compounds, they must not be "patentably distinct" under present Office practice; otherwise, they need only have a common property useful in the combination claimed. The standard format is "a ... selected from the group consisting of A, B, and C." There are many detailed rules on Markush practices described in the preceding section, and modern Patent and Trade Office practice may be to restrict use of Markush claims and to require restriction between inventions the examiner thinks are independent and distinct.

FOOTNOTES:

Footnote 8. *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 67 U.S.P.Q.2d (BNA) 1191 (Fed. Cir. 2003).

Footnote 8.1. *Cf. Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 69 U.S.P.Q.2d (BNA) 1865 (Fed. Cir. 2004).

Footnote 8.2. *Biovail Labs., Inc. v. TorPharm, Inc.*, 326 F. Supp. 2d 605, ... U.S.P.Q.2d (BNA)... (E.D. Pa. 2004).

Footnote 9. *See Brown v. Air Prods. & Chems., Inc.*, 229 F.3d 1120, 56 U.S.P.Q.2d (BNA) 1456 (Fed. Cir. 2001).

Footnote 10. MPEP ?2173.05(h).

Footnote 11. *Id.*

Footnote 11.1. *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 69 U.S.P.Q.2d (BNA) 1865 (Fed. Cir. 2004).

Footnote 12. MPEP ?2173.05(h); section 8:3.

Footnote 13. MPEP ?2173.05(h).

Footnote 14. *In re Harnisch*, 206 U.S.P.Q. (BNA) 300 (C.C.P.A. 1980).

Footnote 15. MPEP ?2173.05(h).

Footnote 16. MPEP ?2173.05(h); *see Ex parte Price*, 150 U.S.P.Q. (BNA) 467 (Bd. App. 1965).

?6:3 Trademarked Materials; Arbitrary Names

Where an ingredient in a composition to be claimed is known only by a trademark or by an arbitrary name used in trade, according to the Patent and Trademark Office,¹⁷ such a name may be used in the application and claims *only* where the term has a fixed and definite meaning, either well known in the literature or defined in the application, if necessary by describing the process of manufacture. Where available, a generic name should be used. If the description is not sufficiently definite to enable one skilled in the art to practice the invention (35 U.S.C. ?112), the claim may be rejected.

A trademark does not identify a particular product, because the product or its characteristic to which the trademark is applied is changeable.¹⁸ Thus, claim the product by its relevant generic name or its characteristics as disclosed on the specification or drawings. Examiners are instructed to reject a claim under section 112, paragraph 1 that includes a trademark or a trade name as a limitation to describe a material or a product.^{18.1} To avoid a rejection do not use a trademark in a patent application claim.

A different type of term is a name used in trade. That is a name for a product used

in a particular art and is nonproprietary. Names used in trade can be used in the claim if they have a sufficiently well known definition in the literature or are accompanied by a precise definition.

In a leading article, ¹⁹ F. Prince Butler reviewed many prior cases and publications on the subject, and deduced the following general rules and summary:

Rule #1-A Trade Term is properly used in a specification if those skilled in the art can make the product designated by the trade term at the time the application is filed, using the specification and/or published literature that is implicated by the specification.

Rule #2-A trade term is also properly used in a specification if the product is generally known to persons skilled in the art and is readily obtainable at the time the application is filed, provided the composition of the product is a trade secret and there is reason to believe that whenever the composition of the product is modified the trade term will also be changed.

Rule #3-A trade term is also properly used in a specification if it designates a component of the embodiment which is not essential to the invention.

Rule #4-A trade term can be used in a claim only if its meaning has been adequately defined in the specification, whereby it imparts specific limitations to the claim.

SUMMARY

Examiners are instructed to reject such claims. Generally, it is undesirable to use trademarks and trade names in patent applications. However, courts have allowed their use under a variety of factual circumstances. Because of the divergence of such decisions it is difficult for patent attorneys and patent office examiners to appraise whether or not particular trade terms have been properly used in patent applications. This note presents four rules which embody all the known cases involving the use of trade terms in patent applications.

The proper test should be the rule of reason, derived only from 35 U.S.C. §112. Has the applicant disclosed everything about the material he or she reasonably can? If so, that is enough.

If "Amberlite IRC 50" is a critical material in a process or composition, and if the applicant does not know what it is and the trademark owner will not say, why should he be denied a patent, assuming the invention is unobvious, etc.? If, as the board or courts worry, the trademark owner goes out of business or so modifies the formula that the invention no longer operates, then the patent would be useless. Validity would not come into question, because no one could practice the invention.

However, if, as more normally happens, the trademark owner does not go out of business, the patent would then remain operative and useful as long as the material stayed available. A patent with an effective life of five years is preferable to no patent at all. Also, since the disclosure of the trademarked material by name is a description of an existing thing, it should not be held "new matter" to add a further description of that material if it subsequently becomes available at any time before the patent is granted and perhaps even after the grant of the patent. The only thing that should be required is an affidavit or statement of *identity*--that the later description indeed describes the composition mentioned in the application--nothing else. The rule against the new matter²⁰ should really have nothing to do with this mere identification question.

Of course, trademarks should always be properly designated, by capitalizing them in upper case type and placing them between quotation marks.²¹

Summary

Avoid defining compositions used in practicing an invention by trademark or trade name so far as possible. Where there is no other way, describe everything known about the material in the application. If rejected under 35 U.S.C. §112, appeal.

FOOTNOTES:

Footnote 17. MPEP §608.01(v); MPEP §2173.05(u).

Footnote 18. MPEP §608.01(v); *Ex parte* Bickell, 122 U.S.P.Q. (BNA) 27, 28 (Bd. App. 1957).

Footnote 18.1. MPEP §706.03(d), [para] 7.35.01 therein and *Ex parte* Simpson, 218 U.S.P.Q. (BNA) 1020 (Bd. App. 1982).

Footnote 19. Butler, *Rules Defining the Use of Trade Terms in Patent Applications*, 51 J. Pat. Off. Soc'y 339 (1969).

Footnote 20. 35 U.S.C. §113 ("No amendment shall introduce new matter into the disclosure of the invention.").

Footnote 21. See MPEP §608.01(v) and other sources on correct trademark usage for details.

§6:4 Special Claims for Chemical Cases--Fingerprint Claims

In chemical composition claims, special forms of claims are sometimes permitted on an emergency basis. One important situation is where a new composition has been produced, such as a new or modified form of a material, but where the differences

from previous forms *cannot* be explained in terms of physical or chemical structure. In that situation, so-called fingerprint claims are sometimes permitted, defining the material in terms of its properties, such as X-ray diffraction patterns, solubility, melting point, etc. ²²

One famous example follows, from the Aureomycin patent, Duggar 2,482,055.

Claim 1 reads:

Substances effective in inhibiting the growth of Gram positive and Gram negative bacteria selected from the group consisting of a substance capable of forming salts with acids, containing the elements carbon, hydrogen, nitrogen, chlorine, and oxygen, being very soluble in pyridine, soluble in methanol and in acetone and being slightly soluble in ethanol and in water, its crystals having a refractive index parallel to elongation between about 1.674 and 1.694, and exhibiting characteristic absorption bands in the infra red region of the spectrum when suspended in a hydrocarbon oil in solid form at the following frequencies expressed in reciprocal centimeters: 3420, 1643, 1609, 1580, 1523, 1302, 1231, 1209, 1121, 1080, 1050, 969, 943, 867, 844, 825, 805, 794, 788, 733, 713 and the acid salts of said substance.

This was a new chemical compound, but the inventors did not know what the structure was at the time. They described it as to every property known, as well as providing considerable detail in the specification on methods of production with a newly discovered strain of bacteria named "*Streptomyces aureofaciens*," because it produced the new chemical Aureomycin.

Note that the proper test for this type of claim should be whether it "distinctly claims" the invention under section 112 of the statute. In other words, do the listed properties so uniquely identify the novel composition, as do fingerprints, that they (1) distinguish from old compositions and (2) cover the new composition with sufficient certainty that potential infringers can tell when they have the patented compound and when they do not.

In *Benger Labs., Ltd. v. R.K. Laros Co.*, ²³ the court held:

. . . nothing in the law requires the courts to deny a patent to the inventor of a new and useful product merely because . . . the chemical structure cannot be recognized and described. All that is necessary is that the patentee make as full disclosure as he reasonably can and that he describe the product with sufficient particularity that it can be identified and that those who are interested in its manufacture are enabled to determine what will and what will not infringe.

Claim 1 in question was: "A composition comprising a substantially nonionic complex of ferric hydroxide with a dextran having an average intrinsic viscosity at

25[degrees]C. at about 0.025 to about 0.25, said complex being stable in contact with water." ²⁴ The court held that precise enough: "whatever its chemical formula may be, it can be distinguished from both mixtures and compounds." ²⁵

In at least some cases, the claim may be simplified by referring to a spectrum shown in a drawing. For example, Donouick *et al.* patent 2,982,689 (May 2, 1961):
A substance effective in inhibiting the growth of gram-positive bacteria, selected from the group consisting of thioestrepton and the salts thereof, said thioestrepton being

a weakly basic substance

having the following elementary analysis . . . ;

has an antibacterial spectrum including . . . ;

possesses a crystalline structure in the pure state;

is substantially soluble in . . . ;

and relatively insoluble in . . . ;

darkens at . . . and

melts at . . . ;

has an absorption spectrum . . . ;

and an infra spectrum when suspended in hydrocarbon oil in

solid form substantially as shown in the drawing.

See section 6:6 on claims referring to drawings generally, and section 6:5 on coined name claims. This seems to be a hybrid claim, defining first the coined name and then its distinctive properties, telling what the coined name means. ²⁶

See also *In re Miller* ²⁷ for an allowable fingerprint claim to polytetrafluoroethylene particles defined by size, molding properties (use), strength, and many other factors. Note this claim is to the form of a product, as a molding compound, not to its chemical composition. ²⁸

FOOTNOTES:

Footnote 22. See MPEP ?2173.05(t).

Footnote 23. *Benger Labs., Ltd. v. R.K. Laros Co.*, 135 U.S.P.Q. (BNA) 11, 14 (E.D. Pa. 1962), *aff'd*, 137 U.S.P.Q. (BNA) 693 (3d Cir. 1963).

Footnote 24. *Benger Labs.*, 135 U.S.P.Q. (BNA) at 13.

Footnote 25. *Id.* at 14.

Footnote 26. *See also* Waksman *et al.* patent 2,992,162 (July 1961; Cataldi *et al.* patent

3,015,607 (Jan 2, 1962); PLI *The Art of Drafting Patent Claims* 220-26, 333-35 (J. Jackson & G. Morris eds. 1966) (out of print).

Footnote 27. *In re Miller*, 169 U.S.P.Q. (BNA) 597 (C.C.P.A. 1971).

Footnote 28. *See Ex parte Gring & Mooi*, 158 U.S.P.Q. (BNA) 109 (Bd. App. 1967).

6:5 Coined Name Claims

A somewhat similar form of claim is the "coined name" claim. For example, in Conover patent 2,699,054, Claim 2 simply reads "Tetracycline."²⁹ While this patent has been much in litigation, the form of claim-- one word--was not attacked. Tetracycline was alleged to be a new organic molecule (whether or not it was new was part of the dispute), which was identified in the specification as to structure, properties and method of production. Of interest, it was a chlorinated form of Aureomycin discovered in the course of the research that finally determined the structure of Aureomycin. Presumably, the antibiotic tetracycline had become known by that name in the literature, so that the mere name did identify the compound, and drawing the long organic molecule was unnecessary.

Apparently, the Patent and Trademark Office has held that coined name claims are proper only where the name was known to the art before the application was filed. That would be rare.

In *Ex parte Brian*,³⁰ the Board held that a claim to "An alkali metal salt of gibberellic acid" was improper since the coined name was not art recognized, although defined in the specification.

Citing authority, the Board stated: "Since these claims do not recite the . . . necessary physical and chemical characteristics [as in other "fingerprint" claims] . . . to properly identify the acid, they do not adequately define the invention."³¹ Fingerprint claims to the unknown structure were allowed as discussed in section 6:4. Product-by-process claims (section 5:2) were rejected because the material

could be otherwise defined, that is, by the fingerprint claims.

It is not clear whether such a claim could be used instead of a fingerprint claim in such a case as Aureomycin, where the structure was unknown at the time, but the name was known. The method claims in the Duggar patent do refer to "A process for the production of Aureomycin," without repeating all the characteristics. Perhaps a coined name claim to an unknown structure, if allowable, would not be as valuable as a fingerprint claim because, from the claim, it would not be clear which of all the properties listed in the specification would be required to infringe the coined name claim, whereas each of the fingerprint claims lists specific key properties that must be met, but not all properties mentioned in the specification. If the claim is to one specific molecule, the number of properties listed would presumably be immaterial because the compound is the same regardless of the number of properties listed.

For fullest protection, the practitioner can use both a fingerprint claim and a coined name claim.

In Altman *et al.* patent 3,382,053 (May 7, 1969), the Office allowed both a coined name claim "A composition of matter comprising beta tantalum" and several fingerprint claims describing the material in terms of its properties and characteristics. The Altman patent involved a new form of the element tantalum of unknown physical structure, but the distinct properties of which could be stated in terms of crystallographic analysis, etc.

In all of these situations, whether or not the structure is unknown, a product-by-process claim might also be proper--as noted in section 5:2-- to define the new material. Note the process would necessarily be different, and almost always unobvious, if a new material were produced. However, such a claim would not necessarily be as valuable as a fingerprint or coined name claim, since the product-by-process claim would cover the material only when made by that process, and there might be other processes to produce the material. Sometimes, fingerprint and product-by-process recitations are combined in a single claim further to identify the material.

As to presenting more than one type of claim to the same material, the board in the *Brian* case, previously discussed in this section, rejected all claims for "undue multiplicity" (sections 8:2-8:3), since applicants were attempting to claim the same material three different ways (coined names, fingerprint, and product-by-process). This ruling seems unduly harsh, and should not be proper today.

FOOTNOTES:

🔍Footnote 29. Its full name is "4-dimethylamino-1, 4a, 5, 5a, 11, 12a-octahydro-3, 6, 10, 12, 12a-pentahydroxy-1, 11-dioxo-2-naphthacenecarboxamide."

Footnote 30. *Ex parte Brian*, 118 U.S.P.Q. (BNA) 242 (Bd. App. 1958).

Footnote 31. *Id.* at 245.

6:6 Claims Referring to Drawings

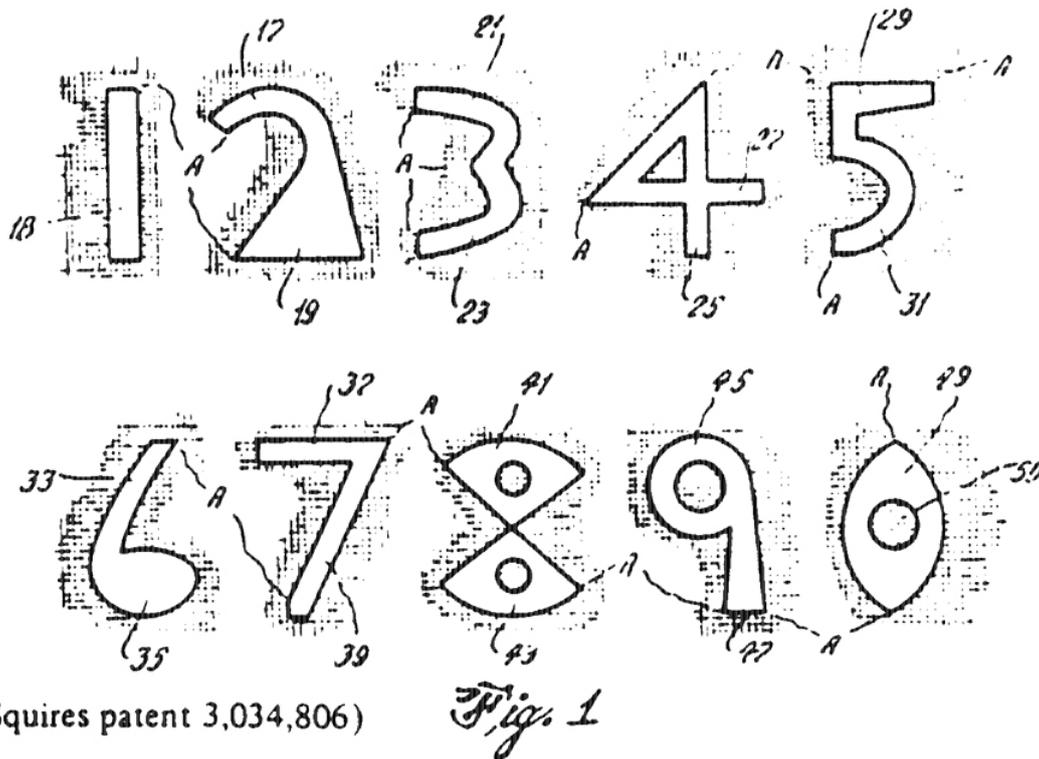
Another example of an emergency situation is a claim referring to a drawing Figure or a table. ³² Citing *Ex parte Fressola*, ³³ the MPEP says such claims are "permitted only in exceptional circumstances where there is no practical way to define the invention in words and where it is more concise to incorporate by reference than duplicating a drawing or table into the claim." Incorporation by reference is a necessity doctrine, not for applicant's convenience. There is no restriction to chemical cases, and it is useful in mechanical, electrical, etc. cases as well as chemical ones.

One example of this comes up in three-element compositions, such as alloys, where the proportions of one element may be varied and the other two may then be varied for each concentration of the first element. This can readily be depicted on a three-element triangular diagram, but is extremely difficult to define in words. Thus, where practical necessity dictates, claims with limitations such as the following have been allowed: "with said manganese content restricted to amounts beneath the curve in the accompanying diagram. . . ." ³⁴ The diagram was a series of curves in a drawing showing maximum amounts of manganese for various amounts of chromium.

Similarly in a process, Claim 1 of Stauch patent 3,248,173 (April 26, 1966) reads: A process for testing female urine to determine pregnancy which comprises heating in the urine at a pH below 6.5 a paper strip impregnated with a predetermined amount of iodine, the amount of iodine being related to the specific gravity of the urine sample and to the volume thereof in the manner shown on the accompanying graph, to produce a raspberry pink color on said strip indicating pregnancy when the test is positive.

The graph was a three dimensional perspective drawing, depicting operable amounts of iodine as a function of volume and specific gravity.

In 1961 this doctrine was extended to a mechanical case. In *Ex parte Squires*, ³⁵ the Board of Appeals allowed a claim to "A font of numerals as shown in Fig. 1," reproduced below:



As is apparent, it is extremely difficult, probably impossible, to describe the characteristics of the numerals in words.

Applicant alleged that this font was particularly superior to previous numerals in low intensity red light encountered in submarines, which increased the readability of the numerals. That was not denied by the examiner.

The Board found this to be: "the best, most accurate way of defining the invention which depends on . . . the precise configuration of the numerals and their interrelation in a set."³⁶ Claim 2 of the Squires patent (the only other claim allowed) reads: "In an environment of low brightness of red light, a font of numerals as shown in Fig. 1."

As to what equivalents are covered by such a truly "picture claim," no one may ever know, since it is a United States government patent intended for use in submarines. For further discussion of the principles, see an article by the attorney for Mr. Squires, L.B. Applebaum.³⁷

In 1966, the Board of Appeals refused to extend the *Squires* doctrine,³⁸ holding that it is a doctrine of necessity only, not one for applicant's convenience. In *Lewin*, a claim to an electrical method as "The method set forth in Figure 15 of retrieving words from a content-addressed memory" was held improper. Figure 15 was a block diagram depicting the steps in the method. The reasoning was that that method of claiming was not necessary, and could not be used merely for convenience.

The Board held:

We note that certain exceptions have become recognized in the case of inventions in which the only, or only feasible mode of definition is by an incorporation by reference from outside the claims, as for example microphotographs of metallurgical grain structures or irregular areas of a graph, such as a phase diagram. *Ex parte Squires*, 133 U.S.P.Q. 598, is a similar exception based on the specific nature of the subject matter of that invention, a font of numerals, which the Board found to be the most accurate way of defining the invention in view of the "poverty of words to properly point out and distinctly claim the invention."

In *Ex parte Gring & Mooi*,³⁹ the Board permitted reference to the drawing, which was there a photomicrograph submitted pursuant to MPEP section 608.02. The Board permits "reference in a claim to a figure of an application drawing where such reference points out with sufficient clarity what could be set forth in words only with prolixity and less clarity." Of course, a design patent claim refers to a drawing.⁴⁰ But that is a special type of patents.

Summary (Sections 6:4-6:6)

In emergency cases involving impossibility of words accurately to define an invention, special techniques may be employed, such as the fingerprint claim (section 6:4); more rarely, the coined name claim (section 6:5); or the claim referring to drawings (section 6:6). These are emergency doctrines only, and normally one has to show there is no other possible or practical way. Normally these are limited to chemical cases, although there is no necessary reason they have to be, as in the "font of type" case.

FOOTNOTES:

³²Footnote 32. MPEP ?2173.05(s).

³³Footnote 33. *Ex parte Fressola*, 27 U.S.P.Q.2d (BNA) 1608, 1609 (Board of Patent Appeals and Interference 1993).

³⁴Footnote 34. *In re Tanczyn*, 97 U.S.P.Q. (BNA) 150 (C.C.P.A. 1953).

³⁵Footnote 35. *Ex parte Squires*, 133 U.S.P.Q. (BNA) 598 (Bd. App. 1961).

³⁶Footnote 36. *Id.* at 600.

³⁷Footnote 37. Applebaum, *The One Line Picture Claim*, 44 J. Pat. Off. Soc'y 379 (1962).

Footnote 38. *Ex parte Lewin*, 154 U.S.P.Q. (BNA) 487 (Bd. App. 1966).

Footnote 39. *Ex parte Gring & Mooi*, 158 U.S.P.Q. (BNA) 109 (Bd. App. 1967).

Footnote 40. *See* section 5:3.

6:7 Use Claims and New Use Claims; Preamble Limitations

One may not simply claim a new use for an existing object or composition, by stating the object or composition and then stating its use.⁴¹ Two examples of improper "use" claims appear in the Manual: "A process for using monoclonal antibodies of claim 4 to isolate and purify . . . interferon" and the "The use of a[n] . . . iron alloy . . . as a vehicle brake part subject to stress by sliding friction." Use claims are common in patents in other countries. A product or process is recited in one claim. Another, sometimes dependent, claim then recites the use of the product or process for a stated purpose, or something does not even state the purpose. This is indefinite and nonstatutory under section 101 or section 112.⁴²

A new use claim is instead a process of using the object or composition or process, which includes steps in the process. The claimed process must be directed to a new use. If the claimed new use is only a newly discovered and therefore inherent result of a known, prior art process directed to the same purpose, it is not a patentable new use, as it is inherent in and anticipated by the known process.⁴³

At least until 1969, standard textbook law and routine Patent Office rulings were that one could not rely for novelty on a statement of intended use in the preamble of a composition claim, sometimes called a "label claim."

For example, if the zinc-electroplating solution of Claim 11 (section 6:1) were old for some other (and, it was hoped, unrelated) purpose, the label "a zinc electroplating solution" would not render the claim to the old material patentable. Instead, one would need to employ a "new use" claim, which is nothing more than an ordinary method claim, the main difference being that the novel feature is not, or need not be, in the manipulative steps of the method. Rather, the novelty may reside in the use of the old composition for a new purpose. Such a claim might read:

13. A method of electroplating zinc, which comprises the step of electrolyzing a solution comprising:

(a) an aqueous solution of zinc acetate, from 30 to 90 grams per liter;

(b) citric acid, from 1.5 to 3 times the zinc acetate concentration; and

(c) an alkaline pH-modifying substance in an amount sufficient to adjust the pH to a value of from 4 to 5.5.

Note that this claim recites the same composition defined in Claim 11, but the invention is now phrased as a method. The test of patentability becomes obviousness of the new use, since a novel process is defined. Even though the only manipulative step, "electrolyzing," is notoriously old, the novelty of a process step may reside in the material being treated as well as in the nature of the step itself (see section 4:7). If the composition were previously used as a cleaning solution, it presumably would be unobvious to employ it as an electroplating solution.

The doctrine that one cannot claim an old material as a composition by stating an intended new use in the preamble has sometimes been stated as being that one cannot patent a new use for an old material. That is misleading because new uses have long been patentable as methods; in fact many method claims inherently involve new uses for old materials. Since 1952, the statute (35 U.S.C. §100(b)) has expressly covered this by stating that the word "process" includes "a new use of a known process, machine, manufacture, composition of matter, or material." ⁴⁴

As another example of a new use for an old material, the method of treating polyethylene of Claim 5 (section 4:7) is also a new use claim if the treating solution (sodium dichromate and sulfuric acid) is known for other uses, such as cleaning test tubes.

Although the statute expressly refers to new uses for old materials, etc., a new use for a new material is equally patentable as a process under standard interpretation of the term "process." In other words, as far as a process claim, such as Claim 13, is concerned, it matters not whether the material is old or new. For the composition claim, such as Claim 11, the composition per se must be novel under conventional tests.

Where the new use is properly claimed as a process, the claim must be written as a normal process or method claim (see sections 4:1-4:2), including steps or acts. In *Clinical Products, Ltd. v. Brenner*, ⁴⁵ an attempted hybrid claim to "the use of X (an old chemical) as a Y (use)" was held improper as not a true process claim. A proper method claim would have been: "the process of (doing thing Y), which comprises administering (compound X) to the body (or object in question)."

Under statute 35 U.S.C. §100(b), there can be a patentable new use for every class of invention. Thus, for a new use for a known process, a claim might read: A process for [the new use] comprising [performing the known step(s)] on a [previously unselected, different, known object, but unobvious to select that object].

For a new use for a known machine, manufacture, composition or matter or material, a claim might read:

A process for [the new use] of a [the known machine, manufacture, composition or material] comprising [performing one or a series including at least one previously unselected step, whether that step is known or unknown as a step, but unobvious to select that step] on [a workpiece] [or] for [accomplishing a specified objective, possibly relating back to the new use].

The following text discusses claiming a known product with a new use in other than method claim form.

Perhaps the leading case on the "new use" product claim is *In re Thuau*⁴⁶ in which the court held that a claim to a therapeutic agent, which was an old compound for tanning, was not patentable as a compound. A typical claim read: "A new therapeutic product for the treatment of diseased tissue, comprising a condensation product of metacresolsulfonic acid condensed through an aldehyde." Method claims were not involved or mentioned in the decision. This case led to the "rule" that "a new use of an old compound, without modification, is not patentable," meaning as a composition. How much "modification" is needed is a subject of much controversy, and many cases have appeared on the details. For example, is it enough to:

1. Add a carrier or a solvent? Generally, no, unless perhaps some particular solvent cooperates specially with the composition.⁴⁷ Note also the Muller DDT claim discussed later in this section.

In *Ex parte Douros & Vanderweff*,⁴⁸ the Board considered a claim to:

A composition for use as an effective algaecide which comprises . . . [a named compound] dissolved in a solvent selected from the group consisting of water, ethyl alcohol and mixtures of water and ethyl alcohol.

The compound was held obvious over the art, but the use was not. With respect to the solvent, the Board held: "It is clearly obvious to add a carrier or a solvent to an unpatentable compound, [citing many cases]." With respect to the statement of use, it held: "The recital in the claims of the intended use of the composition does not patentably distinguish it from an aqueous solution thereof. *In re Sinex* . . . 135 U.S.P.Q. 302."⁴⁹

In *Ex parte Billman*,⁵⁰ Claim 24 read:

A plant stimulant composition containing as an essential active ingredient . . . [X chemical] in a water soluble diluent selected from the class consisting of . . . [generally old materials] . . . in the proportions of 10 to 20 grams for each pound. . . .

X chemical was old for other (unstated) purposes, selection of the solvent apparently was trivial, and the proportions were not alleged to be critical (nor probably were they). The claim was rejected as a direct consequence of *Thuau*. One could not, at least in 1946, avoid the *Thuau* doctrine by adding obvious limitations so as to define a technically novel chemical composition.

2. Make the material into a tablet or capsule; (the so-called dosage-form claims)? Probably not if the tablet is the pure material, but if the dosage form requires a particular unobvious concentration of the pharmaceutical, effective for a certain disease, then, often, yes.

*In re Craige*⁵¹ considered:

13. A veterinary antihelminthic [tapeworm killer] composition containing an essential active ingredient [X, an old chemical] and a solid carrier therefor and in the form of a compressed tablet.

The court held that (1) the label was no help under *Thuau*, which was merely a "restatement of the well established rule 'that a patent for a new use for an old substance quite unchanged is not authorized.' . . . "; (2) adding a carrier, making into a tablet, or doing both was not inventive:

While it is true that in certain cases invention might be present in a very slight alteration and the *Thuau* doctrine avoided, such alteration must always amount to more than mechanical or professional skill.

In *In re Halleck*,⁵² however, the court allowed a claim to "an improved *growth stimulating* composition for animals which comprises an animal feed and *an effective amount* of [old compounds] contained therein for *growth stimulation*." Other than the *italicized* phrases, the mixture was old.

All of this has been very confusing and involves hypertechnical consideration of apparent flyspecks.

In 1967, the C.C.P.A. cast grave doubt on the entire basis of the *Thuau* doctrine. In *In re Duva*,⁵³ the court held that one could not ignore the preamble limitation, "a composition *for* chemically depositing gold," and that *all* statements in the claim must be considered in determining obviousness.

The court stated:

Thus, all *factual* differences which may be properly noted in any portion of a claim must be included within the basis for comparison with the prior art if we are to

properly evaluate the *differences* between the invention defined in a claim and the teaching of a reference. The command of 35 U.S.C. section 103 is to compare the invention *as a whole* with the prior art. Absent a failure of the applicant to comply with 35 U.S.C. section 112, we think every portion of the appealed claims must be considered in determining the invention as a whole in arriving at our decision as to obviousness required by a rejection under section 103. ⁵⁴

See also *In re Miller* ⁵⁵ and *In re Wilson*, ⁵⁶ cited in section 3:11, to the effect that "All words in a claim must be considered in judging the patentability of that claim . . ." Although those cases arose in other contexts (indefiniteness, etc.), the quoted language fits exactly with the *Duva* case, and should be applicable in many situations. In *Union Carbide v. Filtrrol*, ⁵⁷ the district court expressly followed the *Duva* case and held that "non-obviousness of novel compositions requires consideration of limitations in the preambles of the claims." The claims in question were not quoted. ⁵⁸

As to the materiality of preamble limitations generally, prior to the *Duva* case, that was a matter of great confusion. No one could say with any degree of certainty whether a particular preamble limitation was to be counted or not, and the test might be different depending on whether the applicant/patentee wanted the words counted to make the claim patentable, or ignored so as to copy someone else's claim for interference, or to catch an infringer. ⁵⁹

In *Union Carbide*, the body of the claim also contained some novelty, so it might not have been necessary for the court to throw out, if it did, that ancient doctrine. In view of this case, the future of "label-claims" is uncertain. It might be dangerous to rely on any silent overruling of the old *Thuau* doctrine. Thus, it is recommended that claims of the various types permitted, that is, product, process, new use, be sought.

Suppose one were permitted simply to claim: "An insecticide comprising . . . [DDT]," ⁶⁰ DDT being known for other uses. When another party merely makes DDT, it *is* an insecticide comprising DDT, but this cannot be an infringement because DDT is old. It might be difficult to tell when infringement arises. Is it when sold to a farmer in a bottle labelled DDT, but with no instruction as to what to do with it? Would whoever put a label "insecticide" on the bottle be an infringer?

The DDT patent, finally Reissue 22,922, was involved in a second application for reissue in *Ex parte Muller* ⁶¹ before the Board of Appeals. At issue were new use claims sought for the first time in the second reissue application, such as Claim 5: The method of killing insects which comprises dissolving the chemical compound [DDT] in a solvent liquid and spraying the liquid so as to bring the [DDT] into contact with the insects. ⁶²

This claim and a somewhat broader one were allowed as proper new use method claims. The original and first reissue claims were for "A contact insecticide composition comprising" a similar composition, the scope being narrowed in the first reissue. After the first reissue, the patentee learned that the composition was old, in an obscure thesis at the University of Basel, Switzerland, use as an insecticide not being suggested. The Board held that that was a proper reason for reissue, since the product claims were doubtful at best. Interestingly, the product claims were not rejected, although one concurring Board member would have taken them away under the *Thuau* case.

The object of the claim drafter in these cases should be to get as many different types of claims as possible. For example, in *Buzas et al.* patent 2,827,418 (Mar. 18, 1958), Claim 2 covers a new compound per se (but this might be found in obscure prior art); Claim 3 is to an intermediate (which could be unobvious if the compound turns out to be old); Claim 4 is for the process of making the intermediate (in case that material turns out to be old, the process might not be); Claim 6 is for an injectable preparation containing a certain amount of the compound of Claim 2 in water; and Claim 7 is for a tablet containing the required dose (0.15 gram) of the compound of Claim 2. Any of these different claims, as well as use claims, might be very important, depending on prior art later developed and on the court's feelings about the *Thuau* case and extensions to composition and dosage form claims.

Note that the method new use claims are usually far less desirable, and in many cases may be worthless, because the patentee, to enforce the patent, would usually have to sue each individual farmer, doctor, etc., which would normally be impractical. Those users are usually also the customers of the patentee. And who wants to sue a customer? However, the possibilities of also suing the supplier of a dedicated component or material having no substantial noninfringing use as a contributory infringer or suing the supplier for inducing the customer's infringement of the new use claim should be explored as a particular fact pattern develops.

It is interesting to note that the "new use" doctrine has been held not to apply to cases where the use results in a technically novel article of manufacture. This "technical novelty" doctrine was promulgated chiefly by Judge Learned Hand in *Traitel Marble Co. v. U.T. Hungerford Brass & Copper Co.*⁶³ and *Old Town Ribbon & Carbon Co. v. Columbia Ribbon & Carbon Mfg. Co.*⁶⁴ Those cases hold that, as long as there is *any* structural change, the patentable concept can reside in the realization of the new use in the new article, claimed in a claim directed to that article.

FOOTNOTES:

Footnote 41. MPEP ?2173.05(q).

Footnote 42. *Id.*

Footnote 43. *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 58 U.S.P.Q.2d (BNA) 1508, 1514 (Fed. Cir. 2001) (Bristol claimed the result of an infusion in cancer patients, the same purpose as previously, treating cancer); *In re May*, 574 F.2d 1082, 1090, 197 U.S.P.Q. (BNA) 601, 607 (C.C.P.A. 1978); *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 64 U.S.P.Q.2d (BNA) 1202 (Fed. Cir. 2002); *Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. (BNA) 773 (Fed. Cir. 1985). See examples in *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 62 U.S.P.Q.2d (BNA) 1781 (Fed. Cir. 2002) (shoe polish composition for shining shoes would bar later method claims on the composition used for shining shoes (novelty) or for repelling water (inherent in the composition) but would not bar method claim for new use of growing hair); *U-Fuel, Inc. (NV) v. Highland Tank & Mfg., Inc.*, 228 F. Supp. 2d 597 (E.D. Pa. 2002) ("fire resistant") ("such that the storage tank is able to withstand an environment of at least 2000 degrees F. for a period of time of at least two hours").

Footnote 44. See *Gottchalk, The Term "Process" Includes a New Use*, 40 J. Pat. Off. Soc'y 451 (1958); *Hewitt, The New Use Patent*, 51 J. Pat. Off. Soc'y 634 (1969).

Footnote 45. *Clinical Prods., Ltd. v. Brenner*, 149 U.S.P.Q. (BNA) 475 (D.D.C. 1966).

Footnote 46. *In re Thuau*, 57 U.S.P.Q. (BNA) 324 (C.C.P.A. 1943).

Footnote 47. *In re Rosicky*, 125 U.S.P.Q. (BNA) (C.C.P.A. 1960).

Footnote 48. *Ex parte Douros & Vanderweff*, 163 U.S.P.Q. (BNA) 667 (Bd. App. 1968).

Footnote 49. *Id.* at 668.

Footnote 50. *Ex parte Billman*, 71 U.S.P.Q. (BNA) 253 (Bd. App. 1946).

Footnote 51. *In re Craige*, 90 U.S.P.Q. (BNA) 33 (C.C.P.A. 1951).

Footnote 52. *In re Halleck*, 164 U.S.P.Q. (BNA) 647 (C.C.P.A. 1970). For additional discussion of these specific problems, see *Fellner, Method Claims for New Use and Their Enforcement*, 41 J. Pat. Off. Soc'y 54 (1968). For detailed discussion of problems in pharmaceutical practice, see *Wolk, Pharmaceutical Patent Practice*, in

Calvert, Encyclopedia of Patent Practice 622 (1964).

Footnote 53. *In re Duva*, 156 U.S.P.Q. (BNA) 90 (C.C.P.A. 1967).

Footnote 54. *Id.* at 94.

Footnote 55. *In re Miller*, 169 U.S.P.Q. (BNA) 597 (C.C.P.A. 1971).

Footnote 56. *In re Wilson*, 165 U.S.P.Q. (BNA) 494 (C.C.P.A. 1970).

Footnote 57. *Union Carbide Corp. v. Filtrol Corp.*, 170 U.S.P.Q. (BNA) 482, 519 (C.D. Cal. 1971), *aff'd*, 179 U.S.P.Q. (BNA) 209 (9th Cir. 1973).

Footnote 58. *Id.* at 519.

Footnote 59. *See In re Stencil*, 4 U.S.P.Q.2d (BNA) 1071, 1073 (Fed. Cir. 1987).

Footnote 60. The broadest label claim, claim 4, actually reads: "A contact insecticide comprising the chemical compound . . . [DDT] in an aqueous emulsion."

Footnote 61. *Ex parte Muller*, 81 U.S.P.Q. (BNA) 261 (Bd. App. 1948).

Footnote 62. *Id.* at 261.

Footnote 63. *Traitel Marble Co. v. U.T. Hungerford Brass & Copper Co.*, 18 F.2d 66, 68 (2d Cir. 1927).

Footnote 64. *Old Town Ribbon & Carbon Co. v. Columbia Ribbon & Carbon Mfg. Co.*, 72 U.S.P.Q. (BNA) 57, 60 (2d Cir. 1947).

?6:8 Improvement or "Jepson-Type" Claims

A *Jepson* claim recites all or some of the elements of a known article, process, composition, or combination in the preamble to the claim, includes a transition that states "wherein the improvement comprises" or "the combination with the old article, etc., of," and recites in the body of the claim only the new or modified elements, or tells there of new forms of connection or cooperation between old elements, that is, recites the improvement. Such claims are frequently used where there is an improvement in one or more elements of an otherwise old and unchanged combination, or where one or more new elements are added to an old combination.⁶⁵ This type of claim should avoid or help avoid an "old combination" rejection (see section 8:4).

These types of claims are frequently used in some European country patent applications and are required in some countries. Where this type of claim is used,

the preamble relates all elements and relationships in common with the closest reference. U.S. Rule 75(e) states:

Where the nature of the case admits, as in the case of an improvement, any independent claim *should* contain in the following order, (1) a preamble comprising a general description of all the elements or steps of the claimed combination which are conventional or known, (2) a phrase such as "wherein the improvement comprises," and (3) those elements, steps and/or relationships which constitute that portion of the claimed combination which the applicant considers as the new or improved portion. (Emphasis added.)

The word "should" was apparently meant to be strong urging, but not mandatory. At a hearing on the proposed rule, the Assistant Commissioner stated that it was not intended as compulsory. Although the Patent and Trademark Office recommends that "*Jepson*-type" claims be used, they are still seen infrequently in United States patents and applications and examiners seldom, if ever, object to their absence. Further, they tend to focus too much attention on too few features, and de-emphasize that a typical invention is a combination of cooperating elements. The more usual claim form makes the combination protection clearer. Also, at a later time, the patentee may realize that some other feature in the claim or some unnoted interactions among elements have inventive significance. The *Jepson* format may have precluded reliance upon these. ⁶⁶

The danger of a *Jepson* format is that "the preamble elements in a *Jepson*-type claim . . . are impliedly admitted to be old in the art, but it is only an implied admission." ⁶⁷ That implication can be overcome by appropriate explanation, for example, *Jepson* format was used to avoid double patenting. ⁶⁸

In *In re Bernhart*, ⁶⁹ the *Jepson* format was considered optional with no mention of Rule 75(e). ⁷⁰ See further discussion in section 8:3.

The original *Jepson* claim ⁷¹ was:

[16.] *In an* electrical system of distribution of the class wherein a variable speed generator charges a storage battery and when the battery becomes sufficiently charged a voltage coil becomes effective to regulate the generator for constant potential, *the combination with* said voltage coil *of* a coil traversed by current flowing to the battery which is acted upon by decreasing the battery current to reduce the potential maintained constant by the voltage coil. (Emphasis added.)

Generalized, the original *Jepson* form is "In a having [old elements A, B, C] the combination with [A] *of* [new element D]." Under Rule 75(e), the words "the combination with" might be replaced with "wherein the improvement comprises combining a coil . . ." Note that the new element is defined both as to structure and

how it cooperates with the old element A, B, or C to accomplish a useful result.

Various other formats (known as "*Jepson*-type") are permissible, no magic words being necessary. One suitable and straightforward form follows: "In combination with an [A] of the type wherein [conventional elements B and C are provided for doing something], the improvement which comprises. . . ."

The new or modified elements then follow as in any other claim, related structurally and functionally both to each other and to the elements in the preamble.

There are three distinctive parts of the *Jepson* claim, the preamble, the formatted transition phrase and the body of the claim. The preamble may begin with the same preamble as a usual claim, naming the subject of the invention. However, there are two preferred alternatives to tell the reader it is a *Jepson*-type claim. The first starts with the word "In" followed by the name of the subject of the claim, as in Claim 16, above. The second starts with the words "An improved" followed again by the name of the subject of the claim; as in Claim 17, below. The transition phrase would be worded to make good English usage with the preamble words. It is advantageous to work the word "combination" into the preamble somewhere, where appropriate and not awkward in the claim. That is because Rule 75(e) expressly mentions "combination."

There is sometimes an issue as to whether a claim preamble is considered an element of the claim.⁷² But in a *Jepson* claim, the preamble defines not only the context of the invention, but also its scope.⁷³ Therefore, a preamble limitation is considered a claim element.⁷⁴

The transition phrase is suggested in the specific language from Rule 75(e)--"wherein the improvement comprises"-- for example, "An improved A of the type having a B and a C, wherein the improvement comprises. . . ." Other possibilities for a transition phrase include: "In a machine of the type having . . . , the improvement which comprises:" or even "A machine having [old elements named], characterized in that:" It is recommended that the word "improvement" be included in the transition phrase to avoid objection for non-compliance with Rule 75(e).

In European country applications, including claims separating prior art elements from the inventive contribution by a transition phrase, the transition phrase is usually translated into English as something like "characterized in that" or "characterized by comprising." The "characterized" form is acceptable in the United States although not very commonly used. This language is frequently objected to by examiners, but the original claim form can be retained through substituting a more typical *Jepson* claim language transition phrase.

Except when the "characterized" form is used, the body of the *Jepson* claim starts after the transition word "comprises" or "comprising" as in normal United States claims. Thus, that magic word is a code word or trigger, telling the reader where the allegedly novel part of the claim starts. For this reason, it is recommended that the word "comprising" not be used in the *Jepson* preamble; instead use "having," "including," or the like in the preamble. For example, "An improved A comprising B and C, wherein the improvement comprises D" could be confusing.

For a specific example, consider again the barrel take-up of Example III (see section 3:25.1, above), but assume this time that all of the elements shown in the drawing are quite old and well known. Assume that the client's only invention is in the addition of the detector, cutter and accumulator of Claim 15, section 2:9.

A *Jepson*-type claim to the improved combination might read as follows:

17. An improved strand-collecting apparatus of the type in which an advancing strand is collected in a barrel mounted on a rotating turntable, and in which a reciprocating strand guide is positioned above the barrel to guide the advancing strand into the barrel, wherein the improvement comprises:

(a) means for detecting when a predetermined amount of strand has been collected in the barrel;

(b) a cutter, operated by the detecting means, for severing the strand when a predetermined amount has been collected; and

(c) an accumulator, operated by the detecting means, for accumulating the strand after it has been severed.

It should be noted that the body of this claim is identical with that of dependent Claim 15, the only difference being in the preambles. It is a significant difference. In Claim 15, the client invented both the basic system of Claim 2 and the photocell system of dependent Claim 15, whereas in Claim 17 the client invented only the photocell as an improvement on the basic system.

Note that the preparation of the body of a *Jepson*-type claim is very similar to a dependent claim, except that the part that would be the parent claim is the preamble of the *Jepson*-type claim rather than a different claim.

The Patent and Trademark Office interpretation of these claims is set out in MPEP section 608.01(m):

The form of claim required in rule 75(e) is particularly adapted for the description of improvement type inventions. It is to be considered a combination claim. The

preamble of this form of claim is considered to positively and clearly include all the elements or steps recited therein as a part of the claimed combination.

With this description of the entire claim as being a combination, there should be no objection per se to the body of the claim comprising a single means element, as mentioned in section 3:24.

Also, in *Jepson*-type claims, there is less need to tie the preamble elements together as described in section 3:16, as long as the elements of the body are adequately tied to each other *and to* the preamble elements with which they cooperate. However, a bald preamble catalog is not recommended as sound practice. (See section 8:5 on aggregation.)

While the foregoing example relates to a machine claim, *Jepson*-type claims may also be used for methods, articles of manufacture, and compositions.

An example of a method:

18. In a method of collecting an advancing strand in a barrel, of the type wherein the advancing strand is guided into the barrel and the barrel is rotated to vary the point of collection circularly with respect to the bottom of the barrel, the improvement comprising:

reciprocating the guide point back and forth above the barrel so that the point of collection varies radially with respect to the bottom of the barrel.

Note that this claim covers the same combination as Claim 4, chapter 4, except that two of the elements of Claim 4, acknowledged to be old, have been put in the preamble.

A composition of matter:

19. An improved zinc-electroplating solution of the type containing an aqueous solution of zinc acetate, from 30 to 90 grams per liter; citric acid, from 1.5 to 3 times the zinc acetate concentration; and an alkaline pH modifying substance in an amount sufficient to adjust the pH to a value of from 4 to 5.5, wherein the improvement comprises:

0.5 to 1 gram per liter of boric acid.

Note that the preamble of this claim is identical in scope to Claim 11, section 6:1, with added material.

Summary

Use Jepson-type claims for improvement-type inventions, where new or modified elements are added to an otherwise old and unchanged combination. Describe the old elements from the closest single reference in the preamble. Usually the old things can be described fairly broadly. Describe the new or modified elements in the body of the claim after a transition such as "wherein the improvement comprises," or "the improvement comprising." Connect or relate the new elements to each other and to the preamble elements, as with any other claim, particularly in mechanical combination (machine) claims as outlined in chapter 2.

FOOTNOTES:

Footnote 65. See *Wells Mfg. Corp. v. Littelfuse, Inc.*, 192 U.S.P.Q. (BNA) 256 (7th Cir. 1976); *Johns-Manville Corp. v. Guardian Indus. Corp.*, 221 U.S.P.Q. (BNA) 319 (E.D.

Mich. 1983).

Footnote 66. See *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 220 U.S.P.Q. (BNA) 97, 110 (Fed. Cir. 1983); *Biuro Projektor v. UOP, Inc.*, 203 U.S.P.Q. (BNA) 175 (N.D. Ill. 1979).

Footnote 67. *In re Ehrenreich*, 200 U.S.P.Q. (BNA) 504, 510 (C.C.P.A. 1979).

Footnote 68. MPEP ?2129.

Footnote 69. *In re Bernhart & Fetter*, 163 U.S.P.Q. (BNA) 611 (C.C.P.A. 1969).

Footnote 70. *But cf. Dollar Elec. Co. v. Syndevco, Inc.*, 205 U.S.P.Q. (BNA) 949, 955 (E.D. Mich. 1979), *aff'd*, 214 U.S.P.Q. (BNA) 241 (6th Cir. 1982); see also *D. Chisum, Patents ?8.06[1][c]* (1978 & Supp. 1986).

Footnote 71. *Ex parte Jepson*, 243 Off. Gaz. Pat. Off. 525 (Ass't Comm'r 1917).

Footnote 72. See MPEP ?2111.02; section 2:4, *supra*.

Footnote 73. *Epcos Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 61 U.S.P.Q.2d (BNA) 1470 (Fed. Cir. 2002).

Footnote 74. *Rowe v. Dror*, 42 U.S.P.Q.2d (BNA) 1550, 1553 (Fed. Cir. 1997).

?6:9 Generic and Species Claim

In some inventions, there are two or more alternative and mutually exclusive

embodiments of the invention; that is, where two or more different structures, steps, parts or compounds, called "species," may be used interchangeably to accomplish a desired result. ⁷⁵ Examples of this are the legs and springs in Fig.-2 and Fig.-3 of Example I (see chapter 3, above), which may generically be referred to as "a support"; the copper, silver, or aluminum stripe of the resistor in section 6:2, which may be generically referred to as "a conductive stripe" or even "a stripe"; the separation of alcohol from a water solution by fractional distillation or by solvent extraction in section 4:2, which may be generically recited as "separating."

A generic claim is one that defines the element in question with sufficient breadth to cover all of the species claimed, which is also usually all of the disclosed species, and often also covers additional undisclosed species, ⁷⁶ while the species claims cover the separate embodiments one at a time. There may be subgeneric claims that cover some, but not all, of the species. Note that, if no allowable generic claim is presented, a requirement for restriction among disclosed species is likely, called "election of species." ⁷⁷ After election, all claims readable on the species are examined. The ones not elected are not examined, but may be made the subjects of divisional applications. However, if a generic claim is eventually found allowable, the restriction requirement is typically withdrawn. Therefore, the practitioner should not be concerned about whether a claim is a generic or species claim. Just write claims seeking the broadest scope of protection that the disclosed invention and the prior art will allow. Some claims should also be broad enough to cover all species, if possible.

If no concrete generic word is apparent, a means-plus-function clause may be appropriate to provide a generic expression, as outlined in section 3:25. In all technologies, but particularly chemical cases, a *Markush* group is always a generic expression of the listed members of the group (section 6:2). Of course, alternative expressions cannot be used to make a generic claim, as set out in section 3:13, except under the *Markush* practice in section 6:2.

There is no special form for drafting generic and species claims. The species claims may be either dependent or independent, although the dependent claim form is especially useful and common in this situation. The practitioner makes an element of the generic claim more specific in one way for species I and in a different way for species II.

The words "genus" and "species," in most cases, have significance relative to a particular set of claims; a generic expression (electrically conductive *metals*) may be a species of a more generic expression (electrically conductive *materials*, which also includes carbon). The words "genus" and "species" in patent law can be totally arbitrary. The breakdowns are made in whatever way suits the invention. Some species that cannot practically be further divided (sodium chloride) are referred to as "ultimate species." In mechanical cases, there would theoretically never be an

ultimate species, because an element (a spring, for example) could be a species of biasing means, but would be generic to particular kinds of springs (coil springs, leaf springs), and each of these could be further defined in parallel, mutually exclusive ways.

These distinctions are not too significant as far as writing claims is concerned. They relate primarily to the question of whether one can obtain one patent (with an allowable generic claim) or several patents (in most cases where no allowable generic claim is presented).

Summary

Generic claims cover two or more mutually exclusive species, A or B, and possibly also C or D, etc., not all of which may be disclosed. Claims to the individual species cover less than the whole group of things, either one at a time, or less than all at one time. There are no special problems in writing such claims. Such claims may come up in any statutory class of utility invention: machine, process, article of manufacture, or composition of matter.

FOOTNOTES:

Footnote 75. See MPEP §806.04(a)-(j).

Footnote 76. See MPEP §806.04(d).

Footnote 77. 35 U.S.C. §121; Rules 141, 142, 146.
§6:10 Combination and Subcombination

Thus far, we have been considering primarily combination claims; that is, claims to complete machines, processes, manufactures, etc. A subcombination is some element or group of elements that forms a part of the main combination.⁷⁸ A subcombination includes fewer elements than the combination of which the subcombination may be a part. Hence, the subcombination claim is broader than the combination, as it includes fewer elements and limits. If the subcombination has utility by itself, it may be separately claimed, although restriction between the two claimed inventions, combination and subcombination, and election of inventions will often be required if the combination is also claimed.⁷⁹ Subcombinations usually relate to machines, but may also be present in methods, compositions, or articles of manufacture.

As one example, the details of construction of the accumulator used with the barrel take-up arrangement of Claim 17 of section 6:8 would comprise such a subcombination. If new, it could be separately claimed. Such a subcombination claim might start out: "Apparatus for accumulating an advancing strand, which comprises: . . ."

Note that, in that case, the subcombination is a complete mechanism or machine in itself, serving its own function, but which would always be used with other machines to make a combination machine.

Restriction would probably be required since the subcombination may obviously be used in other combinations and is separately classified. ⁸⁰

Other examples of subcombinations are a carburetor for a car, and such other major subassemblies as tires, headlights, etc. A subcombination method might be a method of accumulating strand in a take-up method, or a method of separating chemical *X* from *Y* as a part of a complete process for making *Z*, wherein *X* is a byproduct and useful to be recovered. In a composition, a subcombination might be a new compound per se, useful in killing insects, while a combination would be an insecticide containing the new compound with other materials.

Note that subcombination claims of this sort offer no special problems in claim drafting.

Another common format for subcombination claims is: "In an apparatus for doing something, an A, a B, and a C."

Note that, as written, this type of claim is an exception to the general "rule" about having a transition word or phrase between the preamble and the body (section 2:5). But it is preferred to include a standard transition word. Also, in this type of claim, it is less important to list all elements necessary to make a complete combination, since by definition the claim need only be to some part of the combination.

The author is not certain how far one can go in drafting fragmentary "In a" claims, covering only certain portions of a combination, where less than a complete functional subcombination is claimed. In his experience, such claims have been rejected as "incomplete" (section 8:7) or lacking in utility in that they would lack sufficient structure to themselves make a complete combination, machine or process, etc. Elements from the full combination may be added to the subcombination claim until a complete structure is claimed. Alternatively, the claim preamble may be modified to name the subcombination, rather than the combination of which the subcombination is a part.

Another format combines the subcombination with a *Jepson* approach (section 6:8): "An improved A for an X-type system having old elements Y and Z, wherein the improved A comprises: . . . " (for example: "An improved accumulator for a strand-collecting apparatus of the type having a barrel . . . , wherein the improved accumulator comprises: . . . ").

See further discussion in section 8:4 on old combinations, and the claim involved in *In re Rohrbacher & Kolbe*.⁸¹ That discussion is to the effect that a claim to "a cooling liquid pump for engines" of a certain type, is properly a subcombination claim to the pump.

See also *In re Dean*,⁸² to the effect that a claim to "in a camera having . . . , a shutter-timing apparatus . . . comprising:" is a proper subcombination claim to the timer, not an (allegedly old) combination of the timer and a shutter. See also section 6:7 on new uses and preamble limitations generally.

A claim that might fit a definition of a subcombination was instead held to be for a combination. The claim in *In re Allen*⁸³ read: "A waler bracket for concrete wall forms . . . comprising: a metal bracket . . ." The claim was held to be a bracket, which is an element of a combination, and not a subcombination. The court said: "The bracket is a single integral entity whose shape is defined, rather than a combination of parts which is the usual nature of a subcombination."⁸⁴ Not much turns on this, except for the issue of restriction and election of claims.⁸⁵

With respect to applicant's right to obtain subcombination claims, see *Special Equipment Co. v. Coe*,⁸⁶ discussed further in section 8:7 on incomplete claims.

Summary

Subcombination claims cover parts or portions of a complete combination or system, where the subcombination has utility in itself. There are no special problems in writing such claims, and they may be necessary in some cases to avoid an old combination rejection.

FOOTNOTES:

⁷⁸Footnote 78. MPEP §806.05(a).

⁷⁹Footnote 79. See MPEP §806.05(c) as to requirement for restriction between combination and subcombination.

⁸⁰Footnote 80. See MPEP §806.05(c).

⁸¹Footnote 81. *In re Rohrbacher & Kolbe*, 128 U.S.P.Q. (BNA) 117 (C.C.P.A. 1960).

⁸²Footnote 82. *In re Dean*, 130 U.S.P.Q. (BNA) 107 (C.C.P.A. 1961).

⁸³Footnote 83. *In re Allen*, 145 U.S.P.Q. (BNA) 147 (C.C.P.A. 1965).

⁸⁴Footnote 84. *Id.* at 149.

Footnote 85. MPEP 706.05(a), (c).

Footnote 86. *Special Equip. Co. v. Coe*, 64 U.S.P.Q. (BNA) 525 (U.S. 1945).
7:1 In General

In drafting claims of varying scope, whether dependent or independent claims are used, the claim drafter should make certain that there is "a mere difference in scope" between the claims (MPEP 706.03(k)).¹ Significant differences in scope are not required. But if two claims are so close that they cover the same thing, despite different wording, one can be rejected. This usually does not occur if there are only "a few" claims. Of course, the differences between the claims need not amount to patentable differences, but they should be as substantial as the situation permits and related to the areas of novelty. Such practice ordinarily makes the problems of duplicate or redundant claims (section 8:2) and undue multiplicity of claims (section 8:3) fairly easy to avoid. Dependent claims also help in that regard.

The narrowest claim is usually a sound "picture claim," which should probably recite by name all of the significant structure disclosed, omitting only the nuts and bolts. This should describe the commercially most effective way to carry out the invention, including all preferred conditions.

This not only protects against the copyist, but, wherever possible, it is desirable to assert a narrow claim against an alleged infringer, because such a claim is harder to invalidate either on newly discovered prior art or on formal grounds (too broad, etc.). Furthermore, the narrowest scope claim is more likely allowable than the broadest, so that you will initially be presenting and obtaining some patent protection.

The narrowest claim should be fairly easy to write if the structure and operation are understood. The broad claims are the most difficult to prepare, in that the claim drafter must analyze the structure, pick out its essential elements, and decide how broadly to state them. Intermediate claims should be fairly easy to prepare in that some significant elements or details of construction are either added to a broad claim or omitted from a narrow claim. Although there is no prohibition against a dependent claim adding only prior art features, there may be little value to including such a claim. However, if it covers a preferred commercial design you want to specifically protect, then such a dependent claim has some value.

Any one of the claims may be written first, whichever seems easiest. Different practitioners advocate different methods of beginning. Perhaps a flexible approach is best: if the claim drafter has a clear idea for a broad claim, he should start with that; if not, he should simply write *a claim* and work it over. Having any claim done helps one think of variations. Then elements may be (1) added or described in more

detail to make a narrower claim, or (2) omitted, combined or broadened to make a broader claim. It is probably best if at least several, if not all, claims are prepared before starting to write the remainder of the specification, because then the specification can better be written to point out the claimed invention, and the words in the claim will naturally find clear support in the remainder of the specification (see section 3:6).

While it is important to provide at least mere differences between the claims, the terminology and form should be as consistent as possible except where the differences occur. Do not give the same part different names in two successive claims, except intentionally to change the scope of the claim. However, beware of a common limitation in all claims. If there is one, make certain that it is absolutely essential to patentability.

With respect to preferred numbering and order of multiple claims, refer to section 2:3, numbering and order.

See also the discussion in section 2:9, that there need be no one head claim, or dominating claim in the application. One is entitled to claim every possibly novel combination, subcombination, method, apparatus, etc., that one wants to, subject only to restriction practice that one might have to get two patents instead of a single patent.

Furthermore, within one claim, the elements may be claimed with different degrees of detail, and the less detailed elements are not construed as modified by the details of those elements in the specification or in other claims. ²

Summary

Present a "reasonable" number of claims, given the nature and scope of the invention over the prior art. This varies widely from case to case. Avoid extra claims adding only things old in the art. The narrowest claim or claims should be quite detailed, including all significant structure, both to clearly catch copyist infringers and also to try to get some claims allowed on the first Office action. In that case, you will then be arguing only allowable scope of the invention, not whether or not it is patentable.

FOOTNOTES:

Footnote 1. MPEP 706.03(k).

Footnote 2. Resonate, Inc. v. Alton Websystems, Inc., 338 F.3d 1360, 67 U.S.P.Q.2d (BNA) 1771 (Fed. Cir. 2003).

Section 1:3 hereof identifies the four statutory classes of inventions which may be claimed, process, machine, [article of] manufacture or composition of matter.

Each of the classes of invention should be the subject of a separate claim, to the extent that the invention encompasses several classes of claims. ³ An application may have any or all of each of the different classes of claims. Never mix claim types to different classes of invention in a single claim. ⁴ An apparatus claim covers what a device is, while a method claim covers what a device does. ⁵ They are different. Avoid method limits in a product claim, except in the correct way of describing some element for performing a particular function and in a "whereby" (necessary result of the structure or process claimed) clause. Avoid product limits in a method claim, except where the method involves a workpiece which is being described or the method describes operating some means to act on the workpiece.

An invention to a product, article of manufacture or composition (three of the classes) may be claimed in any of several ways, depending on the individual product. It may be claimed as:

- (1) a product,
- (2) a process for producing the product,
- (3) a process for using the product, and
- (4) a machine for producing the product.

The remaining statutory class of a process may be claimed as:

- (5) a process,
- (6) a machine which performs or uses the process, or
- (7) a product which is produced by the process.

For fullest protection wherever an invention is capable of being claimed in more than one of the different ways, it is recommended that that be done. However, it is likely that an examiner will issue a restriction requirement as between different statutory classes of claims, on the one hand, and even with one statutory class, between different types of processes, for example, (2) and (3) above, on the other hand, so that coverage of each of the different types of claims will require the filing of a respective divisional application. There may be practical economic considerations in avoiding having to file divisional applications which may cause the claim drafter to avoid using multiple types of claims. But, at least, consider using them initially.

When preparing claims of more than one of the types (1)-(7) noted above, avoid mixing claim limitations in one claim directed to different ones of the types of processes (2) and (3) noted above. Avoid mixing limitations of different types of processes (2), (3), (6) above with different apparatus (1) or (7) in one claim.

FOOTNOTES:

☛Footnote 3. *Ex parte Lyell*, 17 U.S.P.Q.2d 1548 (Board of Patent Appeals and Interference 1990).

☛Footnote 4. *Ex parte Lyell, supra*.

☛Footnote 5. *Hewlett-Packard Co. v. Bausch & Lomb, Inc.*, 909 F.2d 1464, 15 U.S.P.Q.2d (BNA) 1525 (Fed. Cir. 1990).

?8:1 Introduction

The following sections cover some formal rejections to claims not previously discussed in detail. By "formal" is meant rejections other than anticipation, obviousness, or lack of statutory subject matter (for example, rejections of methods of doing business, naturally occurring articles, scientific principles, etc.). ¹

FOOTNOTES:

☛Footnote 1. *See* MPEP 706.03(a).

?8:2 Duplicate Claiming

"Duplicate claiming" ² refers to two claims that are "so close in content that they both cover the same thing, despite a slight difference in wording." The manual also provides that "it is proper after allowing one claim to reject the other as being a substantial duplicate." In *Ex parte Primich*, ³ the Board seemed to have renounced this doctrine, at least where the second claim was a dependent claim. But MPEP section 706.03(k) continues.

In practice, a claim that adds, subtracts, or changes one small feature from every other claim would not even be rejected as a duplicate claim. Just reciting an element using a different term, perhaps using a more or less generic expression for the element, is these days accepted as an adequate difference.

The basis for a ground of rejection of duplicate claiming is Rule 75(b): "More than one claim may be presented *provided they differ substantially from each other* and are not unduly multiplied." (Emphasis added to indicate the basis for the duplicate, or redundant claiming, doctrine.) This doctrine theoretically applies regardless of the total number of claims presented, although in practice it is not used often unless "too many" claims are also presented, as discussed in the next section.

Summary

Avoid claims that are "substantial duplicates" as to what is covered, particularly independent claims. Avoid claims that differ only by items clearly old in the art, or highly conventional.

FOOTNOTES:

Footnote 2. MPEP 706.03(k).

Footnote 3. *Ex parte Primich*, 151 U.S.P.Q. (BNA) 737 (Bd. App. 1966).

8:3 Undue Multiplicity

A separate but related doctrine of "undue multiplicity" derives from the same Rule 75(b), second part: "provided... they *are not unduly multiplied*." Theoretically, this means that too many claims are presented, whether or not any two meet the "duplicate" test of the previous paragraph. According to MPEP section 2173.05(n): An unreasonable number of claims, that is unreasonable in view of the nature and scope of applicant's invention and the state of the art, may afford a basis for a rejection on the ground of multiplicity. A rejection on this ground should include all the claims in the case inasmuch as it relates to confusion of the issue.

The boundaries of this rejection are not very clear and it is not used very often. When used, it is usually combined with a duplicate claims rejection.

In an undue multiplicity rejection, the examiner will set a number of claims he thinks is reasonable under the circumstances, and one can then elect that many claims to prosecute on the merits. Then, after prosecution is completed on the elected claims, one can appeal the multiplicity rejection, along with any other rejections, if one still believes it is unreasonable.

In *Ex parte Birnbaum*,⁴ the board reversed an undue multiplicity rejection stating: All of the claims [twenty-four] have been rejected on the ground of multiplicity. While forty pages of claims may seem to be unnecessarily prolix, the mere psychological reaction to this amount of material does not, in and of itself, constitute a legal basis for rejection. The examiner must show either that the claims are so unduly multiplied that they are difficult to understand, or that the claims are for the most part duplicates.

See also *Ex parte Joyce*⁵ for a Board opinion affirming such a rejection and applying a "rule of reason" test (forty-two claims covering thirty pages for a "relatively simple

and not complex" invention).

The C.C.P.A. was not sympathetic to a multiplicity rejection. In 1969, *In re Flint* ⁶ held such a rejection improper on the merits. That case reviews many previous cases on the subject. ⁷

Of course, there is a substantial filing fee for a large number of claims and of independent claims, which provides another reason for avoiding multiplicity. (The fees conversely provide a reason against a multiplicity rejection. If you are willing to pay the extra fee, you should have the extra claims examined too.)

Summary

Avoid presenting "too many" claims in total, and where a large number of claims must reasonably be presented, make sure there are clear-cut differences between the claims. Dependent claims will help in avoiding multiplicity rejections. Basically, be reasonable, particularly where more than ten claims are thought necessary.

FOOTNOTES:

⁴Footnote 4. *Ex parte Birnbaum*, 161 U.S.P.Q. (BNA) 635, 637 (Bd. App. 1968).

⁵Footnote 5. *Ex parte Joyce*, 168 U.S.P.Q. (BNA) 373 (Bd. App. 1969).

⁶Footnote 6. *In re Flint*, 411 F. 2d 1353, 162 U.S.P.Q. (BNA) 228 (C.C.P.A. 1969).

⁷Footnote 7. *See In re Wakefield*, 422 F.2d 897, 164, U.S.P.Q.2d (BNA) 636 (C.C.P.A. 1970).

?8:4 Old Combination; Overclaiming

Damages for patent infringement are awarded based on the claimed invention. The larger the claimed invention, that is, the more elements it contains, the greater may be the base upon which damages are calculated. Hence, one claims an entire machine or installation or article or process, not just a component part. Of course, one can write separate claims to a fuller combination and to a subcombination or component part of the combination.

MPEP section 2173.05(j) sets out the Patent and Trademark Office's view of section 112 of the statute that "old combination" is no longer a valid basis of rejection of a claim, if the claim otherwise complies with section 112, paragraph 2. The rejection was based on the principle that an inventor who improves one element of an old combination should not patent the entire combination including the new element. The Patent Office acknowledges that the Federal Circuit has held the doctrine to no longer be viable. ⁸

A prior edition of the Manual provides an example:

Example [of old combination]: An improved carburetor claimed in combination with a gasoline engine.

The combination of a carburetor and an engine is old and in the invention and the reference, the engine and the carburetor cooperate in the same way.

Although the Patent Office guidelines in the Manual are neither law nor rules, they indicate how the Office will act and will surely influence courts in deciding the issue. But precedents still in effect have invalidated a claim based on its covering an old combination (although the Federal Circuit has more recently said the doctrine is gone).⁹

In *Holstensson v. V.M. Corp.*,¹⁰ the patentees had invented the modern offset-spindle type of phonograph record changer, which replaced the prior slicer blade structure and achieved great commercial success. While the judge indicated this was a very significant invention, he held the claims not only included the novel record dropping mechanism, but also included all of the old and unchanged elements of a complete automatic record player: turntable, pick-up arm and cycling mechanism. Neither did the specification point out what was old and what was new.

The claim in question called for the following elements (old except where italicized):

1. In a talking machine,

(a) a rotatable *hollowshaft*,

(b) a turntable... ,

(c) *a post extending through the shaft and having an upper extension which is offset... for forming a shoulder for supporting a stack of records... ,*

(d) *steadying means... ,*

(e) *a lever pivotally mounted in said supporting post... ,*

(f) a pickup arm...

(g) means... for swinging the pickup arm... , said means also rocking said lever, and

(h) means for then returning the pickup arm inwards to playing position.

The five generally old elements, (a), (b), (f), (g), and (h), were defined only very broadly, while the new elements, (c), (d), and (e), were described in substantial detail. Unquestionably, the new record dropper cooperated with the old cycling mechanism in no basically new way.

The sole issue was the formal ground of old combination or overclaiming. The court even held that "the spindle type record dropper was new and constituted invention [meaning it was unobvious]."

The court then held the claim invalid (emphasis added):

We come, finally, to the critical question for our decision, namely, will the owner of a patent which, *in part, contains patentable invention*, be denied recovery from one who clearly infringes the part of the patent which is invention, merely because the patent is not a true combination and claims as part of the invention that which is old and disclosed in a prior patent? We are of the opinion that we must answer in the affirmative. Such a holding appears unfair unless there is a policy of patent laws which, in its effect, visits total forfeiture upon a patent which attempts to extend its monopoly to something already patented. There is such a policy.

Claiming more than the invention had been called "overclaiming." But that term seems inaccurate, since a subcombination claim to A+B+C is *broader* than a combination claim to A+B+C+D+E+F, etc. Thus, it seems the big combination claim would be *underclaiming* the invention. In fact, had *Holstensson et al.* attempted to file for reissue, to eliminate the old elements, the Patent and Trademark Office would have held that to be a *broadening* reissue.

Regardless of any theoretical discussion of the word "overclaiming," the *Holstensson* case is a strict decision clearly teaching that one should be very careful to claim *only his new invention*, detached from a lot of old things. This type of case, as well as Rule 75(e), should point the way toward *Jepson*-type claims (section 6:8) or subcombination claims (section 6:10), whichever are appropriate.

Claim writers pursue claims to large combinations, and particularly narrower claims to large combinations, because royalties or damages might be based on the value of the large combination including the invention instead of "the Invention." ¹¹

In keeping with its custom of discarding or drastically liberalizing nonart rejections ¹² the C.C.P.A. threw out the classic "old combination" doctrine in 1969.[13] The invention concerned computer programs. Certain claims were rejected as "drawn to the old combination of a programmed computer and a plotting device, which combination is shown to be old by... [a reference]." Here the novelty was strictly in the computer program.

The court quoted the previous Manual section stating that the MPEP "statement has the support of many cases."

The court then held that there was no statutory basis for the rule, as stated, and rejected it. The court discussed the cases calling this "overclaiming" and rejected that, as suggested above by this author.

Such statements [about overclaiming] are indeed puzzling in view of the fact that the addition of elements to a claim *narrow*s its scope and thereby creates a lesser monopoly. Others have said that the combination is not new, or is obvious, if no new coaction or result is obtained. This too is unsound, since it is not the result which is to be patented but the recited machine, composition, etc. If the prior art does not show or suggest that improved element itself, it defies logical reasoning to say that the same prior art suggests the use of the improved element in a combination.

The court next reasoned that, under the present statute, the old combination rejection could only be based on 35 U.S.C. §112, lack of "particularly pointing out and distinctly claiming." The court then held that the claims in issue were particular and distinct. Note, there is nothing peculiar about old combination claims that would make them as a class nonparticular or indistinct. The court thought that, if the plotter were put in the preamble *à la Jepson* (section 6:8), it would "greatly increase the number of words"; and, if eliminated (as a subcombination claim, section 6:10), it would not make the claims "more particular or distinct, since the monopoly... would be substantially broadened." In *Ex parte Barber*,¹⁴ the Board held that *In re Bernhart* had abolished the old combination doctrine.

The classic "old combination" rejection did not apply where the subcombination was only *intended* for use in the combination, but the old elements were not positively recited in the claim.

For example, in *In re Rohrbacher & Kolbe*,¹⁵ Claim 1 in question was directed to a special cooling pump designed for use with a particular kind of engine, but the engine parts were not made positive elements of the claim. Claim 1 read:

1. A cooling liquid pump *for engines having parallel rows of liquid cooled cylinders* and comprising

* an elongated pump casing *adapted to extend between said rows of cylinders and to be secured at the opposite ends thereof to the liquid cooling cavity walls of said rows of cylinders,*

* said casing being formed to provide... [certain chambers defined in detail],...

* said casing ends being formed to provide outlet ports... [defined] and being

adapted to provide communication between said discharge chamber and the cooling liquid cavities within said cavity walls of said rows of cylinders... (Paraphrasing and emphasis added to show relation to the engine.)

In reversing an old combination rejection, the court held:

The first ground of rejection is based on the board's holding that the claims are not drawn merely to pump structure, as contended by appellants, but that the engine forms a part of the claimed combination.

It is clear that the engine is not positively recited as an element of any of the claims. It is referred to only by such statements as that the pump is "for" engines of a particular type and that the pump chambers are "adapted" to communicate with certain portions of the engine. We are of the opinion that such statements are intended merely to define the structure of the pump itself and that, as stated in appellants' brief:

"The pump defined by the claims may be separated from the engine and carried away from the engine. The claims still read on the pump after it has been carried away...."

The appealed claims do not state that the article claimed is an engine or includes an engine, but merely that it is for an engine or is adapted to be connected therewith. Such statements of adaptation for an intended use have been held not to limit the claims to the particular use specified. *Brown Mfg. Co. v. Deere et al.*, 61 F. 972 (C.C.A. 7).

While the device recited in the appealed claims is intended to be used with an engine and has a particular structure adapting it for such use, the claims define only the structure of the pump itself and not a combination of the pump with an engine.

Another example of how to avoid the "old combination" doctrine, while retaining some aspects of the combination in the claim, is to use an "In a" claim discussed under section 6:10 on combination and subcombination. One can claim the subcombination for use in the combination, with the subcombination elements *adapted* to do things to the elements of the combination. Dean's claim 3 in *In re Dean*¹⁶ trod a very fine line to avoid old combination:

In a camera having a shutter mechanism, including two independently operable shutter-actuating elements, a *shuttering apparatus* foreffecting a precisely predetermined camera exposure *comprising*:

* [1] a pair of electro-responsive devices adapted to be individually coupled to said [shutter-actuating] elements;...

* [7] and an electrical time-constant circuit responsive to... for rendering said discharge device conductive to develop a delayed pulse... to cause its associated electro-responsive device to *complete an exposure*. (Emphasis and paragraphing added).

The claim had been rejected, among other grounds, as drawn to an old combination of a timing circuit and an old shutter mechanism.

The C.C.P.A. ruled that the claim was a subcombination claim to the timer per se, not a claim to the combination of the timer and shutter. The preamble limitations "In a camera" and "for effecting a camera exposure" were not considered positive elements of the claim. With respect to "adapted to be coupled," the court stated: To state mere *adaptability* of these parts of the timer to perform the coupling function does not import into the claim the shutter... The above clause is a limitation of element [1] but not an inclusion of shutter elements.

Similar comments were made with respect to such clauses as "to cause its associated... device to complete an exposure." This was merely a statement of the *reason why* the pulse is developed at all, a statement which, together with the preamble we think improves the clarity of definition of the elements of the timer, and nothing more.

These types of claims, then, are really only special forms of subcombination claims, sort of hybrids spelling out inferentially enough of the combination details to give meaning to the subcombination elements, but not including such details in the claim. This seems to be a highly useful type of claim in an appropriate case. (See further discussion in section 6:10--combination and subcombination. Compare also, with the discussion in section 6:7 of new use claims, concerning preamble statements of intended use.)

Summary

The old-combination rejection should no longer be received. But, nonetheless, claim the new things your inventor contributed, not in combination with a lot of old and unchanged things. Point out what your inventive contribution is, not the old environment where it is used. Use Jepson claims (section 6:8) or subcombination claims (section 6:10) to avoid this problem. In addition to avoiding invalidity on a purely technical defense, claims to "the invention" are better received by the examiner and more likely to be allowed. But because the measure of a damages award for an infringement can be based on the entire claimed invention, there can be additional claims to the entire combination, which may be cancelled if rejected.

FOOTNOTES:

Footnote 8. *Radio Steel & Mfg. Co. v. MTD Prods., Inc.*, 731 F.2d 840, 221 U.S.P.Q. (BNA) 657 (Fed. Cir. 1984).

Footnote 9. *Id.*

Footnote 10. *Holstensson v. V.M. Corp.*, 139 U.S.P.Q. (BNA) 401 (6th Cir. 1963), *cert. denied*, 377 U.S. 966 (1964).

Footnote 11. *See* method function of apparatus (section 4:5), product-by-process claims (section 5:2), new-use claims and preamble limitations (section 6:7), mental steps (section 6:8), aggregation (section 8:2), printed matter (section 8:3).

Footnote 12. *In re Bernhart & Fetter*, 163 U.S.P.Q. (BNA) 611 (C.C.P.A. 1969).

Footnote 14. *Ex parte Barber*, 187 U.S.P.Q. (BNA) 244 (Bd. App. 1974).

Footnote 15. *In re Rohrbacher & Kolbe*, 128 U.S.P.Q. (BNA) 117, 119 (C.C.P.A. 1960).

Footnote 16. *In re Dean*, 130 U.S.P.Q. (BNA) 107 (C.C.P.A. 1961).

8:5 Aggregation

A claim to an aggregation is unfortunately very easy to draft. The word "aggregation" is defined in MPEP section 2173.05(k):
Rejections on the ground of aggregation should be based upon a lack of cooperation between elements of the claim.

Example of aggregation: A washing machine associated with a dial telephone.

The statutory classes, particularly the class "machine," are limited by court decisions to "combinations": that is, structures in which the parts cooperate to achieve a result. It has been said ¹⁷ that an aggregation is like a track team, while a true combination is like a football team. In a famous case, ¹⁸ a pencil with an eraser on the end was held to be unpatentable, at least in part because it was an aggregation of parts and the statute did not authorize such claims. MPEP section 2173.05(k) states:

A claim is not necessarily aggregative because the various elements do not function simultaneously, e.g., a typewriter. *In re Worrest*, 40 C.C.P.A. 804, 96 U.S.P.Q. 381 (1953). Neither is a claim necessarily aggregative merely because elements which do cooperate are set forth in specific detail.

Reanalyzing *Reckendorfer*, aside from the major commercial success of pencils with erasers, there is an obvious advantage in being able to correct written material using the same instrument that had originally written it. Just as each typewriter key and associated linkage could be viewed as a separate unit, their cooperation makes a more useful whole. The same applies to that pencil with the eraser on it.

A true aggregation relates to a defect in the structure, and a well-written claim will not help. In section 3:19, it was noted that a valid combination may be rejected as "aggregative as claimed" when the cooperation between the elements is not properly described in the claim.

In 1964, the C.C.P.A. cast doubt on the propriety of aggregation rejections,¹⁹ suggesting that the sole test should be obviousness under 35 U.S.C. §103.

MPEP section 2173.05(k) concludes:

A rejection on aggregation should be made only after consideration of the court's comments in *In re Gustafson*,⁵¹ C.C.P.A. 1358, 141 U.S.P.Q. 585 (1964).

About all this cryptic paragraph does is to alert a diligent examiner that there may be some sort of problem with aggregation rejections, but does not identify what it is.

See *In re Venezia*,²⁰ allowing a claim to an unassembled kit of parts. Expressly, no physical connection was recited between claimed elements.

In *Ex parte Nolden*,²¹ the Board of Appeals cited the *Gustafson* case as rejecting the old aggregation (lack of cooperation) doctrine, stating that the *Gustafson* court suggested that: "the term 'aggregation' as a ground of rejection is nebulous and has no basis under the Patent Act of 1952."

The examiner had rejected the claim as an aggregation under section 112 of the statute, saying that the lack of co-action made the claims indefinite, but citing the "classic aggregation" cases, including *Reckendorfer v. Faber*. That was, of course, the wrong section of the statute. The board quickly held that it was quite clear what subject matter (aggregation or combination) the applicant was claiming. There is nothing about an aggregation claim per se that makes it indefinite under 35 U.S.C. §112. But, just as plainly, there is no section of the statute that supports a pure aggregation rejection--it was a common law doctrine not mentioned in the statute.

In *Ex parte Davie*,²² the Board reversed an "aggregation" rejection by name, following the *Gustafson* case. But the board held the claim unpatentable under

sections 112 and 103 of the statute. Aggregations are often obvious. Note, this was a composition-of-matter claim, involving a noncooperating mixture of compounds.

In *Ansul Co. v. Uniroyal, Inc.*,²³ the court held that "aggregation" applies to a chemical mixture of A and B, where no new function was performed by A or B (a wetting agent). A use (new use) claim was held patentable (section 6:7).

As to a textbook aggregation, there is nothing one can do to improve a claim if the structure itself lacks cooperation. In marginal cases, include as much co-action and cooperation in the claim as the structure permits.

Aggregation-like rejections, involving alleged lack of cooperation between elements (sections 3:19 and 3:20), can come up in other frames of reference than a classical aggregation rejection. For example, in *Ex parte Adams & Ferrari*,²⁴ a claim to a "combination" of a fireplace, damper, and assertedly novel means to indicate when the damper is closed was rejected as obvious over prior art under 35 U.S.C. §103, the examiner stating that "no cooperation is present between the fireplace and the pendant except for what the user may eventually choose to indicate...." The Board reversed, holding:

We know of no requirement in the statute of direct mechanical interaction between the elements of a combination. As long as the over-all result has utility and is unobvious, the elements of a patentable combination may function independently.

See also sections 3:19-3:20 on tying the claim elements together.

Summary

Avoid claiming "aggregations" insofar as possible, particularly in mechanical combination cases; combinations where the elements do not cooperate. Tie the elements together insofar as possible (sections 3:19-3:21). If the invention is an unobvious aggregation, appeal any rejection under the Gustafson case.

FOOTNOTES:

Footnote 17. *Skinner Bros. Belting Co. v. Oil Well Improvements Co.*, 12 U.S.P.Q. (BNA) 61, 63 (10th Cir. 1931):

A rough analogy, that cannot be pressed too far, has repeatedly occurred to me in considering this question. I think of a football team as a combination; one passes, one receives, another blocks, another runs, and still others hold the line. Eleven men are doing different things, each in his own way, and not always simultaneously; yet they are working to a common end, to advance the ball; and they co-act as a unit. I think of a track team as an aggregation; one runs, another hurdles, another jumps, another throws. They all work for a common general end, to amass points

for their alma mater, but there is lacking the vital spark of cooperation or coordination. They work, not as one unit, but as several. In the case at bar, we have no doubt that the device is a combination and not an aggregation. A single object is to be accomplished--to prevent escape of the oil from the well. All the elements coordinate in working to that end. It is not a relay of horses from London to Bath; it is a three-horse hitch to the same coach. We conclude that the first patent is valid.

Footnote 18. *Reckendorfer v. Faber*, 92 U.S. 347 (1875).

Footnote 19. *In re Gustafson*, 331 F.2d 905, 141 U.S.P.Q. (BNA) 585 (C.C.P.A. 1964).

Footnote 20. *In re Venezia*, 189 U.S.P.Q. (BNA) 149 (C.C.P.A. 1976).

Footnote 21. *Ex parte Nolden*, 149 U.S.P.Q. (BNA) 378, 380 (Bd. App. 1965).

Footnote 22. *Ex parte Davie*, 175 U.S.P.Q. (BNA) 122 (Bd. App. 1971).

Footnote 23. *Ansul Co. v. Uniroyal, Inc.*, 169 U.S.P.Q. (BNA) 759, 761 (2d Cir. 1971).

Footnote 24. *Ex parte Adams & Ferrari*, 177 U.S.P.Q. (BNA) 21 (Bd. App. 1972).

8:6 Printed Matter

One of the ancient general rules is that "printed matter" is not patentable, primarily because it is not within the interpretation of the class "manufacture" of 35 U.S.C. §101, discussed in section 5:1. MPEP section 706.03(a) states: "a mere arrangement of printed matter, though seemingly a 'manufacture,' is rejected as *not being within the statutory classes*." Clearly this means that such things as books, menus, tables of scientific data, etc., are not patentable subject matter even though, broadly, they are manufactured articles.

But when printed material is associated with a structural article for some utilitarian purpose, the rule becomes very cloudy. Note the omnipresent word "mere" in the Manual section. Under this rule, the test is whether the printed matter is mere or not. "Nonmere" printed matter is all right, whatever that is. It would be permissible to include printed matter in the claim, but the patentably novel portion could not reside solely in the nature of the printed matter.

In *In re Miller*,²⁵ the court clarified this "rule" in what seems a clear and reasonable fashion: "The fact that printed matter *by itself* is not patentable subject matter, because non-statutory, is no reason for ignoring it when the claim is directed to a combination."

Claim 10 was directed to:

A measuring device comprising:

a spoon for measuring ingredients;

and volume measuring *indicia*... on said spoon... , and

a *legend attached to said spoon*... ²⁶

The spoon was ostensibly an ordinary measuring spoon, the *indicia* were things such as "1 teaspoon," and the legend was, for example, "1/2 recipe." The spoon marked "1 teaspoon" for "1/2 recipe" was really only a half teaspoon. The novel feature resided solely in the proper relation between the *indicia* and the legend.

Thus, it seems the nature of printed matter on an article of manufacture can be considered in determining patentability. In this case, the court considered the printed matter and found the invention highly unobvious.

In re Gulack ²⁷ dealt with printed matter on a substrate, wherein the only difference over prior art under 35 U.S.C. §103 resided in the printed matter. The court said that the claim must be viewed as a whole, that the printed matter was functionally related to the substrate, and that the claims were, therefore, patentable.

Claim printed matter related functionally to other nonprinted matter elements in the claim.

The "printed matter" rule is also discussed in detail in *In re Bernhart & Fetter*, ²⁸ although the claims did not involve printed matter in any way. The general principles of *Bernhart*, on nonstatutory class rejections, seem to apply equally to "printed matter" cases. The general import is that, even though certain items are nonstatutory by themselves, it is proper to include them and rely on them for novelty and unobviousness if combined with other items that are in the statutory class. The "other" items may all be old. The *Millercase* ²⁹ is a perfect example of this reasoning. If true, this is a new and rather beneficent "rule" for inventors.

Summary

Avoid including printed matter in claims where possible. Where necessary to patentability, include the printed matter in combinations with mechanical elements under the Miller case.

FOOTNOTES:

²⁶Footnote 25. *In re Miller*, 164 U.S.P.Q. (BNA) 46, 49 (C.C.P.A. 1969).

Footnote 26. *Id.* at 47 (emphasis added).

Footnote 27. *In re Gulack*, 217 U.S.P.Q. (BNA) 401 (Fed. Cir. 1983).

Footnote 28. *Bernhart & Fetter*, 163 U.S.P.Q. (BNA) 611 (C.C.P.A. 1969).

Footnote 29. 164 U.S.P.Q. (BNA) 46 (C.C.P.A. 1969) (discussed above).

8:7 Incomplete

On completeness, the Office states, MPEP section 2173.05(*l*):

A claim can be rejected as *incomplete* if it omits essential elements, steps or necessary structural cooperative relationship of elements, such omission amounting to a gap between the elements, steps or necessary structural connection... Greater latitude is permissible with respect to the definition in a claim of matters not essential to novelty or operability than with respect to matters essential thereto.

There have been few cases in recent years. The Manual section discusses *In re Collier*,³⁰ wherein the court found that essential structure connecting elements in the claim had not been recited.

If a claim were so rejected, it would be far easier to put in more elements or connections than argue against the rejection. This completeness doctrine, if applied, would set some sort of limit on subcombination or fragmentary claims discussed in section 6:10 such as "in an A, a B, and a C."

In view of this provision, and for general reasons as discussed in sections 3:19-3:21, it is recommended that all claims define complete, operable combinations unless highly exceptional circumstances are present.

*Ex parte Schaefer*³¹ is cited in section 3:11 to the effect that omission of elements from a claim makes it broad, but not vague, indefinite, or misdescriptive. Although the word "incomplete" was not actually used, it clearly was implied.

There is elsewhere in this book a suggestion as to how to prepare a claim related to apparatus or a machine. The writer moves through the apparatus, stopping to recite any element essential to operation of the machine to achieve the objective of the invention. Each element is named, and it is described to cooperate either physically or functionally, or both, with at least one other previously claimed element. That avoids an incomplete claim and also avoids a mere aggregation of elements.

A claim too broad in scope might be incomplete, or might be too broad in view of the

prior art.³²

Summary

To the extent feasible, claim complete combinations of elements. But, it is perfectly proper and advisable to claim a novel subcombination under the cases cited above and in section 6:10.

FOOTNOTES:

Footnote 30. *In re Collier*, 397 F.2d 1003, 158 U.S.P.Q. 226 (C.C.P.A. 1968).

Footnote 31. *Ex parte Schaefer*, 171 U.S.P.Q. (BNA) 110 (Bd. App. 1970).

Footnote 32. *See* MPEP 2173.04.

§ 8:8 Vague and Indefinite

In addition to being incomplete, a claim can be rejected or invalidated because it is vague and indefinite. This derives from 35 U.S.C. § 112, paragraph 2, that the claim does not particularly point out the invention or distinctly claim it. Various formal sources of indefiniteness were pointed out earlier, such as lack of antecedents (section 3:11) or failure to read on the embodiments disclosed (section 3:6). Too little detail in a claim renders it indefinite; too much detail is too limiting for infringement. In *Shatterproof Glass Corp. v. Libbey Owens Ford Co.*,³³ failure to recite the size of the glass sheets or the quantity or quality of the coating did not render the claims indefinite. Words of degree, if defined in the specification, do not render claims indefinite,³⁴ and not indefinite if understood by an expert witness.³⁵

The claim in toto may also be so peculiarly worded that it is unknown just what it covers, even though a patent lawyer may be able to read the claim word for word on the structure disclosed. It may bear no relation to the real point of the invention. That is somewhat similar to a rejection as being too broad, discussed in various sections (particularly section 3:22), but it is also somewhat different.

Examiners are encouraged to suggest amendments to assure definiteness.³⁶

One example is *Laitram Corp. v. DeepSouth Packing Co.*,³⁷ involving what the judge considered to be a worthwhile and unobvious *invention* of a shrimp deveining machine. However, all but one of the claims of Lapeyre et al. patent 2,825,927 were held invalid as "hopelessly vague and indefinite."

Claim 12³⁸ was an example:

A shrimp vein remover comprising: hook-like vein engaging means, shrimp moving means operatively associated with said vein engaging means, and means

associated with at least one of said above named means for effecting relative movement therebetween.

The court held that such claims "do not accurately describe and are not limited to the scope of the... invention." Also, "a patent must be a certain guide; not a congeries [collection] of pregnant suggestions." Further "enterprise and experimentation must not be discouraged by an area of uncertainty as to the scope of the invention."

Although this type of case could come up in any statutory class, it normally occurs primarily in the class "machine." In this case, structural and functional connections (sections 3:19-3:21) were stated, but only in incomprehensible fashion. For example, the shrimp-moving means is "operatively associated" with the vein-engaging means. How? Why? For what purpose? How does a shrimp get deveined? The "glue" mentioned in section 3:19 is nominally present, but the wrong brand of glue was used.

Fortunately for the patentee, Claim 1 was more specific; it was held valid and infringed. For comparison, Claim 1 ³⁹ included:

In a shrimp vein remover, a supporting member, a lip projecting at an acute angle from the supporting member and having a smooth rounded free edge for engaging beneath the vein of a shrimp and for wedging the vein between the lip and the supporting member, and means operatively associated with said supporting member for relatively moving the shrimp with respect to said member to cause separation of the vein from the shrimp meat.

While the judge thought that this "can claim no prizes for clarity or artistry," he also held ⁴⁰ the claim sufficiently definite:

... it is impossible to suppose that anyone who really wished to respect the patent would have any difficulty in identifying what the claim covered... (Quoting from *Musher Foundation v. Alba Trading Co.*, 66 U.S.P.Q. 183 (2d Cir. 1945).)

This case well illustrates the point about obtaining intermediate and narrow claims, section 7:1. In view of the ultrabroad Claim 12, one might be tempted not to concentrate on the more pedestrian claims, such as Claim 1; but ultrabroad claims can be shot down for a great many reasons; specific claims cannot be.

In *In re Wolfrum & Gold*, ⁴¹ discussed in section 6:2 on *Markush* claims, the court held that a *Markush* claim to groups of compounds A or B was not rejectable under 35 U.S.C. § 112, and that 112 rejections of claims were limited to cases where the claim

was not "precise and definite" as to what it covered; that is, the examiner could not understand what *the applicant* regarded as the invention. "An applicant is free under that provision [section 112] to set the metes and bounds of 'his invention' as he sees them...."

Thus, in effect, the court held that section 112 cannot be used as a basis for formal rejections of claims, such as the problem of *Markush* claims covering "patentably distinct" species.

Summary

Avoid "vague and indefinite" claims. Make claims certain as to what they cover and how they relate to the example or examples described in the detailed description.

FOOTNOTES:

Footnote 33. *Shatterproof Glass Corp. v. Libbey Owens Ford Co.*, 225 U.S.P.Q. (BNA) 634 (Fed. Cir. 1985).

Footnote 34. *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 221 U.S.P.Q. (BNA) 568 (Fed. Cir. 1984) ("substantially equal to").

Footnote 35. *Rosemount, Inc. v. Beckman Indus., Inc.*, 221 U.S.P.Q. (BNA) 1 (Fed. Cir. 1984) ("close proximity").

Footnote 36. *See* MPEP 2173.02.

Footnote 37. *Laitram Corp. v. DeepSouth Packing Co.*, 162 U.S.P.Q. (BNA) 14 (E.D. La. 1969).

Footnote 38. *Id.* at 30.

Footnote 39. *Id.*

Footnote 40. *Id.*

Footnote 41. *In re Wolfrum & Gold*, 179 U.S.P.Q. (BNA) 620 (C.C.P.A. 1973).

?8:9 Prolivity

In the previous sections, we stated that claims must be complete and definite; now one must also learn that a claim can be *too* complete and *too* definite. According to a doctrine known as "prolixity," MPEP section 2173.05(m):

Claims are rejected as *prolix* when they contain long recitations of unimportant details which hide or obscure the invention. *Ex parte Iagan*, 1911 Dec. Com. Pat. 10;

162 O.G. 538, expresses the thought that very long detailed claims setting forth so many elements that invention [now including unobviousness] cannot possibly reside in the combination should be rejected as prolix. ⁴²

Although this doctrine is probably used relatively rarely, one should know it exists. A string of dependent claims might well help overcome the "problem," if one wanted to present such a total claim, in that no one claim would be all that long and detailed. Also, once one claim in the string was allowed, the further dependent claims would most likely be allowed without extensive consideration (section 2:9).

A claim suffering from prolixity likely includes so many features that its infringement is likely easily avoided, which means it would be of little value to the client. Breaking out numerous features into dependent claims will preserve valuable claim breadth for the broader claims in the string.

Summary

The overall rule on claim scope is simple to state but often hard to follow:

"The claim should not be too broad nor too narrow, not incomplete nor too complete; it should be just right."

FOOTNOTES:

Footnote 42. See *In re Swinehart & Sfiligoj*, 169 U.S.P.Q. (BNA) 226 (C.C.P.A. 1971); *In re Wakefield*, 104 U.S.P.Q. (BNA) 636 (C.C.P.A. 1970).

?8:10 New Matter

New matter is any element added either to the specification, the drawings or the claims after the application has been filed that discloses recites elements without support in the original disclosure. MPEP section 706.03(o). Anything disclosed in the specification and drawings or claimed in the original claims is by definition not new matter.

A claim cannot itself recite new matter or be based upon any element not disclosed or claimed in the application as filed. A claim cannot be based upon subject matter not found anywhere in the disclosure nor upon new subject matter added after filing. Furthermore, a claim cannot be amended to be narrower or more restricted than the original disclosure or to eliminate something that the disclosure suggests is mandatory. MPEP section 706.03(o) states:

New matter includes not only the addition of wholly unsupported subject matter, but may also include adding specific percentages or compounds after a broader original disclosure, or even the omission of a step from a method.

9:1 In General

Biotechnology may be defined as the use of living organisms to make commercially and therapeutically valuable products and processes, including, inter alia, therapeutic compositions and agricultural and industrial products. Many scientific disciplines are involved in biotechnology, such as genetics, molecular biology, biochemistry, microbiology, virology, cell biology, enzymology, immunology, neurobiology, receptor biology, and fermentation techniques.

Genetic engineering involves the use of recombinant DNA¹ (rDNA) technology to alter the genes of a particular organism (for example, to insert the gene coding for human growth hormone into a bacterium) to allow the now altered organism to make the particular gene product (protein) encoded by the inserted gene.

Related technology allows for the production of highly specific monoclonal antibodies² which can be used to isolate and target specific cellular antigens. MABs can also be useful as therapeutic and diagnostic agents, for diseases such as various cancers.

The results of genetic engineering and monoclonal antibody production may constitute patentable subject matter. The table below sets forth a non-exhaustive list of categories of possible claimable subject matter in biotechnology. Depending on the nature of a particular invention, one or more of these categories may be present in a particular patent application.

Representative Subject Matter for Biotechnology Claims

cDNA, recombinant (r) DNA, synthetic DNA, DNA fragments

Protein, Polypeptide or Peptide (Product) & fragments

Ribozymes, Catalytic RNA

Monoclonal Antibodies (MABs) vs. Protein

Neutralizing or Blocking MABs

Engineered MABs--Fab, FV, VL, VH, SC, etc.; Humanized MABs

Cell Surface Receptor for Protein

Anti-Sense DNA, RNA

Recombinant Vectors; Expression Vectors

Host Cells; Transformed Cell Lines

Gene Sequencing Techniques, PCR-related diagnostics

Methods of Producing Protein via Expression; Methods of Using Protein

Transgenic Animals

Diagnostics/Kits

Pharmaceutical Compositions and Therapeutic Methods

Gene Therapy Protocols and Materials

FOOTNOTES:

🔗Footnote 1. Deoxyribonucleic acid. DNA comprises the genetic information of most living organisms. A related molecule, ribonucleic acid (RNA) is involved in translating the genetic information contained in DNA. Some viruses, such as the AIDS virus or HIV, utilize RNA, rather than DNA as their genetic material. DNA and RNA code for amino acids, which are the building blocks of proteins or polypeptides found in living organisms. The sequence of the DNA or RNA molecule specifies the amino acid sequence of the protein.

🔗Footnote 2. Antibodies are serum proteins produced by the immune system in animals. Antibodies are reactive to foreign antigens and specifically bind to regions on such antigens termed "epitopes." Monoclonal antibodies, or MAbs, are the product of a single antibody producing clone derived from a single cell.

§9:2 Claims to Living Organisms, e.g., Animals and Plants

The U.S. Supreme Court has held living organisms to constitute patentable subject matter under 35 U.S.C. §101,³ saying that statutory subject matter includes "anything under the sun that is made by man."⁴

Following the Supreme Court's holding in *Chakrabarty*, the PTO Board of Patent Appeals and Interferences ("the Board") held that seeds and plants could be covered by utility patents, not just under the Plant Patent Act of 1930 and the Plant Variety Protection Act of 1970.⁵ The Board subsequently held that multicellular organisms, such as animals, were patentable subject matter under 35 U.S.C. §101.⁶ After *Allen*, the PTO issued a statement that it would grant patents on non-human multicellular animals.⁷ Shortly thereafter, in 1987, U.S. Patent No. 4,736,866 was issued for the so-called "oncomouse," a transgenic mouse that had an activated

oncogene inserted into its germline DNA, which makes it susceptible to neoplasms. The subject mice are useful for testing compounds that (1) induce cancers or (2) could treat or slow the disease. The claims of the '866 patent were directed to the animals per se:

1. A transgenic non-human mammal all of whose germ cells and somatic cells contain a recombinant activated oncogene sequence introduced into said mammal, or an ancestor of said mammal, at an embryonic stage. ⁸

11. The mammal of claim 1, said mammal being a rodent.

12. The mammal of claim 11, said rodent being a mouse.

After a hiatus of a number of years, the PTO has issued several additional patents directed to transgenic animals. ⁹

The PTO has also granted patents on processes by which new animal life may be created. ¹⁰ Patents claiming a mammal or method of obtaining a mammal encompass a human being as well. Thus, the only potential biological subject matter prohibited patent protection is human beings. ¹¹ To be sure of not violating these prohibitions, a human being might be expressly excluded at an appropriate location in the claim, for example, a preamble reciting "a non-human mammal."

The Congress has acted to prevent a grant of patents on humans. The so-called Weldon Amendment to an appropriations bill, signed into law in January 2004, ^{11.1} has this prohibition: "none of the funds appropriated or otherwise made available . . . may be used to issue patents on claims directed to or encompassing a human organism." Similar riders are anticipated for subsequent years.

The Bureau of National Affairs in its September 17, 2004 issue of the *Patent, Trademark, Copyright Journal* reported that the Patent and Trademark Office insisted that U.S. Patent 6,781,030 on a method of cloning human organisms did not violate the Weldon Amendment funding ban, as it was not directed to, nor did it encompass, a human organism. Thus, said the Patent and Trademark Office, the ban would not prevent the patenting of methods for creating, modifying, or treating human organisms, including methods for creating human embryos, etc. ^{11.2}

Animal patent disclosures, however, provide some unique problems relating to the written disclosure, enablement and best mode provisions of 35 U.S.C. §112, ¹² and animal claims can present particular problems of indefiniteness under section 112, paragraph 2. This can occur where the animal is claimed in terms of its "phenotype" rather than its "genotype." ¹³ While an animal's genotype may be defined with particularity, its phenotype cannot. ¹⁴ Thus it is important to define the animal in terms of genotype.

The following are representative examples of possible animal claims:

1. A method of producing a nonhuman animal which comprises introducing into at least some cells of a recipient animal a vector comprising gene G, said gene being operably linked to a promoter that is functional in at least some of the cells into which said vector is introduced, such that a genetically modified animal is obtained which can express gene G.
2. A nonhuman animal produced by the method of claim 1, and progeny thereof, wherein at least some cells retain gene G in expressible form.
3. A transgenic mouse whose somatic and germ cells contain and express a DNA molecule coding for human alphabet protein at a level sufficient to provide antiviral activity in said mouse, said DNA molecule having been introduced into said mouse at an embryonic stage, and wherein said DNA molecule is operably linked to an at least partially constitutive non-alphabet protein promoter. ¹⁵
4. A transgenic mouse that carries in the genome of its somatic and germ cells a transgene which comprises a gene of interest operably linked to a promoter sequence which is regulated by a viral gene product of virus X. ¹⁶

Moreover, as noted above, transgenic plants can also constitute patentable subject matter. For example, fertile transgenic *Zea mays* (corn) plants that stably express a heritable heterologous (foreign) DNA are the subject of U.S. Patent Nos. 5,484,956 and 5,508,468.

U.S. Patent No. 5,484,956 is directed to *Zea mays* plants containing a DNA encoding *Bacillus thuringiensis* endotoxin which confers resistance to insects. The claims are directed to the plants themselves, and the following are representative.

1. A fertile transgenic *Zea mays* plant of the R0 generation containing heterologous DNA encoding *Bacillus thuringiensis* endotoxin, wherein said DNA is expressed so that the plant exhibits resistance to an insect, wherein said expression is not present in said plant not containing said DNA, and wherein said DNA is transmitted through a complete normal sexual cycle of the R0 plant to the R1 generation, and wherein said DNA is introduced into said plant by microprojectile bombardment of *Zea mays* callus cells.
2. The transgenic plant of claim 1 wherein said DNA comprises a promoter.
3. The transgenic plant of claim 1 which is selected from the group consisting of field corn, popcorn, sweet corn, flint corn and dent corn.

4. A seed produced by the transgenic plant of claim 1 which comprises a replication of said heterologous DNA.

U.S. Patent No. 5,508,468 is directed to corn plants which contain and express a foreign DNA encoding a seed storage protein to improve the amino acid profile of the corn. The following claims are representative.

1. A fertile transgenic *Zea mays* plant containing an isolated preselected DNA construct comprising a promoter and encoding a *Zea mays* seed storage protein under the control of said promoter, wherein the DNA construct is expressed as said seed storage protein so that the level of a seed storage protein amino acid in the seeds of said transgenic plant is substantially increased above the level in the seeds of a *Zea mays* plant which only differ from the seeds of said transgenic *Zea mays* plant in that said DNA construct is absent and wherein said DNA construct is transmitted through a complete normal sexual cycle of the transgenic plant to the next generation.

2. The plant of claim 1 selected from the group consisting of field corn, popcorn, sweet corn, flint corn, and dent corn.

3. The plant of claim 1 wherein said preselected DNA construct further comprises and expresses a selectable marker gene or a reporter gene.

5. The transgenic *Zea mays* plant of claim 1, wherein the seed storage protein is the 10-kD zein protein, which is expressed so that the level of the whole kernel methionine is substantially increased above the whole kernel methionine level in the corresponding *Zea mays* plant which only differs from said transgenic *Zea mays* plant in that said DNA construct is absent.

11. The transgenic *Zea mays* plant of claim 1 wherein the amino acid is methionine.

Patents for methods of producing recombinant or transgenic plants have also been granted, as, for example, U.S. Patent No. 5,384,253:

1. A method for producing a transgenic *Zea mays* plant comprising:

a) incubating a population of cultured *Zea mays* cells with at least one pectin-degrading enzyme in an aqueous osmoticum so as to partially degrade the walls of said cells to yield a population of transformation-competent *Zea mays* cells;

b) electroporating the population of transformation-competent *Zea mays* cells in a buffered aqueous osmoticum comprising recombinant DNA to yield a population of transgenic *Zea mays* cells stably transformed with said DNA;

c) growing transgenic *Zea mays* callus tissue from said cells; and

d) regenerating a population of fertile transgenic *Zea mays* plants from said transgenic callus tissue; wherein said plants comprise said DNA which is heritable.

2. The method of claim 1, wherein the culture of *Zea mays* cells is derived from a culture of embryogenic *Zea mays* callus tissue.

FOOTNOTES:

Footnote 3. *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

Footnote 4. *Id.* at 309.

Footnote 5. *Ex parte Hibberd*, 227 U.S.P.Q. (BNA) 443 (Board of Patent Appeals and Interferences 1985). The Plant Patent Act of 1930, 35 U.S.C. § 161-64 (1992), protects plants reproduced via asexual means. The Plant Variety Protection Act of 1970, 7 U.S.C. § 2321-2582 (1992), protects sexually reproduced plants--those that are propagated via seeds.

Footnote 6. *In re Allen*, 2 U.S.P.Q.2d (BNA) 1425 (Board of Patent Appeals and Interferences 1985) (the claimed invention was a non-naturally occurring oyster induced into polyploidy).

Footnote 7. *See, e.g., Seide et al., Patent Protection for Animal Inventions*, 1 J. Proprietary Rts. 7 (Nov. 1989) for review.

Footnote 8. *Id.* Today it is unlikely that the PTO would issue such a broad claim (to a "mammal") based solely on the disclosure of mice.

Footnote 9. *See, e.g., U.S. Patent Nos. 5,175,383 ("Animal Model for Benign Prostatic Disease"), 5,175,384 ("Transgenic Mice Depleted in Mature T-Cells and Methods for Making Transgenic Mice") and 5,175,385 ("Virus-Resistant Transgenic Mice") issued on Dec. 29, 1992; U.S. Patent No. 5,221,778 ("Multiplex Gene Regulation") issued June 22, 1993.*

Footnote 10. *See, e.g., U.S. Patent No. 4,873,191 issued to T. Wagner in which the genetic transformation of zygotes is covered. Claim 1 of the '191 patent reads:*

1. A method of obtaining a mammal characterized as having a plurality of cells containing exogenous genetic material, said material including at least one gene and a control sequence operably associated therewith, which, under predetermined conditions, express said gene under the control of said control sequence in a cell of

said mammal, which comprises:

(a) introducing exogenous genetic material into a pronucleus of a mammalian zygote by microinjection, said zygote being capable of development into a mammal, said genetic material including at least one gene and a control sequence operably associated therewith, thereby obtaining a genetically transformed zygote;

(b) transplanting an embryo derived from the genetically transformed zygote into a pseudopregnant female capable of bearing the embryo to term; and

(c) allowing the embryo to develop to term; where said gene and control sequence are selected so that the gene is not activated in such manner and degree as would prevent normal development of the embryo to term.

Footnote 11. See U.S. Const. amend. XIII. More than 200 applications directed to transgenic animals are believed to be pending before the PTO.

Footnote 11.1. H.R. 2673, Pub. L. No. 108-199.

Footnote 11.2. Cong. Rec. H 12840-41 (Dec. 8, 2003).

Footnote 12. See generally Seide et al. *Patent Protection for Animal Inventions*, 1 J. Proprietary Rts. 7 (Nov. 1989) for review.

Footnote 13. An organism's genotype is the sum total of its genetic information. Genotype is often described, however, with respect to one or few physical locations (genes) on a chromosome, *e.g.*, an individual may be homozygous (identical copies) for the gene coding for normal hemoglobin. The organism's phenotype describes all of the observable characteristics, or traits, produced in the organism by the interaction of its genotype and the environments, *e.g.*, sickle cell anemia in individuals homozygous for the gene coding for sickle cell hemoglobin, when red blood cells containing such hemoglobin are exposed to low amounts of oxygen. *Id.* at n.36.

Footnote 14. This is because a single phenotype can result from different genotypes.

Footnote 15. See U.S. Patent No. 5,175,385.

Footnote 16. See U.S. Patent No. 5,221,778.

9:3 Claims Based on a Biological Deposit

Certain biological inventions, for example those that may involve the use of a

microorganism, hybridoma, ¹⁷ animal embryos, or tissue culture material may not be readily known or available to the public, or cannot be adequately described in words to satisfy the written description and enablement provisions of 35 U.S.C. §112, paragraph 1. ¹⁸

In such cases, a biological deposit may be used to satisfy 35 U.S.C. §112, paragraph 1. Sections 1.801 through 1.809 of title 37 of the Code of Federal Regulations (and MPEP section 608.01(p)(c)) set forth the PTO Rules of Practice relating to a biological deposit. However, the Federal Circuit has clarified that a deposit of a preferred cell line in a patent claiming transformed cells is not necessarily required to satisfy the best mode requirement if the specification adequately teaches those skilled in the art how to make the cell line. ¹⁹ Examples of patent claims based upon such deposits are quoted below along with their corresponding specification descriptions. Note the references to the deposited microorganisms in the claim in place of a physical description, composition description, or the like of the deposited material:

U.S. Patent 4,292,406 describes the microorganisms by their deposits:
The newly discovered thermophilic anaerobes were isolated in biologically pure cultures and designated as *Thermoanaerobacter ethanolicus*. A representative strain of this new microorganism in a biologically pure subculture, designated JW 200, has been deposited in the patent strain collection of the American Type Culture Collection, Rockville, Md., USA. ATCC 31550 is the accession number assigned by the American Type Culture Collection to this strain.

A newly isolated representative strain of *C. thermocellum* designated JW 20 has been deposited in the patent strain collection of the American Type Culture Collection, Rockville, Md., USA. ATCC 31549 is the accession number assigned to this strain of *C. thermocellum*. . . .

Claims 1 and 2 of the patent rely on those microorganisms:

1. . . . *Thermoanaerobacter ethanolicus*, having the identifying characteristics of ATCC 31550 and a *Clostridium thermocellum*, having the identifying characteristics of ATCC 31549. . . .
2. . . . , having the identifying characteristics of ATCC 31550 and 31549 . . .

U.S. Patent 4,166,112 also describes microorganisms by their deposit:
The present inventor devised an empirical method for locating and isolating microorganisms having unique, high larvicidal activity and in the instant case succeeded in isolating the microorganism herein referred to as ONR-60A. He further devised a unique carrier for dispersal of the new larvicide.

A sample of the microorganism has been deposited with the International Culture Depository, Columbus, Ohio 43210. In subsequent screening and analysis by WHO, it has been identified as a unique strain of *Bacillus thuringiensis* and has been granted an accession number within this depository as WHO/CCBC 1897.

The spores of ONR-60A were successfully isolated and a pure biological strain obtained the following way. . . .

Claim 1 of the patent also recites the microorganisms:

1. . . . pure biological strain of *Bacillus thuringiensis* var U.S. Patent 3,984,575, also describes a microorganism:

The growth and use of *Lactobacillus lactis* NRRL-B-5628 are described in detail. Set forth in Table 1 are the characteristics of *Lactobacillus lactis* strain NRRL-B-5628. The culture is deposited at Peoria, Illinois Northern Region U.S. Department of Agriculture laboratory and is freely available to public. . . .

Claim 1 of the patent relies on that disclosure:

1. . . live *Lactobacillus lactis* NRRL-B-5628 mixed with a growth. . . . On the other hand, if the microorganism has a recognized name, then that name should be used in the claim.

FOOTNOTES:

Footnote 17. A hybridoma is a cell line that makes and secretes a monoclonal antibody.

Footnote 18. *See Ex parte DeCastro*, 28 U.S.P.Q.2d (BNA) 1391 (Board of Patent Appeals and Interferences 1993) (application rejected as non-enabled, *inter alia*, where microorganisms from which claimed theophylline utilizing enzymes were obtained had been deposited (but subsequent to application filing date), but the specification provided no further description of the physical characteristics of the enzyme, and did not adequately describe how to isolate the enzymes from the deposits).

Footnote 19. *See Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1209-12 (Fed. Cir.), *cert. denied*, 116 S. Ct. 169 (1991) (Note this best mode issue was the basis for Genetic Institute's unsuccessful petition for certiorari to the Supreme Court), and *Fritsch v. Lin*, 21 U.S.P.Q.2d (BNA) 1737 (Board of Patent Appeals and Interferences 1991) (The Board's review of Federal Circuit's best mode holding). *See also* *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1578-

80 (Fed. Cir. 1991). *But see* Halluin, A., *Withholding Patent Biocultures from Public Depositories: Will the Trend Harm Medical Progress?* 4 J. Proprietary Rts. 9, 7-10 (Sept. 1992).

9:4 Claims to Nucleic Acids and Proteins

Proteins are the building blocks and functional materials of living organisms--from viruses to man. Proteins are composed of amino acids that are strung together in a sequence like beads in a necklace. There are twenty different amino acids found in proteins and their sequence provides the protein with its individuality and specifies its functions.

The unique sequence of amino acids in a protein is encoded by a gene, which specifies the order of the amino acids in the protein. In most organisms, genes are composed of DNA (except in certain viruses where the genes are composed of RNA).

DNA is a double helix, formed from two complementary strands, each of which is composed of nitrogenous bases--adenine (A), thymine (T), guanine (G) and cytosine (C)--linked to a sugar (deoxyribose) and a phosphate group to form a nucleotide. The complementary DNA strands are held together by hydrogen bonds formed between specific base pairs: A binds only to T and G binds only to C. The sequence of the bases in DNA is "read" by a cell's protein synthetic machinery in groups of three. These three bases are called "codons," each corresponding to a specific amino acid. Because there are sixty-four (43) possible codon triplets and there are only twenty amino acids, some amino acids are specified by multiple codons. This phenomenon is known as the degeneracy of the genetic code.

The degeneracy of the code gives rise to a unique situation, which, as discussed below, has implications for claiming DNA and proteins. Once the nucleotide sequence of a DNA molecule has been determined, the amino acid sequence of the encoded protein is readily determined. However, because of the code's degeneracy, the reverse is not necessarily true. A protein having a known amino acid sequence may be encoded by millions of possible codon combinations.

The use of recombinant DNA technology has allowed the development of new, purified or modified proteins and polypeptides, such as structural proteins, antibodies, hormones and enzymes, that previously could only be isolated from natural sources with great difficulty. Usually today, complete characterization of the protein or polypeptide and its encoding nucleic acids requires chemical and physical characterization, including determining the amino acid sequence of the protein or polypeptide and/or the nucleotide sequence of its encoding gene. Various manipulations of these structures, for example a change in an amino acid or nucleotide sequence, so that the sequences are different from those in the art, may be the basis for patentability.

One way of claiming a protein or nucleic acid can be by reciting its sequence. If adequate support for a broader claim is provided in the specification, a claim reciting a sequence may depend from the broader claim as in U.S. Patent No. 5,443,825:

1. Purified and isolated human leukemia inhibitory factor (LIF) which is substantially free of other human proteins.
2. Purified and isolated human LIF, according to claim 1, having the amino acid sequence set forth in FIG. 26A and B.
3. Purified and isolated human LIF, according to claim 1, as an expression product of a transformed host cell containing a DNA molecule coding for human LIF.
5. Purified and isolated human LIF according to claim 3, wherein the DNA molecule has a nucleotide sequence as set forth in FIG. 25A-C or FIG. 29A and B.
8. Purified and isolated human LIF having the amino acid sequence set forth in FIG. 26A and B beginning at Ile at position 4.

The isolation, purification and use of human LIF and its encoding DNAs were discussed in the specification. The recited DNA sequences in one of the figures recited in claim 5 was the sequence of the genomic DNA coding for human LIF, while the other was a cDNA sequence. Moreover, claim 8 specifies a truncated version of LIF.

Claims directed to methods for recombinant production of a protein may also be patentable as in U.S. Patent No. 5,427,925:

1. A method of producing human leukemia inhibitory factor (LIF) comprising the steps of
 - a) transforming or transfecting suitable host cells with a recombinant DNA molecule comprising a nucleotide sequence which codes for human LIF,
 - b) culturing the host cells of step (a) under conditions in which said cells express the recombinant DNA and produce human LIF, and
 - c) recovering said human LIF.
2. The method of claim 1 in which said recombinant DNA molecule codes for human LIF having the amino acid sequence set forth in FIG. 26.

4. The method of claims 1, 2, or 3, wherein the recombinant DNA molecule further comprises a promoter sequence operably linked to said nucleotide sequence to allow expression of the recombinant DNA and production of human LIF by said host cells.

The above claims recite the specific amino acid and nucleotide sequences in terms of the sequences set out in figures in the patent. This had been a common way of defining such sequences, which are often quite lengthy. Now, however, such sequences must be set forth in a "Sequence Listing" which must comport with the parameters set forth in the PTO's Rules of Practice relating to amino acid and nucleotide sequences set forth in 37 C.F.R. § 1.821 through 1.825. Patent applications that disclose (and claim) nucleotide and amino acid sequences must assign each such sequence in the application a Seq. ID No. and list them in the sequence listing. Also the applicant must provide the sequence information to the PTO in computer readable form (that is, on a disk) to facilitate searching the sequence for novelty and unobviousness. It is also preferable to claim sequences in terms of a Seq. ID No., rather than by reference to a figure or by setting out the complete sequence.

Often the search for a DNA sequence that codes for and expresses a protein begins by determining at least a portion of the amino acid sequence of the protein (automated amino acid sequencers and amino acid analyzers have been available for nearly thirty years). DNA probes complementary to degenerate DNA sequences encoding a particular amino acid sequence may be chemically synthesized and then used to "fish out" the gene that codes for the protein from, for example, a "DNA library."

However, in recent years, spawned by automated DNA sequencing machines that can churn out high quality nucleotide sequence information, the approach can be reversed. The field of genomics is directed at determining DNA sequences from particular organisms and, in turn, using this information to find, isolate and purify the encoded protein.

Such an approach has led to patents for the enzyme, superoxide dismutase -4 (which cleaves molecular oxygen in cells) (U.S. Patent No. 5,506,133), macrophage inflammatory proteins -3 and -4 (U.S. Patent No. 5,504,003) and human osteoclast-derived cathepsin (U.S. Patent 5,501,969). In each of these patents, the genes were isolated and sequenced before identifying the encoded proteins. The claims are directed to the nucleic acids and to the encoded proteins.

U.S. Patent No. 5,506,133 is representative:

1. An isolated polynucleotide comprising a member selected from the group consisting of:

(a) a polynucleotide encoding a polypeptide comprising amino acid 1 to amino acid 255 set forth in SEQ ID NO:2; and

(b) a polynucleotide which hybridizes to and which is at least 95% complementary to the polynucleotide of (a).

2. The polynucleotide of claim 1 comprising the polynucleotide of (a).

3. The polynucleotide of claim 2 comprising nucleotide 1 to nucleotide 1080 of SEQ ID NO:1.

4. The polynucleotide of claim 1 comprising polynucleotide (b).

5. The polynucleotide of claim 2 wherein the polynucleotide is DNA.

6. The polynucleotide of claim 2 wherein the polynucleotide is RNA.

7. The polynucleotide of claim 3 wherein the polynucleotide is DNA.

8. The polynucleotide of claim 3 wherein the polynucleotide is RNA.

9. An isolated polynucleotide comprising a member selected from the group consisting

(a) a polynucleotide encoding a polypeptide comprising amino acid 31 to amino acid 255 as set forth in SEQ ID NO:2; and

(b) a polynucleotide which hybridizes to and which is at least 95% complementary to the polynucleotide of (a).

10. The polynucleotide of claim 9 comprising polynucleotide (a).

Moreover, because of the nature of biotechnology inventions, several interesting issues have arisen regarding novelty, obviousness and adequate disclosure, a few of which are discussed here.

9:5 Novelty

As biotechnology has matured, lack of novelty has become a greater problem for DNA and protein inventions as a block to the issuance of patents, as a limit to the

scope of issued claims and as a basis for attacking the validity of patent claims. For example, a claim for a naturally occurring protein that has been produced by means of recombinant DNA (rDNA) technology may be denied for lack of novelty if the existence of the natural protein, even if not fully characterized, is known from the literature. ²⁰ In one sense, claims to recombinant versions of a naturally occurring known protein may be treated as "product-by-process" claims which may be deemed unpatentable unless the recombinant product can be shown to be different somehow from the native protein. ²¹

A disclosure of a DNA sequence in a prior art patent was found to anticipate claims to DNA in a later filed application under 35 U.S.C. §102(e) when the application which matured into the prior art patent enabled one skilled in the art to practice the invention. ²²

Another example involved the alleged infringement of a product-by-process claim for purified Factor VIII, where the product per se had been deemed unpatentable (not novel) by the PTO, since it was already known from the literature. ²³ During the litigation, neither side challenged this point or that one may claim a purified form of the natural product. Thus, with adequate disclosure, proteins produced by recombinant technology, the DNA sequences encoding them and monoclonal antibodies (MAbs) directed against such protein may all be patentable.

In *Fiers v. Sugano*, ²⁴ the Federal Circuit addressed novelty of a DNA invention in determining conception and priority of an invention under 35 U.S.C. §102(g) directed to a claimed DNA coding for B-interferon in an interference proceeding. In *Fiers*, the Court reiterated its holding in *Amgen, Inc. v. Chugai Pharmaceutical Co.* ²⁵ that "conception of a DNA, like conception of any chemical substance requires a definition of that substance other than by its functional utility." ²⁶ Thus, for some biotechnology inventions (such as claims to DNA and proteins), conception may not be achieved until the invention has been actually reduced to practice and there is some practical way of defining the invention (for example, by a nucleotide or amino acid sequence or other physical properties), other than by reciting its function.

FOOTNOTES:

Footnote 20. See, e.g., *In re Spada*, 911 F.2d 705 (Fed. Cir. 1990), in which the Federal Circuit held that where the PTO has shown a sound basis for believing that the products of an applicant and the prior art are the same, the applicant has the burden of showing the products are not the same (e.g., by way of evidence presented in the specification or in a declaration under 37 C.F.R. §1.132). Claims to the DNA

Footnote 21. See, e.g., *Ex parte Gray*, 10 U.S.P.Q.2d (BNA) 1992 (Board of Patent Appeals and

Interferences 1989); *In re Thorpe*, 777 F.2d 695 (Fed. Cir. 1985).

Footnote 22. *See Ex parte D*, 27 U.S.P.Q 2d (BNA) 1067 (Board of Patent Appeals and Interferences 1993), in which a prior art patent covering DNA encoding tissue plasminogen activator (t-pa) was deemed an effective reference under §102(e), even though the t-pa DNA sequence in the original application leading to the prior art patent differed from the sequence in the issued prior art patent.

Footnote 23. *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991); *rev'd in part*, *Atl. Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 834, *reh'g denied*, 974 F.2d 1279 (dissent), *concurring*, 974 F.2d 1299 (Fed. Cir. 1992). A representative process claim (claim 1) and a product-by-process claim (claim 13) of the patent in suit are set forth:

1. An improved method of preparing Factor VIII procoagulent activity protein comprising the steps of (a) adsorbing a VIII:C/VIII:RP complex from a plasma or commercial concentrate source onto particles bound to a monoclonal antibody specific to VIII:RP, (b) eluting the VIII:C, (c) adsorbing the VIII:C obtained in step (b) in another adsorption to concentrate and purify same, (d) eluting the adsorbed VIII:C, and (e) recovering the highly purified and concentrated VIII:C.

13. Highly purified and concentrated human or porcine VIII:C prepared in accordance with the method of claim 1.

Footnote 24. *Fiers v. Sugano*, 984 F.2d 1164 (Fed. Cir. 1993).

Footnote 25. *Amgen, Inc. v. Chugai Pharm. Co., Ltd.* 927 F.2d 1200 (Fed. Cir. 1991).

Footnote 26. *Id.* at 1206.

§9:6 Obviousness of DNA Inventions

A controversial issue regarding patentability of DNA claims is whether prior art disclosing general methods of obtaining a DNA molecule ("cloning") may be cited against claims to specific DNA sequences encoding for specific proteins. The Federal Circuit decision in *In re Bell*²⁷ appeared to answer the question in the negative. In *Bell*, the court held that a claimed DNA sequence was not prima facie obvious in view of references setting forth the full amino acid sequence of the polypeptides (insulin-like growth factors I and II) encoded by the claimed DNAs, and a reference providing a general method for cloning DNA.

The *Bell* claims are directed to DNAs coding for insulin-like growth factors (IGF) I & II.²⁸ In finding the invention not obvious, the court noted that for DNA inventions, a "vast number of nucleotide sequences might code for a specific protein" due to the

degeneracy of the genetic code, and that one could not predict beforehand whether a particular amino acid sequence would be encoded by a particular DNA sequence.²⁹ Thus, the established relationship in the genetic code between a particular DNA and the protein it encodes does not necessarily make the gene *prima facie* obvious in the same way that a *prima facie* case may be made for homologs, analogs and isomers in a chemical case.³⁰

Since the *Bell* claims covered only the specific DNA sequences of IGF I and II which are naturally occurring in humans, rather than all of the 1036 possible degenerative DNA sequences which could theoretically encode the polypeptides, the claims were deemed patentable over the prior art.

A subsequent decision by the Board indicated its willingness to disallow the holding in *Bell* and continue to allow examiners to cite prior art disclosing methods of cloning against claims to DNA molecules *per se* in order to render DNA claims obvious. For example in *Ex parte Deuel (Deuel I)*,³¹ the appellant's claims were directed to DNA sequences coding for heparin-binding growth factor (HBGF). The Board upheld the examiner's obviousness rejection based on prior art references disclosing a partial amino acid sequence (the N-terminal sequence) of the protein and a general method for cloning genes which code for proteins having a known N-terminal sequence. The Board relied heavily on statements by the examiner indicating that cloning is routine in the art.³²

The Board tried to distinguish *Deuel I* from *Bell* by stating that, in *Bell*, the prior art actually taught away from the method of cloning used by the appellants.³³ Based in part on this observation, the Board interpreted *Bell* as being limited to its specific facts,³⁴ despite the fact that the issue in each case was stated in broad terms and was virtually identically framed.³⁵ Furthermore, the *Deuel I* Board dismissed the statement in *Bell* pointing out the impropriety of focusing on the method of isolation when the issue was "the obviousness of the claimed composition, not the method by which they are made." It did so by noting that intelligent guesses at the DNA sequence can be made from the amino acid sequence, and that the appellant had not provided any evidence that the cited method required undue experimentation.³⁶

The Board's reasoning in *Deuel I*, however, was explicitly rejected by the Federal Circuit in *In re Deuel ("Deuel II")*.³⁷ The Federal Circuit asserted that the relationship (that is, the genetic code) between proteins and nucleic acids does not render a particular DNA (sequence) obvious from a disclosed amino acid sequence. Furthermore, relying on its previous decision in *Bell*, the court stated that "the existence of a general method of isolating cDNA or DNA molecules is essentially irrelevant to the question of whether the specific molecules *themselves* would have been obvious, in the absence of other prior art that suggests the claimed DNA."³⁸ The court emphasized that the fact that it would be *obvious to try* (that is, an incentive) to isolate a DNA sequence (corresponding to a known amino acid

sequence), and that a known method existed for doing so, does not render the claimed sequence itself obvious until the compound has been definitively isolated. ³⁹

As a result of the Federal Circuit's opinion in *Deuel II*, it appears that the previously problematic question of whether prior art disclosing general methods of DNA cloning may be cited against DNA composition claims with regard to obviousness determinations has been answered in the negative. ⁴⁰

FOOTNOTES:

Footnote 27. *In re Bell*, 991 F.2d 781 (Fed. Cir. 1993).

Footnote 28. Claim 25 of the *Bell* application was found to be representative of the claims in issue in the appeal:

25. A composition comprising nucleic acid molecules containing a human sequence encoding insulin-like growth factor (hIGF) substantially free of nucleic acid molecules not containing said hIGF sequence, wherein said hIGF sequence is selected from the group consisting of:

(a) 5'-GGA CCG GAG ACG CUC UGC GGG GCU GAG CUG GUG GAU GCU CUU CAG UUC GUG UGU GGA GAC AGG GGC UUU UAU UUC AAC AAG CCC ACA GGG UAU GGC UCC AGC AGU CGG AGG GCG CCU CAG ACA GGU AUC GUG

GAU GAG UGC UGC UUC CGG AGC UGU GAU CUA AGG AGG CUG GAG AUG UAU UGC GCA CCC CUC AAG CCU GCC AAG UCA GCU-3', wherein U can also be T;

(b) 5'-GCU UAC CGC CCC AGU GAG ACC CUG UGC GGC GGG GAG CUG GUG GAC ACC CUC CAG UUC GUC UGU GGG GAC CGC GGC UUC UAC UUC AGC AGG CCC GCA AGC CGU GUG AGC CGU CGC AGC CGU GGC AUC GUU GAG GAG UGC UGU UUC CGC AGC UGU GAC CUG GCC CUC CUG GAG ACG UAC UGU GCU ACC CCC GCC AAG UCC GAG-3', wherein U can also be T;

(c) nucleic acid sequences complementary to (a) or (b); and

(d) fragments of (a), (b) or (c) that are at least 18 bases in length and which will selectively hybridize to human genomic DNA encoding hIGF.

Footnote 29. *Bell*, 991 F.2d at 784.

Footnote 30. The court noted, however, that a gene may be obvious in view of the known amino acid sequence of the encoded protein, if it was *known* that the protein was encoded by "unique" codons (*i.e.*, that there was only one DNA sequence coding for the protein). *Id.*

Footnote 31. *Ex parte Deuel*, 33 U.S.P.Q.2d 1445 (Board of Patent Appeals and Interferences 1993).

Footnote 32. *Id.* at 1447.

Footnote 33. *Id.* at 1449.

Footnote 34. *Id.*

Footnote 35. The *Bell* court framed the issue as follows:

The issue before us is whether the Board correctly determined that the amino acid sequence of a protein in conjunction with a reference indicating a general method of cloning renders the genes *prima facie* obvious; *In re Bell*, 991 F.2d 781, . . . (Fed. Cir. 1993), whereas the Board in *Deuel I* framed the issue as: Whether or not knowledge of the amino acid sequence of a protein, in conjunction with a general method of cloning, renders the invention, as a whole, *i.e.*, the gene, *prima facie* obvious.

Ex parte Deuel, 33 U.S.P.Q.2d at 1449.

Footnote 36. *Id.* at 1450.

Footnote 37. *In re Deuel*, 51 F.3d 1552 (Fed. Cir. 1995).

Footnote 38. *Id.* at 1559 (emphasis added).

Footnote 39. *Id.* at 1559-60 (emphasis added).

Footnote 40. Perhaps the major beneficiary of the Federal Circuit's *Deuel II* decision will be in regard to claims to monoclonal antibodies ("MABs"). (See below.) Generally the PTO has taken the position (like in *Deuel I*) that a MAB is obvious if it is directed to a known antigen (particularly if the sequence or structure is known) (*i.e.*, the "relationship" question), given the known methods for making MABs. The rationale of *Deuel II* may be applied, however, if the MAB is clearly defined and circumscribed.

9:7 Obviousness of Biotechnology Process Claims

For a number of years, biotechnology inventions dealing with processes were almost always subject to obviousness rejections in view of the Federal Circuit's decision in *In re Durden*.⁴¹ The question of patentability of such claims was framed as whether an old process becomes new and nonobvious due to the presence of either or both a new starting material in the process or a new product resulting from the process (so-called "analogous processes"). While *Durden* involved the patentability of a

chemical process,⁴² its major impact has been on patentability of biotechnology inventions, where *Durden* has been often cited, almost by rote application, to deny patentability of process claims, even though the Federal Circuit admonished that each determination had to be based on the facts of the particular case.

For a long time *Durden* had a chilling effect on the pursuit of process patent protection and delayed issuance of patents. *Durden* rejections could be overcome, only at great expense, such as in U.S. Patent No. 4,766,069 which claims rDNA coding for interleukin 1B (IL-1b), and a process for making the interleukin. The issued claims of the patent include:

1. A recombinant DNA cloning vehicle comprising a DNA sequence comprising human [IL-1] IL-1 beta gene sequence.

12. A process for preparing human [IL-1B] IL-1 beta which comprises culturing a microbe hosting a cloning vehicle comprising DNA encoding human [IL-1B] IL-1 beta and recovering human [IL-1B] IL-1 beta.

However, the process claims in Amgen's original erythropoietin (EPO) application that ultimately matured into U.S. Patent No. 4,703,008 (the Amgen patent in suit in the various EPO litigations) could not be obtained because of *Durden*, and Amgen elected to prosecute the DNA, vector and host claims in the application leading to the '008 patent. Amgen process claims for making EPO by recombinant DNA technology were left for another application.⁴³ Representative DNA claims of the '008 patent include:

1. A purified and isolated DNA sequence encoding erythropoietin, said DNA sequence selected from the group consisting of: (a) the DNA sequences set out in Figs. 5 & 6 or their complementary strands; and (b) DNA sequences which hybridize under stringent conditions to the DNA sequences defined in (a).

7. A purified and isolated DNA sequence consisting essentially of a DNA sequence encoding a polypeptide having an amino acid sequence sufficiently duplicative of that of erythropoietin to allow possession of the biological property of causing bone marrow cells to increase production of reticulocytes and red blood cell, to increase hemoglobin synthesis or iron uptake.⁴⁴

The Federal Circuit limited the holding in *Durden* to cases dealing with the patentability of a process of *making* a product, not a process of *using* one in *In re Pleuddemann*.⁴⁵ The Board, citing *Durden*, had rejected Pleuddemann's claims covering a method of *using* novel and patentable silane coupling agents in bonding methods. In reversing, the Federal Circuit stated that one could claim an invention in different ways:

- (1) the compound per se;
- (2) the method or process of making the compound; and
- (3) the method or process of using the compound. ⁴⁶

The court reiterated the prohibition of using an applicant's invention against the inventor to show obviousness of his invention against the inventor. *Pleuddemann* follows the rationale and holding of *In re Mancy*, a C.C.P.A. decision dealing with biological subject matter, where a claim for the use of a new product was distinguished from a claim for its manufacture and a finding of obviousness overturned. ⁴⁷

Durden-type rejections primarily affected three types of biotechnology claims:

- (1) purification process claims;
- (2) claims to preparation of MAb for a specific antigen; and
- (3) claims to methods of making an identified gene product, for example, a recombinant protein or plant, via genetic engineering techniques.

Drafting around *Durden* rejections was difficult, for example, because of the uncertain patentability of the product itself (for example, a protein). A recombinant protein may be deemed already known (anticipated) under 35 U.S.C. §102 or obvious under §103 where the natural protein is known, or where some of its basic properties are known, even if the protein is not fully characterized or purified. ⁴⁸

Moreover, without process of *making* claims, biotechnology inventors cannot take advantage of the Process Patent Amendments Act of 1988. ⁴⁹ Specifically, without such claims neither 19 U.S.C. §1337 nor 35 U.S.C. §271(g) ⁵⁰ would prevent foreign manufacturers located abroad from using a process of making a product (patented in the United States) to produce the products, such as medically useful proteins, and then importing them into the United States. ⁵¹

However, in the Biotechnology Patent Process Protection Act of 1995 (the "Biotechnology Act"), ⁵² Congress added a new section (b) to 35

U.S.C. §103 to deal with the obviousness of process of making claims in biotechnology inventions:

(b)(1) Notwithstanding subsection (a), and upon timely election by the applicant for patent to proceed under this subsection, a biotechnological process using or resulting in a composition of matter that is novel under section 102 and nonobvious under subsection (a) of this section shall be considered nonobvious if--

(A) claims to the process and the composition of matter are contained in either the same application for patent or in separate applications having the same effective filing date; and

(B) the composition of matter, and the process at the time it was invented, were owned by the same person or subject to an obligation of assignment to the same person.

(2) A patent issued on a process under paragraph (1)--

(A) shall also contain the claims to the composition of matter used in or made by that process, or

(B) shall, if such composition of matter is claimed in another patent, be set to expire on the same date as such other patent, notwithstanding section 154.

(3) For purposes of paragraph (1), the term "biotechnological process" means--

(A) a process of genetically altering or otherwise inducing a single- or multi-celled organism to--

(i) express an exogenous nucleotide sequence,

(ii) inhibit, eliminate, augment, or alter expression of an endogenous nucleotide sequence, or

(iii) express a specific physiological characteristic not naturally associated with said organism;

(B) cell fusion procedures yielding a cell line that expresses a specific protein, such as a monoclonal antibody; and

(C) a method of using a product produced by a process defined by subparagraph (A) or (B), or a combination of subparagraphs (A) and (B).

Also, the Federal Circuit issued two decisions, *In re Ochiai*⁵³ and *In re Brouwer*,⁵⁴ directed to the patentability of process claims in general. In view of the passage of the Biotechnology Act, *Ochiai*, and *Brouwer*, the PTO issued a Notice regarding examination of product and process claims in biotechnology.⁵⁵ In view of *Ochiai* and *Brouwer*, however, it is believed that reliance on section 103(b), which is specific for

biotechnology, will be minimized. The effect of the Notice, cases, and statutes, however, should be increased issuance of claims to biotechnology process.

FOOTNOTES:

Footnote 41. *In re Durden*, 763 F.2d 1406 (Fed. Cir. 1985).

Footnote 42. Both the starting material for the process and the resulting product of the process were deemed novel and patentable.

Footnote 43. As a result of the '008 patent not having claims covering the method of making recombinant EPO, Amgen was deemed to have no recourse to prevent Chugai, which was manufacturing EPO abroad, from bringing its EPO into the U.S. pursuant to either 35 U.S.C. §271(g) or 19 U.S.C. §1337(a). *See Amgen, Inc. v. Chugai Pharm., Ltd.*, 13 U.S.P.Q.2d 1737 (D. Mass. 1989), and *Amgen, Inc. v. United States Int'l Trade Comm'n*, 902 F.2d 1532 (Fed. Cir. 1990). The PTO has since allowed Amgen's process claims, which became involved in an interference with an application from Genetics Institute. The Board determined priority in Amgen's favor. *See Fritsch v. Lin*, 21 U.S.P.Q.2d (BNA) 1739 (Board of Patent Appeals and Interferences 1991). After further appeals, these cases have now been settled. Amgen has recently been issued its patent covering the method for making EPO using the DNA of the '008 patent. *See U.S. Patent No. 5,441,868.*

Footnote 44. U.S. Patent No. 4,703,008. The validity of a number of claims of the '008 patent was upheld in *Amgen v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200 (Fed. Cir.), *cert.*

denied, 112 S. Ct. 169 (1991). However, claim 7 was invalidated for lack of enablement. *See discussion, infra.*

Footnote 45. *In re Pleuddemann*, 910 F.2d 823 (Fed. Cir. 1990).

Footnote 46. *Id.* at 826 (citing *In re Kuehl*, 475 F.2d 658 (C.C.P.A. 1973)).

Footnote 47. *Application of Mancy*, 409 F.2d 1289 (C.C.P.A. 1974). Claims to the use of a culture of *Streptomyces bifurcus*, which had been supplied by the patentee, to make the antibiotic doxorubicin were deemed patentable. Although, similar culture techniques had previously been used to produce the antibiotic with other strains of bacteria, the court upheld the process claims. In other words, patentability of the novel strain of bacteria imparted patentability to the method of using it to make the antibiotic. Many commentators have indicated that *Mancy* is more applicable than *Durden* to the patentability of method of making claims in biotechnology.

Footnote 48. *See, e.g., Ex parte Gray*, 10 U.S.P.Q.2d (BNA) 1922 (Board of Patent

Appeals and Interferences 1989). In *Gray*, the Board essentially treated claims to a recombinant protein (nerve growth factor--NGF) as unpatentable "product-by-process" claims under 35 U.S.C. § 102 and/or 103, in view of art directed to purified NGF.

Footnote 49. Pub. L. No. 100-418, title IX, subtitle A, 101 Stat. 128 (1988) codified at 19 U.S.C. §1337 (1991). This section empowers the International Trade Commission to issue an exclusion order of a product made, produced or processed abroad, if the product was made by a process covered by a valid and enforceable patent.

Footnote 50. Pub. L. No. 100-412, 35 U.S.C. §271(g), which provides that "[w]hoever without authority imports into the United States or uses or sells within the United States a product which is made by a process patented in the United States shall be liable as an infringer."

Footnote 51. For just such an example, see *Amgen, Inc. v. United States Int'l Trade Comm'n*, 902 F.2d 1532 (Fed. Cir. 1990). See also Seide, *Durden Debate*, AIPLA Bull., at 525-27 (Apr., May, June 1991).

Footnote 52. Pub. L. No. 104-41, §1, 109 Stat. 351 (Nov. 1, 1995), 35 U.S.C. §103(b).

Footnote 53. *In re Ochiai*, 71 F.3d 1565 (Fed. Cir. 1995).

Footnote 54. *In re Brouwer*, 77 F.3d 422 (Fed. Cir. 1995).

Footnote 55. See 51 Pat. Trademark & Copyright J. (BNA) 626 (Mar. 21, 1996).

§9:8 Sufficient Written Description and Utility of Nucleic Acid

The description requirement dictates that an inventor describe with particularity the claimed features of the invention. In a three-party interference dealing with who was the first to invent a DNA coding for B-interferon, *Fiers v. Sugano*,⁵⁶ the Federal Circuit discussed the legal standard for a sufficient written description for a claimed DNA:

On reconsideration, the Board correctly set forth the legal standard for sufficiency of a description: the specification must "reasonably convey [] to the artisan that the inventor had possession at that time of the [making of the invention that he had possession of the] claimed subject matter." (citations omitted).⁵⁷

The court went on to say that

An adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself. . . .

A bare reference to a DNA with a statement that it can be obtained by reverse transcription is not a description; it does not indicate that Revel was in possession of the DNA. ⁵⁸

The court reaffirmed its holding in *Amgen v. Chugai* that an adequate disclosure of a DNA invention is more than "a wish, or arguably, a plan for obtaining the DNA." ⁵⁹ The court found that the claim in issue, which purported to cover all DNAs coding for B-interferon, was analogous to a single means claim and, thus, did not comply with the requirements of 35 U.S.C. §112, paragraph 1. ⁶⁰ The court found Revel's application was attempting to "preempt the future before it arrived" by "claim[ing] all DNAs that achieve a result without defining what means will do so," and, as such, was not in compliance with the written description requirement. ⁶¹

More recently, a controversy erupted when the PTO denied patent applications for gene sequences and for procedures that would use these sequences to diagnose disorders with these genes. The PTO took the position that simply finding DNA sequences and claiming their use as research reagents was not sufficient for a patent. Thus, the PTO required the gene inventor to show a level of utility beyond the gene's use as a research tool. This requirement presents particular problems with regard to the utility of gene fragments. Some argued that even gene fragments, also known as express sequence tags (ESTs), are patentable because they can be used as molecular probes to search for complete genes. ^{61.1} Others argued that ESTs are not patentable if their only known utility is limited to conducting research.

This controversy led the PTO to finalize its patent utility guidelines for patent examiners in assessing whether a claimed invention should be awarded patent protection. ^{61.2} These guidelines address primarily the issue of utility standards for gene and gene fragment patents by adopting the structure of a test for showing utility. This test is the "specific, substantial, and credible" utility test.

A utility is considered "specific" when it is particular to the subject matter claimed. ^{61.3} Specifically, disclosing the utility for a gene fragment to be a gene probe or chromosome marker is not enough to pass the "specific" utility test. ^{61.4} What is also required is the identification of the particular gene or chromosome target because otherwise this gene fragment is considered just as useful as any random fragment of nucleic acid. ^{61.5} Similarly, if the stated utility of a gene or gene fragment is diagnosing a condition, the condition to be diagnosed must also be identified before it can satisfy the "specific" utility test. ^{61.6}

Furthermore, a utility is considered to be "substantial" if it establishes "real world" use and does not require further research to identify an immediate benefit.^{61.7} For example, a polynucleic acid molecule whose only disclosed utility is to study its own properties does not satisfy the "real world" requirement while a polynucleic acid molecule whose disclosed utility is the identification of a gene that is linked to specific medical conditions satisfies this test.^{61.8}

Finally, a utility is considered "credible" if a person with ordinary skill in the art would accept that the invention is currently available for such use.^{61.9} This is not considered a very strict standard since it is usually satisfied unless the utility assertion is inconsistent with the logic underlying the assertion.^{61.10} For instance a stated utility for a polynucleic acid molecule as a probe for a particular gene satisfies the "credible utility" requirement because polynucleic acid molecules are commonly used for this purpose.^{61.11}

FOOTNOTES:

Footnote 56. *Fiers v. Sugano*, 984 F.2d 1164 (Fed. Cir. 1993).

Footnote 57. *Id.* at 1170.

Footnote 58. *Id.* at 1170-71.

Footnote 59. *Id.* at 1171.

Footnote 60. *See In re Hyatt*, 708 F.2d 712 (Fed. Cir. 1983) ("the enabling disclosure [must] be commensurate in scope with the claim under consideration").

Footnote 61. 984 F.2d at 1171.

Footnote 61.1. *See Utility Examination Guidelines*, 66 Fed. Reg. 1,092, 1,094 (Jan. 5, 2001) (Comment 9: "The disclosure of a DNA sequence has inherent value and . . . possible uses for the DNA appear endless. . .").

Footnote 61.2. *Utility Examination Guidelines*, 66 Fed. Reg. 1,092 (Jan. 5, 2001).

Footnote 61.3. *See 2000 Revised Interim Utility Guidelines' Training Materials* issued to patent examiners, at p.5.

Footnote 61.4. *Id.*

Footnote 61.5. *Id.*

Footnote 61.6. *Id.*

Footnote 61.7. See Stephen G. Kunin, *Written Description Guidelines and Utility Guidelines*, 82 Pat. & Trademark Off. Soc'y 77, 96-97, 98 (Feb. 2000).

Footnote 61.8. *Id.*

Footnote 61.9. See 2000 Revised Interim Utility Guidelines' Training Materials issued to patent examiners, at p.5.

Footnote 61.10. See *id.*

Footnote 61.11. See Kunin, *supra* note 61.7, at 98.

9:9 Enablement for DNA and Protein Claims

Often an inventor wishes to obtain claims not only to a protein or DNA having one specific sequence, but also to proteins or DNAs whose sequences have been modified. Because the PTO considers biotechnology to be highly unpredictable technology with simple changes in amino acid or nucleotide sequences possibly giving rise to altered functions, we must take great care to provide adequate enablement for broader claims.⁶²

One way to enable broader protein or DNA claims is to provide some functional language in the claim to define the modified protein or DNA. For example, in *Ex parte Mark*,⁶³ the Board determined that appealed claims directed to cysteine-depleted muteins⁶⁴ of biologically active proteins, which required the mutein to retain the biological activity of the native protein, to be enabled. Claim 1 is representative:

1. A synthetic mutein of a biologically active native protein in which native protein has at least one cysteine residue that is free to form a disulfide link and is nonessential to said biological activity, said mutein having at least one of said cysteine residues substituted by another amino acid and said mutein exhibiting the biological activity of said native protein.

The Board found that the record established, inter alia, via a declaration under 37 C.F.R. §1.132, that for a given cysteine-containing protein, one skilled in the art would be able to determine in a routine fashion (that is, without undue experimentation) whether replacement or deletion of a cysteine residue would result in a mutein covered by the claims (that is, retain biological activity of native protein).⁶⁵

Moreover, as discussed above, genetic engineering and immunological inventions are considered highly unpredictable technologies, requiring more than a single embodiment to afford a broad scope of enablement.⁶⁶

The Federal Circuit reviewed the scope of enablement for claims to DNA in regard to claim 7 of Amgen's U.S. Patent No. 4,703,008: ⁶⁷

7. A purified and isolated DNA sequence consisting essentially of a DNA sequence encoding a polypeptide having an amino acid sequence sufficiently duplicative of that of erythropoietin to allow possession of the biological property of causing bone marrow cells to increase production of reticulocytes and red blood cell, to increase hemoglobin synthesis or iron uptake.

The court construed claim 7 as a generic claim covering "all possible DNA sequences that will encode any polypeptide having an amino acid sequence 'sufficiently duplicative' of EPO to possess the property of increasing production of red blood cells." ⁶⁸ The district court had determined that over 3,600 different EPO analogs could be made by substituting at only one amino acid in the polypeptide chain, and over one million if three amino acids in the polypeptide were changed.

The Federal Circuit noted that the district court had erred in its analysis by focusing on EPO *protein* analogs, rather than on the *claimed DNAs*, but nonetheless found that there was insufficient disclosure to enable one skilled in the art to carry out the invention commensurate with the scope of the claim. ⁶⁹ The court noted that Amgen's claim was directed to DNA sequences and that "Amgen has not enabled preparation of DNA sequences sufficient to support its all-encompassing claims." ⁷⁰

The rationale in *Amgen* was followed by the Board in *Ex parte Ishizaka*, ⁷¹ which found claims to nucleic acids coding for polypeptides exhibiting glycosylating inhibiting factor activity, defined in terms of the nucleotide sequence and homologues thereof, to be unpatentable under both 35 U.S.C. §112, paragraphs 1 and 2. The Board determined that, although the claims superficially appeared to be definite, their intended scope could not be determined, nor was there sufficient enablement for the apparent breadth of the claims. ⁷²

Similarly, in *Ex parte Maizel*, ⁷³ the Board reviewed and upheld for lack of enablement rejected claims directed to a recombinant DNA vector coding for human B-cell growth factor (BCGF) protein or a "biologically functional equivalent thereof." ⁷⁴ Among other grounds, the claims were rejected as being broader in scope than the enabling disclosure (under section 112, paragraph 1) and as being directed to subject matter not described in the specification (new matter).

In affirming the scope of enablement rejection, the Board analogized the rejected claims to "single means" claims, which have been disparaged by the Federal Circuit. ⁷⁵ The applicants had chosen to claim the DNA, not by what it is, but by what it does (functionally), that is, encoding a protein (BCGF) having particular biological and

structural characteristics, or a biologically functional equivalent thereof. ⁷⁶ The Board commented:

The problem with the phrase "biologically functional equivalent thereof" is that it covers any conceivable means, *i.e.*, cell or DNA, which achieves the stated biological result while the specification discloses, at most, only a specific DNA segment known to the inventor. ⁷⁷

Since the specification provided, at most, only a specific DNA segment, the Board concluded that the scope of the claims was "far in excess of that warranted by the scope of the enablement set forth in the specification." ⁷⁸

FOOTNOTES:

Footnote 62. The enablement provision of 35 U.S.C. §112, [para] 1, requires that the specification provide sufficient information to permit one skilled in the art to make and to use the invention without the exercise of undue experimentation.

See Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d at 1384. Enablement is not precluded if some experimentation is necessary--it must not, however, be undue. *Id.* Furthermore, the patent does not have to teach and preferably omits what is well known in the relevant art. *Id.*

Footnote 63. *Ex parte Mark*, 12 U.S.P.Q.2d (BNA) 1904 (Board of Patent Appeals and Interferences 1989).

Footnote 64. A "mutein" is a protein in which one amino acid (naturally occurring) is replaced by another.

Footnote 65. *Mark*, 12 U.S.P.Q.2d at 1906-07.

Footnote 66. *See, e.g., Ex parte Hitzeman*, 9 U.S.P.Q.2d 1821 (Board of Patent Appeals and

Interferences 1987). ("[T]he) scope of enablement provided to one having ordinary skill in the art of appellants' specification disclosure is to [sic] commensurate with the scope of protection sought by the appealed claims. . . . [A]ppellants' specification fails to provide those having ordinary skill in the art reasonable assurance, *as by* adequate representative examples, that vectors and yeast transformants falling within the scope of the appealed claims can be prepared and used.") (Emphasis in original).

Footnote 67. *Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1212-14 (Fed. Cir.), *cert. denied*, 112 S. Ct. 169 (1991).

Footnote 68. *Id.* at 1212.

Footnote 69. *Id.* at 1213.

Footnote 70. The court noted that with regard to DNA claims:

What is necessary is that he provide a disclosure sufficient to enable one skilled in the art to carry out the invention commensurate with the scope of his claims. For DNA sequences that means disclosing how to make and use enough sequences to justify grant of the claims sought.

The court further stated that it did "not intend to imply that generic claims to genetic sequences cannot be valid where they are of a scope appropriate to the invention disclosed by an applicant. That is not the case here, where Amgen has claimed every possible analog of a gene containing about 4,000 nucleotides, with a disclosure only of how to make EPO and a very few analogs." *Id.* at 1214. *See also In re Deuel*, 51 F.3d 1552, 1560 (Fed. Cir. 1995).

Footnote 71. *Ex parte Ishizaka*, 24 U.S.P.Q.2d (BNA) 1621 (Board of Patent Appeals and Interferences 1992).

Footnote 72. *Id.* at 1625-26. At present, there is no case from the Board or Federal Circuit discussing the scope of enablement required to support broad claims intended to generically encompass homologues, analogues, fragments, etc. of peptides, polypeptides, and proteins. However, in view of *Amgen* and *Ishizaka*, it is believed that there must be more than a mere allegation in the specification that such derivatives may be made (without undue experimentation) to obtain (or uphold) broad claims.

Footnote 73. *Ex parte Maizel*, 27 U.S.P.Q.2d (BNA) 1662 (Board of Patent Appeals and Interferences 1993).

Footnote 74. Claim 1 of Maizel's application reads as follows:

1. A recombinant DNA vector comprising a DNA sequence which encodes a protein exhibiting a molecular weight between about 8 and about 14 kilodaltons upon gel exclusion chromatography, said protein having an amino acid sequence which includes the non-**B**-galactosidase derived sequence of amino acids displayed in Figure 4, or a biologically functional equivalent thereof, and having a **BCGF** biological activity characterized by an ability to stimulate the incorporation of thymidine into **DNA** of **BCGF**-dependent B-cells, or an ability to stimulate the comitogenesis of anti-u activated B-cells, when said protein is cocultured in effective concentrations with said respective B-cells *in vitro* (emphasis in original).

Footnote 75. See *In re Hyatt*, 708 F.2d 712 (Fed. Cir. 1983).

Footnote 76. *Maizel*, 27 U.S.P.Q.2d at 1665.

Footnote 77. *Id.*

Footnote 78. *Id.*

9:10 Claims to Monoclonal Antibodies (MAbs)

The potential subject matter of MAb (and hybridoma) inventions may be divided into several categories:

- (1) the hybridoma cell line per se;
- (2) the MAb secreted by the hybridoma of interest;
- (3) methods of making MAbs;
- (4) methods of using MAbs, including immunoassays; and
- (5) immunoassay kits incorporating MAbs.

Protection for the product MAb would provide the inventor with the right to exclude others from making and using the MAb. Preferably, MAb claims should cover the inventor's MAb, as well as others that possess the same inherent properties. The problem becomes how to avoid narrowly defining the MAb (for example, "MAb RKS 123."). MAbs may be defined in terms of their binding characteristics if the antigen is known (for example, "MAb reactive with leukocyte interferon"). If the antigen is unknown, the MAb might be claimed more generally in terms of function (for example, "MAb that binds to human breast adenocarcinoma cells, but not to normal human breast epithelial cells"). Another approach is to claim the MAb in terms of the specific antigenic determinant or "epitope" with which it reacts.

However, the outcome of several decisions from the Board, for example, *Ex parte Erlich (Erlich I)*, ⁷⁹*Ex parte Erlich (Erlich II)*, ⁸⁰*Ex parte*

Sorg,⁸¹ has circumscribed the patentability of monoclonal antibody claims. In view of these decisions, MAb claims are usually subject to a rejection for obviousness, once the antigen with which the MAb reacts has been identified, purified or otherwise characterized.

However, this rejection may be overcome by a clear showing (for example, by way of a declaration under 37 C.F.R. §1.132) that either an inventive process was used to

make the MAb or that the MAbs exhibit novel specificity for a particular antigen.⁸² Moreover, as discussed above, the decision in *In re Deuel*⁸³ is highly relevant to the patentability of MAbs directed to known antigens and has been used successfully in securing such claims.

The following are some forms for MAb claims that have been successful:

1. A monoclonal antibody which specifically binds to a peptide having an amino acid sequence identical to carboxy terminal heptapeptide of protein X and has the same antigen-binding specificity as antibodies produced by the deposited cell line having the ATCC number HB 0000.⁸⁴

2. A monoclonal antibody produced by hybridoma cell line ATCC No. HB 0000, which antibody binds to a determinant site on a cell surface glycoprotein antigen of human tumor cells and antibodies which bind to the same antigenic determinant as does the monoclonal antibody produced by ATCC No. HB 0000 and compete with the monoclonal antibody produced by HB 0000 for binding at that antigenic determinant, Fab, F(ab)2, and Fv fragments and conjugates of said antibody.⁸⁵

3. A continuous cell line which produces a monoclonal antibody, wherein said monoclonal antibody binds to the same antigenic determinant as monoclonal antibody LAX produced by hybridoma cell line ATCC No. HB 0000, said cell line produced by the process of fusing a lymphocyte derived from a mouse immunized with carcinoma cells or an immunogenic determinant thereof and a mouse myeloma cell.⁸⁶

4. A continuous cell line which produces a monoclonal antibody, wherein said monoclonal antibody binds to the same antigenic determinant as monoclonal antibody LAX produced by hybridoma cell line ATCC No. HB 0000, said cell line produced by the process of fusing a lymphocyte derived from a human with carcinoma and a myeloma cell.⁸⁷

5. A process for the determination of the presence of or concentration of an antigenic substance in a fluid comprising the steps:

(a) contacting a sample of the fluid with a measured amount of a soluble first monoclonal antibody to the antigenic substance in order to form a soluble complex of the antibody and antigenic substance present in said sample, said first monoclonal antibody being labelled;

(b) contacting the soluble complex with a second monoclonal antibody to the antigenic substance, said second monoclonal antibody being bound to a solid carrier, said solid carrier being insoluble in said fluid, or order to form an insoluble complex of said first monoclonal antibody, said antigenic substance and said second

monoclonal antibody bound to said solid carrier;

(c) separating said solid carrier from the fluid sample and unreacted labelled antibody;

(d) measuring either the amount of labelled antibody associated with the solid carrier or the amount of unreacted labelled antibody; and

(e) relating the amount of labelled antibody measured with the amount of labelled antibody measured for a control sample prepared in accordance with steps (a)-(d), said control sample being known to be free of said antigenic substance, to determine the presence of antigenic substance in said fluid sample, or relating the amount of labelled antibody measured with the amount of labelled antibody measured for samples containing known amounts of antigenic substance prepared in accordance with steps (a)-(d) to determine the concentration of antigenic substance in said fluid sample, the first and second monoclonal antibodies having an affinity for the antigenic substance of at least about 10⁸ liters/mole. ⁸⁸

FOOTNOTES:

☛Footnote 79. *Ex parte* Erlich, 3 U.S.P.Q.2d 1011 (Board of Patent Appeals and Interferences 1986).

☛Footnote 80. *Ex parte* Erlich, 22 U.S.P.Q.2d 1463 (Board of Patent Appeals and Interferences 1992).

☛Footnote 81. *Ex parte* Sorg, 22 U.S.P.Q.2d 1958 (Board of Patent Appeals and Interferences 1992).

☛Footnote 82. *See, e.g.*, U.S. Patent No. 5,109,115 (the selection of a bombesin antigen conjugate was non-obvious), and U.S. Patent No. 5,134,075 (a MAb that has novel specificity to L45, a tumor antigen, is nonobvious). For a further discussion *see* McGough, K. & Burke, D., *The End of Monoclonal Patents*, Biotechnology, vol. 10, 1082 (Oct. 1992).

☛Footnote 83. *In re* Deuel, 51 F.3d 1552 (Fed. Cir. 1995).

☛Footnote 84. *See* U.S. Patent No. 5,109,115.

☛Footnote 85. *See* U.S. Patent No. 5,134,075.

☛Footnote 86. *Id.*

☛Footnote 87. *Id.*

Footnote 88. See U.S. Patent No. 4,376,110 at issue in the *Hybritech* cases.

9:11 Claims to Therapeutics

Claims to therapeutic biotechnology compositions or methods of treating a disease using the composition should be supported by *in vitro* or *in vivo* evidence of usefulness. ⁸⁹*In vitro* evidence alone should be sufficient, as in *Cross v. Iizuka*, ⁹⁰ which involved claims to imidazole derivative compounds having general pharmacological effects. ⁹¹

The Federal Circuit upheld the Board in finding that practical utility was established on the basis of *in vitro* evidence alone, even though this evidence did not establish a specific therapeutic use. The court stated that:

there was a reasonable correlation between the disclosed *in vitro* utility and an *in vivo* activity, and therefore a rigorous correlation is not necessary where the disclosure of pharmacological activity is reasonable based upon the probative evidence. ⁹²

Reasoning that *in vitro* testing is usually a prerequisite to, and indicative of, therapeutic value in humans, the court further articulated its position by stating: We perceive no insurmountable difficulty, under appropriate circumstances, in finding that the first link in the screening chain, *in vitro* testing, may establish a practical utility for the compound in question. ⁹³

In this case, additional evidence was presented indicating a correlation between the claimed drug and its parent compound, which had previously demonstrated the pharmaceutical activities being claimed.

Despite *Iizuka*, the PTO had taken an increasingly narrow and stringent view, particularly with regard to claims to therapeutic benefits. For example, a decision from the Board, *Ex parte Balzarini*, ⁹⁴ involved claims to pharmaceutical compositions that recited broad pharmaceutical activity for treatment of retroviral diseases, including AIDS, in both animals and humans. The specification supported this utility with only *in vitro* testing.

The Board rejected Balzarini's claims for lack of utility, stating that the evidence did not indicate that those skilled in the art would find the *in vitro* evidence predictive of *in vivo* utility. This determination was reached even though the Board conceded, as in *Iizuka*, that *in vitro* testing is useful as a screening tool for further *in vivo* testing. The Board went on to make the remarkable statement that with regard to the field of anti-viral compounds, while it is not requiring human clinical trials, "it may very

well be that in

1987 or even now those skilled in this art would not accept anything short of such human clinical trials." ⁹⁵

With regard to claims to products having useful "pharmaceutical activity" which are supported only by *in vivo* testing in animals, in *In re Krimmel* ⁹⁶ the U.S. Court of Customs and Patent Appeals held that such evidence is sufficient to satisfy the utility requirement so long as the animals on which the tests are performed are "usually used by those skilled in the art to establish the particular pharmaceutical application in question," and the condition treated occurs both in humans and in lower animals. ⁹⁷

Krimmel involved a compound which was alleged to be effective in treating inflammation of the iris. The court found that, even if the applicant's *ultimate* purpose for the claimed invention was for treatment of the human condition, lack of proof of effectiveness in humans was not determinative of the patentability. ⁹⁸ In reaching its conclusion, the court stated:

There is nothing in the patent statute or any other statutes called to our attention which gives the Patent Office the right or the duty to require an applicant to prove that compounds or other materials which he is claiming, and which he has stated are useful for "pharmaceutical applications" are *safe, effective, and reliable for use with humans*. ⁹⁹

The court held that the application satisfied the utility requirement since the invention was sufficiently useful in the art, regardless of whether it was ever proven to be useful for treating a human ailment. ¹⁰⁰

Moreover, in *Nelson v. Bowler* ¹⁰¹ the C.C.P.A. held that pharmacological or therapeutic inventions that provide *any* "immediate benefit to the public" satisfied the utility requirement of section 101. Thus, the *identification* of the pharmacological activity of a compound and its relevance to a specific pharmacological use are sufficient. As the court stated in *Nelson v. Bowler*: Knowledge of the pharmacological activity of any compound is obviously beneficial to the public. It is inherently faster and easier to combat illnesses and alleviate symptoms when the medical profession is armed with an arsenal of chemicals having known pharmacological activities. Since it is crucial to provide researchers with an incentive to disclose pharmacological activities in as many compounds as possible, we conclude the adequate proof of any such activity constitutes a showing of practical utility. ¹⁰²

In response to perceived problems relating to the inability to obtain claims to

therapeutic biotechnology products and process, the PTO promulgated a new set of guidelines on utility for biotechnology inventions that must be followed by examiners. ¹⁰³ These guidelines specifically address certain aspects of the PTO's controversial position on utility. For example, the guidelines explicitly state, *inter alia*, that:

* an examiner should accept any reasonable use that can be viewed as providing a public benefit;

* evidence of a pharmacological activity of a compound which has a reasonable correlation to an asserted therapeutic use is sufficient; and

* data from human clinical trials or evidence of safety for treatment in humans is not required.

The guidelines also place a clear burden on the examiner to show by a "well-reasoned" factually-supported statement why an asserted utility is *not* credible. Under the guidelines, demonstrated *in vitro* or animal data should be sufficient to show utility.

Citing PTO's utility guidelines with approval, the Federal Circuit in *In re Brana* ¹⁰⁴ explicitly rejected the Board's pre-guideline position on utility. Stating that the Commissioner "confuses the requirements under the law for obtaining a patent with the requirements for obtaining government approval to market a particular drug for human consumption," ¹⁰⁵ the court unambiguously held that human testing of pharmacologically active compounds (having anti-tumor activity) was *not* required to establish utility of the compounds for purposes of patentability under 35 U.S.C. §101. ¹⁰⁶

In view of the new utility guidelines and supporting Federal Circuit opinions, the recent trend in the PTO of requiring a higher utility standard under section 101 for biotechnology applications is likely to cease. ¹⁰⁷ Demonstrated *in vitro* or animal data should once again be sufficient to establish utility. Clinical studies in humans, if at all possible, are of course preferable. Evidence, by way of a declaration under 37 C.F.R. §1.132, may also be used to support the claims.

FOOTNOTES:

⁸⁹Footnote 89. However, for methods of treatment using products of biotechnology, *in vitro* data alone have in the past been deemed insufficient to show utility, especially when the treatment is for diseases such as cancer, neurodegenerative and other neurologic diseases and viral diseases, particularly AIDS; *see infra*.

⁹⁰Footnote 90. *Cross v. Iizuka*, 753 F.2d 1040 (Fed. Cir. 1985).

Footnote 91. *See also In re Brana*, 51 F.3d 1560 (Fed. Cir. 1995).

Footnote 92. 753 F.2d at 1050.

Footnote 93. *Id.* at 1051.

Footnote 94. *Ex parte Balzarini*, 21 U.S.P.Q.2d (BNA) 1892 (Board of Patent Appeals and Interferences 1991).

Footnote 95. *Id.* at 1897.

Footnote 96. *In re Krimmel*, 292 F.2d 948 (C.C.P.A. 1961).

Footnote 97. *Id.* at 952-53.

Footnote 98. *Id.* at 953.

Footnote 99. *Id.* at 954 (emphasis added).

Footnote 100. *Id.* at 953.

Footnote 101. *Nelson v. Bowler*, 626 F.2d 853, 856 (C.C.P.A. 1980).

Footnote 102. *Id.*

Footnote 103. *See* 60 Fed. Reg. 36,263 (1995) and associated Legal Analysis.

Footnote 104. *In re Brana*, 51 F.3d 1560, 34 U.S.P.Q.2d (BNA) 1442 (Fed. Cir. 1995).

Footnote 105. *Id.* at 1442.

Footnote 106. 34 U.S.P.Q.2d at 1442-43.

Footnote 107. However, some examiners in the biotechnology examining group are issuing similar types of rejections under 35 U.S.C. §112, [para] 1 for failing to teach "how to use" the claimed invention. The guidelines, however, are explicit that determining utility under §112, [para] 1 follows the same parameters as under §101. *See also In re*

Brana, 51 F.3d 1560 (Fed. Cir. 1995), in which the utility question was couched as a rejection under §112, [para] 1, not §101.

9:12 Claims for Gene Therapy

Gene therapy, in general, is directed to the introduction of a gene encoding a specific protein into a cell for the purpose of producing such protein in the body for therapeutic effect. Gene therapy claims can be directed, inter alia, to gene transfer techniques, improved vectors (for example, retroviruses, adenovirus, AAV, lipid carriers), targeting specific diseases and cell types. For example, U.S. Patent No. 5,436,146 provides for methods of preparing AAV vectors for use in gene therapy. Claim 1 is representative:

1. A method for producing a helper-free stock of recombinant adeno-associated virus comprising:

a) cotransfecting cells permissive for adeno-associated virus replication, in the presence of helper virus infection with i) a recombinant adeno-associated virus vector which contains a portion of foreign DNA sequence and which can be incorporated into an infectious virion and ii) a recombinant helper adeno-associated virus DNA which provides viral functions sufficient for the replication and packaging into infectious virions of said recombinant adeno-associated virus vector, and recombinant adeno-associated virus vector, and which comprises a nucleotide sequence not found in wild-type adeno-associated virus which promotes expression of adeno-associated virus genes which results in the viral functions provided, but which lacks adeno-associated virus terminal repeat sequence and shares no adeno-associated virus sequences with said vector, and which cannot itself be incorporated into an infectious virion in said cotransfected cells; and

b) collecting virions produced.

Therapeutic applications in the gene therapy field may be directed to *ex vivo* (*in vitro*) and/or *in vivo* approaches for the introduction of genetic material into cells.

Briefly, the *ex vivo* approach involves removal of target cells from the body, followed by introduction of a particular gene of interest into the cells and subsequent transplantation back into the body, where the inserted gene produces a desired product and result. For example, the *ex vivo* approach is the subject matter of U.S. Patent No. 5,399,346 to Anderson et al. Claim 1 of the '346 patent reads as follows:

1. A process for providing a human with a therapeutic protein comprising:

introducing human cells into a human, said human cells having been treated *in vitro* to insert therein a DNA segment encoding a therapeutic protein said human cells

expressing in vivo in said human a therapeutically effective amount of said therapeutic protein.

While the above-recited claim appears quite broad in its face, the '346 patent is highly controversial and may not withstand likely challenges. ¹⁰⁸

The *in vivo* approach to gene therapy involves direct administration of the genetic material to an individual, either through administration at the site of interest or through the use of a targeting mechanism (for example, a virus vector or a lipid) to ensure that the introduced gene enters the cells of interest, where it can be expressed to produce a therapeutic effect.

FOOTNOTES:

Footnote 108. See, e.g., Brisbee, C.A., *Will The Broad Ex Vivo Gene Therapy Patent Be Challenged: An Appraisal*, Genetic Eng'g News (May 15, 1995) at 22-23. Indeed, the '346 patent is currently involved in a three-party interference.

?10:1 Writing Claims

Patent claim writing is an art, not a precise science. There is no correct or best claim. So long as the goals of claim writing are achieved, any claims will suffice. But, through practices of patent attorneys and agents, the *Manual of Patent Examining Procedure* (MPEP) requirements of the Patent and Trademark Office, precedents in the district courts and the courts of appeals, what may be viewed as good claim form has evolved. The following discussion seeks to state in words what experienced practitioners have learned and put into practice.

?10:1.1 Goals of Claim Writing

[A] Covering the Invention

The inventor/client's invention has been disclosed in the specification and drawings of the application. The object or goal of the invention has been understood. The concept of the invention is understood. The claims should cover the disclosed invention.

1. The coverage should be as broad as possible, as discussed below. The claims should cover the inventor's concept. ¹ Some claims should cover the concept as broadly as possible.

2. The claims should also protect the specific disclosed embodiments. Some claims should be sufficiently detailed that even if the broad claims covering the inventor's concept are held invalid, anyone who copies any of the inventor's disclosed

preferred embodiments will infringe a valid detailed claim.

[B] Claims Coverage Should Be As Broad As Possible

Broad coverage means not only that every particular preferred disclosed embodiment is protected in the claims, but that the claims cover all expected and unanticipated equivalents that competitors and others may later develop and all intentional and unintentional copies of the claimed invention which embody the inventor's concept. The inventor/client will compare a competitive or a similarly functioning product or process with the patented embodiments. If the client sees similar structure, operation and/or result, he will want to be able to use his patent to halt an infringement. It is the claim drafter's job to have written the claims in the application to not only cover what the attorney and the inventor/client could at the time of application prosecution have envisioned as competing products, but to cover competitive products which neither the inventor nor the attorney thought of or could even have imagined at the time, but which employ the concept of the invention.

[C] Cover Competing Products or Methods

1. A claim should cover a product that is identical to the invention, particularly identical to the preferred embodiments.
2. A claim should cover a product or a method that is similar to the claimed invention in that:
 - a. the similar product or method to be covered is different from that disclosed in the disclosure, specification, and drawings of the patent, but embodies the same inventive concept and/ or,
 - b. the competitive product or method achieves the same result.

Patent claims typically are not result dependent, that is, they do not merely claim an apparatus or method for achieving a particular result. Instead, they claim several product elements or a series of method steps which achieve a particular result. Nonetheless, the claims should be broad enough to reach to a competitive product or method which is substantially similar to, or which has no substantial differences from or is interchangeable with or which accomplishes substantially the same result in substantially the same way (a restatement of the Doctrine of Equivalents which has evolved through judicial precedents, most recently, *Hilton Davis v. Warner-Jenkinson Co.*), ² possibly by using the same or a related structure or process. The attorney should envision and write the claims to cover various undisclosed, even unimagined equivalents of the embodiments of the invention that are disclosed in the application and that are included in the inventor's concept.

[D] Avoid the Prior Art

The claims should be as broad in scope as the prior art permits, should not read on the prior art, but should improve upon it. The prior art establishes the maximum breadth of claim scope.³ The concept of the invention typically is its distinguishing feature over the prior art. The claims should be broad, but should include the concept of the invention which distinguishes it from the prior art.

[E] No Unnecessary Limits

Coupled with the avoidance of the prior art is the avoidance of unnecessary limitations in the claims, those not dictated by prior art or by proper form under the rules and practices of claim drafting which are in part set out in the *Manual of Patent Examining Procedure* and are required by section 112 of the Patent Act.

The "all limitations" rule requires that an accused infringing product or process contain each limitation of the claim. The patentee cannot rely on the Doctrine of Equivalents to broaden the scope of a claim element if that would "entirely vitiate a claim limitation." Better to claim the ultimate function to be accomplished, rather than the intermediate detailed function leading to the ultimate function, with the expectation of being able to rely on the Doctrine of Equivalents later. For example, when a claim element about a seat mount said it was "slidably mounted," and the accused seat was rotatably mounted, the court found the accused seat not to be equivalent to the claim element, although both provided both translational and rotational motion relative to the seatbase.^{3.1} Had the claim element recited achieving both rotational and translational motion, the ultimate objective there, the infringement might have been literal and there might have been no finding of lack of equivalence.

?10:1.2 How to Write the Broad Claim

[A] Use Different Classes of Claims

Mechanical inventions are of numerous types. Some inventions can be covered by different classes of claims:

1. Nearly all mechanical inventions, except methods, can be expressed in product or apparatus claims which describe the structure in terms of its elements, their relative locations and their cooperation. Product claims should be used for mechanical inventions where possible.
2. Even method inventions may have a novel, unobvious product analog, so that some method inventions can be stated in product terms, and vice versa. A broad example of that would be a method claim comprising various steps, each of which is

performed by respective machine elements, and a corresponding analog claim to an apparatus comprising the various machine elements that perform the various steps.

3. Sometimes a unique structure, or workpiece, or component element, or starting material, etc. is used during the performance of the method. Product claims can be directed to that feature used in the method. The claim writer should review any method invention to see if a product claim could be written on any aspect of the method.

4. A method claim is a series of steps of manipulation, whether the steps would be performed wholly by machine or partly by a person, so long as they are not purely mental steps (an algorithm, which is dealt with in connection with electronics and computer claims). Any invention which lies in the manipulation of an object is susceptible to a method claim, which should be written.

5. As noted above, certain product inventions include different respective means which perform different manipulative steps. Maybe a method analog claim can be written wherein each means for performing a step in a product claim can be included in a method claim as a recitation of the performance of that step.

6. A product covered in a product claim may in part perform, or may have some subassembly which performs, a novel process or method, and that may be included in a separate method claim.

7. Where the method is solely the function performed by the product covered in a product claim, and the method would not otherwise be unobvious, then the method should not be claimed.

8. Product by process claims should also be considered to claim a product where a novel, hopefully patentable, method is used to produce or fabricate a particular product. The patentability of the resulting product itself as a product is judged under sections 102 and 103 of the Patent Act, not by the patentability of the method by which the product is produced. If a new method is used to produce an existing product, a product by process claim would not be allowable under sections 102 or 103.

[B] The Goal or Object of the Invention

Every invention has a purpose, to improve upon something, or to achieve a particular objective or goal. All claims should be directed toward that. Claims to an invention should not be written merely to describe the structure disclosed, as this will lead to inclusion of unnecessary claim limitations. Before writing any claims, try to articulate to yourself the objectives or goals of the invention.

1. An invention may have more than one objective or goal, or it may solve more than one problem. These may be related. A good set of claims would include respective claims directed to each objective or goal.

2. To cover the inventor's solution to each objective, consider using a separate independent claim. Focus on one goal or objective and claim it completely. Thereafter switch to the other goal or objective and claim that completely. Similarly, the apparatus under consideration has several different features, whose existence in the final product may be mutually exclusive, that is, one feature need not be present when the other is. Two separate sets of claims will be developed, possibly headed by two independent claims each directed to a different objective, or each directed to a final product with not all of the mutually exclusive features. But the invention will be fully covered. It is possible that an Examiner examining the application may issue a restriction requirement on the ground that two or more separate and distinct inventions have been claimed.

But that should not dissuade the drafter from preparing the groups of claims.

[C] The Inventor's Way of Achieving the Objective or Goal

Before beginning to write the claim, also state to yourself the inventor's way of achieving each goal or objective. In other words, state the invention. By first articulating the inventor's way of achieving the goal, the drafter avoids detailing many of the unnecessary specific disclosed structures, and recites only those which achieve the objective. Sometimes, the articulated goal or objective and the articulated way it is achieved are the same and, by doing one, you do both.

[D] Writing the Claim

1. While writing the claim, observe a preferred embodiment of the invention. For a mechanical invention, look at a primary drawing Figure which shows the embodiment that is the subject of the claim, also consider the specification, as needed. Throughout the claim writing, keep referring to the embodiment. You want to claim the invention without naming elements that are not disclosed. You also want to describe elements accurately. The claim drafter is also the specification writer and is in charge of amending the drawings. While writing the claims, you may recognize that certain elements essential for inclusion in the claim are not in the disclosure. Hence, the claim writing stage is also important to enable the claim drafter to assure that every element claimed can be found in the drawings, as required by rule 83(a).

2. Move through the illustrated embodiment. In the broadest independent claim, recite only each element of the embodiment which is critical to the inventor's way of achieving the goal or objective of the invention.

3. A complete structure for achieving the objective and which covers the invention must be claimed. Do not omit necessary elements, as that would make the structure incomplete and inoperative. If you are claiming a gear and a wheel that is to be driven by the gear, there must be some connection between the wheel and the gear or the structure is incomplete.

4. Omit mentioning elements that, while shown in the preferred embodiment, are not critical to the inventor's way of achieving the objective.

5. A product claim has a number of interacting or connected elements, whether it be a claim to an apparatus or to an article of manufacture. The claim drafter must start somewhere.

a. With an operating apparatus, you start somewhere and write a claim moving along the action or motion.

i. With an apparatus that accomplishes or does something, you might start at the drive or the motor and move through the apparatus in the direction toward its output element or, you might start at the final output element and move backward through the apparatus to the drive.

ii. Because of simultaneous actions or interactions, while you are claiming elements as you move through from the drive to the output, in order that the claim make sense, you may have to break off your sequence of describing elements through the apparatus and pick up the description elsewhere in the apparatus. For example, if the invention concerns two separate types of motion controlled from a single drive, and the types of motion are interacting, you may carry a description of elements from the drive outward to the first means causing the first motion, and then carry a description of elements from the drive out to the second means that is causing the second motion. Then the cooperation between the two motions is described. But a logical sequence should be used.

iii. A claim on a mechanical apparatus, when well written, often can be understood by a reader even without seeing any drawing disclosure and should usually be understood when it is read by a patent practitioner familiar with that art, in conjunction with a drawing depicting the embodiment claimed. A logical sequence of recited claim elements enables a reader somewhat familiar with that art to read a well-drafted claim without having first studied the disclosure in detail. Were the elements seemingly randomly named in the claim, it would be more difficult to follow and understand the claim.

b. The guidelines provided above would apply equally to a claim directed to an article of manufacture, which does not move. With an article of manufacture, start

at one part and move through the article. There is a logical sequence of reciting elements through the article, for example, typically from the base out to whatever is supported on the base, or vice versa. Writing in a logical sequence will enable the reader to understand the claimed article without needing to study the disclosure in detail.

6. There is an art to selecting the elements to be named in the broadest claim. The preferred embodiment has many more elements than need be recited in the broadest claim. While the absence of a need to recite many of the illustrated elements for a complete structural recitation of an invention will be apparent (for example, the number of screws used, or even the presence of a screw, for holding elements together, may not be necessary to recite), the decision about inclusion of other elements may not be so easily made.

7. I have found it helpful to use an essentially method step analysis of the apparatus to be claimed. In any machine or product, each element performs some function or operation which makes its presence in the apparatus necessary. However, when writing the broadest claim and determining which elements are necessary to achieve the inventor's objective, not all of these functions are necessary. As you move through the disclosure, for example, move through a primary drawing Figure, consider not only the elements you observe, but the function that each element performs in the observed structure. If that function is necessary to achieving the inventor's objective, whether it be an active function or just a function of being present, then whatever performs that function probably should be recited in the broadest claim. I say only probably should be included because certain functions that you will believe are necessary may be parts of a larger group of functions which together may be defined by a broader claimed description of an element that satisfies an overall objective of the particular sub-assembly of elements.

8. When a function believed critical to achieving the inventor's objective is seen, the elements which must be recited to perform that function are recited. This is true in an apparatus claim. It is also true for an article of manufacture claim, which describes elements that are there, although usually are not active. Various elements in a product claim can be described in the claim in terms of the function each performs.

[E] Claiming Individual Claim Features

Every element in a claim must be properly identified and described, or else the claim is improper under section 112. To identify a claim element:

1. Name the element.
 - a. Usually the element is given the name that it has in the specification as a noun.

This enables the reader of the patent to understand the claimed element on two levels. First, the name in the specification is or perhaps should be sufficiently descriptive that when the claim is read without, or perhaps with, reference to the drawing and without reference to the specification, the claim element referred to can be understood. Secondly, when the element is read in conjunction with the specification in which it is already named, antecedent support for that element is found in the specification.

b. Using the name for the element that appears in the specification does not give that claim element all of the characteristics of that element which are disclosed in the preferred embodiment in the specification and drawings. The element has only the characteristics recited in the claim itself.

c. The name given to the element should be related to the primary function which the element performs in the claimed combination. The element may have a different name in the specification, which is the name by which the element is usually known. But, some feature of that element may be important and it is that feature of the element which would be named in the claim. If a particular name is selected for an element in writing a claim because, for example, of the function that the element performs in the claimed structure, the specification should be reviewed to add that name for the element into the specification.

For example, the item disclosed in the disclosure may be an anvil on which a workpiece is worked. But it is not an anvil or any other product used in lieu of an anvil that is significant for the claim. It is instead the presence of the surface of the anvil on which the workpiece is worked that is significant. Hence, the claimed element should be a "surface," rather than an "anvil." The specification may have only described an anvil, and may not have mentioned the surface. But, because the writer is probably drafting the specification along with the claim, the writer would not only recite "a surface" in the claim, he would return to the specification previously prepared and modify it so that it recites ". . . an anvil having a surface on which the workpiece is worked . . ." or the equivalent, so that you could then claim the surface as the critical element, and not the needlessly limiting "anvil." This is an example of looking for the function that the element of interest performs and then claiming the element in terms of the part of it that performs the necessary function, rather than claiming the element in its entirety.

d. Often, and especially if you use a functional analysis, the tendency might be to describe each element as means for accomplishing a function, rather than giving that element a name that appears in the specification. This is permissible under the statute. But it is not always or even usually necessary to do that, and using another noun, for example, "a surface on which the workpiece is worked" as contrasted with "means on which the . . ." makes the claim more easily understood. The occasions to use "means for performing a function" language are addressed in section 3:25 of

this treatise.

2. After naming the element, the claim drafter describes where the element is in the apparatus or the article. In particular, describe to which previously named element the new element is connected or with which it co-acts, for example, a gear connected with the shaft, a gear on the shaft, or two shafts near each other.

a. Avoid reciting an unplaced or unrelated element, which makes it impossible to know where the element is in the complete structure.

b. In this regard, the recited physical relationship or placement of the claim elements should be capable of being drawn or diagrammed. Some practitioners like to be able to draw a claim combination based not upon the drawing in the disclosure of the application, but rather based upon the word description in the claim. If no physical relationship or relative placement between two elements appears in a claim, the person making the diagram should not be able to diagram the connection or relative placement, and that may provide an indication that a necessary relationship should be described.

c. Recitation of a placement or connection is not needed for the first named element in the broadest claim (the housing in Claim 1 at II above).

d. Sometimes, to logically explain the cooperation among various elements, describing the connection of a newly named element to others on the first appearance of the new element, may make the claim difficult to understand. It is possible to name an element earlier in a claim and to, for the first time, refer back to the earlier named element later in the claim when describing the physical relationship between a later named element and the earlier named element. Two separate elements may cooperate with a third one. One element must be named first, and there would be no way to relate it physically to the other elements until all three are named. This is an example of a situation where the physical relationship between two elements is described sometime after at least one of the elements has been identified. But it is preferable to describe the physical relationship of an element to others at the time the element is first named. That makes the claim more easily comprehended than to list a catalog of elements and later describe the various connections among and between them.

e. It is not required to recite the physical relationship or placement of an element with respect to others. Sometimes, a description of the functional relationship between two elements sufficiently suggests their physical relationship, so that a specific recitation of the physical relationship is not needed. For example, the claim limitation "a motor for driving the shaft," which is a mere functional description of the relationship between those two elements, serves equally well as would "a motor connected with the shaft for driving the shaft." As discussed below, a description of

the physical connection between elements, without some indication of the reason for the connection, while accurate in terms of what is disclosed, tends to make the claim more difficult to read and understand. For another example, "a motor connected with the shaft," without reciting the reason for that connection ("for driving the shaft") may be accurate. But, it makes the particular relationship and, thus, the claim difficult to understand. Where the claimed functional description of the cooperation between elements satisfactorily also suggests their physical relationship, the physical relationship need not also be claimed. Yet, describing the physical relationship is still helpful to the reader. Sometimes, the actual physical relationship between an element and all others is irrelevant and only their functional relationship is important. In that case, the physical relationship need not be mentioned at all, and only that functional relationship need be mentioned.

f. Every claimed element of a mechanical claim must appear in the drawing of the application. If a claim includes an element that the claim drafter feels must be in the claim, that element must also be found in the drawing of the disclosure. ⁴ If the element is missing from the drawing, the drawing should be amended by the drafter of the claim to include the element. Probably, the specification should be amended to describe the new element shown in the drawing and recited in the claim, because there should be an antecedent for the element in the specification, including the name for the element recited in the claim. ⁵ If the original disclosure at the time of filing lacked a particular element, and the claims as filed lacked the element, it is not possible to later add that element to the claim, because to do so would be to introduce new matter.

3. The description of where an element is with reference to others is often joined with a description of the function of that combination of two elements, as in "a motor connected with the shaft for driving the shaft to rotate."

a. In addition to naming an element and saying where it is with reference to other claimed elements, the function of the element in the entire claimed structure or at least with respect to another element with which it cooperates is recited, as mentioned above in the description of the cooperation between the motor and the shaft. Sometimes, the function performed is not related to any physical relationship between the elements. As discussed in the preceding part hereof, in that case there need be no description of the placement or physical relationship of the elements. Only a description of the cooperation and joint functioning is recited in the claim.

b. Essentially, the claim drafter is describing what the claimed element does. You describe the function of the element either for itself, i.e., what it does, and/or you describe what it does in cooperation with or does to another element, and/or you describe how it affects another element, and/or you describe how it acts on or affects a workpiece which is not one of the claimed elements of the structure. For example, "a hammer for flattening the workpiece against a surface" describes the

function of one claim element, the hammer, in terms of another claim element, the surface, and in terms of the workpiece. Sometimes the workpiece is not on the surface, so that the description would be "a hammer for banging the workpiece," and that could be an adequate description, especially if the presence of the surface is not critical to action by the hammer on the workpiece. (What moves the hammer or what the hammer is connected to has not been recited, but that is presumably described in the claim.)

[F] Revising the Claim after Writing It

1. After each claim is written, and again after all of the claims have been written, remove all elements from every claim that are unnecessary for achieving the inventor's goal or objective. This clearly applies to the broad independent claims. It also applies to the dependent claims. A dependent claim may add details as to a previously broadly claimed limitation. But, sometimes the dependent claim adds too much detail. Each further detail covered in a dependent claim perhaps should be added in respective successive dependent claims. If there are two details of one particular feature that are to be claimed or a particular feature is to be further claimed in detail in a later dependent claim, consider breaking up the dependent claim into two or three dependent claims, each adding one further detail.

2. Review each claim, limitation by limitation. Keep in mind the inventor's goal or objective and the inventor's way of achieving that goal. Remove, especially from the broader claims, any elements that are not essential for achieving that objective. Strike an element from the independent claim and consider whether to insert it in another dependent claim to be added. Similarly, in every dependent claim directed to one particular feature, consider dividing up the dependent claim and moving any other extra feature to yet another dependent claim, which further details the subject of the dependent claim or adds a new limitation.

3. When a limitation is removed from a claim, it may also remove the recitation of the physical relationship between a remaining element and the removed element or it may remove a description of a cooperative functional relationship between two of the remaining claimed elements. Correct the amended claim to re-establish a physical and/or functional relationship between remaining elements.

4. Consider whether any set of cooperating elements can be combined together into a more generically claimed element which performs an overall function that the individual elements perform in combination. Be sure that all necessary functional limitations still remain. Sometimes a broader encompassing generic description of two previously separately named elements adequately claims them, without also making the claim an unacceptable functional recitation of an intended result without the supporting structure for accomplishing that result. ⁶

[G] Alternate Claim Drafting Techniques

1. The above described technique of moving through the apparatus and claiming each relevant element as it is encountered may be viewed by some claim readers as making a claim difficult to understand. Some readers may find it helpful to see a general picture of the invention and to have an outline of the whole structure that will be claimed before reading about its details. For an improved telephone, for instance, one might first recite, in the first independent claim, the main subassemblies of the telephone, including a base unit, a handset and a connecting cord between them. Then the claim recites each subassembly in more detail, in the manner discussed above. This provides a claim of a similar scope as the prior technique, with a slight modification at the beginning portion of the claim.

2. There is a catalog of elements approach to claim writing. A list of all of the various elements in the preferred embodiment in the disclosure, that is, in the drawings and the specification, is prepared by reciting the descriptive nouns and adjectives of the features. Then with the drawing and/or the specification at hand, the main claim is prepared by selecting, out of the catalog of elements, those elements which are deemed critical for the invention. Other elements are saved for inclusion in dependent claims.

There is much to recommend this approach. Before the claims are written, the drafter can assure that there is a complete catalog of all of the elements to be considered, even if some are not eventually recited in a claim. This prevents omission of critical elements, although it has the potential to cause inclusion of unessential elements. No matter which claim writing technique is used, the inventor's objective and the way of achieving it should be kept in mind so that elements relevant to attainment of the objective of the inventor are selected for inclusion in the claims.

A claim written to include all of the elements in the catalog would be a picture claim directed to the most preferred disclosed embodiment. Such a claim well protects that preferred embodiment. But its breadth is not sufficient for fullest protection of an invention against others who decide to adopt the inventor's concept, but not his precise embodiment, for achieving that objective. Further, with the catalog of elements approach, avoid aggregation or listing of elements that are not connected to each other.

?10:1.3 Claiming Plural Embodiments

An inventor of a mechanical invention often conceives various embodiments for practicing the inventive concept. The specification and drawings of the patent include disclosures of preferred embodiments. The embodiments should be adequately protected in the claims.

[A] The Generic Claim

The claim drafter should consider the inventor's objective and the way in which the objective is accomplished, consider all of the disclosed embodiments and find a common thread running through all of them which defines a single solution or way of achieving the objective or goal. Then, the claim drafter should write a generic claim, with minimal structural limitations, yet claiming a complete structure, that is directed to the generic invention and generic structure found in all of the embodiments disclosed.

1. The primary generic claim written on all embodiments would be an independent claim. The generic claim may have limitations which can be further developed and detailed, or there may be additional limitations or features of all of the embodiments that are not included in the first generic claim. It is not unusual to provide dependent generic claims on those features, which claims are generic because they cover all of the embodiments.

2. There may be some features in one embodiment that are not present in others and that prevent preparation of a generic claim which covers all embodiments, which avoids prior art, which also has sufficient structural limitations and which is not a mere statement of the desired objective without a supporting structure. In that case, no generic claim can be written. Separate independent claims on the separate embodiments can be written. To the extent possible, a subgeneric claim, generic to some of the embodiments, would be written and another subgeneric claim generic to others of the embodiments would be written. Sometimes those subgeneric claims may be so different that they may really recite separate and independent inventions that should be covered in separate patent applications. However, if they are different embodiments of what the inventor has identified as the same invention, then it is recommended that they initially be included in the single application, that as claims as broad as possible on all of the embodiments be written, and that the applicant await a restriction requirement, if any, as to the claims to different inventions, rather than from the outset filing a number of applications on different embodiments, which may not be needed.

3. Following each generic claim, it is recommended that an individual dependent claim and, more usually, a group of dependent claims, be written to cover specific features of each embodiment which are directed to the inventor's way of achieving the general goal or objective of the invention. For each individual embodiment, therefore, there will be generic claims and claims specific to that embodiment.

[B] Use Enough Claims to Completely Cover the Invention

1. If there are several embodiments, cover all of them in enough claims. This has

been reviewed in earlier sections hereof.

2. Some limitations may have been stricken out of earlier claims to keep those claims broader. Those limitations can be added back in respective additional dependent claims. This also has been discussed earlier.

3. Several elements may have been combined in one more generic claim limitation to make an earlier claim broader in scope and less particularly limited. Each such element may be specified individually in a later dependent claim. Where two elements had been combined to make a broader claim, one dependent claim may recite, "wherein the generic feature is comprised of both of the elements." Where appropriate, one dependent claim may recite that "the generic feature is comprised of one of the elements," and another dependent claim may recite that "the generic feature is comprised of the other element," and yet another dependent claim may recite that "the generic feature is comprised of both of the elements." The latter claiming technique gives broader coverage.

4. A dependent claim should recite elements which relate to accomplishment of the objective or goal of the invention. Numerous features in any preferred embodiment could each be made the subject of a dependent claim. But it is not useful to have a claim just adding details that are not related to the accomplishment of the ultimate objective of the invention. There is a contrary view, perhaps somewhat cynical, on this. The validity of claims is eventually judged in view of prior art. More detailed claim limitations may not be found in primary cited prior art, but only in other secondary references. Invalidating a very detailed claim under 35 U.S.C. §103 may require combining several references, so many that it could be said that claim would not have been obvious in view of the combined prior art.

5. Dependent claims are used to cover the specific commercial embodiment. Narrower claims are needed to cover the preferred design because:

a. That protects against a copyist copying the precise preferred embodiment. To avoid the patent claim, the copyist must make changes.

b. A more detailed claim is more difficult to invalidate over prior art, while protecting against a copyist. Of course, the ultimate is a picture claim, which in words recites the details of the preferred embodiment. But there is no reason to go that far in claiming details.

c. Dependent claims are used to cover the detailed features of the embodiments illustrated in the specification and drawings.

§10:1.4 Claiming An Important Function in a Product Claim

Do not simply claim a result, that is, a claim having a preamble naming a device or product simply stated as being for accomplishing a particular result.

1. The MPEP gives as an example of such a forbidden claim, "A woolen cloth having a tendency to wear rough, rather than smooth." Note that such a claim lacks any structure for accomplishing the stated ultimate objective.

2. Before claim writing, as noted above, the drafter should determine the ultimate objective, for example, those features of a woolen cloth. Thereafter, determine the technique disclosed by the inventor for accomplishing that objective, for example, multiple layers of short filaments. Then claim a structure which accomplishes that ultimate objective by using the inventor's invention "A woolen cloth comprising a first layer of woven wool cloth, the first layer having projecting filaments, a second layer. . . ." That is a claim to a structure, not a claim merely to an ultimate objective.

3. Correspondingly, of course, do not merely claim some means for accomplishing the ultimate result.

4. Instead, claim a series of related elements, as discussed above. Some of these elements may comprise means for accomplishing a particular function or step. But wherever the means for accomplishing that step is claimed, the drafter does not simply claim the step functionally as its own objective, the drafter claims some means for accomplishing that step, which is permitted by 35 U.S.C. section 112, paragraph 6.

[A] Whereby Clauses

1. "Whereby" or statement of ultimate result clauses ⁷ are permitted. Such statements should be used to state only the necessary outcome or result of the previously described structure. ⁸ They are functional clauses. The "whereby" clause should not be relied upon to add a structural limitation, whether or not that structure is critical to accomplish the inventor's objective. Some precedents suggest that "whereby" clauses can be used to add structural limitations. They are effective in a claim. ⁹ But, that is not good form to examiners. Therefore, it is dangerous to rely on the "whereby" functional clause to add structure.

When a "whereby" clause is written in a claim, the claim should be reviewed to make sure that it recites structure to support that "whereby" clause. If needed, the claim should be amended to add structural elements that are antecedents to the "whereby" clause. Since the "whereby" clause likely will state some objective of the invention, the fact that no element is present which would serve as an antecedent to the "whereby" clause should raise a question as to the sufficiency of the structural limitations of the claim.

A "whereby" clause that merely states the result of the limitations in the claim adds nothing to the patentability of substance of the claim.¹⁰ But it may help the reader understand the claimed structure, sum it up, and make the claim more readable. Use them as appears appropriate.

2. Writing the claims as suggested above, where the description of elements of the claims includes a statement of their function or cooperation with other elements, may make a "whereby" clause unnecessary, because all of the functions that might be recited in the "whereby" clause have already been recited in the descriptions of operations performed by various claim elements. However, sometimes descriptions of the functions of individual elements do not show how they fit together and function as a complete structure, because only a "whereby" clause does that.

FOOTNOTES:

Footnote 1. See *Corporate Communications Consultants, Inc. v. Columbia Pictures Indus.,*

Inc., 576 F. Supp. 1429, 221 U.S.P.Q. (BNA) 883 (S.D.N.Y. 1983), *rev'd without opinion*, 776 F.2d 1064 (Fed. Cir. 1985).

Footnote 2. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 35

U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995).

Footnote 3. *Corporate Communications Consultants, Inc. v. Columbia Pictures Industries, Inc.*, 576 F. Supp. 1429, 221 U.S.P.Q. (BNA) 883 (S.D.N.Y. 1983), *rev'd*, 776 F.2d. 1064 (Fed. Cir. 1985); *Beale v. Schuman*, 212 U.S.P.Q. (BNA) 291 (Board of Patent Appeals and Interferences 1980).

Footnote 3.1. *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 76 U.S.P.Q.2d (BNA)

1001 (Fed. Cir. 2005).

Footnote 4. 37 C.F.R. ?1.83(a).

Footnote 5. 37 C.F.R. ?1.75(d)(1).

Footnote 6. See *Clements Indus., Inc. v. A. Meyers & Sons Corp.*, 712 F. Supp. 317, 12

U.S.P.Q.2d (BNA) 1874 (S.D.N.Y. 1989).

Footnote 7. See section 3:23, *supra*.

Footnote 8. *In re Certain Pers. Computers*, 224 U.S.P.Q. (BNA) 270 (Ct. Int'l Trade 1984).

Footnote 9. See *Eltech Sys. Corp. v. PPG Indus., Inc.*, 710 F. Supp. 622, 11 U.S.P.Q.2d (BNA) 1174 (W.D. La. 1988), *aff'd*, 903 F.2d 805, 14 U.S.P.Q. (BNA) 1965 (Fed. Cir. 1990).

Footnote 10. *Tex. Instruments, Inc. v. United States Int'l Trade Comm'n*, 988 F.2d 1165, 26 U.S.P.Q.2d (BNA) 1018 (Fed. Cir. 1993).

10:2 The Means Clause

10:2.1 Avoid Overbroad Means Clause

Recitation in a claim of a means "to perform the ultimate function or objective of the invention is too broad. "Means for causing a woolen cloth to wear rough, rather than smooth," would not be a proper claim as this statement merely indicates there is some means for accomplishing the final objective. A complete structure must be claimed, moving through the apparatus or the article and describing each element essential to accomplishing that final objective.

10:2.2 Use of Means Clauses

A means clause is used to describe the function of a particular element, as discussed herein. However, before deciding to argue patentability based on a means-plus-function limitation in response to an examiner's rejection, remember that including a means-plus-function clause may create a prosecution history estoppel which limits the patentee's protection. The examiner will argue that the prior art of record teaches an equivalent of the disclosed means-plus-function structure, with no guidelines to support that assertion. Although *In re Donaldson* provided no guidelines to determining what is an equivalent, the Federal Circuit and the Supreme Court recently gave that term better definition in *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, discussed below.

1. Review the inventive structure and select each element that performs a function for accomplishing the ultimate objective. If appropriate, recite that element as a means for performing its particular function in the entire structure.

2. A means clause to be effective as such should be written in the "means for . . ." style. If a noun other than "means" is used to name the element, then it may not be treated as a "means for" clause governed by 35 U.S.C. 112. *In re Donaldson* and the Patent Office guidelines on means claims, discussed in section

3:25 hereof, indicate that the Patent Office, at least, will not require that a claim recite "means for" or "step for" before treating that claim as one under section 112, paragraph 6. But, court and Federal Circuit precedents have not yet appeared dealing with the Patent Office's proposed change in application of section 112, paragraph 6. However, bear in mind that use of the word "means" will not necessarily make the claim a means-plus-function limitation.¹² Use of an extra adjective before "means," like "rod means," eases the reader's reference to the element being claimed and is usually a means-plus-function limitation covered by 35 U.S.C. §112,¹³ unless the resulting claim term describes a definite structure that performs the function, rather than an indefinite "means."

Equivalency under 35 U.S.C. §112 differs from the Doctrine of Equivalents.¹⁴ The Doctrine of Equivalents equitably expands exclusive patent rights, while section 112, paragraph 6, limits the broad language of means-plus-function limitations in combination claims to equivalents of the structures, materials, or acts in the specification.¹⁵ The Doctrine of Equivalents turns on the "substantiality" of the differences between the patented and accused products or processes, and that the evidence that the accused device or process "performs substantially the same overall function or work, in substantially the same way, to obtain substantially the same overall result as the claimed invention."¹⁶

In applying the Doctrine of Equivalents, one determines the range of equivalents when analyzing the prosecution history, pioneer status of the invention, and the prior art. Then one must determine whether the particular element of the accused device or process is "equivalent" (as defined above) as to fall within that range.¹⁷ When applying section 112, the only issue is whether the single means in an accused device which performs the claimed function is the same as or equivalent to the structure in the specification which performs that same function.¹⁸

Although the decision in *In re Donaldson Co.*¹⁹ does not explain how to examine for equivalency when dealing with a means-plus-function clause. However, the opinion did state in footnote 8 that the term "equivalent," as used in 35 U.S.C. §112, paragraph 6, is not to be interpreted as an equivalent under the Doctrine of Equivalents, citing *D.M.I., Inc.*²⁰ and *Pennwalt Corp.*²¹ However, the

Patent Office guidelines to examiners tries to explain how the Patent Office should examine for equivalency.

The Federal Circuit has recently explained the term "equivalent" by holding that a trial court had properly instructed a jury regarding the interpretation of "means" clauses in combination claims, including an instruction that such clauses must be interpreted to cover structure disclosed in the specification as corresponding to the "means" clause, as well as equivalents thereof, and that an "equivalent" means

under 35 U.S.C. §112 is one that "functions identically and is merely an insubstantial change that adds nothing of significance" to the device disclosed in specification. ²² The court in *Durable* relied on *Valmont* in its analysis. But *Warner-Jenkinson* provides the full court's current opinion on scope of equivalence.

3. It presents no problem if the means clause is at what is known as the point of novelty, that is, it recites the feature that distinguishes the claim from prior art. The claim may have a number of limitations that are in the prior art and one distinguishing feature. The means clause may be that distinguishing feature.

4. A means clause is used especially where the function or action, rather than the specific structure that causes or accompanies the action, is important to the claim.

5. A means for performing a function clause is useful where there are actually two separate functions being performed and the two functions accomplish a further broader objective, so that the "means for performing the further function" encompasses both of the more specific functions. The "means for performing a function" clause is also useful where there is a partial overlap in functions between two structures. For example, a shaft may have two functions, to drive a propeller and to drive a wheel. Merely claiming that shaft as one element could be too limiting, since that does not deal with the objectives of that shaft, which are to drive a propeller and to drive a wheel. However, the claim recites "means for driving the propeller and means for driving the wheel," (the purest means style), or "first means for driving the propeller and second means for driving the wheel," or "propeller driving means connected to drive the propeller (not in means style) and wheel driving means for driving the wheel," then the overlapping functions of the shaft are covered by use of the means for language covering both of the functions. Additionally, should an infringer not use the single shaft for two purposes, but instead provide two shafts, one for each driving purpose, or even use other means than a shaft to drive one of the propeller or the wheel, the claiming of two separate means for performing respective functions covers it, if the infringer's structure is equivalent to what is disclosed.

6. As noted above, do not add the word "means" after a generic descriptive noun describing the element. However, if there are either one or more than one of the same type of units that cooperate, as noted above, such as one of a series of mirrors or blades, etc., then use of the word "means" following the descriptive word, mirror, blade, etc., can cover either one or several of those items that cooperate and together perform a function. This is because use of the noun "means" after what then becomes the descriptive adjective, "mirror," "blade," etc., eases the reader's reference to the claimed means. ²³

7. A means clause can differ from a prior art reference that applies to it only in the means feature. A means limitation at the point of novelty, although proper, could be

found unpatentable, because of prior art showing something else that performs the same function. The Patent Office gave a "means" limitation the "broadest reasonable interpretation." Now under the examining guideline for "means" claims,²⁴ the "means or step plus function" limitation is to be limited to the corresponding structure, material or acts described in the specification and their equivalents. This was designed to be more restrictive than previous examining practice.

8. A problem in interpreting apparatus claims arises in computer-arts inventions (section 4:9) when the structure in the claim is defined only as "means for" performing a specified function. In computer-related inventions, the means often perform the function of solving mathematical algorithms and making calculations. Consequently, the applicant has the burden of showing that the claims are drawn to a specific apparatus rather than other apparatus capable of performing the same functions.

The recent Federal Circuit decision *In re Alappat* reversed *Ex parte Alappat*²⁵ by holding that

[I]t was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing the functions" recited . . . and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process.²⁶

The court stated that precedents do not support the Board's view that the particular apparatus claims at issue should be viewed as nothing more than process claims for which when one determines patentability, the issue would be whether the method is statutory subject matter under 35 U.S.C. §101. The Federal Circuit's decision in *In re Donaldson* confirms *Alappat*.

For example, the court in *In re Alappat* stated that when independent Claim 15 is construed in accordance with 35 U.S.C. §112, paragraph 6, Claim 15 reads as follows, the subject matter in brackets representing the structure which *Alappat* discloses in his specification as corresponding to the respective means language recited in the claims:

15. A rasterizer [a "machine"] for converting vectors in a data list representing sample magnitudes of an input waveform into anti-aliased pixel illumination intensity data to be displayed on a display means comprising:

(a) [an arithmetic logic circuit configured to perform an absolute value function, or an equivalent thereof] for determining a vertical distance between the endpoints of each of the vectors in the data list;

(b) [an arithmetic logic circuit configured to perform an absolute value function, or

an equivalent thereof] for determining an elevation of a row of pixels that is spanned by the vector;

(c) [a pair of barrel shifters, or equivalents thereof] for normalizing the vertical distance and elevation; and

(d) [a read only memory (ROM) containing illumination intensity data, or an equivalent thereof] for outputting illumination intensity data as a predetermined function of the normalized vertical distance and elevation.

Claim 15 recites a machine, or apparatus, made up of a combination of known electronic circuitry. The court held that because Claim 15 is directed to a machine, which is one of the four categories of patentable subject matter, it appears to be patentable subject matter. The Board had held that the claimed subject matter falls within the "mathematical algorithm" exception. The court stated that the claimed subject matter in this case does not fall within the exception.

The court held that, although all of the means elements recited in Claim 15 represent circuitry elements that perform mathematical calculations, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means. The court found this is not a "disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result. The fact that the four claimed means elements function to transform one set of data to another through what may be viewed as a series of mathematical calculations does not alone justify a holding that the claim as a whole is directed to nonstatutory subject matter." ²⁷ Claim 15 is limited to the use of a particular claimed combination of elements performing the particular claimed combination of calculations to transform, that is, rasterize, digitized waveforms (data) into anti-aliased, pixel illumination data to produce a smooth waveform.

The court also found that the Board majority erred in stating that claim 15 is unpatentable merely because it "reads on a general purpose digital computer 'means' to perform the various steps under program control." ²⁸ The Board majority had assumed that the stored program digital computer was within the range of equivalents, under section 112, paragraph 6, of the structure disclosed in the specification. Precedent has held that programming a general purpose computer to carry out the claimed invention, that is, function, creates a new machine which may be patentable subject matter.

FOOTNOTES:

Footnote 11. See section 3:25, *supra*.

Footnote 12. *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524 (Fed. 1996). See *Surgical Laser Techs., Inc. v. Laser Indus. Ltd.*, 29 U.S.P.Q.2d (BNA) 1533, 1535 (E.D. Pa. 1993).

Footnote 13. *Manville Sales Corp. v. Paramount Sys., Inc.*, 14 U.S.P.Q.2d (BNA) 1291 (E.D. Pa. 1989), *modified*, 917 F.2d 544, 16 U.S.P.Q.2d (BNA) 1587 (Fed. Cir. 1990).

Footnote 14. *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 25 U.S.P.Q.2d (BNA) 1451 (Fed. Cir. 1993).

Footnote 15. *Id.* at 1455.

Footnote 16. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 35 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995), *rev'd on other grounds*, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997); see also *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931,

934, 4 U.S.P.Q.2d (BNA) 1737, 1788 (Fed. Cir. 1987) (en banc), *cert. denied*, 485 U.S. 961, 1009 (1988).

Footnote 17. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 18. *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1575.

Footnote 19. *In re Donaldson Co.*, 16 F.3d 1189, 29 U.S.P.Q.2d (BNA) 1845 (Fed. Cir., 1994).

Footnote 20. *Id.*, 755 F.2d at 1575, 225 U.S.P.Q. (BNA) 236 at 239.

Footnote 21. *Pennwalt Corp.*, 833 F.2d at 933-34, 4 U.S.P.Q.2d at 1741 (en banc). See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997).

Footnote 22. *Durable, Inc. v. Packaging Corp. of Am.*, 31 U.S.P.Q.2d (BNA) 1513 (Fed. Cir. 1994).

Footnote 23. *Manville Sales Corp. v. Paramount Sys., Inc.*, 14 U.S.P.Q.2d (BNA) 1291 (E.D. Pa. 1989), *modified*, 917 F.2d 544, 16 U.S.P.Q.2d (BNA) 1587 (Fed. Cir. 1990).

See the previous discussion of *Surgical Laser Techs., Inc. v. Laser Indus. Ltd.*, 29

U.S.P.Q.2d (BNA) 1533 (E.D. Pa. 1993), wherein the court supported the jury's determination that "probe tip means" does not constitute means-plus-function language; whereas "securing means" does.

Footnote 24. MPEP ?2181.

Footnote 25. *In re Alappat*, 33 F.3d 1526, 31 U.S.P.Q.2d (BNA) 1545 (Fed. Cir. 1994), *rev'g Ex parte Alappat*, 23 U.S.P.Q.2d (BNA) 1340 (Board of Patent Appeals and Interferences 1992).

Footnote 26. 31 U.S.P.Q.2d at 1540 (Fed. Cir. 1994).

Footnote 27. *In re Alappat*, 31 U.S.P.Q.2d at 1557-58. *See In re Iwahashi*, 888 F.2d 1370, 1375, 12 U.S.P.Q.2d (BNA) 1908, 1911 (Fed. Cir. 1989).

Footnote 28. *Alappat*, 23 U.S.P.Q.2d at 1345.

?10:3 Method Claim

A method claim ²⁹ covers a manipulative process which converts, changes, or operates on a workpiece in some manner.

A method claim is particularly valuable because it is not usually tied to a particular structure for accomplishing its objective. As a technical art evolves, new products and hardware are developed. But a basic method continues to be used, and new product technology may continue to perform the patented method long after the product disclosed and perhaps also claimed in the patent has been superseded.

?10:3.1 Sample Method Claim

A product like the steam and dry iron shown in case 28 in appendix A of this treatise, does something to a workpiece, like a cloth. It is capable of being covered in a method claim. Sample method claims for the iron appear below. Note how the method limits are analogs, to an extent, for product limits.

Method Claim on "Steam And Dry Iron"

10. A method of ironing comprising:

applying an ironing surface to a cloth to be ironed for applying ironing pressure to the cloth; moving the ironing surface in a first direction while delivering steam to a first leading side of the ironing surface which leads movement of the ironing surface in the first direction;

moving the ironing surface in a second direction while delivering steam to a second leading side of the ironing surface which leads movement of the ironing surface in the second direction;

blocking delivery of steam to the second leading side of the ironing surface while delivering steam to the first leading side, and blocking delivery of steam to the first leading side of the moving surface while delivering steam to the second leading side;

whereby steam leads and may pass under the ironing surface as it moves in either of the first and second directions.

11. The method of claim 10, wherein the ironing surface is part of an iron;

the method further comprising generating steam in the iron and transmitting the steam to be delivered to the then leading side of the ironing surface.

12. The method of claim 11, wherein the steam generating comprises heating water in the iron.

13. The method of claim 12, further comprising heating the ironing surface.

14. The method of claim 13, wherein the heating of water in the iron and the heating of the ironing surface are performed in the same step.

15. The method of claim 11, wherein the iron includes a rockable handle thereon and a valve for directing steam to the then leading side of the ironing surface, the valve being connected with the handle for being operated by rocking of the handle;

the delivery and blocking delivery of steam comprising rocking the handle to operate the valve to selectively deliver steam to the then leading side of the ironing surface.

16. The method of claim 10, further comprising selectively blocking delivery of steam to both leading sides of the ironing surface simultaneously while the iron is moved.

17. The method of claim 10, wherein the ironing surface first leading side is at the front end of the ironing surface and the ironing surface second leading side is at the rear end of the ironing surface.

?10:3.2 The Elements of a Method Claim

1. A method claim recites a series of steps, typically not apparatus features, article of manufacture features, or characteristics of components. A method claim names

each method step. A product claim names each structural element. ³⁰

2. The step in a method claim is recited in the verb gerund or "-ing" form. (See claim 10 above.) It is an active form of a verb. Even non-action verbs are used actively, for example, "waiting." Other verb forms are avoided, such as a passive form. For example, use "introducing," not "is introduced." The gerund form typically causes the verb to be the first word in the method limitation, but not always.

3. Typically, a method step in a claim is described in terms of operating on something, either on an apparatus (the ironing surface, above) that in turn operates on the workpiece (the object being ironed, above) or directly on the workpiece, for accomplishing a particular objective.

4. A method limitation names the step by using an appropriate descriptive verb word from the specification (moving, delivering, blocking). As with a product claim, if the needed verb is not in the specification, it is recommended that the word from the claim be added into the specification by the claim drafter.

5. The step is described by indicating what object or workpiece the step is performed on, for example, "striking the workpiece. . . ." An invention seldom performs a step without acting on something.

6. Where possible, a function or purpose for performing each step is indicated, for example, "striking the workpiece for flattening" it. (See Claim 10 above, first "applying" limitation.)

a. As with product claims, sometimes the function need not be described if an adequate description is provided by naming the step performed and indicating what the step is performed on.

b. On other occasions, there is an adequate description of the claimed function by naming the step and indicating the function that the step is performing without indicating the structure or workpiece on which the step is being performed, for example, "hammering for flattening the workpiece" or "hammering the workpiece for flattening it." This, the process equivalent of a "means for" limitation, is permitted under 35 U.S.C. §112, and is discussed briefly below.

§10:3.3 In a Method Claim, a Product Is Not Being Claimed

1. A product recited in a method claim is a structure which performs some or all of the steps indicated in the claim "rotating two fingers of the machine . . ." and/or performs those steps on the workpiece "rotating two fingers against the workpiece . . . ," or broadly "contacting the workpiece" The last mentioned clause is a broad method clause just indicating what is happening without specifying

the product that participates in accomplishing it.

2. A narrow method limitation has a method verb acting on some machine element to act on the workpiece. Broader still is to have the method step acting on the workpiece without reciting a particular machine element that does that action. Possibly broader still would just be reciting a process step for accomplishing a result which is on the way to accomplishing the objective of the method, without specifying the nature of the particular step that accomplishes it. That is, the method analog of a means for accomplishing a function claim limitation.

3. The Patent and Trademark Office has released proposed new examination guidelines for evaluating the patentability of computer-related inventions. The examiners, when classifying the invention defined by each claim as to its statutory category, should presume that a series of specific operational steps to be performed in or with the aid of a computer is a statutory "process." The computer is an apparatus performing a process.

?10:3.4 A Dependent Method Claim

1. A dependent method claim either adds additional limitations (Claim 13 above) or details or further defines previous limitations (Claim 14 above). The comments made above concerning dependent product claims apply to dependent method claims.

2. A dependent method claim can add an additional step (claim 13 above), or can define a previously broadly described step (Claim 12 above) as a more detailed precise step, or can recite a set of separate steps that make up a previously broadly claimed method step (Claim 15 above).

3. A dependent method claim can include product limitations only (Claim 17 above). In contrast, a dependent product claim should not include only method limitations, as discussed above. In a method claim, for example, where the method is performed using a particular structure or using a particular substance that acts upon something else than, for example, the product, or even the tool element used for performing the process, or the substance or material used in performing the process can be recited in a separate dependent method claim.

4. Claimed methods work on a workpiece to modify it in some way. There would not be a separate claim defining or altering the workpiece, because the workpiece is by definition not one of the claimed elements.

5. Where a method claim has a more broadly stated step and that more broadly stated step is defined in terms of a more narrowly stated step, both of the steps may be recited in a single limitation and both should be recited in the gerund form. The

broader step is recited prior to the narrower step in the method claim (if Claims 11 and 12 above were combined into one claim). For example, a claim might read "separating [the broader step] by distilling [narrower step]" rather than reciting "distilling to separate." Staying with that example, the distilling and separation may be also viewed in the sense that separation is the objective while distilling is the step, so that the claim limitation could also be written as "distilling for separating. . . ." But where a step is a narrow, more specific way of doing a step that is broader in scope, then the broader scope step should precede the narrower scope step in the claim limitation.

In this example of a broader step encompassing a narrower one, the claim writer should consider separating the "distilling" and "separating" steps into two claims, with the earlier claim reciting the broader "separating" and the later dependent claim reciting the "distilling," as in "wherein the separating comprises distilling [the workpiece]."

¶10:3.5 A Step for Accomplishing a Particular Function

35 U.S.C. §112, paragraph 6, says that a recitation of a step for accomplishing a function is construed to cover what is disclosed in the specification and equivalents. Therefore, the "step for" limitation (see first limitation in Claim 10 above) covers equivalents. Case precedents have required use of the words "means for" to fall under 35 U.S.C. §112. Patent Office guidelines MPEP section 2181 and section 2184 have eased that strict language requirement. Few cases have commented on the corresponding wording for process steps.³¹ But if you were solely to rely upon the language "step for" performing function, you might recite "performing a step for pressing the workpiece." That appears awkward. Another way of reciting the same method would be "pressing the workpiece." Case precedents establish that section 112, paragraph 6 applies to the step for limitation, but not that "pressing the workpiece" limitation which is outside section 112, paragraph 6.

¶10:3.6 No Physical Interrelationship of Claimed Steps

1. In contrast to product claims, an interrelationship or connection of method claim steps to one another and their connection need not be recited.

2. Typically, method steps are performed in a sequence (see Claim 10 above). Other than that sequence, they may bear no physical relationship to each other. But the claim steps must act in some logical sequence to lead to the final objective. Sometimes the various steps in the method are performed simultaneously (Claim 10 above). But they too lead to the final goal.

3. Although the method steps are not necessarily related physically or by function to each other, they are usually related to the workpiece to which the method claim is

directed (item being ironed in Claim 10 above). Any method step not somehow directly or indirectly related to the workpiece probably does not belong in the method claim.

4. The method steps should always be related to attaining the final objective. Any steps not directed toward accomplishment of that objective clutter the method claim with unnecessary limitations which ease avoidance of the claim by an infringer.

?10:3.7 Review the Claim After Writing

Method claims should be reviewed as described above to be certain that every limitation relates to the invention and is necessary for accomplishment of the objective. Detailed limitations which are not essential to the broadest way of claiming the method to achieve the ultimate objective should be removed from the broad claim and perhaps should be moved to narrower dependent method claims.

FOOTNOTES:

Footnote 29. *See* sections 4:1-4:6, *supra*.

Footnote 30. *See* *Hewlett-Packard Co. v. Bausch & Lomb, Inc.*, 909 F.2d 1464, 15 U.S.P.Q.2d (BNA) 1525 (Fed. Cir. 1990).

Footnote 31. *See* *O.I. Corp. v. Tekmar Co., Inc.*, 42 U.S.P.Q.2d (BNA) 1777 (Fed. Cir. 1997).

?10:4 Article of Manufacture Claims

A. An article of manufacture is an object which exists and may do something, but it does so without claimable motion. An electric battery, a shoe, a window screen are articles of manufacture. They have practical uses, but no parts whose relative movements are relevant to the claimed invention. The actual article disclosed in the specification may have moving parts. But the article itself, not the action that the article is capable of performing with reference to a workpiece, is the subject of an article of manufacture claim.

B. Means for accomplishing a function limitations can be used in an article of manufacture claim. For example, such a claim includes "means for attaching A to B" or "means for closing the open end of . . ." or some other state of being between components of the article which can be described in "means for" language.

C. An article of manufacture claim could differ from the prior art by its shape, arrangement of parts, materials used, an inventive part included in an apparatus and sometimes by the manner in which it is made, although that typically is the subject of a product by process claim, discussed below.

D. The Patent and Trademark Office has released proposed new examination guidelines for evaluating the patentability of computer-related inventions. These Guidelines were released on June 1, 1995. In reviewing the written description and the claims, the examiners must "classify the invention defined by each claim as to its statutory category (that is, process, machine, manufacture or composition of matters)." Examiners making that classification should presume the following, according to the guidelines:

A computer-readable memory that can be used to direct a computer to function in a particular manner when used by the computer is a statutory "article of manufacture."

?10:5 Product-by-Process Claims

A product-by-process claim ³² defines a product in the terms of the process used to make the product.

The most common situations in which claims use both product and process terms are:

- (1) when a product is new and unobvious, and incapable of independent structural definition;
- (2) the product is old and obvious, but the process is new; and
- (3) the product is new and unobvious, but has a process-based limitation. ³³

Occasionally, a product-by-process recitation is used to define one component part of a product in a claim rather than used for the entire claim. For example, a product may have a number of components, including a particular structure that is described in the terms of the process by which it is made, that is, an electrical product may have a new structure which includes a contact made by a particular process. That contact would be covered by a respective product-by-process limitation within the body of the claim.

A product-by-process claim can be used in an application having a regular product claim. ³⁴ There is no limit on the number of product-by-process claims that may be used in one application.

A product-by-process claim is particularly useful when there are method claims, or method steps in an article of manufacture, or in product claims where the method or the steps cause something to be produced. In this case, the item that has been produced, or even the feature of the claimed structure that has been produced, may

be made the subject of a product-by-process claim. Such a claim would recite a product [naming the product itself] made by the process comprising steps: . . . and then reciting the steps as in a method claim.

Product-by-process claims in a patent reciting a method for producing a "random faded effect" on fabric were held invalid because they were directed to non-patentable subject matter under 35 U.S.C. §101. The court found the claims were more similar to claims in a design patent as the appearance of the random faded effect on jeans attracts attention, but does not affect the utility of the jeans.³⁵ But, if the product is the jeans, the process of producing them should be claimable and so should the process used in producing jeans with that effect. The issue is more likely whether the process is novel or unobvious (section 102 or section 103) over existing jeans, rather than a subject of patenting at all. (See next paragraph.)

A product-by-process claim must satisfy 35 U.S.C. §§ 102 and 103. Therefore, it is possible to have a completely new process, while the resulting product made by the process may not be patentable, because it is old.³⁶ For example, there could be a new process for the assembly and packaging of cigarettes, but the resulting product, the cigarette itself is well known. Therefore, a product-by-process claim on such a cigarette would not be patentable.

A process limitation describing how a product is used, rather than how the product is made, does not result in a product by process claim, and thus does not fall within the holding of *Scripps Clinic & Research Foundation v. Genentech, Inc.*³⁷

The Federal Circuit is split on whether the process terms in a product-by-process claim serve as limitations when determining infringement. In *Scripps*, the court held:

[T]he correct reading of the product by process claims is that they are not limited to product prepared by the process set forth in the claims.

Shortly, after the *Scripps* decision, the Federal Circuit rendered what appeared to be a decision contrary to *Scripps*. In *Atlantic Thermoplastics Co. v. Faytex Corp.*,³⁸ the Federal Circuit held:

Process terms in product-by-process claims serve as limitations in determining infringement.

The *Atlantic* court determined that the product-by-process claim at issue was not infringed by a product made by a process different from the one recited in the claim.

A district court decision follows *Atlantic* by holding that product-by-process claims cover only the process, not the product, when determining infringement, so that the

Scripps decision distinguishing between a process which produces a totally new substance and a novel process applied to a product which exists in prior art, is not controlling. ³⁹

The district court stated that it appears that "a majority of the judges of the Federal Circuit would rule that *Atlantic* states the controlling law." ⁴⁰

However, the dissent in *Atlantic* provides a rationale to resolve the conflict between *Scripps* and *Atlantic*. They support drawing a distinction between (1) product-by-process claims used to describe a new and unobvious product which is incapable of independent structural definition (that is, similar to "Fingerprint" claim rationale) and (2) product claims having process limitations which were argued to be a basis for patentability over the prior art. ⁴¹*Scripps* refused (for infringement purposes) to apply a process limitation of the former type. *Atlantic* applied a process limitation of the latter type.

In *Scripps*, the product was difficult to describe for patentability purposes. Consequently, a product-by-process claim was used. Hence, the court held that an accused product could infringe the patent even though it was made using a different noninfringing process. In *Atlantic*, in contrast, the product-by-process claim appeared to have been added to avoid rejection of the patent. Hence, the court determined, in order to find infringement, not only must the product be the same, but the product must be made by the same process claimed.

The Federal Circuit has not yet resolved the conflict between its two precedents, nor has it clarified whether their decision in *Atlantic* was intended to overrule *Scripps*. Consequently, when drafting product-by-process claims, one should be aware that process language could limit the claim, as in *Atlantic*. Therefore, when deciding whether to use a product-by-process claim, one should be cautious that it may limit the usefulness of the patent at a later date when trying to have other products, made by different processes, held to infringe the claim.

For patentability purposes, use of product-by-process claims allows one to patent products which are structurally difficult to describe. But they may limit one's ultimate ability to obtain a judgment for infringement if a party makes the same product via a different noninfringing process.

An example of a product-by-process claim used to describe a structurally difficult product is taken from *Scripps* ⁴²:

Claim 13 is representative of the product-by-process claims:

13. Highly purified and concentrated human or porcine VI-II:C prepared in accordance with the method of claim 1.

Claim 1 is:

1. An improved method of preparing Factor VIII procoagulant activity protein comprising the steps of

(a) adsorbing a VIII:C/VIII:RP complex from a plasma or commercial concentrate source onto particles bound to a monoclonal antibody specific to VIII:RP,

(b) eluting the VIII:C,

(c) adsorbing the VIII:C obtained in step (b) in another adsorption to concentrate and further purify same,

(d) eluting the adsorbed VIII:C, and

(e) recovering highly purified and concentrated VIII:C.

FOOTNOTES:

Footnote 32. *See* section 5:2, *supra*.

Footnote 33. *Atl. Thermoplastics Co. v. Faytex Corp.*, 974 F.2d 1279, 23 U.S.P.Q.2d (BNA)

1801, 1803 (dissenting from denial of rehearing en banc) (Fed. Cir. 1992).

Footnote 34. *In re Certain Steel Rod Treating Apparatus & Components Thereof*, 215 U.S.P.Q. (BNA) 237 (Ct. Int'l Trade 1981).

Footnote 35. *Levi Strauss & Co. v. Golden Trade S.R.L., S.D.N.Y.*, No. 92 Civ. 1667 (RPP)

(Apr. 14, 1995).

Footnote 36. *In re Marosi*, 710 F.2d 799, 218 U.S.P.Q. (BNA) 289 (Fed. Cir. 1983); *Ex parte Edwards*, 231 U.S.P.Q. (BNA) 981 (Board of Patent Appeals and Interferences 1986).

Footnote 37. *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 1991), *clarified on reconsideration*, 18 U.S.P.Q.2d (BNA) 1896 (Fed. Cir. 1991). *Mentor Corp. v. Coloplast, Inc.*, 998 F.2d 992, 27 U.S.P.Q.2d (BNA) 1521 (Fed. Cir. 1993).

Footnote 38. *Atl. Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 834, 23 U.S.P.Q.2d

(BNA) 1481 (Fed. Cir.), *reh'g en banc denied*, 974 F.2d 1299, 24 U.S.P.Q.2d (BNA) 1138

(concurring opinion); 974 F.2d 1279, 23 U.S.P.Q.2d (BNA) 1801 (dissenting opinions) (Fed. Cir. 1992).

Footnote 39. *Tropix, Inc. v. Lumigen, Inc.*, 825 F. Supp. 7, 27 U.S.P.Q.2d (BNA) 1475 (D. Mass. 1993).

Footnote 40. *Tropix, Inc.*, 27 U.S.P.Q.2d at 1478.

Footnote 41. See the dissenting opinion of Judge Newman in *Atlantic*, 23 U.S.P.Q.2d (BNA) 1801.

Footnote 42. *Scripps*, 18 U.S.P.Q.2d at 8005.

?10:6 The Jepson Claim

The *Jepson* claim ^{42,1} format can be used for method claims as well as product claims. The *Jepson* format is good and proper. ⁴³ But the occasion is rare when it is the recommended format. The Patent and Trademark Office encourages its use in independent claims. ⁴⁴ Its use is optional. It is seldom used in practice.

Examples of a *Jepson* claim now appear. They are based on the steam and dry iron product in case 28 in appendix A.

18. A steam and dry iron comprising:

a housing having an ironing surface; the ironing surface having a front side and a rear side with respect to motion of the ironing surface over an article to be ironed;

steam ports at the ironing surface for delivery of steam to the ironing surface;

a steam supply for delivering steam to the steam ports;

wherein the improvement comprises:

the steam ports including a front steam port at the front side of the ironing surface and a rear steam port at the rear side of the ironing surface;

a valve connected between the steam supply and the front and the rear ports, the valve being selectively moveable to a first position opening communication from the steam supply to the front port while closing communication between the steam supply and the rear port, and to a second position opening communication between

the steam supply and the rear port while closing communication between the steam supply and the front port;

a valve operator connected with the valve for moving the valve to the first position as the iron is moved toward the front side of the ironing surface and for moving the valve to the second position as the iron is moved toward the rear side of the ironing surface;

whereby steam will exit the front and rear ports, respectively, to lead the iron in its motion toward the front and the rear sides of the ironing surface.

19. The steam and dry iron of claim 18, wherein the improvement further comprises the valve having a third position at which the valve closes communication from the steam supply to the front and the rear ports.

20. The steam and dry iron of claim 18, further comprising a heating element at the ironing surface for heating the ironing surface.

The *Jepson* format claim recites all or at least some elements of a known article, process, or combination in its preamble. ⁴⁵ The preamble is usually rather lengthy, in contrast to the short preamble recommended for other product and process claims. The preamble may recite: "An apparatus comprising . . . ," reciting prior art elements in proper claim style.

Following its preamble, the *Jepson* claim includes a transition clause that states, "wherein the improvement comprises," or "the combination with the old article, etc. of."

The following body of the claim recites only the new elements or the modified elements or tells of the new forms of connection or cooperation between all of the elements by reciting the improvements.

Jepson claims may be used when there is an improvement in one element of an otherwise old combination.

A dependent *Jepson* claim may be used to define only a known or prior art element.

A *Jepson* claim is similar to the claim form used in some European countries.

In the preamble, the various elements should be properly named and interrelated, as is done in other format claims. Similarly, in the part of the claim defining the improvement, the elements also should be properly named and related either to elements in the preamble portion or in the improvement portion, so that the *Jepson* claim meets all the other claim drafting requirements.

One danger of the *Jepson* claim format is that it emphasizes some elements of a combination over the others. It suggests to a reader that one should not look at the novelty and unobviousness of the entire combination, but rather at only a part of the combination. It may encourage a court which is later assessing the validity of the patent to combine a prior art reference directed to the preamble material of the claim with another prior art reference directed to the material following the transition and to suggest that these two references are properly combined to render the claim obvious and invalid. ⁴⁶ While such a combination of prior art in a validity determination would be proper even if the usual claim format were used, the fact that a prior art reference is found, which shows all of the features that are recited in the *Jepson* claim to be the novel features, may weigh strongly in the mind of a trier of fact in deciding if that claim is invalid.

FOOTNOTES:

Footnote 42.1. See section 6:8, *supra*.

Footnote 43. See *Ex parte Jepson*, 1917 Dec. Comm'r Pat. 62, 243 Off. Gaz. Pat. Office 525 (Ass't Comm'n Patents 1917).

Footnote 44. 37 C.F.R. §1.75(e).

Footnote 45. *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 220 U.S.P.Q. (BNA) 97 (Fed. Cir. 1983); *Johns-Manville Corp. v. Guardian Indus. Corp.*, 586 F. Supp.

1034, 221 U.S.P.Q. (BNA) 319 (E.D. Mich. 1983); *amended*, 223 U.S.P.Q. (BNA) 974 (E.D. Mich. 1984), *aff'd*, 770 F.2d 178 (Fed. Cir. 1985).

Footnote 46. See *In re Fout*, 675 F.2d 297, 213 U.S.P.Q. (BNA) 532 (C.C.P.A. 1982), and *In re Ehrenreich*, 590 F.2d. 902, 200 U.S.P.Q. (BNA) 504 (C.C.P.A. 1979).

§10:7 Particular Points Related to Good Claim Drafting

§10:7.1 Preamble

The preamble ⁴⁷ of a claim is its first words. It identifies the field of the invention. Preferably, that is all it should recite.

For an invention in a bicycle, for example, a preamble that says "vehicle" would appear to be of broader scope than a preamble that says "bicycle." Yet, if the invention is clearly directed to a bicycle, there is no benefit to having a preamble "vehicle" which is more encompassing than the invention itself. The preamble

should be realistically narrow in scope. Conversely, if the preamble says "bicycle," but the invention is adaptable not only for bicycles but for motorcycles, and if an infringer were later to market a product which had all of the feature limitations in the claim, but which was a motorcycle rather than a bicycle, the infringer might argue that the claim does not reach the accused product because the claim is limited in scope to a bicycle. The preamble must be sufficiently broad to cover the product in the preferred embodiment to which the inventor has directed his attention (bicycle), but also to cover other embodiments, such as "two-wheeled vehicles," to which the invention may be directed. (In Claim 1 in

II above, the preamble is a steam and dry iron. Yet Claim 1 only claims the steam iron aspect. The dry iron aspect is introduced in dependent Claim 2. The preamble of Claim 1 may be too narrow and an accused infringer may say that it excludes the two directional steam irons of Claim 1. Perhaps the preamble should merely have been "An iron" or "A steam iron."

To avoid a too limited scope preamble, the claim writer might be tempted to merely recite the broad "Apparatus comprising" or use "device" or a similar non-specific noun. But a too broad preamble is also not good practice, although not improper. Some writers use a statement of ultimate purpose or field of use with the non-specific noun, for example, "Apparatus for flattening a workpiece" [statement of objective], or "Apparatus for ironing" (II above), or "Apparatus for improving a vehicle transmission" [field of use].

Typically, a preamble is either identical to or a slight adaptation of the title of the invention that appears at the head of the specification (which is why the claims in II above have their stated preamble). The title in the specification and the preamble of the claims should be correlated and consistent. If one is changed, the claim writer should consider changing the other.

A good preamble is short. It does not tell a story. It does not typically describe the ultimate purpose of the invention. (But see above.) It does not typically describe the workpiece on which the invention operates. (Again, see above.) A preamble limited to the title of the invention as it appears at the head of the specification should always be enough.

On the other hand, the preamble may have to be longer because in order to understand an invention, one must understand its context. Therefore, sometimes the purpose of the invention is recited in the preamble before the transition word, as in "Apparatus for treating a web to prevent tearing, the apparatus comprising . . ." The title of the invention at the head of the specification may be slightly different, but there is no short claim preamble that does that job. Consideration should be given to keeping the preamble short in length, avoiding noting the ultimate objective of the invention and avoiding noting the workpiece, unless that is the only

way to define a field for the invention, which is what the preamble does.

The preamble should not be longer for providing a basis for elements that appear in the body of the claim, except for the unusual *Jepson* claim preamble. Even a *Jepson* claim preamble has its own introductory portion or preamble which defines the field of the invention. Also, the preamble does not mention or distinguish the prior art.

The preamble of an independent claim may be a full statement of the field or the full title of the invention, longer, as in the apparatus preambles noted above. The preamble of the dependent claims need not be as lengthy as the preamble of the independent claim. Often, the preamble of the dependent claim merely consists of the major noun of the preamble of the independent claim. In the above example, the dependent claim preamble may simply be "The apparatus of claim . . ." But the preamble of any dependent claim can have more details.

The preamble of the dependent claim must be consistent with that of the claim from which it depends. If the previous claim is to "apparatus," the dependent claim should not be to "device." If the previous claim is to "bicycle," the dependent claim should not be to "vehicle." Change one or the other claim for consistency.

Depending upon how it reads, the preamble may or may not provide elements in the claim which limit or restrict its scope, other than the normal purpose of a preamble to define the field of the invention.

?10:7.2 Subparagraph Claim Form

In an effort to improve U.S. claim clarity, the subparagraph claim form ⁴⁸ is preferred. The subparagraph format is not required. Preferably, each new major claim element and subassembly is made the subject of its subparagraph. A major claim element may, in turn, be comprised of a number of other claim elements. Those other claim elements may be or need not be the subject of separate subparagraphs, as the claim drafter decides.

Some claim drafters use numbers or letters to indicate the different elements and subparagraphs. This, too, is optional.

?10:7.3 Multiple Dependent Claims

A multiple dependent claim ⁴⁹ refers back to more than one preceding claim.

A special one-time fee is payable for any multiple dependent claim in the application. In addition, each multiple dependent claim is treated as the number of claims on which it is dependent, so that a multiple dependent claim dependent on two other claims is treated as two claims.

It is not permissible to have a multiple dependent claim dependent upon another multiple dependent claim. A multiple dependent claim can be dependent only upon a number of single dependent claims. In turn, only a single dependent claim can be dependent upon a multiple dependent claim.

Each single dependent claim dependent upon a multiple dependent claim is for fee purposes treated as the same number of claims as the multiple dependent claim.

It is almost always possible to break a multiple dependent claim into single dependent claims. For fee reduction purposes and clarity of claiming, in the United States form, it is better to have single dependent claims, rather than multiple dependent claims. But the claim drafter may use multiple dependent claims that are acceptable.

?10:7.4 Inferential Claiming

Each new element in a product claim and each new step in a method claim should be first introduced either as (a) the subject of its own clause (the "housing" in claim 1, line 2, at II above), or (b) a previously introduced and named item or a step comprises it, has it or includes it, that is, its presence is indicated by using a verb that describes the state of being (having, comprising, including, being), rather than an action verb (see the introduction of the "ironing surface" in claim 1, line 2 at II above). Being the subject of its own clause means that it is either stated in the clause that such an element or step is present or the element or step is named at the beginning of the clause and thereafter that element or step, which has been named now for the first time, does something or has something done to it. It is important that a new item mentioned for the first time in the claim not be first mentioned as an element operated upon or cooperated with by a previous element described in the same clause.

The indefinite article "a" may be used where it is preceded by either of the words "comprises," "includes," "has," or "being" or the equivalent, which indicates a state of being, rather than some activity involving that element being named.

A new element or step is introduced with an indefinite article "a" or "an." (Some plural items have no introductory article "a" and are introduced by the plural noun itself. But, from the context, the silent introductory indefinite article can be inferred.) On the other hand, when a previously identified element or step is repeated, it is introduced by a definite article "the" or "said".

The claim drafter should look at the claim to see that each element or step is introduced with an indefinite article. Then note whether that element or step is the subject of the clause or whether it is being acted upon or is itself acting upon

another object or step. If it is being acted upon or acting upon another object, then it should be the subject of that clause.

The only exception to the inferential claiming prohibition is where the indefinite article "a" is used to introduce a workpiece. Because the workpiece is not an element of the claim, but rather is only worked upon by one of the claim elements, it would not be introduced as the subject of its own clause.

An example of improper inferential claiming is the clause "the motor being connected with a shaft which is connected with the gear for driving the gear." In that claim limitation, the shaft is inferentially claimed. It is not the subject of the clause. If there is a subject, it is the motor or the gear. Also, the shaft is not being described in a state of being with respect to the motor or the gear, but rather it is being described in a state of action. Proper wording might be "a shaft connected with the motor and with the gear for communicating driving motion from the motor to the gear." This says the same thing, but does not inferentially claim the shaft. (Implicit in this clause, of course, is that the motor and the gear were previously introduced in the claim, since each is preceded in the clause by the definite article "the.") Referring to the other exception, if the clause reads "the motor including a shaft extending to the gear," that would not be inferential claiming. The shaft has been first introduced in the claim in a state of being with respect to the motor, so that for an inferential claiming analysis, the shaft is now properly in the claim. Thereafter, and even in the same shaft introducing clause, the shaft can be active, and it is described as cooperating with the gear. It is no longer inferential claiming once the element with the indefinite article "a" has been properly introduced. (See the introduction of the water chamber in claim 5 at II above.)

FOOTNOTES:

Footnote 47. See section 2:4, *supra*.

Footnote 48. See section 2:8, *supra*.

Footnote 49. See section 2:11, *supra*.

?10:8 Review of Some Basics n50

n50. The following remarks were prepared by Myron Cohen [then] of Hubbel, Cohen & Stiefel, as advice to our PLI Agent's Exam students at claim drafting clinics, in which the students prepare claims to sample structures for criticism by our tutors, including Mr. Cohen. Many such problems appear in appendix A.

Mr. Cohen's half-time pep talk to his students not only summarizes and highlights many of the most important portions of this treatise on how to write mechanical claims, it contains very sage advice on how to write broad claims generally.

Although some of the advice is intended for the rank beginner, and other parts focus on particular kinds of Agent's Exam questions, all can learn from these self-styled "random thoughts" of Mr. Cohen. [These thoughts were composed over some ten years of practice in tutoring novice claim drafters. They are decidedly not random; they hit the students' problems on the head. --Faber].

?10:8.1 Random Thoughts on How to Draft Claims to Mechanical Apparatus

A claim is a one-sentence definition of the structure of the defined invention. It defines that invention with the same particularity and precision as the description of a parcel of land in a deed. The analogy to the deed is a good one because United States claims serve to define the outer limits or boundaries of the invention in the same fashion as the description of land in a deed defines the outer limits of the land monopoly. Thus, United States claims do not define the spirit or heart or central theme of an invention. Much of this does not shed any light on how to draft claims, but it is important to recognize that claim language must be extremely precise. The precision of the language has nothing whatsoever to do with the breadth or narrowness of the claim, for the broad claim must be drawn with the same precision as the narrow claim. The point is that there are very few if any chores in the area of legal draftsmanship that are as demanding of language as the chore of drafting a claim.

Throughout the balance of these remarks, I intend to speak principally of apparatus claims. I shall touch on method claims briefly and on composition claims not at all. However, the truly tough job in drafting mechanical claims is the preparation of a broad claim to apparatus, and that is what we are going to concentrate on.

Most commentators in the field of United States claim drafting usually state that an apparatus claim is *not merely a catalog of parts*.⁵¹ They are absolutely correct in saying this. Unfortunately, they usually overlook the fact that, while an apparatus claim is not *merely* a catalog of parts, it *absolutely must include a catalog of parts*. It is the cataloging of the parts that gives rise to what we call the positive recitation of the elements. That is, each structural element in the claim must be set forth directly and independently of every other element.

Thus, if an apparatus is to be claimed that includes three elements, A, B, and C, then the claim must have as a part of itself language that states "an A" and language that states "a B" and language that states "a C."

However, as the commentators told us, a United States claim is not merely a catalog of parts. What distinguishes a United States claim from a mere catalog is the inclusion in the claim of language that directly or indirectly interrelates each element in the claim with each other element. The interrelationship can be

(1) by connection, either a dynamic connection (such as "rotatably mounted on") or a static connection (such as "fixed to");

(2) by definition of relative position between two elements (such as element B being disposed above element A); or

(3) by setting forth yet another element in the catalog that interrelates two elements, (such as a gear train drivingly connecting element B to element A).

Thus, when one drafts a claim, perhaps the simplest way to do it is first to set forth a catalog of the major parts. After this has been done, one can either add additional parts to interrelate the major parts or modify the major parts to put in language of relationship. For example, a claim can read as follows:

A gadget comprising:

an A;

a B interrelated with A; and

a C interrelated with B.

It will be seen in the example that by interrelating A with B and by interrelating B with C you have indirectly interrelated C with A. Thus, all three elements, A, B, and C, are directly or indirectly interrelated and you have a complete claim. If, on the other hand, the claim called for:

A gadget comprising:

an A;

a B interrelated with A; and

a C.

you would not have a complete claim, as C would not be interrelated with either A or B. Such a claim would not be complete and would be rejected as being indefinite.⁵²

Perhaps a more common way of writing a United States claim is to interrelate the main elements with additional structural elements that must also be positively recited or catalogued. Thus a perfectly proper claim would be:

A gadget comprising:

an A;

a B;

a C;

means interrelating A with B; and

means interrelating B with C.

This example meets all of the tests of a complete claim: all the elements are positively recited and each element is directly or indirectly interrelated with each other. The form of this last claim can prove rather sterile: generally speaking, a skilled claim draftsman would write the claim in slightly different form. The preferred form would probably be:

A gadget comprising:

an A;

a B;

means interrelating A with B;

a C; and

means interrelating B with C.

In apparatus claims, we are concerned solely and exclusively with a definition of structure. By structure I mean hardware, something you can touch, something you can feel, something you can manipulate. We are not interested in function, and the function of an element cannot be used as a substitute for the definition of the structure of the element itself.

However, there is one exception to the rule concerning the avoidance of the definition of an element by virtue of its function. In the last paragraph of section 112 of the statute, there is a statutory authority for defining an element as "a means for performing a function."⁵³ Now you may very well think that is ridiculous, that merely saying "means for performing a function" is as functional as defining the element by the function itself. Well, your logic may be good, but if you believe that you fail as a lawyers. The Congress of the United States has said that "means for performing a function" is structural, it is not functional.⁵⁴ So, by act of Congress, such language meets all of the statutory requirements for the definition of a structural element. In this connection, I would like to urge you not to avoid the use of the expression,

"means for." It is a perfectly fine expression, and gives rise to the writing of claims of substantial breadth.

There is one place that "means for" cannot be used. You cannot define a structure by a single element that is defined in terms of a means for performing a function. That is what is meant by a "single means claim" and it is regarded as being functional. However, when you have more than one element in a claim, there is nothing wrong with defining one, several or all of the elements in terms of "means for." I might say that there have been times when I have actually done this and have secured the allowance of such claims. When the prior art permits it, it is the best kind of claim you can get.

There are a couple of specific rules that I would like to set forth for your guidance in connection with taking the examination. These rules, in some instances, you may shed after you have become a licensed practitioner; but I think they should be followed at this point in your career.

The first rule is *never use the expression, "adapted to" or "adapted for."* Both of these expressions tend to be somewhat functional and may lead to an objection on the ground of the claim's being indefinite.⁵⁵ There is a perfectly simple solution to the problem of proper language to be used in lieu of "adapted to" or "adapted for." The proper linguistic solution is the word "for." Thus never say, "a base adapted to support a table." It is much preferable to say, "a base for supporting a table."

The second rule, which I think should be followed through the examination, is *never use the word "whereby" ⁵⁶in a claim.* Now I know that you have been told that "whereby clauses" are perfectly good, and I, for one, use them regularly.

However, I think you have to know when to use them and when not to use them, and I seriously doubt that you have reached the point in your development as claim drafters at which you can use them with consistent propriety. Generally speaking, my experience has been that when a novice claim drafter uses the word "whereby," he or she generally uses it to introduce a lengthy functional expression to cover up or blur the fact that he or she has not set forth the necessary structure. My advice to you is when you are drafting a claim and you suddenly see the word "whereby" jump out of that paper, stop! Go back and write the claim again. If the word "whereby" is going to be used, I think you are going to have a claim that is going to cost you a considerable number of points.

The third rule relates to the definition of holes, grooves, and other absences of material.⁵⁷ Just as I have said that every structural element, every hardware element, must be recited positively, I can give you an equally inflexible rule concerning *holes, grooves, slits, and slots.* *They cannot be recited positively;* they must always be recited inferentially. Thus, you cannot say "a doughnut, a hole in the

center of a doughnut." That would positively recite the hole in the doughnut and would be considered improper. The proper way to handle this is to write "baked goods comprising: a cylinder of dough having a hole in the center thereof." Note that the hole just is not positively set forth or catalogued. It is "impositively" or inferentially recited by the use of the word "having." In the same manner, you might call for "a tube having a circumferential groove therein" or "a link having an axially extending slot therein."

Everything that I have discussed above relates to independent claims, that is, to claims that are wholly self-contained as to the structure set forth herein. There is another breed of claim called a "dependent claim,"⁵⁸ which is a claim of narrower scope than the claim from which it depends. A dependent claim is one that incorporates by reference all of the structure of the claim from which it depends. Thus, a dependent claim is not self-contained, but relies for some of the structure defined therein on a claim that is referred to in the preamble of the dependent claim.

The Patent and Trademark Office greatly prefers dependent claims to a series of ever narrower independent claims. The Office has found them easier to examine, as such dependent claims highlight the points of difference between successive claims. For this reason the Patent and Trademark Office charges less for each excess dependent claim than for each excess independent claim. That being the case, when you take the exam, if you are asked to write three claims of differing scope defining a particular structure, you should write one broad independent claim and two dependent claims. When you are asked to write "broad, intermediate, and narrow," claims, you should make claim 2 depend from claim 1 and claim 3 depend from claim 2, whereby⁵⁹ claim 1 must logically be the broadest, claim 2 must be the intermediate claim, and claim 3 must be the narrowest.

But beware. The first rule of taking any exam is reading the exam carefully. One year, for no discernibly good reason that I have ever conjured up, the Patent and Trademark Office, notwithstanding its own preference for dependent claims, specifically instructed the examinees to write three *independent* claims of different scope. Many of the students wrote a single independent claim and two dependent claims and lost many points on the two dependent claims. So, please read the exam and follow the instructions. If no instructions are given, then follow the formula given of one independent broad claim followed by a first dependent claim that depends on number 1 and a second dependent claim which depends on number 2. Dependent claims are quick and easy to write, as you will see in a moment, and conform with Patent and Trademark Office preference.

As I told you, a dependent claim incorporates by reference the entire subject matter of the claim from which it depends. If a dependent claim depends from a dependent claim, then it incorporates everything set forth in the claim from which that claim in turn depends. The chain of incorporation by reference can go on indefinitely.

There are only three things a dependent claim can do: it can add structure to the claim from which it depends; it can more particularly define structure already set forth in the claim from which it depends; or it can do both of those things. ⁶⁰

In order for a claim to add additional structure, the dependent claim must have the following language:

The gadget as defined in claim 1, *further comprising* . . .

After the words "further comprising," you set forth the additional structural elements. Thus, for example, suppose you have a main or independent claim that states:

A gadget comprising:

an A;

a B interrelated with A; and

a C interrelated with B.

If in a narrower claim, you wish to add an element D to the claimed combination, then you would write a dependent claim in the following form:

The gadget as defined in claim 1, *further comprising* a D interrelated with (A or B or C).

Do not forget, even in a dependent claim every element must be directly or indirectly interrelated in some fashion with every other element that is contained in the claim either by express language or by incorporation by reference.

If, however, rather than adding an additional element D, you wish to define more particularly that the element B is actually made up of subelements E, F, and G, then you would be performing the second function of a dependent claim. You would be more particularly defining an element already set forth. To do this, the dependent claim would read as follows:

The gadget as defined in claim 1, *wherein* element B includes E, F, and G interconnecting E and F.

Please note this example sets forth more particularly just what is the construction of element B. Note that this dependent claim adds no additional element to the structure. Thus, when confronted with defining B as we have done in the

immediately preceding example it would be improper to set forth this definition in the following fashion:

The gadget as defined in claim 1, further comprising an E, an F, and a G interrelating E and F.

The reason for this claim's being improper is that E, F, and G make up B. By using the "further comprising" language you have included element B twice in the structure, once as "B" and once as "E, F, and G," when in fact B only appears once in the gadget. It is for this reason that the language "wherein" must be employed more particularly to define an already claimed element rather than "further comprising."⁶¹

All that I have said above relates to claims directed to structure, to apparatus. Apparatus claims are clearly more difficult to write than method claims. I am not going to spend much time on method claims other than to say that a method claim is merely a recitation of the manipulative steps necessary to perform the process.⁶² Note the emphasis on the word "manipulative." By manipulative steps, we mean steps that can be performed directly or indirectly by hand or by machine controlled by the hand. Generally speaking, you cannot include mental steps, in such processes. In setting forth the manipulative steps you invariably use the "-ing" form of the verb such as "placing, gouging, sawing, heating, cooling, drilling," etc. In method claims you generally set forth the series of steps in the preferred sequence of performance.⁶³ However, be careful not to limit yourself to that sequence unless the particular sequence is critical. Be very wary of direct or indirect temporal limitations, such as, for example, the word "then" preceding the verb at the beginning of the step. Also be wary of performing a particular step implicitly after another step. For example, if a method calls for hollowing out a bar, and also heating the bar, be careful not to call for the heating step as "heating said hollowed bar," because then you would be required to perform the heating after the hollowing in order to infringe the claim. However, if this particular sequence is necessary to a successful practicing of the process, then naturally you must include it.

Finally, I thought I might tell you just how I go about writing a broad claim in my day-to-day practice.⁶⁴ The reason I stress the broad claim is that once you have written a broad claim, that is, a claim as broad as the prior art will permit, it really is very simple through the mechanism of dependent claiming to write narrower claims.

The first thing you must do in writing any broad claim is to arrive at the decision as to what is and what is not essential to "the invention," meaning in this sense the patentable invention over the prior art. In this connection, and I speak principally to the chemists in the room, do not be afraid of making the wrong decision. If you do not know what really constitutes the invention, then decide on something and write

three claims to it. You will get points for doing that. ⁶⁵ You will get no points if you leave your paper blank. As a matter of fact, I must tell you that when I took this examination, all too many years ago, I actually wrote three claims to a cutting machine having a shock absorbing means, when, in fact, what I thought was a shock absorbing means was a safety guard. But I wrote three good claims, and I passed the exam. So do not panic on the assessment of where the invention is. Make a decision as to where the invention is and then write a broad claim using the following technique.

After I have decided what the invention is, what I do is, on a piece of scratch paper (do not put it in the notebook or the exam book yet, put it on a piece of scratch paper) I write a claim of indeterminate breadth. That is, some of my elements come out very broadly and some of my elements come out very narrowly, and I really do not care. All I am concerned with is getting something on paper from which to work. Once I have written down this claim of indeterminate scope I conduct what I call my schizophrenic dialogue. That is, I actually talk to myself and ask myself two series of questions. The first series of questions relates to each of the major elements in this claim of indeterminate scope. I read over each element and I ask myself if this element is necessary to the invention as I have perceived it. Thus, if I have included as an element of my draft claim "a housing surrounding the drive shaft" and I know that the machine will work without the housing as well as with the housing, then I cross out that entire element. I do not need it and I do not want it to limit my claim unduly. By carrying on the first series of questions, I get rid of any unnecessary major elements in the claimed combination. Once I have done that I go back and check to see that each element remaining in the claim is in fact interrelated with each other element. If it is not, I add language to interrelate the unrelated elements.

Once I perform this second step to make sure that everything is interrelated, I go through the claim again. This time I go word by word and ask if the word is necessary. When I do this, I look for all words of limitation, such as "rigid, flexible, elongated, round," etc. Does the element have to be rigid? If it does, leave "rigid" in; if it does not, take it out. I look for "s's" on the ends of words because unless I need a plurality of the element, I have limited the claim to having the plural and have given up on the possibility of preventing someone from using the combination with a single one of those pluralized elements. In this fashion, I proceed through the claim word by word to measure the necessity of each word. If I do not need the word, I take it out. If I think that a given noun without modification is simply too broad or a modifier is necessary for the invention to be operative, I include the modifier.

When I get done with this second scanning of the claim, I have a broad claim, and it is as simple as that. Do not be bashful to talk to yourself and ask "Is this element necessary?" or "Is this word necessary?" and then say "Yes" or "No." That is the way you are going to broaden your claim in the simplest, most direct fashion. After you have completed all of this crossing out and interlineating, then your claim is in shape

to be copied it into your exam book, and you have yourself a broad claim.

With respect to the narrower claims, I have already told you that I strongly urge you to write them in dependent form unless expressly told otherwise. I would also urge you, *if possible*, to narrow your claims in the area that you really consider to be novel in the combination. Thus, for example, if what is new is the addition of an element D to an old combination of A, B, and C, then it is preferable for the second claim to define the new element D more particularly and the third claim to define the same element even more specifically. ⁶⁶ But in writing your narrower claims please be sure that there is *substantial difference* between them. For example, do not try to distinguish one claim from another by saying "wherein the means for securing element A to element B is a nut and a bolt." That is simply not a substantial limitation, and you will lose points on it.

FOOTNOTES:

Footnote 51. See sections 3:19 and 3:20.

Footnote 52. Section 8:8; or "incomplete," section 8:7; or drawn to an aggregation; section 8:2; or not properly drawn to a machine: sections 3:19-3:20. Whatever the exact name of the ground of rejection, the examiner will usually object to such a claim [JLL].

Footnote 53. See section 3:25.

Footnote 54. See section 3:22.

Footnote 55. See sections 3:11 and 3:21. *But see* Patent Office guidelines of 1994, which broaden the range of the claim language that falls under section 112, paragraph 6 so that "adapted to" or "adopted for" would not necessarily be rejected as functional. However, on the agent's exam and before an experienced examiner during prosecution, you are better advised to adhere to the more traditional approach, pre-guidelines, of using "for" [Faber].

Footnote 56. Section 3:23.

Footnote 57. See section 3:15.

Footnote 58. See section 6:7.

Footnote 59. Note the purpose of a "whereby" clause (section 3:23), since the function necessarily follows from the previously recited structure [JLL].

Footnote 60. A dependent claim cannot eliminate a feature of a previous claim.

Footnote 61. See section 3:9 on (double inclusion of elements). This point is to assure that the claim language is clear. Words other than "wherein" may achieve the same purpose and may be used: "In the gadget of claim 1, element B comprising [or further comprising] an E. . . ." [Faber].

Footnote 62. See sections 4:16-4:3 on (method claims, generally).

Footnote 63. Section 4:3.

Footnote 64. Sections 3:3, 3:7, 7:1, etc.

Footnote 65. This advice applies to the type of Agent's Exam question given some years ago, where the examinee was required to write three claims to a mechanical structure (can opener, electric shaver, etc.) given only the drawing, with no description of the parts or how the device worked; and little if any indication of what might be the novel features. Examples of this type of question are given in appendix A

[JLL].

Footnote 66. The dependent claims should cover those elements which contribute to achieving the objectives of the invention. Detailing elements of the disclosed apparatus which are unrelated to the invention is unnecessary and gives the patentee little of value. On the other hand, you want to protect the likely commercial embodiment of the invention, and claims to that may include those unrelated elements, for fullest patent protection [Faber].

Appendix A. Claim-Drafting Principles and Practice in Claim-Drafting Techniques

The following material is selected from examples used in the Practising Law Institute's Patent and Trademark Office Agent's Examination Review Course. These examples are intended to provide practice in drafting claims of various kinds, and in criticizing poorly written or "sloppy claims." Many examples are from prior Agent's Exam questions.

The sample claims and the comments are intended primarily for students planning to take the Agent's Exam, and do not represent sophisticated claim-drafting practices or possibly controversial claim writing techniques that might be permissible and advantageous under modern court decisions cited in this book. The comments are intended to reflect Patent and Trademark Office practices and preferences, as understood from the Manual of Patent Examining Procedure, Patent and Trademark Office published remarks of acceptable answers to Exam questions, and generally conservative practice.

The sample claims in most cases are intended to be fairly moderate in scope,

primarily to teach techniques of drafting relatively sound claims, in most cases not the broadest claims that might be allowable. In most real-life situations, drafting of really broad claims requires an exact knowledge of the prior art and, usually, a chance to argue such claims extensively in an amendment, because they are usually rejected the first time round. In all but a few of the examples, the prior art is not given, or not given precisely; thus the object of these examples is to give an intermediate-scope sample claim that an Examiner reviewing a student's paper would like and be willing to accept fairly readily as allowable and conforming to good, standard claim-drafting techniques and practices.

If the student wishes to use these examples for practice, he should study the problem or question, then write claims or other answers as directed. Then he should compare his claims and answers with the sample claims and comments to look for major differences. In most cases, there are many acceptable claims and approaches, almost as many as there are patent attorneys. Claim-drafting is an art, not a science, after all. Thus there are no right or wrong answers. The best bet is to ask an experienced patent attorney to review your claim in detail. On the mechanical structure cases, particularly those given only a drawing, read again the advice in Appendix B on describing mechanisms and Chapter 10 on writing claims to mechanical structures.

The following is a list of the cases in Appendix A and what problems they illustrate.

List of Cases

I Drafting of Claims

Case 1 W.F. Stephen--Apparatus for Propelling Articles

Preparing Apparatus Claims--Relation of Apparatus Claims to Method

Case 2 H.R. Keltner--Traveling Lawn Sprinkler

Apparatus Claims, Given the Specification Dependent Claims

Case 3 G. J. Tonn--Nutcracker

Preparing Apparatus Claims Given Only a Drawing

Case 4 H. A. Wood--Hose Nozzle

Preparing Apparatus Claims Given Only a Drawing

Case 5 S. A. Brown--Glue Container and Spreader

Preparing Apparatus Claims Given Only a Drawing

Case 6 S. W. Chambers--Electrically Automatic Can Opener

Preparing Apparatus Claims Given Only a Drawing

Case 7 G. Washington--Sowing Device

Preparing Apparatus Claims Given Only a Drawing

Case 8 L. D. Wenstrand--Apparatus for Transferring Articles from an Article-Feeding Device to an Article-Receiving Device

Preparing Apparatus Claims Given Only a Drawing

Case 9 T. Kokeisl--Apparatus for Storing and Delivering Granular or Like Flowable Materials

Preparing Apparatus Claims Given the Specification Claims

Case 10 J. W. McBride--Power Propelled Water Craft

Preparing Apparatus Claims Afloat

Case 11 Optical Sound Reproduction

Preparing Electrical Circuit Claims

Case 12 Unijunction Pulse Generator

Preparing Electrical Circuit Claims

Case 13 R. E. Gunderman--Process for Preparing Films from Polymer Latexes

Preparing Method Claims Markush Claims-- Generic and Species Claims

Case 14 F. J. Bickel--Brush Making

Preparing Method Claims

Case 15 G. S. Hiers--Method of Attaching & Straightening Flock

Preparing Method Claims

Case 16 Method of Making Foil

Preparing Method Claims

Case 17 A. Lippman--Method for Determination of Adhesions of Ice

Preparing Method Claims

Case 18 M. J. Brown--Method of Plastic Encapsulation Using Irradiation

Preparing Method Claims

Case 19 Coating Method

Preparing Method Claims

Case 20 Crowell--Maleic Anhydride Purification

Preparing Chemical Process Claims

Case 21 Purification of Phenol Chemical Process

Preparing Chemical Process Claims

Case 22 L. Morris--Soap Dish

Preparing Article of Manufacture Claims

Case 23 E. Haslett--Coaster

Preparing Article of Manufacture Claims

Case 24 Parabanic Acid

Preparing Composition of Matter, Chemical Process and Method of Use Claims

Case 25 Hypothetical Business Model

Preparing Business Method Claims

Case 26 Process for Producing Biologically Functional Molecular Chimeras

Preparing Biotechnological Claims

II Criticizing "Sloppy Claims"

Case 27 J. H. Kohler--Suction Cleaner

Criticizing "Sloppy Claims" (Also drafting machine claims given the specification)

Case 28 J. D. Voskresenski--Steam and Dry Iron

Criticizing "Sloppy Claims"

Case 29 Bomb Proof Coating

Criticizing "Sloppy Claims"

Case 30 Self-Priming Pump

Criticizing "Sloppy Claims"

Case 31 Coated Pipe

Criticizing "Sloppy Claims"

Case 32 Golf Ball Cleaner

Criticizing "Sloppy Claims"

Case 33 Foam Breaking

Criticizing "Sloppy Claims"

III Review and Catalog of Sloppy Claim Errors

I Drafting of Claims

Case 1

PREPARING APPARATUS CLAIMS--RELATION OF APPARATUS CLAIMS TO METHOD CLAIMS

[See graphic in original printed material]

Problem

Draft an apparatus claim to the structure of Fig. 1 (assuming it to be new): A vacuum exists at the left end of tube 20, which tends to draw articles 21-21 into the tube, while high pressure exists at the right end thereof which forces the articles out of the tube. Assume the prior art is a standard blowgun or peashooter. Query: Would method claims be proper? If so, write a method claim.

Case 1

PREPARING APPARATUS CLAIMS--RELATION OF APPARATUS CLAIMS TO METHOD CLAIMS

SAMPLE CLAIMS-- APPARATUS FOR PROPELLING ARTICLES

Moderate Scope

1. Apparatus for propelling an article, which comprises:

- * a tube having a bore extending therethrough, the tube bore having an entrance end and an exit end, the bore being shaped for closely receiving and passing the article therethrough;
- * a source of compressed gas;
- * a conduit extending from the source of compressed gas and terminating in the bore at an acute angle directed toward the exit end of the tube for discharging a partial vacuum at the entrance of the bore; and
- * means for feeding the article to a position immediately adjacent to and, in alignment with, the entrance end of the tube for sucking the article into the entrance end of the tube and for blowing it out the exit end.

Fairly Broad

2. Apparatus for propelling an article, which comprises:

- * a tube having a sidewall defining a bore through the tube for closely receiving and passing the article through the tube; and

* 3. Apparatus for propelling an article, which comprises: a tube etc.

- * means for injecting a gas under pressure into the bore through the side wall of the tube at an angle such that a partial vacuum is created at a first end of the tube and the gas is discharged out the other end of the tube so that an article placed adjacent to and in alignment with the first end of the tube is sucked into the tube and is blown

out the other end of the tube.

COMMENTS

This is a simple example, not from an Agent's Exam, illustrating some of the main principles in drafting apparatus claims. Claim 2 is about as broad in scope as one would want to go in the main claim; Claim 1 about as narrow.

Note, "a tube having a bore," an example of how to claim holes, section 3:15. Note the references, apparently inferential, in Claim 2 to "a first end" and "the other end" of the tube. As any tube inherently includes ends, the inferential reference to features inherently present in the element "a tube" is not improper inferential claiming. Better might be to first have recited, "the tube having a first end and another (or an opposite) end."

In Claim 1, the source of gas and conduit can readily be combined into "means for injecting gas," as in Claim 2. In Claim 2, the "means for injecting a gas... such that... clause follows *In re Chandler*, cited in section 3:25-3:25.1.

The "means for feeding" clause in Claim 1 is obviously appropriate, particularly since the structure of the means (air blast 29) is probably not important to the inventive concept. This element is more broadly phrased in Claim 2, which would be superior in practice, "so that an article placed...." Thus, Claim 2 would cover the case where a human places the article 21 in the appropriate position, as in a pneumatic transport system, which uses this principle. Literally, the "means for" clause does not cover a human being, as noted in section 3:25-3:25.1.

ANSWERS TO QUERY ON METHOD CLAIMS

Method claims would be proper, assuming the invention, with a scope such as in Claim 2, is novel. Such a claim, following the scope of Claim 2 could read:

3. The method of propelling an article, which comprises:

injecting a gas under pressure through a side wall of a tube having a bore therethrough for closely receiving and passing the article therethrough, the gas being injected at an angle to the tube such that a partial vacuum is created at a first end of the tube and the gas is discharged at the other end of the tube; and

placing the article adjacent to and in alignment with the first end of the tube so that the article is sucked into the first end of the tube and is blown out the other end of the tube.

Note how an apparatus claim (2) can be turned into a method claim by finding the

actions or steps-- "injecting gas" and "placing the article." Otherwise, Claim 3 is of essentially the same scope as Claim 2. Note how the minimum necessary apparatus limitations are brought into the claim (see section 4:6); for example, injecting a gas... through *a wall of a tube*. Of course the mechanical structure recited in the claim should be minimized so far as possible. It would seem that "a tube" of the right size is indispensable in practicing the method.

Note finally how a broad product claim is, in effect, generally a series of functions or steps recited in structure (elements, elements of composition terms), whereby important elements of a broad product claim are those which perform a vital step in a method, and those elements not performing a vital step may possibly be eliminated from the product claim, or possibly may be stated more broadly or generically.

Case 2

PREPARING APPARATUS CLAIMS--GIVEN A SPECIFICATION--DEPENDENT CLAIMS

[See graphic in original printed material]

Problem

Given the specification, write three claims of varying scope, indicating "broadest," "intermediate" and "narrowest." Assume that it is old in the art to use the power provided by the rotation of the sprinkler head to cause movement of the sprinkler along the hose supplying water to the sprinkler. In narrowing your claims, do not rely on immaterial limitations.

Case 2

PREPARING APPARATUS CLAIMS--GIVEN A SPECIFICATION--DEPENDENT CLAIMS

SAMPLE CLAIMS--TRAVELING LAWN SPRINKLER

Broadest

1. An improved traveling lawn sprinkler of the type having a wheeled carriage, a rotary sprinkler head mounted on the carriage, and a fitting on the carriage to connect a water supply hose to the sprinkler head, wherein the improvement comprises:

(a) a pair of friction drive wheels mounted rotatably on the carriage for gripping the

supply hose therebetween;

(b) a rotary cam mounted on the sprinkler head for rotation thereby;

(c) a cam follower mounted reciprocally on the carriage and driven by the cam; and

(d) a one-way drive linkage actuated by the movement of the cam follower in one direction to rotate the drive wheels intermittently in order to cause the carriage to travel along the hose.

Intermediate

2. An improved traveling lawn sprinkler as recited in Claim 1, in which the one-way drive linkage comprises:

* a pair of ratchet wheels fixed to and rotatable with the friction of drive wheels; and

* a pair of spring pawls carried by the cam follower, each pawl engaging one of the ratchet wheels, for driving the ratchet wheels.

Narrowest

3. An improved traveling lawn sprinkler as recited in Claim 2, in which the cam comprises an eccentric circular flange formed integrally with the sprinkler head and having an eccentricity designed to rotate the ratchet wheels through a distance equal to the space between successive teeth of the ratchet wheels for each revolution of the sprinkler head.

COMMENTS

This structure was used on the November 1962 Agent's Exam.

When used on the Exam, the statement in the problem about "assume it is old" was given.

In view of the statement that traveling lawn sprinklers with rotary heads, etc., are old, an improvement or Jepson-type claim might appear preferable. (See Rule 75(e), discussed in section 6:8.) But, see below for examples of usual style claims which cover the same ground.

It is difficult in this case to tell what specific structure to put in Claim 1, and what to leave for Claims 2 and 3. This is particularly tough in this case, since there is no real "summary of the invention" in the specification, and the statements in the object clauses (col. 1, lines 15-25) are generally old according to the question.

It appears that the purpose in stating that "it is old to use the power, etc." was to force the student to claim at least some mechanical structure, and not present merely "means responsive to... for driving..." types of claims. Sample Claim 1 is only one of several possible arrangements, specifically reciting some of the mechanical details; many other combinations seem equally good. Note that, if too much structural detail is put in Claim 1, then the student is hard put to add *significant* details for Claims 2 and 3. (See section 2:9.)

These claims further illustrate principles of selecting and naming claim elements (section 3:7), and connecting or relating the elements (sections 3:19-3:21) to make up a complete combination. For example, the friction drive wheels are "mounted rotatably on the carriage," "for gripping the hose." This relates them both structurally and functionally to the cooperative preamble elements, carriage and hose (the workplace).

Claims 2 and 3 illustrate dependent claims, adding further detail of elements from the parent Claim 1 (section 2:9). Note, Claim 2 defines element (d) of Claim 1 in more detail, while Claim 3 tells more about element (c) of Claim 1, and ties this structure in with the material added in Claim 2. This is perfectly proper, and would be proper even if the matter added in Claim 3 did not cooperate with the structure added in Claim 2. Then, it would be the claim drafter's option whether to make Claim 3 depend from Claim 2 or Claim 1.

Since the question asked one to label "broadest," "intermediate" and "narrowest," Claim 3 should depend from Claim 2, not Claim 1. Otherwise It might not necessarily be narrower than Claim 2. But if Claim 3 recites all of the limitations of Claim 2 and adds yet more limitations, Claim 3 would be yet narrower than Claim 2.

SAMPLE CLAIMS--TRAVELING LAWN SPRINKLER--Claim Set 2

Broadest

1. A traveling lawn sprinkler comprising:

- * a carriage; wheels supporting the carriage; the wheels being rotatable to move the carriage;
- * a rotary sprinkler head rotatably mounted on the carriage, the sprinkler head being shaped such that spraying from the head rotates the head on the carriage; means for connecting a water supply hose to the sprinkler head for supplying water thereto;
- * at least one friction drive wheel rotatably mounted on the carriage and for

engaging the supply hose as the drive wheel is rotated;

* a rotary cam mounted on the sprinkler head for rotation thereby; a cam follower reciprocally mounted on the carriage and placed for being engaged by and for being reciprocally driven by the cam as it rotates;

* a one way drive linkage connected with the cam follower for being actuated by movement of the cam follower in one direction and connected with the one drive wheel for intermittently driving the drive wheel to rotate for causing the drive wheel to move along the supply hose and moving the carriage along the hose.

Intermediate

2. The traveling lawn sprinkler of Claim 1, in which the one-way drive linkage comprises: [see rest of prior Claim 21].

Narrowest

3. The traveling lawn sprinkler of Claim 2, In which [see rest of prior Claim 3].

COMMENTS

Note that the regular claim form may be used. All elements, old and new, cooperate to make the invention operate.

Only one friction drive wheel is needed, although two such cooperating wheels are preferred. Claim 1 here recites only one. A dependent claim could recite the second drive wheel.

The supply hose is not a positively recited element, but is instead inferentially claimed. The sprinkler is a separate entity from the hose and the hose may be supplied separately. Yet, one may treat the hose as an element and positively claim it, for so much of the operation relies upon that hose.

The claim requires that the same supply hose that supplies water also defines the track for the friction drive wheel. Query, must that track be only the supply hose? The invention does not appear to require that, especially as the inventive features are found in the drive elements on the carriage.

Case #

Preparing apparatus claims given only a drawing

[See graphic in original printed material]

Problem

Prepare three claims of varying scope

Case #

Preparing apparatus claims given only a drawing

Sample claims--nutcracker

1. A nutcracker, which comprises:

- * a frame;
- * a pair of opposed jaws mounted on the frame, at least one of the jaws being mounted for movement toward the other to crack a nut placed between the jaws;
- * a pair of operating handles mounted on the frame and movable toward and away from each other; and
- * a ratchet-and-pawl drive linkage connected to one handle and one jaw for closing the jaws a limited amount each time the handles are closed to crush a nut positioned between the jaws.

* 2. A nutcracker as recited in Claim 1, wherein:

- * a spring mounted in one handle for urging one jaw toward the other to clamp a nut placed between the jaws.

* 3. A nutcracker as recited in Claim 2, wherein:

- * a first one of the handles comprises a cylindrical member having a cylindrical bore closed at one end;
- * the spring comprises a compression spring positioned in the bore against the closed end of the bore;
- * a first one of the jaws comprises a cylindrical member having a shaft portion slidably received in the bore against the spring and a jaw portion slidably received in the bore against the spring and a jaw portion protruding from the first handle, the cylindrical member having a ratchet surface formed along a portion of its length and comprising part of the ratchet-and-pawl drive linkage;

* the second jaw is pivotably mounted to the second handle; and

* a pawl pivotably mounted to the second jaw for engagement with the ratchet surface.

Comments

From the February 1962 Exam. No description was given. Claim 1 illustrates one of several possible approaches, picking out 3 or 4 main elements, defined fairly broadly, and then connecting them together to form an operable nutcracker. Then pick out relatively significant details for Claims 2 and 3.

Case 4

Preparing apparatus claims given only a drawing

[See graphic in original printed material]

Problem

Write three claims of varying scope, indicating "broadest" "intermediate" and "narrowest." Hand-held, trigger-operated hose nozzles are old.

Case 4

Preparing apparatus claims given only a drawing

Sample claims--hose nozzle

Broadest

1. A trigger-operated hose nozzle, which comprises:

(a) a casing having a barrel section with a rear end and a front end, the casing having a handle section with an entrance end, the handle section being so connected to the barrel section that, in use, the handle section depends from the rear end of the barrel section, the two sections being shaped and oriented to have a continuous passage therethrough designed to permit flow of fluid into an entrance end of the handle section and out through the front end of the barrel section, the barrel section having a valve seat near the front end;

(b) a valve member slidably mounted in the barrel section, the valve member having a front portion designed for reception in the valve seat, the valve member having a rear portion;

(c) resilient means for urging the valve member into engagement with the seat to seal the nozzle against discharge of fluid;

(d) a trigger pivotably mounted to the casing and spaced from the handle section a distance such that the handle section and trigger may be gripped and the trigger squeezed toward the handle section;

(e) a lever pivotably mounted within the handle section and engaged with a rear portion of the valve member; and

(f) means for translating movement of the trigger toward the handle section into pivoting movement of the lever to open the valve.

Intermediate

2. A hose nozzle as recited in Claim 1, wherein:

* the valve member includes an elongated cylindrical stem centered within the barrel section, the stem having a rear end and a center and having a circumferential groove near the end thereof and an enlarged flange near the center thereof;

* the barrel section includes an inwardly projecting portion, the resilient means comprises a coil spring mounted within the barrel section between the inwardly projecting portion of the barrel section and the flange of the valve stem; and

* the lever comprises a flat bar mounted wholly within the handle section and having a U-shaped groove at its upper end designed to receive the groove of the valve stem.

Narrowest

3. A hose nozzle as recited in Claim 2, further comprising:

* a pair of pivot pins secured to the lever and extending transversely therefrom near the lower end thereof;

* the handle section having a pair of internal projections and the projections having U-shaped recesses in which the ends of the pivot pins are received to permit pivoting of the lever;

* the movement-translating means comprises a cylindrical plunger engaging both the trigger and a middle portion of the lever; and

* the handle section having a cylindrical bore in a front wall thereof, for receiving the plunger closely but slidably through the wall, the bore also being provided with a fluid tight seal about the plunger for preventing leakage of fluid between the plunger and bore.

Comments

This structure was used on the November 1965 Exam.

As usual, it is difficult or impossible to tell exactly what if anything is point of novelty. To do this, one would really need to know the exact state of the trigger-type hose nozzle art as of December 1955.

On reading the patent, one discovers that the primary point of novelty apparently resided in the specific construction of the pivot mounting for the lever 25 inside the handle 12. This is seen at best only dimly in fig. 4. This the examinee could not possibly realize.

Therefore, the only sensible approach is to recite what appear to be the main structural parts of the combination in Claim 1, leaving some structural details for Claims 2 and 3. Sample Claim 1 represents one such approach, but many others would be equally good, depending on the way the reader viewed the structure. Some details should be regarded as obviously noncritical and thus left out of Claim 1, such as whether the casing is one piece or two, the angle of the handle to the barrel, or the shape of the valve seat.

In view of the statement in the question, we cannot assume that this is the basic patent on the trigger-operated squirter and claim it as broadly as

--a casing, a valve, and a trigger for operating the valve.--

The point of the question was to force us to claim some details of structure, not merely means for A, plus means for B.

It is recommended that at least some structural details be put in Claim 1; however, such details as the structure of the plunger 23 for converting motion of the trigger 21 into movement of the lever 25 are presumably not critical, and could well be expressed as "means for translating..." as in sample Claim 1.

Claim 1 is one typical example of many claims that could be written, and is on the narrow side. Substantially broader claims can be written, so long as some significant structural detail is included.

Case 5

PREPARING APPARATUS CLAIMS GIVEN ONLY DRAWING

[See graphic in original printed material]

Problem

Write three claims of varying scope.

Case 5

PREPARING APPARATUS CLAIMS GIVEN ONLY DRAWING

Sample claims--glue applicator

1. A liquid applicator which comprises:

- * a container for the liquid, said container having a lower frontal edge and a discharge opening extending along the lower frontal edge;
- * a rotatable, liquid-applying roller;
- * means for mounting said roller to said container for movement from a first position closing the discharge opening to a second position uncovering said discharge opening to receive liquid issuing from said uncovered discharge opening; and
- * an actuator connected to said mounting means for selectively moving said roller between said first and second positions.

* 2. An applicator in accordance with Claim 1, wherein said mounting means comprises:

- * an arm hingedly connected to said container for pivotally moving said roller between said first and second positions.

* 3. An applicator in accordance with Claim 2, further comprising:

- * a spring connected to said roller mounting means for resiliently urging said roller into said first position to close said discharge opening.

Comments

This is from an old Agent's Exam. No description was given, and it is impossible or

nearly so to figure out all the structural details. One must claim what he can understand or guess at. Rarely if ever would the main features of novelty be in structural details such as the springs and levers in the actuating mechanism. It is better to focus on the main functions performed, with some structural detail, in this type of case.

Note, it is not necessary to make the claim preamble "liquid applicator" conform to the title of the patent "glue applicator." The claim preamble can be broader whenever one wishes, but of course must be consistent with the title. For the Agent's examination, however, it is preferable to have the claim preamble conform to the name of the invention, the title of the specification, as that is where the invention lies. In practice, you have control over the title and specification also, so you can amend them consistent with the claim preamble and the selected breadth of the claims.

Note also the use of "said" rather than "the" for references to antecedent expressions and elements. Either word is acceptable. Consistency of choice is preferred for style and ease of reading.

Case 6

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

[See graphic in original printed material]

Problem

Write three claims of varying scope and label them "Broadest," "Intermediate" and "Narrowest."

Case 6

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

Broadest: Sample Claims--Can Opener

1. A can-opener, which comprises:

* a frame having a can-receiving space;

* a can punch;

* means for mounting the punch on the frame above the can-receiving space for movement into and out of engagement with the top of a can positioned in the space;

* a can-sensing member movably mounted on the frame and having a portion thereof normally projecting into the space for engagement and movement by a can inserted in the space; and

* means, responsive to the engagement and movement of the can-sensing member by a can positioned in the can-receiving space, for moving the punch into engagement with the can top for perforation thereof.

Intermediate

2. A can-opener as defined in Claim 1, wherein the mounting means comprises:

* a lever pivotally mounted on the frame, the punch being pivotally mounted on the lever and depending toward the can-receiving space.

Narrowest

3. A can opener as defined in Claim 2, wherein the moving means comprises:

* a solenoid for pivoting the lever; and

* switch, operated by a predetermined movement of the can sensing member, for energizing the solenoid.

Comments

From the August 1966 Exam. This one is very difficult, as the drawing is poor, many would not know what some of the parts are in any event (solenoid 22, mercury switch 36, etc.). Also, the title may be misleading in can "opener," rather than punch.

But, if one had to try to claim this without any description, he would have to look for the main functions performed and omit the structural details of how it works. The solenoid and switch actuating mechanism are probably conventional anyway.

In this kind of case, where you are not sure exactly what is going on, study the drawings carefully (colored pencils help, to locate the same element by number in different views). Comparing the before and after pictures of FIGS. 1 and 3, it should be apparent, or almost so, that the can 12 goes in a space at the left, above a base or frame 11. Since the title says "electrically operated automatic," the can must hit or actuate something (tip 33 of arm 32, note how it has moved to the right in fig. 3 from fig. 1), to turn on the electrical gadget 22. This is a good time for "means responsive to insertion of a can... for moving the punching [or opening] means...," since the details of what 22 is and how the switch works probably are not important,

at least to Claim 1.

It should be clear, in any case, that rod 20 moves down to pivot lever 16 down, thus lowering punch 29 into the can top. There are actually two punches 29, 30 as seen with difficulty in FIG. 2, but this is not important.

Sample Claim 1 is a fairly broad claim to the main functional elements, which seems appropriate here: some sort of frame or support to locate the can; a punch, or punching means; something to mount the punch for movement into and out of the can top; something to sense the can ("automatic"); and something to operate or actuate the punch after ("*in response to*") sensing.

Since there is a combination of several cooperating means functions here, there would be no problem with a claim of all means elements, since no one of them would by itself constitute "means plus function at the point of novelty" (sections 3:25 and 3:25.1), assuming that were improper or dangerous. However, to play safe and not include all means clauses, it costs nothing to specify a frame, a can punch, and a sensing member. These expressions are just as broad as punching means or sensing means.

Case 7

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

[See graphic in original printed material]

Problem

Object is to sow seeds behind plow blade. Holes are spaced to sow optimum numbers of seeds per acre. Draft three claims of varying scope.

Case 7

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

SAMPLE CLAIMS--SOWING DEVICE

1. Apparatus for sowing seeds, which comprises:

* a movable frame;

* a hollow cylinder, having closed ends, in which the seeds to be sown are placed, the cylinder having a plurality of holes through its walls slightly larger than the seeds to be sown;

* means for mounting the cylinder rotatably on the frame and in a horizontal position with its longitudinal axis perpendicular to the direction of movement of the frame; and

* means for rotating the cylinder in timed relation to movement of the frame so that, as the cylinder rotates, the seeds drop individually to the ground through the holes in the cylinder.

* 2. A sowing apparatus as recited in Claim 1, in which the holes are tapered, larger on the outside of the cylinder than on the inside, to prevent the holes from clogging with seeds.

* 3. A sowing device as recited in Claim 1, in which a plurality of funnels are mounted on the frame below the cylinder and in alignment with the holes to collect the seeds as they are dropped from the cylinder and conduct them to the ground.

COMMENTS

This invention was by George Washington. The problem stated three claims of "varying scope," thus it is permissible to make Claims 2 and 3 both dependent from Claim 1.

A subcombination claim (section 6:7) would also be in order:

1A. In combination with a wheeled plow, a device for sowing seeds into the freshly plowed ground, which comprises:

[here recite Claim 1, with "frame" changed to "... plow..."]

Claim 1 illustrates claiming holes (section 3:15), and a "means for doing something so that..." clause (section 3:25 and 3:25.1).

Claim 2 illustrates a dependent claim adding details of an element of the main claim.

Claim 3 adds a new element to the main combination (section 2:9 on dependent claims).

Case 8

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

[See graphic in original printed material]

Problem

Draft an apparatus claim.

Case 8

PREPARING APPARATUS CLAIMS GIVEN ONLY A DRAWING

SAMPLE CLAIM--APPARATUS FOR TRANSFERRING ARTICLES

Apparatus for transferring an article from an article-feeding device to an article-receiving device, which comprises:

- * a turntable mounted adjacent to the receiving device and to a discharge end of the feeding device;
- * a conveyor mounted on the turntable for selective alignment with one of the feeding device and the receiving device, depending on the position of the turntable;
- * means for positioning the turntable initially to align the conveyor with the feeding device to receive an article therefrom;
- * means, responsive to the presence of an article on the conveyor, for rotating the turntable from the initial position to a discharge position in which the conveyor aligns with the receiving device; and
- * means for actuating the conveyor to transfer the article from the conveyor to the article-receiving device after the turntable has been rotated to the discharge position.

COMMENTS

This claim covers what are believed to be the essential elements of the invention: the turntable, one conveyor and drive, and means responsive to the article on the conveyor to rotate the turntable. The responsive means could have been a photocell, weight sensor or the like; one conveyor on the turntable is all that is absolutely essential; and the main conveyors 12 and 13 could be any feeding and receiving devices.

The preamble, while lengthy, conforms to the title of the invention in the specification.

In the "conveyor" feature, the description of two positions "with one of the feeding device and the receiving device..." avoids use of an undesired alternative "or" while

providing a limitation having the meaning: "with the feeding device or the receiving device."

This was not an Agent's Exam question.

Case 9

PREPARING APPARATUS CLAIMS GIVEN THE SPECIFICATION

[See graphic in original printed material]

Problem

Draft three claims of substantially varying scope covering the apparatus for storing and delivering granular or like flowable materials described in the preceding specification. Claims in dependent form may be used. The claims should not distinguish from each other by merely immaterial limitations and should distinguish over any prior art described in the specification.

Case 9

PREPARING APPARATUS CLAIMS GIVEN THE SPECIFICATION

SAMPLE CLAIMS--KOKEISL PATENT 3,125,256

1. An improved apparatus for storing and delivering flowable bulk material, the apparatus being of the type having a vertically disposed funnel-shaped member with an inlet opening at the top for receiving the material and an outlet opening at the bottom for delivering the same, a closure member for selectively opening and closing the outlet opening, and a porous filter element for introducing a gaseous medium under pressure into the funnel-shaped member to loosen the material and assist in discharging it, the improvement wherein:

* the funnel-shaped member is formed with a cross-sectional enlargement between the inlet and the outlet openings thereof; and

* the filter element is mounted at the cross-sectional enlargement outside of the slide path of the material, to deliver the gaseous medium into the funnel-shaped member in the direction of the outlet opening.

* 2. An improved apparatus for storing and delivering bulk material as recited in Claim 1, wherein:

* the funnel-shaped member comprises two similar conically tapered funnels

mounted one above the other so as to define an annular gap between the lower end of the upper funnel and the upper end of the lower funnel; and

* the filter element is mounted in and fills the annular gap, so that the gaseous medium may be delivered generally downward through the filter element into the upper portion of the lower funnel.

* 3. An improved apparatus for storing and delivering bulk material as recited in Claim 2, wherein:

* a generally cylindrical casing is provided for mounting the funnels and the closure member, the casing defining in conjunction with a portion of the outer wall of the upper funnel an annular distribution chamber for the gaseous medium which is closed except for the space occupied by the filter element; and

* means are provided for selectively admitting the gaseous medium under pressure into the annular chamber.

COMMENTS

This patent was used on the February 1968 Exam in the form reproduced here. As sometimes is done, a choice was given between writing claims to this patent and a chemical process, Crowell patent 2,308,588 on purifying maleic anhydride (Appendix A, Case 20).

The specification states, paragraphs I and 2, that the general combination of a funnel, a closure and a filter element is old for the same general purpose. In paragraph 3, It states that the main point of novelty consists in (1) providing a cross-sectional enlargement, and (2) in locating the filter element in a particular stated fashion. Thus, Claim 1 should focus primarily on these factors. Statements in the specification such as "preferably the funnel-shaped bottom part... may exhibit an annular gap..." (p. 2, lines 3-10) indicate preferred but not critical features. Things such as this are good to include in Claims 2 and 3, but should not be in Claim 1.

Sample Claim 1 indicates one approach to this structure, using the Jepson form to put the elements stated to be old in the preamble. This is probably not necessary for this case, but should be helpful both to better point out the invention and avoid a possible "old combination" rejection. (See sections 6:8 and 8:4.) Various other approaches are possible, the main points being to limit details of description of the admittedly old elements and concentrate on the portions stated to be new.

As usual, the additional claims should be devoted primarily to the new features and not merely add elements or features stated to be old in the art. See section 6:9,

citing MPEP 706.03(k); "... It is possible to reject one claim on an allowed claim if they differ only by subject matter old in the art..." Although this "rule" may be questionable and is probably little used, it indicates Patent and Trademark Office policy on the subject.

In addition, items such as the shape of the closure member 32, while not expressly stated to be old, have no real bearing on the subject invention and would be best not to describe in detail.

Also, note that since the container from which the granules come and the source of compressed air are not shown, they should not be positively recited in the claim (Rule 83).

Since the question said to write three claims of *substantially varying scope*, Claim 3 need not be dependent from Claim 2. The choice would depend on whether you were adding in Claim 3 items closely related to those added in Claim 2 (in series) or items related to the elements of Claim 1 and not particularly important to the additions of Claim 2 (in parallel).

Case 10

PREPARING APPARATUS CLAIMS AFLOAT

[See graphic in original printed material]

Problem

Draft two claims of varying scope, assuming paddle boats are old, including ones with two sets of paddles mounted to conveyor belts on opposite sides of the boat.

Case 10

PREPARING APPARATUS CLAIMS AFLOAT

SAMPLE CLAIMS--MCBRIDE PATENT 2,941,494

Fairly Broad Claim

1. A propelling mechanism for a water craft, which comprises:

(a) an endless belt carried by the craft, the belt having a lower run extending substantially horizontally beneath the craft, the belt having a plurality of transverse slots therethrough at intervals along the length thereof;

(b) means for driving the belt along horizontally;

(c) a plurality of paddles movably mounted to the belt at intervals along the length thereof for movement therewith; and

(d) means for setting the position of each paddle with respect to the belt so that (1) each paddle extends outward beneath the belt, thereby to extend into the water to propel the craft, when the paddle is traveling with the lower run of the belt, and (2) each paddle is retracted to above the belt at the ends of the lower run of the belt.

COMMENTS

This rather broad claim covers what are believed to be the main elements of the invention: the belt, belt drive, paddles and position-governing or setting means. Various other means could be employed to extend and retract the paddles, the essential thing being that a means be provided. On the "means + function so that..." clause, note *In re Chandler*, 117 U.S.P.Q. (BNA) 361, 364 (C.C.P.A. 1958), discussed in sections 3:25 and 3:25.1.

Another Claim

2. In a drive for propelling a boat:

* a hull on the boat which always will float; a wheel at the bow and one at the stern, and a belt around the wheels which moves with a turn; and for driving a wheels a motor in tote;

* a set of strong oars from a tree, extending in slots through the belt to the sea; on the belt, for each oar, in pivot a yoke, for retracting these oars at the end of each stroke to stop any splash and to set the oars free.

COMMENTS

This claim covers the main elements in somewhat different order. It may be too broad in the last two lines, in that "a yoke for" performing the function might not be considered as entitling one to the same breadth as a statutory "means for" clause as in Claim 1. (See section 3:25 and 3:25.1.) With relatively broad, functional clauses such as this it is probably safer to use the exact statutory language "means for," for example "Yoke means mounted pivotally on said belt...."

Case 11

PREPARING ELECTRICAL CIRCUIT CLAIMS

[See graphic in original printed material]

Problem

Sound movie patent--draft a claim to the system.

Case 11

PREPARING ELECTRICAL CIRCUIT CLAIMS

SAMPLE CLAIM--OPTICAL SOUND PRODUCTION

A system for producing audible sounds in accordance with a varying visual pattern formed on a transparent film, which system comprises:

- * means for projecting a beam of light;
- * a photoelectric detector for receiving said beam of light and for generating an output signal which varies as the amount of said light received by said detector;
- * means for advancing said film between said projecting means and said detector to vary the amount of light received by said detector in accordance with the variations in said visual pattern; and
- * means responsive to variations in said output signal for producing audible sounds.

COMMENTS

Note, this claim is a mixture of electrical, optical and mechanical elements, which is OK. "Means for" clauses are very common in circuit claims, since the specific circuit components are rarely critical in combination claims.

The "means for projecting a beam" of light can also be as broadly claimed by reciting "a projector of a beam of light" or "a light beam projector" or even "a light projector." The film and the visual pattern are workplaces, so that they are inferentially claimed.

In a claim, name an item, physically locate it and/or say what it does.

Case 12

PREPARING ELECTRICAL CIRCUIT CLAIMS

[See graphic in original printed material]

Problem

Draft a specific claim to this circuit

Case 12

PREPARING ELECTRICAL CIRCUIT CLAIMS

SAMPLE CLAIM--UNIUNCTION PULSE GENERATOR

A pulse generator for generating voltage pulses across an external load, which comprises:

- * a unijunction transistor having an emitter and first and second bases;
- * a first resistor;
- * means for connecting said first resistor between said first base and the negative terminal of an external d.c. voltage source;
- * a second resistor;
- * means for connecting said second resistor between said second base and the positive terminal of said d.c. voltage source;
- * a third resistor;
- * means for connecting said third resistor between said emitter and said positive terminal;
- * a capacitor;
- * means for connecting said capacitor between said emitter and said negative terminal; and
- * means for connecting the external load for said generator between the first base and the negative terminal of said d.c. voltage source;
- * said transistor, resistors and capacitor having parameters selected so that, when said source and said load are connected to said pulse generator by said connecting means, said capacitor repetitively charges from said d.c. source through said third resistor until the voltage across said capacitor reaches a value that causes said unijunction transistor to conduct, and then discharges through said transistor, and

the parallel paths of said first resistor and the external load, whereby each discharge of said capacitor generates a voltage pulse across the external load.

COMMENTS

This claim further illustrates practice in composing detailed circuit claims (section 3:26); listing the elements and parts, and connecting them together both structurally (section 3:20) and operationally (section 3:21).

Note that the power source and load are not made elements of the claim, as the pulse generator would normally be sold including only the components in the phantom-line box, up to terminals or connectors A, B, C, D. The purchaser or user would usually add the battery and load. The clauses such as "means for connecting said first resistor between said first base and the negative terminal of an external d.c. source" illustrate one way to claim the subcombination (pulse generator) as it is connectable to operate, without expressly claiming the battery. The "means for connecting" would always include a terminal (clip or post) such as B; thus the claim covers the circuit in the phantom box as a subcombination (section 6:10). The claim also covers the complete unit connected as shown in the drawing, in which case the "means for" clause also includes the lead or wire connecting terminal B to the battery.

The operational clause (section 3:21) was placed at the end of the claim (section 3:24) since it requires the presence of 211 of the recited circuit components connected in the stated manner. This was made a separate clause since it relates to the operation of all of the elements, not just the last named one (means for connecting the capacitor). Note the "whereby clause" (section 3:23) is proper since the pulse-generation function necessarily follows from the previously recited structure. If the structure had novelty, the clause about selecting parameters (R_g , C, and turn-ON voltage of the transistor) would clearly not be unduly functional under the cases cited in section 3:22. Given some novelty, any "man skilled in the art" would know how to select the components to generate the desired pulse.

In all probability, if the circuit had novelty and was not obvious in the connection of the components in the stated manner, the last clause of the claim, telling how the circuit works, would not be necessary and could be omitted. Circuit claims are frequently patented with only statements of physical connection. Whether a final clause telling how it works should be included is largely up to the judgment of the claim writer, and to some extent the Examiner. Such a clause may help make the claim more definite and help convince the Examiner it is novel and unobvious, and may avoid an "accidental anticipation"-type rejection on a circuit that looks structurally similar but works entirely differently.

Case 13

PREPARING METHOD CLAIMS MARKUSH CLAIMS--GENERIC AND SPECIES CLAIMS

[See graphic in original printed material]

Problem

Part I--Write three method claims of varying scope, based on the specification as written.

Part II--Write a Markush claim covering the specific coagulants mentioned at the start of the ninth paragraph of the specification.

Part III--Write two method species claims to the two ways of heating described.

Case 13

PREPARING METHOD CLAIMS MARKUSH CLAIMS--GENERIC AND SPECIES CLAIMS

SAMPLE CLAIMS-- PROCESS FOR PREPARING FILMS

Part I

1. In a process for preparing a continuous coherent article from a film-forming, electrolyte-coagulable polymer latex, the process being of the type including the steps of

(a) wetting a moving supporting surface with an electrolyte coagulant solution,

(b) casting a film of the polymer latex on the wet surface to form a continuous, coherent, porous coagulum of the polymer and coagulant solution,

(c) washing the coagulum so formed to remove the electrolyte, and

(d) drying and fusing the washed coagulum into a continuous coherent article;

the improvement which comprises:

(e) heating the coagulum prior to step (c) to a temperature sufficient to strengthen and condition the coagulum without destroying its porosity, and below the fusion temperature of the coagulum.

Claim 1 is in a *Jepson* format. For the agent's examination, this is a difficult and thus less preferred format. Claim 1 can be written in more usual form without separating out the feature believed to distinguish over the art:

1. A process for preparing a continuous coherent article from a film-forming, electrolyte-coagulable polymer latex, the process including the steps of
 - (a) wetting a moving supporting, surface with an electrolyte coagulant solution,
 - (b) casting a film of the polymer latex on the wet surface to form a continuous, coherent, porous coagulum of the polymer and coagulant solution,
 - (c) heating the coagulum to a temperature sufficient to strengthen and condition the coagulum without destroying its porosity, and below the fusion temperature of the coagulum.
 - (d) washing the coagulum so formed to remove the electrolyte, and
 - (e) drying and fusing the washed coagulum into a continuous coherent article.

Other claims to follow:

2. A process as recited in Claim 1, wherein the polymer latex is selected from the group consisting of the polymers and copolymers of vinyl chloride and vinylidene chloride with each other and with other monoethylenically unsaturated comonomers.
3. A process as recited in Claim 2, wherein the coagulum is heated to a temperature of about 35 to 70°C in step (e).

Part II

4. A process as recited in Claim 2, wherein the coagulant solution is an aqueous solution of an inorganic salt selected from the group consisting of calcium chloride, magnesium chloride, and aluminum sulfate.

Part III

A--First Species--fig. 1:

5. A process as recited in Claim 3, wherein the heating step is accomplished by localized radiant heating of the outer surface of the coagulum after step (b).

B--Second Species--fig. 2:

6. A process as recited in Claim 3, wherein the heating step is accomplished by uniformly heating the supporting surface.

COMMENTS

In preparing method claims from a specification, there should be no problem in understanding the method or in naming the parts or steps. Usually, the names given in the specification will suffice, such as "wetting," "casting," etc. A problem might be in figuring out what is most fundamental to the method for inclusion in Claim 1, and what details should be left for other claims. Since the specific question asked in Part I was to write three claims of "varying scope," It is not necessary (but would not hurt) to make each claim include all of the limitations of the preceding claim.

In this case, the specification states very clearly (especially col. 1, lines 34-43 and 55-67) that the "Invention" in this case involves an improvement in a prior known process which is *otherwise unchanged*. Specifically, the "Invention" involves adding a single step, heating (e of sample Claim 1), to the several conventional steps (a thru d) of the prior process.

This factual situation should point the way toward using a "Jepson," or improvement-type, claim, one form of which is employed in sample Claim 1. (See section 6:8.) Rule 75(e) which reads as follows:

Where the nature of the case admits, as in the case of an improvement, any independent claim should contain in the following order, (1) a preamble comprising a general description of all the elements or steps of the claimed combination which are conventional or known, (2) a phrase such as 'wherein the improvement comprises,' and (3) those elements, steps and/or relationships which constitute that portion of the claimed combination which the applicant considers as the new or improved portion.

From the use of the word "should," it would appear that the Office would like to force or at least strongly urge the use of Jepson claims for improvement inventions. It is not quite certain what "should" means, when "may" is used in some rules and "must" in others. But, in practice, Examiners seldom request or suggest the *Jepson* format, and its use is rare.

As to the format for a Jepson claim, section 6:8 gives several alternatives, the exact choice of which is not critical. However, for the transition between the preamble and the body of the claim, it might be advisable to use the exact language of rule 75(e)--"wherein the improvement comprises."

As to the scope of Claim 1, a question is presented as to whether the specific

temperature range (35-70°C.) should be recited. From the way this is discussed in column 3, lines 31-45, it appears that the precise temperature is noncritical, and will vary for different latexes to give optimum results. Therefore, it would appear satisfactory to define the amount of beating functionally, in terms of the result effected, even though the heating step per se is the "heart of the invention." Of interest, Claim 1 of the patent did issue in functional terms in this respect, as follows:

In a process for preparing... (etc.)... , the improvement consisting of subjecting said coagulum to heating below the fusion temperature prior to said washing step...

Note that sample Claim 1 tried to be a little more specific, without reciting a temperature range, by telling everything about the heating step mentioned in the specification.

Whether to recite specific latexes is another problem. The way the specification is written, one would not think this necessary since the class of resins is said to be known as is the basic process of preparing such coagula. However, Claim 1 of the patent does recite a class of resins.

Sample Claims 2 and 3 add what appear to be important subfeatures of the invention. If one or both of these items were included in Claim 1, subclaims could be drafted to specify the way or ways of heating, the type of coagulants, the "air knife" step, etc. If the "moving" supporting surface were omitted from Claim 1, this could also be added.

It is acceptable to use submethod claims which add only mechanical structure such as:

The method as recited in claim X, wherein the supporting surface is a rotary drum.

Subordinate method claims preferably add method steps, tell more about previously recited steps, or add details of the materials being worked on, such as the composition of the latex, etc. In general, avoid structure insofar as reasonably possible in writing method claims (see Part IV). Of course, there is no objection to describing the article or materials being worked on in whatever detail is necessary to the method being claimed.

Part II was intended to familiarize the student with "*Markush*" language. (See section 6:2.)

Part III was intended to test knowledge of genus and species expressions. (See section 6:9.) On some exams, the examinees have been asked to prepare genus and species claims on the disclosure. When this disclosure was used on the

November 1965 examination, genus and species claims were requested. Presumably, species would have been acceptable directed either to the two methods of heating, as in Part III, or to two specific latexes.

The most important point to remember about species claims is that they must define two or more alternative and mutually exclusive variations on an element of the generic claim.

Case 14

PREPARING METHOD CLAIMS

[See graphic in original printed material]

Problem

Part I--Write a three method claims of varying scope, based on the specification as written.

Part II--assume that specification disclosed that, for some applications, it was desirable to bend the inner and outer walls 3B and 3C equally toward the center of the channel. With this in mind, prepare a generic claim and two species method claims (using claims from Part I where possible).

Case 14

PREPARING METHOD CLAIMS

SAMPLE CLAIMS--BRUSH MAKING

Part I:

1. A method of making a brush, which comprises:

* assembling a plurality of bristles with a core member and a channel having a U-shaped cross section by placing the core member in the channel so that the bristles are lopped about the core member with the ends of the bristles protecting from the open end of the channel; and

* partially closing the open end of the channel to secure the bristles and the core member in the channel.

* 2. A method as recited in Claim 1, for making a hollow cylindrical brush, wherein the assembling step comprises:

- * looping a plurality of the bristles about a ring-shaped core member; and
- * inserting the core member and bristles into an annular channel having a U-shaped cross section of such size as to receive the core member and bristles therein.
- * 3. A method as recited in Claim 2, wherein the channel is partially closed by bending the edge of the inner wall of the channel toward the other wall thereof while maintaining the outer wall fixed.

Alternate 3. A method as recited in Claim 2, wherein the partial closing of the channel comprises bending the edge...

Part II:

Claims 1 and 2 are generic. Claim 3 is directed to the first species, that disclosed in the specification. The following claim covers the second species:

- 4. A method as recited in Claim 2, wherein the channel is partially closed by bending the edges of the inner and outer walls of the channel toward each other.

COMMENTS

This disclosure was used on the November 1956 Agent's Exam. As is customary for the method claims, the entire specification (minus claims) was given. In some instances, an examinee has been requested to compose genus and species method claims.

In preparing method claims from a specification, there is usually no problem in understanding the method or in naming the parts or steps. Usually, the names given in the specification will suffice, such as "looping," "annular channel," etc. A problem is in figuring out what is most fundamental to the method for inclusion in Claim 1, and what details should be left for other claims. Since the specific question asked in this case was to write three claims of "varying scope," it is not necessary (but would not hurt) to make each claim include all of the limitations of the preceding claim.

Claim 1 covers what appears to be the most important steps--assembling the elements and closing the channel. This claim covers other possible methods of assembling the core, bristles and channel, such as laying the bristles in the channel first and then inserting the core. In this case, some details must be left out of Claim 1 because the method is so simple that there would otherwise be a problem in preparing three claims of *materially* different scope.

Another approach to Claim 1 would be to claim the looping and inserting steps

separately perhaps along the following lines:

"... looping a plurality of bristles about a core member; inserting the core member and bristles into a channel...."

Probably the most important thing in writing method claims is to make certain that the "elements" of the claim are manipulative steps or acts (looping, inserting, closing, bending, etc.). Apparatus used in carrying out the method should not be mentioned insofar as it is possible to avoid it; thus, in this case, there is no need to recite the die 20 or the expanding tool 21. Of course, there is no problem in describing as much of the *article* being worked on as is essential to the method being described, such as the core member, channel and bristles.

On the species Claims 3 and 4, see section 6:9.

Case 15

PREPARING METHOD CLAIMS

[See graphic in original printed material]

G.S. Hiers Patent 2,328,904 Specification

This invention relates to a method of and apparatus for producing flocked pile fabrics.

High voltage electrostatic methods have heretofore been used in the production of flocked pile fabrics, but fabrics so produced, while having a great number of pile fibers per unit area and hence sufficient density of face coverage as well as excellent erectness of pile, have been characterized by deficient anchorage of the fibers to the adhesive with the result that the durability of the fabric has been unsatisfactory. In addition, the great number of pile flock fibers per unit area is undesirable for many purposes, as too great density of the pile face, particularly with straight fibers of equal length, causes stiffness which interferes with the draping properties of the fabric. As it is exceedingly difficult to control the regular deposition of pile forming flock when less than an excess of the amount actually secured to the base fabric is introduced into the electrostatic field or positioned on portions of the base fabric, as by sifting, prior to those portions of the base fabric entering the electrostatic field, prior flocked fabrics were produced which were relatively costly because of the amount of flock used and yet undesirable because of their lack of desired draping quality and softness of appearance.

Beater methods have also been employed in the production of flocked pile fabrics, but in fabrics so produced, while the anchorage of the fiber to the adhesive is good,

the erectness of pile and density of coverage is not all that is desired for some uses.

According to my improvements, I overcome these prior difficulties and deficiencies and produce a flocked pile fabric having a desired erectness of pile, density of coverage and excellence of anchorage of fiber to adhesive and hence a fabric which is superior to fabrics produced by either the beater or the high potential electrostatic methods alone or prior combinations of these methods. It will be understood, of course, that wool fibers which are cured or crescent shaped, will not have the erectness of the straighter fibers, but the wool fibers will be oriented to the extent permitted by their shape.

I accomplish the above desirable result by subjecting the adhesively coated fabric successively to a rapid beater operation and to high potential electrostatic forces. The successive steps of first rapidly beating or otherwise vibrating the fabric upon which fibers have been or are being deposited and then positioning the flocked fabric within a high potential electrostatic field may be repeated as often as and to the extent that is necessary to produce the desired result. During the rapid beating step a low potential electrostatic field may be generated by frictional engagement of the beating means with a material other than the base fabric and/or with the base fabric itself, although beating alone will form a pile face.

The generation of the low potential electrostatic field is not essential to the broad concept of the present improvements and the particular methods will be the subject matter of separate applications. The rapid beating alone will cause the pile forming flock to stand on end in a known manner, although the erectness and density of pile is less than exists in fabrics produced by high potential methods. The beating step, aside from embedding the end of the flock in the adhesive, also uniformly distributes it over the face of the base fabric. The adhesive is not yet set and the pile fibers are adjustable therein, as will be explained. In cases where the adhesive has set it may be treated with a solvent to soften it to tackiness. This latter step is not essential to the continuous process. The loose or excess fibers resulting from the beating step may be removed by a vacuum device or other convenient means.

In the initial operation flock fibers are dropped upon the adhesively coated surface of a cotton or other base fabric which is vibrated rapidly preferably under the beats of a rapidly rotating polygonal bar or bars which may be in actual contact with the back of the base fabric or which may be in engagement with a flexible apron interposed between the beater and the base fabric and in contact with both.

Following the rapid beating and excess flock removal operations or a softening operation, the flocked fabric is placed within a high potential electrostatic field to cause the deposited fibers to assume a more erect position in the adhesive and to thereby create openings into which additional flock may subsequently be dropped. I prefer that the high potential field be used solely for straightening the position of

fibers previously applied without additional flock being deposited while the fabric is within the high potential field. Additional flock may, however, be introduced within the field if desired.

Upon removal from the high potential electrostatic field, the flocked fabric is brought into contact with a beating means which may be similar to or somewhat different from that used in the initial step, and during the second beating operation additional flock of the same or different kind and/or length is dropped upon the rapidly vibrating fabric. Following this operating, the fabric may again be placed within a high potential electrostatic field and this sequence of steps may be continued until the desired result is obtained. Ordinarily, two applications of flock will suffice.

It is an object of this invention to provide a method of and apparatus for producing a flocked pile fabric having good anchorage of fiber to base, erectness of pile and sufficient density of face coverage.

Another object is to provide a means of controlling the amount and uniformity of an application of pile flock fibers before their entrance to a high potential electrostatic field.

Another object is to provide a method of producing flocked pile fabrics which includes the steps in sequence of depositing flock fibers upon an adhesively coated base fabric by a beater method, and then by means of a high potential electrostatic force causing the deposited fibers to assume a more erect position in the adhesive.

Another object is to anchor flock fibers in the adhesively coated surface of a base fabric by heating and to thereafter subject the flocked fabric to a high potential electrostatic force to cause the anchored fibers to assume a more erect position and thereby create openings in the face of the fabric, and then to anchor additional fibers by a subsequent beating operation.

Another object is to subject an adhesively coated base fabric to a plurality of flocking operations by beater methods and interpose between the flocking the step or steps of pulling the deposited fibers to more erect position in the adhesive.

A further object is to deposit upon an adhesively coated base fabric as much flock as can be secured by a single beating operation, and then by high potential electrostatic methods to cause the fibers to assume a more erect position and thereby create openings into which additional flock may be dropped and anchored by a subsequent beating operation.

These and other objects of invention will clearly appear from the following description of a preferred embodiment, in which:

The figure depicts schematically apparatus suitable for flocking a base fabric in accordance with my improvements.

Referring to the drawing, reference numeral 10 depicts a base fabric of cotton or other suitable material which is carried over guide roll 11 to drier 12, in which moisture may be removed from the fabric to the point of bone dryness if desired, after which an adhesive 13 of rubber cement, pyroxylin, or other composition, may be applied to the face side of the fabric as by doctor blade 14 positioned between guide rolls 15 and 16. Flock fibers 17 of wool, mohair, cotton, viscose, casein, acetate, or other textile material, and of desired length may be deposited upon the adhesively coated surface as from hopper 18, having screen bottom 19 and rotating blade 20 for forcing the flock through the screen.

Polygonal beater bar 21, positioned beneath the fabric and apron 22 at a point preferably just beyond that at which the fibers are dropped upon the fabric, may be rotated by conventional means (not shown) at a speed sufficient to cause rapid vibration of the base fabric.

The apron 22 may be supported as by rollers 23, 24 and 25 and may be dried as by can drier 26 if desired. The beating bar 21 may be of all metal or metal with a surface covering of lucite, Bakelite, hard rubber, or other good dielectric material, and should be rotated at a speed which will produce at least three thousand beats per minute.

Fibers dropped upon the rapidly vibrating base fabric are forced into the adhesive in somewhat erect position by the mechanical forces alone or together with the electrostatic forces present the degree of erectness being dependent somewhat upon the intensity of the electrostatic field. The fabric so flocked is then passed beneath suction tube 27 which extends across the fabric to remove the excess flock, after which the fabric supported by guide roller 28 passes into high voltage electrostatic field 29, established between electrodes 30 and 31 by the impression thereupon of voltages on the order of from 20 to 100 k.v. The high potential field may be of alternating polarity if desired, but is preferably unidirectional and its energy may be supplied from low voltage alternating current line supply S through step-up transformer 32 and mechanical rectifier 33. One of the electrodes is preferably grounded.

Within the high potential field in the previously deposited fibers are caused to assume a more erect position in the still soft adhesive thereby creating openings which are more or less uniformly distributed over the face of the fabric and which may be later filled by the deposit of additional flock. Such additional flock may if desired be applied while the fabric is still within the high potential field, but I prefer that the high potential field be used solely for fiber straightening purposes.

Upon leaving the high potential field, the flocked fabric is passed over guide roller 34 and beneath hopper 35 containing additional fibers 36 of the same or different kinds and/or lengths as those initially applied and which may be sifted upon the fabric while it is being rapidly vibrated by rapidly rotating polygonal bar 37. As in the first beating operation, apron 38 of wool may be interposed between the bar 37 and the base fabric. The apron may be supported as by rollers 39, 40 and 41 and may be dried as in can drier 42 if desired.

The fibers deposited in this second beating step will fill the openings created when the fibers were straightened up in the high potential field. Following the second application of flock, the excess may be removed as by suction tube 43, or by other conventional means.

If for any reason further straightening of deposited fibers and application of additional flock is desirable, the fabric may be passed through a second high potential field similar to the first and then to another flocking and beating operation. These steps may, of course, be continued until the desired result is attained. Ordinarily, two flockings interposed by a single straightening operation will be sufficient.

After the final flocking and/or straightening operation, the fabric may be passed over guide roller 44 to drier 45 where the adhesive is set and thence over roller 46 to roll up of the finished fabric.

I have found that fabrics made in accordance with my improvements have excellent anchorage of fiber to base, erectness of pile and density of face coverage.

My invention also contemplates the application of flock of different kinds, colors, and/or lengths, whereby pleasing effects may be attained.

Problem

Write three method claims of varying scope, given the specification.

Case 15

PREPARING METHOD CLAIMS

SAMPLE CLAIMS--METHOD OF ATTACHING AND STRAIGHTENING FLOCK

1. A method of attaching and straightening flock fibers on a base material, which comprises the steps of;

* *depositing* flock fibers upon an adhesively-coated base while the adhesive is soft,

- * *vibrating* the base to attach an end of some of the flock fibers to the still soft adhesive,
- * *removing* unattached flock fibers, and then
- * electrostatically *attracting* the attached fibers into erect positions on the still soft adhesive.
- * 2. The method according to Claim 1, including the additional steps of
 - * *depositing* additional flock fibers upon the still soft adhesive,
 - * *vibrating* the base material to attach the ends of some of the additional flock fibers to the still soft adhesive to fill any openings on the face thereof, and *removing* unattached flock fibers.
- * 3. The method according to Claim 2, including the additional steps of
 - * electrostatically *attracting* the attached fibers into erect positions on the still soft adhesive, and
 - * *setting* the adhesive to fix the fibers to the base material in their erect positions.

COMMENTS

Action words have been italicized for illustration (only). Instead of "depositing," there could be recited two steps, viz.,

- (a) *coating* the base with an adhesive, and
- (b) *depositing*...

The written description states that the additional "depositing" and "vibrating" steps of Claim 2 may be repeated until a desired density of flocking is achieved. Thus, an additional claim could take the form of:

2A. The method according to Claim 2 wherein the steps thereof are continuously repeated in sequence until a predetermined density of the flock fibers is achieved.

Note how the main Claim 1, can often be lifted from the "Summary of the Invention" (rule 73) given in the specification prior to the detailed description. In this case, the "summary" appears in the first full paragraph on page 2 of the specification, where the patentee tells what he thinks his invention is, in a relatively broad sense. These

summaries are required by rule 73, but cannot always be relied on in practice to define the scope of the invention accurately. But in claim-drafting practice, this is usually the best guideline one has.

Case 16

PREPARING METHOD CLAIMS

[See graphic in original printed material]

Problem

Write three claims of varying scope on the depicted process. Prepare a fourth claim covering zinc, tin or aluminum as the material of the foil.

Case 16

PREPARING METHOD CLAIMS

SAMPLE CLAIMS--METHOD OF MAKING FOIL

1. A method of making a continuous strip of metal foil, which comprises:

- * advancing an endless carrier through a metal-deposition chamber;
- * depositing a layer of metal foil on the carrier as it passes through the chamber;
- * stripping the layer of foil from the advancing carrier; and then returning the stripped carrier to the metal-deposition chamber.

* 2. A method as recited in Claim 1, for making a continuous composite strip of the metal foil having a backing sheet, which further comprises:

- * depositing a continuous adherent backing sheet on the layer of foil prior to stripping the foil from the carrier.

* 3. A method as recited in Claim 2, further comprising:

- * winding the composite strip of foil and the adherent backing sheet into a coil with the layer of foil exposed; and
- * inserting a protective layer of wax paper between the convolutions of the coil as it is wound.

* 4. A method as recited in Claim 1, wherein the foil metal is selected from the group consisting of zinc, tin and aluminum.

COMMENTS

Claim 1 covers the endless feature without defining the reinforcing strip, which is one approach. Another equally good approach would be to cover the step of adding the reinforcing strip, in which case the endless feature could be omitted from Claim 1.

Claim 2 is a dependent claim varying the preamble of the parent claim.

Claim 3 adds preferred details, and Claim 4 illustrated Markush practice (See section 6:2).

Case 17

PREPARING METHOD CLAIMS

[See graphic in original printed material]

Problem

Draft three method claims of varying scope, given the drawing and the following:

1. First, the container 1 is filled with solidifiable liquid, preferably water.
2. Next, the sliver 11 is inserted through the opening 9 in the cover 7, and the sliver 11 is placed in the liquid.
3. Then, the liquid is solidified as at 3, preferably from the bottom up, so that no unsolidified liquid is trapped within the solid during freezing and to minimize the formation of faults or cleavage points, as at A, during solidification.
4. The solidified body 3 is confined within the cover 7 via clamp 13.
5. The sliver 11 is pulled with a force F , and the pulling force is measured at the time when the sliver 11 is pulled from the solidified, confined body 3.
6. The difficulty with the prior art was that it did not use the cover 7, with the result that the solidified body 3 would fracture at the fault A, giving a false reading. The object of the method is to get an accurate reading as to when the adhesion between the sliver 11 and the body 3 is broken by the force F .

Case 17

PREPARING METHOD CLAIMS

SAMPLE CLAIMS--TESTING ADHESION

1. A method of determining the adhesion of one solid material to another solid material, which comprises the steps of:

(a) inserting a member formed of one of the materials into a liquid mass of the other material, the member being inserted into the mass with a portion thereof extending therefrom;

(b) solidifying the mass;

(c) confining the entire external surface of the solidified mass;

(d) applying a gradually increasing, separative force to both the solidified mass and the member; and

(e) measuring the force at which separation is effected to determine the adhesion of the one solid material to the other.

2. A method as recited in Claim 1, wherein the member is a metal and the solidified mass is ice.

3. A method as recited in Claim 2, wherein the mass is solidified by freezing it in stages from the bottom thereof to the top thereof.

COMMENTS

In practice, Claim 1 is of proper scope. For the examination, Claim 1 may be overly broad. The title of the invention in the specification is Method for Determination of Adhesion of Ice. But Claim 1 describes adhering one solid material to another. Thus, for the examination, Claim 1 might better read:

1. A method of determining the adhesion of ice, comprising:

(a) insetting a solid silver into water;

(b) solidifying the water to ice by freezing;

(c) confining the external surface of the ice through which the sliver is accessible;

(d) pulling the sliver from the ice through the external surface by applying a gradually increasing force to the sliver while the external surface of the ice is confined;

(e) measuring the pulling force at which the sliver separates from the ice.

Case 18

PREPARING METHOD CLAIMS

[See graphic in original printed material]

Problem

The object is to encapsulate the component in a soft body of plastic having a hard outer shell. The gamma radiation cures the plastic only to the soft state and is then stopped. the beta radiation is much less penetrating, and hardens only the outer surface of the resin, so that the interior remains soft and gelatinous.

Draft a claim to this method. Assume both gamma and beta radiation, per se, are known to cure such resins for encapsulation purposes.

Case 18

PREPARING METHOD CLAIMS

SAMPLE CLAIM--ENCAPSULATION METHOD

A method of encapsulating an article, which comprises:

- * positioning the article in a body of liquid resin of a type that cures gradually upon exposure to both gamma and to beta radiation;
- * irradiating the body of resin with gamma radiation until the body has been partially cured to form a gelatinous body surrounding the article; and
- * irradiating the gelatinous body with beta radiation so that an outer layer thereof is cured to form a hard protective shell of the resin on the surface of the gelatinous body.

COMMENTS

Structural (apparatus) elements, such as the mold, are not needed in a method claim (section 4:6), and should be omitted insofar as possible. The main method

steps are "irradiating" and then "irradiating" in the prescribed sequence.

Note the phraseology "irradiating... until... cured...." As discussed in section 4:2, this follows the format "performing an act [irradiating] to accomplish a step or function [curing]." This could equally well have been phrased "partially curing... by irradiating" or "by exposing," etc. This is the form of reciting the overall step performed by the act.

The first and second steps could be combined: "irradiating a body of a liquid resin... having the article positioned therein...."

Case 19

PREPARING METHOD CLAIMS

[See graphic in original printed material]

Problem

Part I--Draft one generic and two species method claims to the method shown.

Part II--Would it be proper to present claims to the coating apparatus or the finished article? Assume there are no restriction requirement problems.

Case 19

PREPARING METHOD CLAIMS

SAMPLE CLAIMS--COATING METHOD Generic and Species Claims

1. A method of coating an article with a thermoplastic material, which comprises:

- * supporting the article with a holder;
- * coating the article and adjacent portions of the holder with the thermoplastic material in liquid form, and allowing the coating material to solidify;
- * withdrawing the holder from the article so as to leave a tab of solidified coating material protecting from the article at the portions formerly engaging the holder; and
- * heating and forming the tab so as to coat the portion of the article formerly engaging the holder.

* 2. A coating method as recited in Claim 1, wherein the supporting step includes applying a partial vacuum between the holder and portions of the article, and wherein the partial vacuum is released prior to the withdrawing step.

* 3. A coating method as recited in Claim 1, for use with a paramagnetic article, wherein the supporting step includes applying an electromagnetic force to the holder to support the article, and wherein the electromagnetic force is released prior to the withdrawing step.

COMMENTS

Step 2, "coating and allowing to solidify," is a perfectly proper *step*, allowing something to happen--that is, just sitting there doing nothing. Also, the coating and allowing steps are clearly related, and can be put in the same subparagraph of the claim. They could equally well have been separated. The "allowing" concept could also have been put into the following clause instead: "withdrawing... after the coating has solidified." In clause 4, the "heating and forming" steps are done together and can be combined.

Query

1. Apparatus claims are not proper, because there is nothing new in the magnetic or vacuum holder. The sole novelty is in the manipulation (new use) of such old equipment as part of a novel coating process. New uses for old devices may be claimed only as methods. (See section 6:7.)

2. Article claims are not proper, because the coated article is the same as that produced in any other manner. It has no distinguishing characteristics based on the novel method of manufacture. But, a product-by-process claim is proper. (See section 5:2.)

Case 20

PREPARING CHEMICAL PROCESS CLAIMS

[See graphic in original printed material]

Problem

Draft three claims of substantially varying scope covering the method described in the specification. Claims in dependent form may be used. The claims should not distinguish from each other by merely immaterial limitations and should distinguish over any prior art described in the specification.

Case 20

PREPARING CHEMICAL PROCESS CLAIMS

SAMPLE CLAIMS-- MALEIC ANHYDRIDE PURIFICATION

1. A process of purifying crude maleic anhydride containing chromogenic impurities, comprising:

- * subjecting crude maleic anhydride to a hot-aging process in liquid phase;
 - * conducting the hot-aging process in the presence of a compound selected from the group consisting of the oxides and hydrated oxides of boron to convert the chromogenic impurities to products which are relatively nonvolatile compared to maleic anhydride; and then
 - * separating the maleic anhydride from such products by fractional distillation.
- * 2. A process as recited in Claim 1, wherein the hot-aging process is carried out at a temperature between about 140°C. and 200°C.
- * 3. A process as recited in Claim 2, wherein: the compound is selected from the group consisting of boric oxide, metaboric acid and orthoboric acid, in an amount not exceeding 10 percent by weight of the crude maleic anhydride.

COMMENTS

This patent was used on the February 1968 Exam. A choice was given between this patent and a mechanical structure on apparatus for delivering granular materials, Kokeisl patent 3,125,256 (Appendix A, Case 9).

Note the specification, first five paragraphs, describes the prior art, particularly the patentee's own "hot-aging" process. In paragraphs six to eight (the "summary of the invention," required by Rule 73), he tells one exactly what the invention is in a broad sense. In preparing Claim 1, it is best to abstract this summary in claim language, as was done for example in Claim 1.

The *Jepson* form (section 6:8) may be used for Claim 1 in this case (Rule 75-e) because it is pellucid from paragraphs 5 and 6 of the specification that this "invention is in the nature of an improvement over... the hot-aging process of my... [prior] patent...." The *Jepson* form can be used, with the elements of the old process set out in the preamble. (See sections 6:8 and 8:4 (on "old combination")).

Note how phrases such as "crude maleic anhydride," "chromogenic impurities," and

"hot-aging," which are defined in the specification, can and should be lifted out of the specification and used in the claim without further definition. (See section 3:6 on "Support in the specification" for words used in the claims, and section 3:7, that applicant can be his own lexicographer, define the words as he chooses so long as he is not using a meaning repugnant to the customary meaning of the word.)

For the Agent's examination, it is recommended to not attempt to claim any broader than the patentee says is in the invention the summary, nor much narrower. In practice, when writing the specification, initially write the summary as broadly as the broadest claim. Note that process details such as "preferably, the aging treatment is conducted at temperatures between 140ºC. and 200ºC." should be left for subordinate claims. These the patentee says are important but not critical.

In chemical process claims, useful things to add in dependent claims are temperatures, pressures, times, proportions, specific materials, etc.

Case 21

PREPARING CHEMICAL PROCESS CLAIMS

[See graphic in original printed material]

Problem

Draft three claims of substantially varying scope covering the process described in the disclosure. The three claims should be in *independent* form the claims should not distinguish from each other by merely immaterial limitations and should distinguish over any prior art described in the disclosure.

Case 21

PREPARING CHEMICAL PROCESS CLAIMS

SAMPLE CLAIMS--PURIFICATION OF PHENOL

1. A method of purifying phenol in a mixture containing phenol and carbonyl-compound impurities, the method comprising contacting said mixture with a nitrogen compound of the formula R1-NH-R2 wherein R1 and R2 are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, hydroxyalkyl, and a polymethylene radical which taken together with the nitrogen atom forms a heterocyclic ring, with the carbonyl compounds, and separating the phenol from the resulting reaction products.

2. A method of purifying phenol in a mixture containing phenol and carbonyl-compound impurities, the method comprising contacting said mixture *in the liquid phase* with a nitrogen compound of the formula R1-NH-R2, wherein R1 and R2 are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, hydroxyalkyl, and a polymethylene radical which taken together with the nitrogen atom forms a heterocyclic ring, the amount of the nitrogen compound being *from about 0.02 to about 0.2* percent by weight of the weight of the phenol present in the mixture, to thereby react the nitrogen compound with the carbonyl compounds, and separating the phenol from the resulting reaction products.

3. A method of purifying phenol in a mixture containing phenol and carbonyl-compound impurities, the method comprising contacting said mixture with *ammonia at a temperature from about 41° to 182°C*, the amount of ammonia being from about 0.02 to about 0.2 percent by weight of the weight of the phenol present in the mixture, to thereby react the ammonia with the carbonyl compounds, and separating the phenol from the resulting reaction products by *distillation*.

COMMENTS

The question asked for three independent claims; otherwise dependent claims would be more suitable here. Since claims of varying scope were requested, Claim 3 need not include everything in Claims 1 and 2, but this would not hurt either. Italicization in Claims 2 and 3 is solely to show what was added.

Case 22

PREPARING ARTICLE OF MANUFACTURE CLAIMS

[See graphic in original printed material]

Problem

Draft three claims of varying scope. Label them "broad," "intermediate" and "narrow."

Case 22

PREPARING ARTICLE OF MANUFACTURE CLAIMS

SAMPLE CLAIMS--SOAP DISH

BROAD

1. A soap dish, which comprises:

- * a housing having a bottom wall and a frontal opening, the bottom wall being slanted downward from the back toward the frontal opening; and
- * a plurality of spaced projections extending upward from the bottom wall, the upper surfaces of the projections being shaped for defining a generally horizontal surface for supporting a cake of soap out of contact with the bottom wall, the projections being spaced to define channels therebetween such that water on a cake of soap placed on the projections drains downward between the projections and then along the slanted bottom wall out the frontal opening.

INTERMEDIATE

2. A soap dish as recited in Claim 1, wherein the projections comprise spaced parallel ribs running from the back toward the front of the housing.

NARROW

3. A soap dish as recited in Claim 2, for mounting into a recess in a wall, wherein:

- * the housing also includes three side walls and a rear wall, all shaped to fit in the recess with the frontal opening substantially flush with the wall; and
- * the housing further includes means for mounting the housing in the recess, and
- * a downwardly turned lip forming a continuation of the bottom wall and protecting forward beyond the frontal opening to permit water to drain out of the dish and away from the wall.

COMMENTS

Claim 1 illustrates typical technique in preparing article of manufacture claims. The procedure is essentially the same as for machine claims, but usually much simpler:

1. Select a preamble--"soap dish"--pretty easy.
2. Find and name what you think are the essential elements (A) "housing," or base, support, frame, etc.; (B) "projections," or ribs, etc. (see section 3:7 on "naming"). Best to make projections separate element, as they would not have to be integral with housing.
3. Select essential features of elements (section 3:14). Slanted bottom wall and

opening (section 3:15 on claiming holes) for base (the side walls and wall mounting are not vital to operation); and horizontal surface, with channels, formed by projections.

4. Connect elements together (sections 3:19-3:20) and with workplace (soap), "extending upward from the bottom wall," "for supporting a cake of soap."

5. Preferably, tell what elements do and how, as in last three lines of Claim 1. This is effectively a "whereby" clause.

Claim 2 further defines the "projections" as "ribs," which hopefully is fairly significant. See section 7:1 on claims of varying scope, and section 2:9 on dependent claims.

Claim 3 is a dependent claim adding one element and also further defining one element of a parent claim. Claim 3 also contains a revised preamble, adding further details of the setting for the dish (See section 2:9). Note the wall into a recess of which the dish is placed should not be an element of the claim. See sections 3:2 and 3:3. Put the work-piece or background in the preamble; and try to claim the combination in the form in which it would be sold, not as it would be used, wherever possible.

Case 23

Preparing article of manufacture claims

[See graphic in original printed material]

Problem

Draft three claims of varying scope to the coaster shown in the drawings. Following are some of the disclosed features and characteristics of the coaster:

1. It will remain attached to the bottom of a glass even when picked up.
2. It fits glasses of different sizes.
3. It is light in weight.
4. It absorbs condensate that runs down the side of the glass.
5. Its outside surface will not may a surface on which it is placed.
6. The annular ring I and the disc-like bottom 3 are made of a cellular, elastic

material.

7. The upper end of the annular ring 1 is bevelled as at 3.

8. The loop 4 may hold a napkin 5.

9. The ring 1 and the bottom 3 may be molded as a unit, or may be separate items which are adhesively attached,

10. The bottom 3 may also be made of an elastic material such as rubber, but in any event its outer surface is liquid impervious.

11. The cellular, elastic material of the ring 1 and the bottom 3 is liquid absorbent.

12. The basic shape is old.

Case 23

Preparing article of manufacture claims

Sample claims--coaster

1. A coaster for a glass, which comprises:

* a cup-shaped glass-receiving member having a flat bottom of liquid-impervious, elastic material, and an upstanding side wall of an elastic, liquid-absorbent material.

* 2. A coaster as recited in Claim 1, wherein the side wall has an interior rim that is so bevelled inwardly that as the glass container is inserted into the coaster, the bottom edge of the glass engages the rim and expands the side wall outwardly, allowing entry of the container into the coaster.

* 3. A coaster as recited in Claim 2, further comprising a handle formed integrally with the bottom and attached to the exterior of the side wall.

Comments

Similar to the previous problem, this rather easy-to-write claim involves selecting a preamble and essential elements, here a "glass-receiving member" which includes a "bottom" and a "side wall." Note that while the shape of the "member" is per se old (see item 12 above) the characteristics of the bottom ("liquid-impervious" and "elastic") and the side wall ("elastic" and "liquid-absorbent") result in a novel coaster. The glass (workpiece) is set forth in the preamble. Claim 2 adds mechanical detail about the side wall and Claim 3 adds a new element ("handle") both in

independent fashion.

Case 24

Preparing Composition of Matter, Chemical Process and Method of Use Claims

[See graphic in original printed material]

Problem

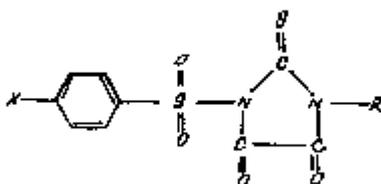
Draft three claims in *independent* form which distinguish over any prior art described in the specification. Claim 1 should cover broadly the parabanic acid derivatives of the invention. Claim 2 should cover broadly the method of making parabanic acid derivatives of Examples 1 and 2. Claim 3 should cover a method of using the compound of Example 2.

Case 24

Preparing Composition of Matter, Chemical Process and Method of Use Claims

Sample Claims--Parabanic Acid Derivatives

1. A compound having the formula



* wherein X is selected from the group consisting of nitro, amino, and alkyl of not more than four carbon atoms, and

* wherein R is selected from the group consisting of hydrogen, alkyl of not more than 12 carbon atoms, and alkenyl of not more than 12 carbon atoms.

* 2. A method of preparing a compound selected from the group consisting of

1-(p-nitrobenzenesulfonyl) thioparabanic acid and
1-(p-aminobenzenesulfonyl)-3-ethylthioparabanic acid, which comprises:

* (a) reacting oxalyl chloride with a material selected from the group consisting of p-nitrobenzenesulfonyl thiourea 1-(p-aminobenzenesulfonyl)-3-ethyl thiourea, at a temperature sufficient to form the corresponding compound and to drive off hydrogen chloride; and

* (b) recovering said compound from the mixture.

* 3. A method of modifying plant growth, comprising dispersing in plant growth media an amount of 1-(p-aminobenzenesulfonyl)-3-ethylthioparabanic acid effective to modify the plant growth.

COMMENTS

From the September 1970 Agent's Exam. Claim 1 must be "a broad claim" to the derivatives of the invention. This should be very simple, given the specification. In fact, one can practically copy the "summary of the invention," column 1, lines 35-48. Note--do not claim any broader than the specification clearly states, such as by imagining that X could just as well be pentyl (5 carbons) or benzene.

Claim 1 follows the general form in the book, section 6:1, and various modifications of form are possible. However, "a compound having the formula" or "of the formula" is a very common, standard form for claims to new compounds, or molecules. One could equally well claim "parabanic acid derivatives having the formula...." Avoid any statement of use in a "pure compound" claim, such as "phytoxicants having the formula...." There is no need to state the preferred use in a compound claim. In this problem, as given, the compounds are presumably novel; thus, Claim 1 should cover the compounds per se, for any use.

Note the classic Markush phraseology, "wherein R is selected from the group consisting of...." (See section 6:2.) It is now equally correct to use the "alternative" phraseology provided in MPEP 706.03(y): "... wherein X is nitro, amino, or alkyl...."; and "wherein R is hydrogen, alkyl of... , or alkenyl of...." Note that this use of the alternative is limited by the Manual to materials "so related as to constitute a proper Markush group," as in this problem.

Of interest, this claim covers 150 individual compounds (not counting isomers), 25 R substituents with any of six X substituents. Note also, that it is not necessary to know what parabanic acid is, or "nitrobenzene sulfonyl...." etc. to write this claim. One can safely copy the pertinent language in the specification, where the patentee is supposed to state what the claimed invention is as well as giving examples, etc.

Claim 2

This requires more care, as one wants a *broad* method (as to the steps performed) for making the two specific compounds of Examples 1 and 2. Thus, the preamble should be limited to the method of preparing the two named compounds (not a broad Markush group), and preferably using the named reactants, oxalyl chloride and the particular thiourea precursors. The examinee could not conceivably know what if any other precursors or chlorides could be substituted, and would be very ill advised to guess.

As to the process steps, these should be phrased fairly broadly since a broad method claim was requested. The common steps of examples 1 and 2 appear to be mixing (or adding, treating, reacting), heating (or refluxing), and recovering. These can be combined into two or even one step the choice is optional so long as the scope is correct.

A single step process could be phrased as "reacting [A] with [B] at a temperature sufficient to form (C)." There would be no problem in including the broad temperature ranges (40-150°C) from column 1, lines 59-60, but most preferred process details should be omitted since this is to be a broad claim to the process, and it does not appear from the specification that process parameters are critical to success.

Note, on the law (not part of *this* question), that a process for making a novel compound, such as in Claim 2, is not necessarily patentable (nonobvious) merely because the compound is patentable. (See section 4:4.) The courts have held (over vigorous dissent and with much adverse criticism by the bar) that a so-called "obvious method" of making a new compound or product of any kind is not patentable merely because the compound or product is patentable.

Claim 3

This claim is to cover a method of using the specific compound of Example 2, which should be specifically named in Claim 3. The preamble could be "controlling" or "modifying" plant growth (not both in the alternative), as indicated in column 2, line 44. The only possible step can be "dispersing" (col. 2, lines 57-58) or contacting, treating, etc. This claim typifies the relatively rare case of a single-step method (section 3:24), which is perfectly permissible.

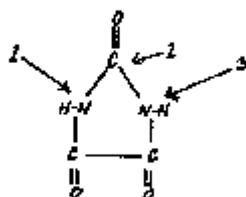
Note that this method of using claim is a "new use" claim (section 6:7), and that such claims can be patentable for new uses for new compounds as well as for old compounds. If the compounds turned out to be old for other purposes, the "use claims" such as Claim 3 could still be patentable if the use was unobvious. This happened in the DDT case (*Ex parte Muller*) cited in the book, section 6:7.

Note that Claim 3 specifies "an amount... effective to..." Cases hold that the recitation "... an effective amount..." is *not* indefinite. This is particularly true in this case, where the specification defines the term "effective amount" (col. 2, lines 56, etc.) and gives many examples of effective amounts. Obviously, in the present case, the invention as to use of the compounds resides in discovering that the parabanic acid derivatives *are* plant growth modifiers (inhibitors or poisons), rather than in the determination of particular amounts needed to effect such modification. As stated in the specification, the amount can vary quite widely based on particular plants, soils, even rainfall, for a particular one of the compounds.

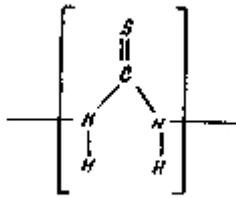
Note that this question asked for all claims in *independent form*, as sometimes is requested. Make certain to follow directions! In this case, because of the specific nature of the claims requested, including varying statements of the compounds involved in each successive claim, it would be difficult and highly cumbersome to use a dependent claim anyway.

Dependent claims "crossing statutory classes" (process, compound), such as "A method of preparing the compounds related in Claim 1...," or "A method of modifying... comprising dispersing... a compound as recited in Claim 1..." are not correct. Product and process type claims should be separate. The only exception is a product-by-process claim.

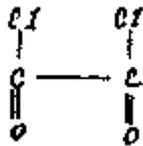
For those interested in the chemical details, parabanic acid is:



This is a cyclic diacid formed by oxidation of uric acid. Thioparabanic acid substitutes = S for the =O in the 2 position. The thiourea radical is:



Oxalyl chloride is:



Thus, with HCl driven off, the amine nitrogens of the thiourea bond to the carbons of the oxalyl radical to form the parabanic ring.

Case 25

PREPARING BUSINESS METHOD CLAIMS

A hypothetical business model is described here. Please prepare a set of method claims based on the business model:

The Environmentally Friendly Investment Fund

An investment fund has the objectives of making money for investors in the fund and encouraging environment friendly activity. There are various environmentally friendly investments offered by the investment fund and the investors can dictate how their money investments will be distributed among the various investment choices. Each of the investment choices must successfully stand on its own, that is, some of the investment choices may make money and others may not. The managers of the investment fund will also decide, and may periodically change their decision, that certain activities are more meritorious and some less meritorious than others, and may weight those investments to a greater or less extent in the fund. Such weightings can be periodically changed by the managers for any reason, including a change in their belief as to the environmental value of the particular

investment activity or the desire of the fund managers to rebalance the proportions of the funds invested in particular activities, profitability of an activity and for other reasons.

Details of the fund follow:

The managers of the fund will identify various investment opportunities from time to time, and at least five have been identified:

1. An air pollution monitoring system for monitoring the quality of air and air pollution in any environment where the monitoring system is positioned.
2. A flowing water pollution reduction system which filters and cleans flowing water, rivers and streams, for example, for various purposes.
3. A pollution reducing, coal fueled, electricity generating plant.
4. A fuel efficient, pollution reducing combustion engine for use in vehicles, but with its use not so restricted.
5. An improved, non-polluting, nuclear powered, low power for a small area, electricity generating facility.

The investment fund managers, in each quarter year, put a weighted value on each of the investment opportunities to encourage investors to invest in particular ones for better funds distribution or in support of their own environment improvement philosophy. For this quarter, the weighting is two times for the air pollution control, and one-half times for the combustion vehicle and the others are weighted at one.

Each investor invests an amount of money and may designate percentages of their money which goes to each of the investment activities from 0% to 100% for each investment opportunity. Or they can permit the fund managers to allocate based on their criteria of environmental benefit, maximizing profit over the quarter, etc.

Each investment activity generates a financial return, positive or negative and to a respective extent. At the end of each quarter year, that investment activity return over the preceding quarter is multiplied by the previously assigned weight factor. The total amount of money then in the entire fund is also computed. Each investment activity is credited with the amount of the initial investment plus its proportion in the total change in value of the adjusted weighted change in value attributable to that investment activity. Each investment activity then has a current total investment value. The total amount that each investor had invested in each activity is known, and the investor's proportionate share of the total value of each investment activity is known. The value of the investor's share in that activity is

then attributed to the investor. The investor receives in his account the total value of his participation in each of the investment activities.

At the end of each quarter year, managers of the investment fund may choose additional or different investment activities for the next quarter, and may change the weighting of the available activities. At the end of the quarter the investor may withdraw all or part of his funds, add money and may reappportion his funds among different ones of the now offered investment activities. In order that the investment fund be orderly and that investment activities not be too frequently disturbed, investors can only invest new funds in investment activities or draw out all or part of their funds from the investment fund or redirect their investments to other investment activities in the fund only at the ends of the calendar quarters.

Should an investor make a withdrawal of funds at any time before the end of a calendar quarter, the investor would be penalized the amount of any increase in the value of his investment for the preceding portion of the same quarter when the funds were withdrawn and the investor would be able to withdraw only the amount that had been invested in that activity at the beginning of the quarter year. However, if the value of the investor's investment in any of the investment activities had decreased during the portion of the same quarter preceding the withdrawal, the investor could only withdraw the actual value of the investment in the activity at the time and not the original investment at the beginning of that quarter.

Problem

Please write a set of claims on this business method.

Case 25

PREPARING BUSINESS METHOD CLAIMS

Sample claims

Some claims might be:

1. An investment method comprising:

* designating a plurality of different investment activities in which investors' funds may be invested, wherein each of the investment activities has the potential for improving the environment;

* applying a weighting to each of the investment activities according to selected criteria;

- * assembling a pool of invested funds from a plurality of investors, wherein each investor is able to invest a respective amount of money and each investor designates portions of his investment which are to be directed to each of the investment activities;
 - * operating the investment activities with the purpose of increasing the value of the investors' investment;
 - * at the end of a selected time period, calculating the total value of the investment fund from all the investment activities, attributing a portion of the value of the fund to each of the investment activities in accordance with the actual amount that had been invested in each activity and by weighting the change in the value of the funds in the activity according to the assigned weighting;
 - * calculating the value of an investor's investment in the fund based upon the investor's portion of the value of each activity which had been adjusted for the weighted change in value.
- * 2. The method of Claim 1, further comprising:
- * selectively changing at least one of the investment activities and the weighting of the investment activities at the end of each time period; and permitting each investor to at least one of redirect his investments to other ones of the activities of withdrawing funds from the investment fund and adding money to the investment fund in addition to the investor's funds not withdrawn and investing the added funds in selected ones of the investment activities at the start of each new time period.
- * 3. The method of Claim 1, wherein the environmentally beneficial investment vehicles include at least one of the group consisting of:
- * air pollution monitoring; water pollution reduction; combustion engine efficiencies; non-polluting coal fueled power plant operation and nuclear power plant operation.

Case 26

PREPARING BIOTECHNOLOGICAL CLAIMS

UNITED STATES PATENT 4,237,224

Process for Producing Biologically
Functional Molecular Chimeras

Inventors: Stanley N. Cohen, Herbert W. Boyer

BACKGROUND OF THE INVENTION

1. Field of the Invention

Although transfer of plasmids among strains of *E. coli* and other Enterobacteriaceae has long been accomplished by conjugation and/ or transduction, it has not been previously possible to selectively introduce particular species of plasmid DNA into these bacterial hosts or other microorganisms. Since microorganisms that have been transformed with plasmid DNA contain autonomously replicating extrachromosomal DNA species having the genetic and molecular characteristics of the parent plasmid, transformation has enabled the selective cloning and amplification of particular plasmid genes.

The ability of genes derived from totally different biological classes to replicate and be expressed in a particular microorganism permits the attainment of interspecies genetic recombination. Thus, it becomes practical to introduce into a particular microorganism, genes specifying such metabolic or synthetic functions as nitrogen fixation, photosynthesis, antibiotic production, hormone synthesis, protein synthesis, e.g., enzymes or antibodies, or the like--functions which are indigenous to other classes of organisms--by linking the foreign genes to a particular plasmid or viral replicon.

SUMMARY OF THE INVENTION

Methods and compositions are provided for genetically transforming microorganisms, particularly bacteria, to provide diverse genotypical capability and producing recombinant plasmids. A plasmid or viral DNA is modified to form a linear segment having ligatable termini which is joined to DNA having at least one intact gene and complementary ligatable termini. The termini are then bound together to form a "hybrid" plasmid molecule which is used to transform susceptible and compatible microorganisms. After transformation, the cells are grown and the transformants harvested. The newly functionalized microorganisms may then be employed to carry out their new function; for example, by producing proteins which are the desired end product, or metabolites of enzymic conversion, or be lysed and the desired nucleic acids or proteins recovered.

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Preparation of Plasmid Chimera

In order to prepare the plasmid chimera, it is necessary to have a DNA vector, such as a plasmid or phage, which can be cleaved to provide an intact replicator locus and system (replicon), where the linear segment has ligatable termini or is capable of being modified to introduce ligatable termini. Of particular interest are those

plasmids which have a phenotypical property, which allow for ready separation of transformants from the parent microorganisms

A wide variety of plasmids may be employed of greatly varying molecular weight. The desirable plasmid size is determined by a number of factors. First, the plasmid must be able to accommodate a replicator locus and one or more genes that are capable of allowing replication of the plasmid. Secondly, the plasmid should be of a size which provides for a reasonable probability of recircularization with the foreign gene(s) to form the recombinant plasmid chimera. Desirably, a restriction enzyme should be available, which will cleave the plasmid without inactivating the replicator locus and system associated with the replicator locus. Also, means must be provided for providing ligatable termini for the plasmid, which are complimentary to the termini of the foreign gene(s) to allow fusion of the two DNA segments.

The original plasmid should desirably have a phenotypical property which allows for the separation of transformant bacteria from parent bacteria. Particularly useful is a gene, which provides for survival selection. Survival selection can be achieved by providing resistance to a growth inhibiting substance or providing a growth factor capability to a bacterium deficient in such capability.

Conveniently, genes are available, which provide for antibiotic or heavy metal resistance or polypeptide resistance, e.g., colicin. Therefore, by growing the bacteria on a medium containing a bacteriostatic or bacteriocidal substance, such as an antibiotic, only the transformants having the antibiotic resistance will survive.

Growth factors include the synthesis of amino acids, the isomerization of substrates to forms which can be metabolized or the like. By growing the bacteria on a medium which lacks the appropriate growth factor, only the bacteria which have been transformed and have the growth factor capability will clone.

In preparing the plasmid for joining with the exogenous gene, a wide variety of techniques can be provided, including the formation of or introduction of cohesive termini. Flush ends can be joined. Alternatively, the plasmid and gene may be cleaved in such a manner that the two chains are cleaved at different sites to leave extensions at each end which serve as cohesive termini. Cohesive termini may also be introduced by removing nucleic acids from the opposite ends of the two chains or alternatively, introducing nucleic acids at opposite ends of the two chains.

To illustrate, a plasmid can be cleaved with a restriction endonuclease or other DNA cleaving enzyme. The restriction enzyme can provide square ends, which are then modified to provide cohesive termini or can cleave in a staggered manner at different, but adjacent, sites on the two strands, so as to provide cohesive termini directly.

Where square ends are formed such as, for example, by HIN (Haemophilus influenzae RII) or pancreatic DNase, one can ligate the square ends or alternatively one can modify the square ends by chewing back, adding particular nucleic acids, or a combination of the two. For example, one can employ appropriate transferases to add a nucleic acid to the 5' and 3' ends of the DNA. Alternatively, one can chew back with an enzyme, such as a λ -exonuclease, and it is found that there is a high probability that cohesive termini will be achieved in this manner.

An alternative way to achieve a linear segment of the plasmid with cohesive termini is to employ an endonuclease such as EcoRI. The endonuclease cleaves the two strands at different adjacent sites providing cohesive termini directly.

With flush ended molecules, a T4 ligase may be employed for linking the termini. See, for example, Scaramella and Khorana, J. Mol. Biol. 72: 427-444 (1972) and Scaramella, DNAS 69: 3389 (1972), whose disclosure is incorporated herein by reference.

Another way to provide ligatable termini is to leave employing DNase and Mn⁺⁺ as reported by Lai and Nathans, J. Mol. Biol, 89: 179 (1975).

Problem

Draft three method claims of varying scope, given the specification. Direct the narrower claims to the formation of "staggered and cohesive termini."

Case 26

PREPARING METHOD CLAIMS, BIOTECHNOLOGY SAMPLE CLAIMS, METHOD FOR REPLICATING A BIOLOGICALLY FUNCTIONAL DNA

1. A method for replicating a biologically functional DNA, which comprises:

* transforming under transforming conditions compatible unicellular organisms with biologically functional DNA to form transformants; said biologically functional DNA prepared in vitro by the method of:

* (a) cleaving a viral or circular plasmid DNA compatible with said unicellular organism to provide a first linear segment having an intact replicon and termini of a predetermined character;

* (b) combining said first linear segment with a second linear DNA segment, having at least one intact gene and foreign to said unicellular organism and having termini ligatable to said termini of said first linear segment, wherein at least one of said first and second linear DNA segments has a gene for a phenotypical trait, under joining

conditions where the termini of said first and second segments join to provide a functional DNA capable of replication and transcription in said unicellular organism;

* growing said unicellular organisms under appropriate nutrient conditions; and

* isolating said transformants from parent unicellular organisms by means of said phenotypical trait imparted by said biologically functional DNA. (1)

* 2. A method according to Claim 1, wherein said predetermined termini are staggered and cohesive. (6)

* 3. A method according to Claim 2, wherein said cohesive ends are formed by staggered cleavage of said viral or circular plasmid DNA and a source of said second segment with a restriction enzyme. (8)

or

3. A method according to Claim 2 wherein said cohesive termini are formed by addition of nucleotides. (9)

COMMENTS

The above claims are from the Cohen and Boyer patent as issued; the number of the claims as they appeared in the patent are provided in the parentheses. The Cohen and Boyer patent describes the method behind what is commonly called recombinant DNA or genetic engineering, that is, a method of transferring genetic material from one organism into the cells of another organism, across species lines if desired.

Though biotechnology is a relatively new field, techniques previously used to write claims for chemical or microbiology cases can be used for biotechnology cases as well. Note, for example, that Claim 1 is a series of action steps arranged in a logical order (see sections 4:2 and 4:2).

One goal in biotechnology cases is covering the variability introduced by the use of living organisms and their biochemical systems. Anticipating future developments in a field for the next seventeen years and writing claims broad enough to encompass them has always been challenging; but with biological systems, it is possible that a new organism or protein will be discovered that performs the same or similar reactions as those described in the patent. The question then becomes how similar is the new organism or protein to those disclosed in the patent. Devising generic categories are not always satisfactory, because living systems are notoriously difficult to categorize. For example, witness the continuing debate as to whether humans' closest cousin is the chimpanzee, orangutan, or gorilla. ¹

One approach to the issue of biological variability is to claim a feature functionally (see Sections 3:18 and 3:19). Note that in Claim 1, the termini (ends) are primarily defined as ligatable (connectable) to one another. The dependent claims set out details such as the "staggered and cohesive" variation of the termini, which can be formed by chemical or enzymatic means. Another claim in the patent ² refers to "blunt end" termini, a form of the termini created by the use of enzymes isolated from organisms different from the organisms that are the source of the enzymes used to create the "staggered and cohesive" termini.

II Criticizing "Sloppy Claims"

The following examples are from Agents' Exams given between August 1966 and September 1970, where the student was given a specification and a set of claims, and asked to comment on errors or possible errors in those claims.

This required a detailed knowledge of the law, rules and Patent Office practices on many points of claim-drafting law and practice.

Case 27

CRITICIZING "SLOPPY CLAIMS" (SUCTION CLEANER)

[See graphic in original printed material]

Specification

The present invention relates to suction cleaners and particularly to new and improved agitating means in suction cleaners. More specifically the invention comprises the provision, in a suction cleaner, of the combination of a rotary agitator, embodying both positive beating and brushing means, with a reciprocating brush whose direction of movement is parallel to the axis of the rotary agitator.

It is an object of the present invention to provide a new and improved suction cleaner. It is a further object to provide new and improved surface-agitating means in a motor-driven suction cleaner. A still further object is the provision, in a suction cleaner, of combined rotary and reciprocating agitating means. Still another object is the provision of a suction cleaner in which rotary agitating means are provided in the suction cleaner nozzle from which a reciprocating brush is driven. A still further object is the provision, in a motor driven suction cleaner, of a rotary agitator embodying positive agitating means and brushing means, and a horizontally reciprocating agitator comprising a brush. These and other objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

In the drawing in which a preferred embodiment of the present invention is disclosed:

Fig. 1 discloses a side view of a modern suction cleaner, with certain parts broken away, with the present invention embodied therein;

Fig. 2 is a section upon the line 2-2 of Fig. 1;

Fig. 3 is an enlarged section through the cleaner similar to that shown in Fig. 1 showing, in dotted lines, the supporting frame of the rotary and reciprocating agitators pivoted downwardly from the nozzle mouth;

Fig. 4 is a view in perspective of a reciprocating brush element;

Fig. 5 is a partial view in perspective of the agitator-supporting frame showing the reciprocating brush set;

Fig. 6 is a view in perspective of the pivoted latch or retaining cover of the brush seat;

Fig. 7 is a view in perspective of the pivoted brush supporting frame.

The present invention is disclosed embodied in a modern suction cleaner which comprises a main casting or casing including a nozzle 1, a fan chamber 2, which is interiorly connected to the nozzle 1 by means of the air passageway 3, and an exhaust outlet 4 to which is detachably connected a dust bag 5. A motor casing 6 is positioned upon the main casing immediately above the fan chamber 2 and houses a suitable driving motor, which is not shown, but the shaft 7 of which extends downwardly thru the fan chamber 2 where the fan 3 is mounted thereon. The shaft 7 extends into the rear end of the air passageway 3 where it carries a suitable pulley 9. The cleaner is movably supported by means of front wheels, of which one is shown resting upon a supporting surface being indicated by reference character 10, and by means of a rear wheel 11. A pivoted handle 12 is mounted on the casing of the cleaner and provides means by which the operator can propel the machine over the surface covering undergoing cleaning.

Within the nozzle 1 of the cleaner and extending thereacross is a rotary agitator which, in its general appearance, differs but slightly from a common and well known type. This agitator comprises a large diameter cylindrical body 13 on the surface of which are mounted helically-extending rigid beater elements 14, 14 which extend substantially the length of the agitator, with the exception of a small central portion which is reduced in diameter to form a pulley 15. Carried by the cylindrical body 13 of the agitator and seated within the periphery thereof are longitudinally-extending

brushes 16, 16 which are of a common and well-known type and which are removably secured in their seats in any suitable manner. Upon the surface body 13 of the agitator, immediately adjacent the sides of the pulley 15, which is connected to the driving pulley 9 on the motor shaft 7 by a suitable belt 21, are encircling cam races positioned below the periphery of the body. These cam races are designated by the reference characters 22, 22 and have a function which will be apparent from the following description. A shaft 17, which extends through the agitator with each of its ends resting in a seat 20 in the side member 19 of the frame 18, rotatably supports the agitator.

Between the side members 19, 19 of the frame 18, which is pivoted within the nozzle 1 at a point somewhat in the rear of the rear nozzle lip 23, is a front cross member 24 which extends closely adjacent and parallel to the front wall of the nozzle 1, being secured thereto, and holding the frame 18 within the nozzle, by ordinary and suitable means which form no part of the present invention. This cross member 24 slopes downwardly from the lower end of the front wall of the nozzle 1 and forms the front lip of the nozzle thereby cooperating with the rear nozzle lip 23 in defining the nozzle mouth. The lip 24, however, differs from the usual nozzle lip thru being provided with two transversely-extending openings or apertures 25, 25, each of which extends parallel to the axis of the rotary agitator and has a length substantially equal to half the length of the agitator. Seated upon the lip 24 with their bristles projecting downwardly thru the apertures 25, 25 are brush elements 26, 26 which comprise rigid backs having the flexible brush bristles mounted therein. The length of each brush element 26 is slightly less than the length of the aperture 25 in the nozzle lip 24 thru which the bristles extend, thereby permitting the brush a limited range of movement transversely of the agitator mouth, that is, parallel to the longitudinal axis of the agitator itself. To make use of this permissible movement of the brushes 26, 26 in order to obtain the maximum agitation of the surface covering undergoing cleaning, each brush element 26, 26 is provided at its inner end, with an upstanding lug 27 on which is mounted a roller or head 28 of such size that with the brush seated upon the front lip 24 the roller 28 extends within the adjacent cam race 22 in the cylindrical body 13 of the rotary agitator, with the result that upon the rotation of that body the brush 26 will be reciprocated back and forth as the roller 28 is moved by the cam. To insure the permanent positioning and the correct alinement of each brush 26 with the aperture 25, relative to which it must slide, a pivoted cover element 29 is provided which is pivotally mounted upon a pin 30 carried by the side of the transverse member or lip 24. The cover member 29 is adapted to closely enclose the sides and top of the brush 26 to hold it in contact with the upper surface of the lip 24. To prevent the unintentional displacement of the cover relative to the lip the forward edge of the lip is curved upwardly, as at 31, and is adapted to resiliently clamp the forward edge of the cover which extends against it in the closed position.

In the operation of a suction cleaner constructed in accordance with the present

invention, the suction-creating fan within the fan chamber is rotated by the driving motor resulting in a decrease in the pressure existing within the nozzle thereby effecting the lifting of the surface, covering undergoing cleaning against the nozzle lips, as is clearly indicated in Figure 1. With the surface covering suspended against the nozzle lips the rotary agitator is rotated at high speed by the driving belt 21 which is connected, as aforescribed, between the pulleys 15 and 9, the latter carried by the motor shaft. The beating elements 14, 14 upon the agitator function to violently vibrate the surface covering to dislodge the embedded foreign matter which is positioned therein. The longitudinally-extending brushes 16, 16 upon the agitator surface cooperate with the rigid beating elements 14, 14 and assist in the removal of the light dirt. As the agitator is revolved the brushes 26, 26, which are carried by the front nozzle lip 24 of the cleaner, are reciprocated transversely or parallel to the longitudinal axis of the rotating agitator and, thru extending below the nozzle lip, contact the surface covering which is positioned adjacent thereto and function to deflect, bend and agitate the pile of that covering in a direction as right angles to the direction of vibration and bending effected by the beating elements 14, 14 and the brush elements 16, 16 carried by the rotary agitator.

To effect the removal of the agitators constructed in accordance with the present invention from the nozzle, it is only necessary to pivot the supporting frame 18 downwardly to the position shown in dotted lines in Figure 3. With the frame so positioned the rotary agitator may be lifted therefrom, the supporting shaft 17 sliding outwardly from its open ended seat 20 in each end plate 19 of the frame. With the rotary agitator removed it is then possible to pivot each brush-holding cover 29 on its supporting pin 30, a recess 32 being conveniently provided in the forward edge of the nozzle lip into which an instrument such as a screw driver may be inserted to wedge the cover free from the retaining forward edge of the lip. With the cover pivoted back it is then possible to remove the brush 26 by merely lifting it from the lip and withdrawing the bristles through the aperture 25 through which they were extended, there being two brush elements, the same operation is necessary to release the other element.

If desired, a single brush element extending across the full width of the nozzle may be used instead of two brush elements.

Problem

Part I--Given the specification and drawings, comment on the "Problem Claims" following.

Part II--Assuming you were asked to write three claims of varying scope, and indicate "broadest," "intermediate" and "narrowest." Write *only* the first such claim ("broadest"), and indicate what features you might include in the other two claims.

PART I--PROBLEM CLAIMS

Below is the statement of the question from the April 1967 Exam:

This part of the examination consists of three claims drawn to a suction cleaner apparatus proposed to be added to an application having the accompanying specification and drawings. Certain words and phrases in the claims have been italicized and numerically designated. *Most, but not all*, of the italicized portions represent instances wherein the claims fail to comply with the United States patent law or accepted claim writing practice. In addition to the 10 numbered items in the claims, there are two additional instances involving deficiencies in the claims in substance or form. These instances should be listed as items 11 and 12 in your answer. For each number in each claim and for items 11 and 12, make a short statement as to why the underlined portion does represent a defect, if such is the case.

NOTE: For this exercise, try to find *four* more major errors (11), (12), (13), (14) and discuss.

Case 27

CRITICIZING "SLOPPY CLAIMS" (SUCTION CLEANER)

SAMPLE CLAIMS TO BE CRITICIZED

6. A suction cleaner comprising a body supported by wheels, a drive motor mounted on said body forward of *the rear pair of wheels*(1), *the nozzle*(2), formed on the front portion of the body having a lip, *a flexible*(3) agitator roll mounted in said nozzle, and drive means connecting said motor and agitator to cause it to rotate. Said nozzle being further provided with a rear lip, a supporting frame for the agitator pivotally mounted adjacent *said lip*(4), a single brush agitator mounted on said other lip and extending across the full width of said nozzle, *adapted to reciprocate* upon rotation of said rotary *agitator*(5), drive means for said reciprocating agitator including *a cam race*(6), on said rotary agitator.

7. The suction cleaner of this invention *includes*(7) a motor, a suction creating means, a rotary agitator, and an additional brush agitator mounted to reciprocate relative to the surface being cleaned.

8. A suction cleaner according to *Claims 6 or 7*(8) in which the nozzle has mounted therein forward of the rotary agitator *two reciprocating agitators*(9) having brush elements made of nylon to ensure long *wear*(10).

COMMENTS ON PART I--PROBLEM CLAIMS

1(a). There is no *antecedent* in the claim for the "rear pair" of wheels. The claim has previously stated only that there are wheels. ¹

1(b). Also, there is *no support in the disclosure* for the rear "pair" of wheels. The specification discloses "a rear wheel 11." A claim may not be contrary to, or inconsistent with, the specific example(s) disclosed. ²

2. There is *no antecedent* in the claim for "the nozzle." ³

3. There is *no support in the disclosure* for a "flexible" agitator roll. The agitator 14 is shown as a solid member. ⁴

4. "Said lip" is indefinite because two different lips have previously been recited. ⁵

5. "Adapted to reciprocate..." was stated by the Patent Office to be improper "functional language without supporting structure." The "adapted to" phrase attempts to imply the mounting of the brush element (26) and its driving connection to the rotary agitator (13). ⁶

6. "A cam race" was considered "OK." ⁷

7. The wrong verb form, "includes," is used. The claim must form a *complete sentence*, being the direct object of the (understood) phrase "I claim...." ⁸

8. "Or 7" Is improper recitation of a multi-dependent claim. [See section for various forms of multidependent claims.] ⁹

9. "Two reciprocating agitators" is improper. If this claim is dependent from Claim 6, the recitation of *two* agitators is *inconsistent* with "a *single* brush agitator" in the parent claim. A dependent claim may not add statements inconsistent with the structure of the parent claim. ¹⁰ If Claim 7 is the parent claim, "an additional brush agitator" is already an element of the parent claim, so that it would be improper to add two more, apparently as new elements. This would be *double inclusion* of elements. ¹¹

10. There is no support in the disclosure for "nylon." ¹² The specification does not state of what material the brushes are made. ¹³

OTHER ERRORS

11. Claim 7 is directed to a catalog of elements. There is no connection or cooperation whatever between the elements. ¹⁴

12. Claim 6 is composed of two sentences, and is thus improper under Patent Office practice. ¹⁵

13. There is no antecedent in Claim 6 for "said *other* lip." Nothing in the claim would tell which of the lips referred to is meant by "other."

14. In Claim 6, "a *single* brush agitator" is not illustrated in the drawings. ¹⁶ Every feature of the invention specified in the claims must be shown in the drawings. ¹⁷

The foregoing were the four other specific errors identified by the Patent Office. There may be other errors of a lesser or more technical nature. For example:

15. Claim 6 does not have sufficient elements or cooperation between elements to make the complete combination stated in the preamble. Specifically, the combination claimed is a "*suction cleaner*," but nothing is recited in the claim to produce suction. ¹⁸

16. In Claim 6, "a body supported by wheels," the term "by wheels" is inferential claiming, as the wheels were not previously introduced. Better would have "... been a body, wheels supporting the body...".

17. "Of this invention," in Claim 7 appears to be surplusage. The same could be said of "to ensure long wear" in Claim 8. ¹⁹

SOME GENERAL NOTES ON ANSWERING SLOPPY CLAIMS QUESTIONS

Be quite specific as to the error; don't just say "no antecedent" or "indefinite," etc. For example (1) item (3) "*flexible* agitator," point out that the description does not state that the agitator is flexible and, if you noted it, that the agitator is illustrated as being solid. If you remembered that the rules of practice provide that all terms in the claims must find clear support or antecedent basis in the description, you could mention this. There is no need to cite rule number ²⁰ or the exact language so long as the substance is correct.

At the other extreme, there is no need for a long essay or any discussion of philosophy or policy. Up to two or three short sentences along the lines of the suggested answers are sufficient.

Normally, do not volunteer how you would do it correctly. This can hardly gain, and might lose if you are wrong.

Where you think there are two things wrong, mention both in the order you think most important. For example, if you thought (as many do) that "nylon" (item 10) is a trademark and might be improper for that reason, ²¹ mention also that there is no

support in the description (since nylon is not a trademark and you might get most of the credit for having the right answer, as well as an incorrect statement).

PART II --SAMPLE CLAIMS AND COMMENTS (SUCTION CLEANER)

From the specification, it is quite clear that the general arrangement of the suction cleaner, including the motor, fan (8), rotary agitator (13), beaters (14) and rotary brushes (16) is conventional. The invention is stated to relate to adding the transversely reciprocating brushes 26 to this old structure. Thus, an improvement or *Jepson*-type claim could be used.

Such a claim follows, of fairly broad scope:

1. An improved suction cleaner of the type including a movable casing, a rotary agitator mounted in the casing for rotation about an axis transverse to the direction of movement of the cleaner, and drive means for rotating the agitator and producing suction within the casing; wherein the improvement comprises:

(a) a brush element mounted in the casing for reciprocating movement parallel to the axis of rotation of the agitator; and

(b) means for reciprocating the brush element in timed relation to the rotation of the agitator.

Note section 6:8, and rule 75(c) with respect to *Jepson*-type claims. It would probably not be necessary in Claim 1 to specify the mechanical details of the cam-type drive linkage between the agitator and the reciprocating brushes. This per se is generally conventional. The main point of novelty, so the specification states, is in adding the transverse brushes. This should be claimable fairly broadly, within the general combination of the suction cleaner.

Claims 2 and 3 could add details of the gear drive, and the specific mounting and positioning of the reciprocating brushes with respect to the agitator.

It would be best not to use dependent claims adding *only* matters that the specification (or any instructions given with the problem) says are old. Thus, such things as the helical beater (15) structure would not be appropriate to add via a dependent claim since it is part of the old structure *and* does not coact in any new way with the new structure.

Case 28

CRITICIZING "SLOPPY CLAIMS" (STEAM AND DRY IRON)

[See graphic in original printed material]

Excerpts from Specification

The feature of this invention is the supplying of steam to the article being ironed in advance of, and while moving the iron across the article whether in a frontward or backward direction.

However, if the operator desires to iron dry, he may shut off the supply of steam and use the device of this invention as a dry iron.

An equally important feature of this invention is the controlling of the supply of steam through either the front or rear ports of the iron to the article being ironed as desired. The operation of the means for controlling the supply of steam is simple and coincides with the normal movement by hand of any iron over an article to be ironed.

The water chamber of the steam iron is indicated as 6 and the upper section of the chamber becomes a steam dome when the water is heated sufficiently by electrical element 7. The heating element is encased in the bottom of the iron by a flat ironing surface 8 and connection between usual electric cords and the heating element 7 is made by wiring not shown to the electrical terminals 9.

A plurality of steam ports represented by 10 are located in the flat ironing surface 8 around the front end of the iron and a similar plurality of ports 11 are located in the flat surface 8 around or across the back end of the iron. The front ports 10 lead to the forward steam chamber 12 while the rear ports 11 connect with the rear steam chamber 13. The front steam chamber 12 may encircle the forward part of the iron and back along the sides of the iron as far as desired. Similarly the back steam chamber 13 may extend across the back as shown and also extend back along the sides of the iron as desired. However, in order to accomplish one of the features of the iron of this invention the front and rear steam chambers cannot be connected. The chambers are formed between the wall of the combination water and steam chamber 6 and the outside casing 14 of the iron. In areas of the side walls beyond the limits of front steam chamber 12 and rear steam chamber 13 the casing 14 and wall 6 of the combined steam and waterchamber are contiguous as seen in Figures 2 and 5 of the accompanying drawing.

A steam valve 15 controls the passage of steam from the steam and water chamber 6 to the front steam chamber 12 and a similar valve 16 controls passage of steam into the rear chamber 13. In Figure 1 the two steam valves 15 and 16 are shown in closed positions. In Figure 4 valve 15 is open and 16 is closed which would be their relative positions when the iron is being moved forward. In Figure 3 front valve 15 is closed while rear valve 16 is open which would be their relative positions when the

iron is being moved backward. The operation of these steam valves 15 and 16 is accomplished by handle 17 which is free to rock on pin 18 in trunnion 19 which is bolted by means 20, or in any other way connected to casing 14.

A strip of spring steel 21 is fastened to the underside of handle 17 by any means, such as bolts 22, and is preformed so that its two end sections bear down on the heads of valve stems 23 and 24 so as to keep steam valves 15 and 16 closed as shown in Figure 1.

When the operator of the steam iron decides to move it forward, he naturally presses on the rear of the handle so that the front of the iron will slide over the article being pressed. Thus in the normal operation of the iron he inclines the handle down in the rear and it rocks on pin 18 so that the forward part of the handle is up. This movement of the handle causes steam valve 15 to open up whereas steam valve 16 is firmly shut as shown in Figure 4.

Similarly if the operator decides to pull the iron backwards across the article being ironed, he bears down on the forward end of the handle, and thus on the front of the iron, thereby releasing pressure on the back end of the rockable handle and the back of the iron, so that the iron will slide backward over the article being ironed. This manipulation of the handle in turn closes steam valve 15 tight and allows steam valve 16 to open as shown in Figure 3.

The obvious reason for so operating the handle of the steam iron is to simultaneously operate the steam valves and thus supply moist steam through ports 10 when moving the iron forward while ironing, and through ports 11 when moving the iron backward. Thus supplying moist-steam to the article being ironed eliminates otherwise sprinkling or wetting the article before ironing.

Problem

Given the drawings and excerpts from the specification, criticize errors in the following "sample" Claims 1-7.

SAMPLE CLAIMS TO BE CRITICIZED

1. A combination steam and dry iron, comprising a body having a water chamber therein and front and rear steam chambers. The iron includes a bottom member, a first plurality of openings formed in the forward portion of the bottom plate and communicating with the front steam chamber, a second plurality of openings formed in the rear section of the bottom plat, and a toggle member connected to alternately activate the valve means whereby the iron may be operated either forwardly or backwardly to iron clothes more effectively than heretofore.

2. An iron including push-pull valve means for automatically spraying steam ahead of the iron when moving forwardly and behind the iron when moving backwardly.
3. Apparatus as recited in Claims 1 or 2, wherein the water chamber is omitted and steam is supplied directly to the iron from a central steam boiler through a flexible hose.
4. A base 8, a heater 7, a plurality of valves 15-16, a selective actuator 21 for the valves selected from the group consisting of springs, weights, and levers, a plurality of steam ports 10-11, and a handle 17.
5. A method as recited in Claim 4, further comprising the step of moving the iron alternately forward and back to iron the clothes.
6. A method as recited in Claim 5, further comprising a pair of leaf springs for actuating the valves when the handle is pivoted.
7. Any and all novel features described, referred to, exemplified or shown.

Case 28

CRITICIZING "SLOPPY CLAIMS" (STEAM AND DRY IRON)

COMMENTS

This specification was given on the August 1966 Exam, and the examinees were asked to criticize defective claims, rather than to prepare claims to a structure as had been customary in the past. The "sample claims to be criticized" used here are similar to those used on the Exam, but not identical.

The following list covers errors and debatable points which were intentionally made in the "sample" claims. There may be other errors.

Claim 1, in general. As an overall criticism, this claim does not set forth all of the elements necessary to "the invention," as defined in the specification. In particular, there is no specific description of the main point of the invention, which has to do with supplying steam selectively through front and rear ports as the iron is moved forward and back, by manipulating the handle to actuate valves. Thus, the claim is "incomplete" (see section 8:7.) and "inconsistent with the disclosure" (section 3:6.).

Claim 1, line 3, the claim consists of two sentences rather than one. (See section 2:2.)

Lines 3 and 5, "plurality of openings" are made "elements" of the claim. (See section

3:15.) Holes should not be positively recited. This should read, for example, "a bottom member having a plurality of openings... [etc.]."

Lines 4 and 6, "bottom *plate*" is "indefinite" (section 3:11). This should read bottom "member," as in line 3. One must use consistent terminology for the same element throughout the claim.

Lines 4 and 6, no antecedent for "*theforward* portion" or "*therear* section." It is at least debatable whether or not "bottom members" inherently have forward or rear actions. (See section 3:7 and section 3:3.) Better practice is, for example, "a bottom plate having a forward portion... etc."

Line 6, no connection of the second plurality of openings with the rear steam chamber. Also, no connection between the water chamber and the steam chamber, and nothing about heating the water. Thus, the claim is drawn, in part, to a "catalog of elements" (section 3:19).

Line 7, "toggle member." Mechanically this is not a "toggle member" but even if the student did not know this, the word "toggle" does not appear anywhere in the specification. Terms and phrases used in the claims must find clear support or antecedent basis in the specification. (See Rule 75(d) and section 3:6.) If this type of question is given, read the specification fairly closely and watch for inconsistencies in terminology.

Line 7, "connected to." It is doubtful whether this phrase sets forth enough structural cooperation with the other elements. (See section 3:21.) There is insufficient structure recited to support the functional statement.

Lines 7 and 8, "*the valve means*." No antecedent. This should have been made an element of the claim. (See section 3:11.)

Lines 8 and 9, "whereby." The function immediately following whereby" has nothing to do with the claimed structure in that all ordinary irons may be operated either forwardly or backwardly. The statement about ironing more effectively does necessarily follow from the previously recited structure. (See section 3:23.)

Also, laudatory expressions of this type ("more effectively than heretofore") are not permitted. This is "surplusage" (section 2:7).

Claim 2, line 1. It seems unclear whether "*push-pull*valve means" has any meaning, and this language is not used in the specification. This clause is vague and indefinite (section 8:8).

Line 1, this iron does not work "automatically." Thus, the claim is "misdescriptive"

and "inconsistent with the specification." Line 1, the claim is a single means" claim. (See section 3:25.) The statute (35 U.S.C. ?112) sanctions "mean plus function" clauses only in claims to *combinations*. Also, the claim may be objectionable as being too broad, in that the broad means plus function language comes at the point of novelty (sections 3:25 and 3:22).

Line 1, the transition "including" is acceptable (section 2:5). However, "comprising" is preferred.

Claim 3, line 1, "Claims 1 or 2." Rule 75(c) permits multiple dependent claims. (See section 2:11.) But, note section for a format for such claims.

Line 2, *omitting* the water chamber. See above, a dependent claim must *further restrict* the preceding claim. Thus elements cannot be subtracted, because this is a broadening of the claims.

Line 2 and 3, steam boiler and water hose. This runs afoul of rule 83, that the drawing must show every feature of the invention specified in the claims (section 3:6). Also, this is not described in the excerpts from the specification which were given (although it was described in the full specification as a conventional technique for commercial establishments).

Line 2, "steam is *supplied*." This sounds like a method limitation, and would be better defined (if included at all) in such terms as "... further comprising a central steam boiler, and a flexible hose... etc."

Claim 4, line 1, no preamble. Claims normally have some form of preamble, and it may be improper to omit it altogether. (See sections 2:4 and 3:2.)

Lines 1-4, reference numerals. There is no objection to the use of reference characters in claims, but this is done very rarely. However, when used, the characters should be enclosed in parentheses. This is provided on an optional basis in a notice "Guidelines for Drafting a Model Patent Application under the Revised Rules," 832 O.C. 5 (November 1, 1966) (section 3:7).

Lines 1-4. The claim is merely a "catalog" of elements, with no structural or operational cooperation set forth. (See section 3:19.) The claim must be drawn to an assembled, operable combination. This type of claim is often called an "aggregation," meaning as claimed (section 8:5).

Lines 2 and 3, "*selected from the group...*" This uses Markush language (see section 6:2) for mechanical elements, which is proper. The Markush type of alternative phraseology is useful for chemical cases where no generic expression is available but is also useful for mechanical cases. Also, the complete expression is alternative,

which is improper. (See section 3:13.) Note also that weights and levers are not disclosed or shown, which is improper, as noted earlier, because it lacks "support in the description."

Line 4, the steam "ports" (holes) are claimed positively.

Claim 5, line 1, the "*preceding* Claim (4) is not a method claim. It is an improper dependent claim because it is "inconsistent" with its parent claim.

Lines 2 and 3. The step added by the subclaim is only the overall step of moving the Iron in the conventional manner. It is probably objectionable, or at least poor practice, to add dependent claims which add only highly conventional steps (section 8:2).

Claim 6. This is a dependent *method* claim adding *only* further details of *structure*, which is improper. Dependent method claims should add method steps or further define method steps. Also, apparatus limitations should be avoided as far as possible in method claims. (See sections 6:7 and 4:6.)

Line 2. There is no antecedent for "when the handle is pivoted," *in either Claim 6 or "parent" Claims 5 or 4.*

Claim 7. This is a so-called "omnibus" claim, which is improper under 35 U.S.C. §112. Such claims have been held not "to particularly point out and distinctly claim" the invention (section 1:2).

GENERAL APPROACH TO "SLOPPY CLAIMS" QUESTIONS OF THIS TYPE

Given the first drawing, specification and sloppy claims, skim the claims first to see what they cover, generally, and mark obvious or trivial errors. (Here, unlike the previous case, the possible errors were not underlined.) Then read the specification fairly carefully against the claims. You must understand the main points of the invention fairly well to find some of the more sophisticated errors (incomplete, omits essential elements, reads on admitted prior art, etc.).

Underline the main elements (from the claims) in the specification, and make sure all are described in the same or consistent terminology. Make sure that everything in the claims is described, and that all structure claimed is shown in the drawings.

Then, of course, all of the formal, grammatical, and language errors described in the book must be found and identified, and answers written along the lines suggested in the previous problem.

One had approximately one and one-half hours to answer this type of question.

Case 29

Criticizing "sloppy claims" (Bomb-Proof Coating)

[See graphic in original printed material]

Problem*

Read Instructions Carefully

This part of the examination requires analysis of 5 claims proposed to be added to an application having the accompanying specification and drawing. Certain words and phrases in the claims have been underlined and numerically designated. *Most, but not all,* of the underlined portions represent instances wherein the claims fail to comply with United States patent law or accepted claim writing practices. In addition to the 10 numbered sites in the claims, there are 2 additional instances involving deficiencies in the claims in substance or form. These instances should be listed as items 11 and 12 in your answer. For each number in each claim and for items 11 and 12, make a short statement as to why the underlined portion does represent a defect, if such is the case.

6. (1) *A bombardment-resistant coating for structures* which comprises an (2) *inner layer of shock resistant material* and a thick external layer formed of (3) *asphaltic concrete containing mineral fibers*.

7. (4) *A structure having thereon a coating* comprising layers of material (5) *such as* (6) *mineral rubber* combined with layers of penetration resistant materials selected from (7) *the group consisting of steel, cement concrete, and asphalt concrete*.

8. (8) *A new process for rendering a structure resistant to penetration and shattering by bombardment* which comprises covering the externally exposed surfaces of said structure with an inner layer 1/16-1/2 inch thick of (9) *paper saturated with asphalt or felt saturated with asphalt*, and applying to said inner layer at least six inches thick of penetration-resistant hard asphalt concrete.

9. A structure having thereon (10) *a coating essentially as described in the drawing*.

10. A bombardment-resistant structure consisting of the product of the method set forth in Claim 8.

* Reprinted as given on the Feb. 13, 1968, Exam.

Case 29

Criticizing "Sloppy Claims" (Bomb-Proof Coating)

Comments*

1. (a) Claiming a coating without claiming the combination with the base material
- (b) No antecedent basis in specification for "bombardment-resistant coating."
- (c) O.K.
2. Indefinite--unbased comparative "thick."
3. No disclosure of "concrete containing mineral fibers."
4. O.K.
5. Indefinite or alternative.
6. O.K.
7. The members are a proper group in Markush form, because they share a common relevant characteristic.
8. The term "new" in the claim is unnecessary and surplusage.
9. Indefinite because alternative.
10. Claim may not refer to the drawing and is indefinite as defining structure only by reference to the drawing.

Answers for 11 and 12 (unnumbered deficiencies).

(a) Claim 10 obviously nonstatutory because the structure can be defined other than reference to the method.

(b) Claim 8 drawn to an obvious method.

(c) Claim 8--the range (1/16"-1/2") lacks antecedent support in the specification.

* Quoted from Patent Office Approved answers. There are fewer errors here than in the previous two problems, but they are more sophisticated. Also, many more requires knowledge of the law.

Case 30

Criticizing "sloppy claims" (Self-Priming Pump)

[See graphic in original printed material]

Problem*

This part of the examination requires analysis of the four following claims proposed to be added to an application having the accompanying specification and drawings. The claims all would be subject to rejection.

Identify the portions or attributes of each claim that afford grounds for rejection and make a short statement for each as to why rejection is in order.

5. A self-priming pump system comprising a pump, an inlet for said pump, an outlet therefor, and means automatically supplying liquid to prime said pump when insufficient liquid is present at the pump inlet, said means including a suction well and an automatic valve regulating the flow of repriming liquid to said well.

6. A self-priming pump system comprising a pumpage supply (2), a suction casing (4), a pump (20), a drive motor (26), an automatic valve (30), and a drain pipe (9) communicating with the said valve.

7. A self-priming pump system comprising a pump having a horizontal inlet and an outlet, a suction well having a cavity which is partially below said inlet, the suction line opening into the suction well at a level above said inlet to supply liquid to the cavity, a suction skirt having a lower end positioned in said cavity below said inlet and having an upper end connected to said inlet. A portion of said upper end is elevated above said inlet, reservoir means for repriming liquid having an upstream end connected to said outlet of said pump, a repriming valve connected to said pump outlet, a drain conduit connecting said valve to said suction well, means in the inlet of said valve for detecting a drop in liquid velocity, a valve device within the repriming valve biased to closed position, a discharge column leading from said valve, and an air relief conduit extending from said discharge column to a point upstream of said inlet.

8. A self-priming pump system as described in Claim 7 in which said upper end of said suction skirt extends up to but not above the pump inlet and in which the said fluid responsive detecting means includes a Venturi passage.

* Reprinted as given on the Nov. 19, 1968, Exam.

Case 30

Criticizing "Sloppy Claims" (Self-Priming Pump)

COMMENTS*

(Claim 5) Failure to point out novel combination in view of admitted prior art (under "Background of the Invention"). Also full credit for recognition of lack of structural relationship of suction well and automatic valve to remaining elements of claim.

(Claim 6) Mere catalog of elements, claim is incomplete in not setting forth relationship between elements. Use of reference numerals is not a defect. Section 608.01(m).

(Claim 7)

(a) no antecedent for suction line.

(b) use of period improper.

(c) not supported by disclosure, inaccurate.

(d) double inclusion, the valve casing and discharge pipe serve as the reservoir previously claimed.

(e) indefinite as to which valve is antecedent.

(f) indefinite as to which inlet is antecedent.

(Claim 8) Improper dependent claim is not including all elements of base claim, i.e. dependent claim is inconsistent with base claim. No proper antecedent for "said fluid responsive detecting means" since original claim called only for detecting means.

* Quoted from Patent Office Approved Answers. Some of these errors required careful study of the specifications and a good knowledge of how the device Works.

Case 31

Criticizing "Sloppy Claims" (Coated Pipe)

[See graphic in original printed material]

PROBLEM*

This part of the examination requires analysis of 6 claims proposed to be added to an application having the accompanying specification and drawing. Certain words and phrases in the claims have been underlined, and designated by a number in parentheses. Most, *but not all* of the underlined portions represent instances wherein the claims fail to comply with United States patent law or accepted claim writing practice. For each number before an underlined section, make a short statement as to why the underlined portion does represent one or more defects, if such is the case.

7. (1) *a pipe having chemical and heat resistant properties* comprising a base pipe material and (2) *a coating applied on the exterior, on the interior, or on both the exterior and interior of the concrete base*, said coating being formed from a composition consisting of a polyester resin, (3) *a granular filler material*, a polymerization catalyst, and (4) *a polymerization inhibitor selected from the group comprising hydroquinone, t-butyl catechol, or quinone*.

8. A pipe as defined in Claim 7 in which the granular filler material (5) *is sand*.

9. A method of treating a concrete pipe to impart wear resistance which comprises (6) *the steps of coating the inner surfaces of the pipe with a composition comprising an unsaturated polyester resin, styrene monomer, and* (7) *a catalyst selected from the group consisting of dicumyl peroxide and benzoyl peroxide, applying sand of 40-140 mesh size to the coating on the pipe, and curing the coating at 325°F*.

10. (8) *A pipe as defined in Claim 8 in which the sand is used in a ratio of 3.8 parts to one part of resin*.

11. A pipe as described in Claim 7 in which the composition includes (9) *a pigment to impart a desired color to the pipe*.

12. (10) *A novel pipe comprising concrete, and a composition of polyester resin, sand, and a catalyst curing agent*.

* Reprinted as given on Aug. 26, 1969, Exam.

Case 31

Criticizing "Sloppy Claims" (Coated Pipe)

COMMENTS*

1. (a) Lower case "a" improper as first word.

(b) No support for "heat resistant."

2. (a) Alternative expression is indefinite.

(b) No antecedent for "concrete."
3. "Granular material" is too broad since specification indicates that only certain materials (e.g. sand, gravel) will yield satisfactory results.
4. Improper Markush claiming by reason of (a) "comprising" and (b) "or."
5. No error involved.
6. Sequence of steps not supported by disclosure--sand is incorporated in composition prior to application to pipe.
7. No error--proper Markush group.
8. Claim 10 is an improper dependent claim because it is separated from a previous dependent claim. MPEP 608.01(n).
9. Addition of pigment renders the claim inconsistent with parent claim in which the composition is limited ("consisting of") to certain stated components.
10. (a) "Novel" is surplusage.

(b) Mere catalog of elements--does not set forth structural relationship of concrete and composition.

* Quoted from Patent Office Approved Answers.

Case 32

CRITICIZING "SLOPPY CLAIMS" (Golf Ball Cleaner)

[See graphic in original printed material]

Problem*

This part of the examination requires analysis of 5 claims proposed to be added to an application having the accompanying specification and drawing. Certain phrases in the claims have been underlined and designated by a number in parenthesis. Most, but not all of the underlined portions represent instances wherein the claims fail to comply with United States patent law or accepted claim writing practice. For each number before an underlined section, make a short statement as to why the

underlined portion does represent a defect, if such is the case.

3. A golf ball washer comprising (1) *a first housing*, said housing having (2) *at least one access opening* therethrough, means for selectively closing said opening, a first body of absorbent material fixed to a portion of said housing (3) *by adhesively securingsaid* first body to said housing on the inside thereof, a second body of absorbent material within (4) *said cylindrical housing*, means including a shaft mounting (5) *one of said first and second bodies for rotation* relative to said housing, said bodies defining an annular chamber therebetween, and means attached to said shaft for manually rotating said rotatable body; (6) *a detergent solution is contained within the absorbent material of said first and second bodies*.

4. A washer as set forth in Claim 3 wherein (7) *the first and second bodies cooperate with one another to form an annular chamber*.

5. A washer as defined in Claim 3 wherein (8) *the means for rotating said rotatable body is omitted*.

6. A washer as recited in Claim 3 in which the absorbent material of both said first and second bodies is (9) *selected from the group consisting of neoprene and sponge rubber*.

7. A washer as defined in Claim 3 wherein said means for rotating said rotatable body includes a crank attached to said shaft and (10) *means for rotating said crank*.

* Reprinted as given on March 31, 1970, Exam.

Case 32

Criticizing "Sloppy Claims" (Golf Ball Cleaner)

COMMENTS*

1. "First" is surplusage.
2. "At least one" is improper since there is no support in the disclosure for more than one.
3. Improper method limitation.
4. "Cylindrical" does not have antecedent basis in the claim.
5. The recitation is inaccurate and inconsistent with the preceding recitations in the claim, since the first body has previously been defined as being fixed; accordingly,

only the second body may rotate. [Here use of "is" causes the problem.]

6. The recitation is improper, since a claim must be the object of a single sentence starting with "I (or We) claim" (or the equivalent).

7. The recitation is a double inclusion of the previously recited element in Claim 3.

8. A dependent claim is not proper if it expressly omits a previously recited element since an essential characteristic of a proper dependent claim is that it shall include every limitation of the claim from which it depends.**

9. No error; proper Markush group.

10. The recitation is unsupported in the specification because there is no disclosure of structural means for rotating the crank. The specification only discloses the operator's hand for rotating the crank which cannot be claimed.

* Quoted from Patent Office Approved Answers.

* * Full credit was given for alternate answer drawn to Claim 5 being incomplete because it omits an essential element of the invention.

Case 33

CRITICIZING "SLOPPY CLAIMS" (Foam Breaking)

[See graphic in original printed material]

Problem*

This part of the examination requires analysis of claims proposed to be added to an application already on file in the United States Patent Office from which Claims 1-9 have been cancelled and having the [accompanying] specification and drawings directed to "Foam Breaking."

Certain words and phrases in the claims have been underlined and designated by number in parenthesis.

Some, but not all, of the underlined portions represent instances wherein the claims fail to comply with United States Patent Law or accepted claim writing practice.

... [S]tate whether each items (1) through (12) is "proper" or "Improper" and if "improper" why so.

10. An apparatus for converting foam to a liquid comprising a tank means to hold a quantity of liquid, (1) *outlet means or equivalent means* at the bottom of said tank means to pass liquid from said tank, said outlet means adapted to fill a container and (2) *draw liquid therefrom*, conduit means to remove foam from (3) *said filled containers*, said conduit means leading to said tank means, a solid plate having a surface thereof positioned substantially perpendicularly to the line of flow of said conduit means, (4) *means to draw said foam* through said conduit means at such a velocity that said foam impinges on said surface and will thereby be converted to (5) *fluid*, a constriction provided within said conduit means adjacent the outlet end thereof and adjacent said surface, the ratio of the distance from the end of said constriction to said surface to the diameter of said constriction being in the range of 0.25 to 1.

11. (6) *An apparatus for converting foam to a liquid comprising a tank means to hold a quantity of liquid, outlet means at the bottom of said tank means to pass liquid from said tank means, said outlet means adapted to fill a milk carton, conduit means to remove foam from milk carton, said conduit leading to said tank, and means to draw said foam through said conduit.*

12. A method of converting (7) *liquid to a foam* which comprises passing said foam through a substantially cylindrical constriction to increase the velocity of the foam passing therethrough and impinging the effluent from said constriction against a solid plate positioned substantially perpendicular to the line of flow of the impinging foam, at a velocity sufficiently great to break down the foam, (8) *the ratio of the distance between the effluent end of said constriction and said solid plate surface to the diameter of said constriction being in the range of 0.2 to 1.*

13. (9) *The product produced by the process of Claim 12.*

14. The method of Claim 11 wherein (10) *said ratio is in the range of 0.4 to 0.6.*

* Excerpted from instructions given on Sept. 15, 1970, Exam.

Case 33

CRITICIZING "SLOPPY CLAIMS" (FOAM BREAKING)

COMMENTS*

1. The recitation is improper because of the inclusion therein of "or equivalent means." Such inclusion is improper because (i) the expression is thus rendered alternative, MPEP 706.03(d), or (ii) the meaning of "equivalents thereof" is not necessary to cover the invention (2 points).

2. The phrase is improper because it is vague and indefinite, MPEP 706.03(d), or no antecedent for "outlet means" (2 points).
3. The phrase is improper because there is no antecedent basis therefor or because the scope is vague and indefinite. MPEP 706.03(d) (2 points).
4. The phrase is considered proper (2 points).
5. The phrase is improper. The term "fluid" is broader than the written disclosure. The term should be "liquid" because fluid includes gases. Also, no antecedent basis for "fluid" exists (2 points).
6. This phrase is improper because (i) it reads on the prior art described in the specification or (ii) it omits material limitations or (iii) it is misdescriptive (4 points).
7. The phrase is improper because the process described in the specification converts a foam to a liquid and not a liquid to a foam (2 points).
8. The phrase is considered proper (2 points).
9. The phrase is a proper product by process. MPEP 706.03 (e), but is so broad now that it reads on the prior art since it covers nothing more than a carton of liquid, such as milk (4 points).
10. The phrase is improper because it contains new matter 35 U.S.C. section 132, last sentence. The limitation "0.4" is not found in the specification and therefore cannot appear in the claims. MPEP 706.03(o) (2 points). In addition full credit was given if it was noted that Claim 11 was not a method claim or there is no antecedent basis in Claim 11 for the underlined portion.

* Quoted from Patent Office Approved Answers.

III Review and Catalog of "Sloppy Claims" Errors

The following chart lists the type of claim errors, or problems that were not errors, including the seven prior agents Exam questions given in the preceding examples, (appendix A cases 27-33). Also listed are a few additional types of errors not included in the Exam questions. The chart keys the errors to the pertinent sections of this book, and to each cases 27 to 33 where the error or possible error appeared.

Review and Catalog of Sloppy Claim Errors

Type of
Error

Appendix A Cases

			27	28	29	30	31	32	33
	Book	Suction	Steam	Bomb-	Self-	Coated	Golf	Foam	
	Section	Cleaner	and	Proof	Priming	Pipe	Ball	Breakin	
			Dry	Coating	Pump		Cleaner	g	
			Iron						
1.	Claim in two sentences	2:1, 2:8	x	x		x		x	
2.	Wrong verb form ("A suction cleaner includes...") or improper punctuation	2:1, 2:5, 2:8	x			x			
3.	Nonstatutory claim	1:1			x	x			
	a.Omnibus claim ("The invention as shown and described.")	1:2		x					
	b.Referri ng to drawing where unnecessa ry ("A as shown in	1:2 and 6:6		x					

	the drawing.")						
4.	Lack of antecedent and/or support in claim		x	x	x	x	x
	a. Inferential addition	3:8, 3:11	x	x	x	x	x
	g limitations not previously introduced ("... rear pair of wheels... " where number not previously recited)						
	b. Inferential addition	3:11	x	x	x	x	
	g element not previously introduced ("... rear pair of						

	wheels...							
	" where							
	number							
	not							
	previousl							
	y							
	recited)							
5.	Indefinit	8:8	x	x	x	x	x	x
	e							
	a.	3:11	x	x		x		
	Unclear							
	which of							
	two							
	previous							
	elements							
	reference							
	is							
	being							
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	("front							
	and rear							
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	y							
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	d;							
	reference							
	is							
	"said							
	wheel")							
	b.Alterna	3:13		x	x		x	x
	tive							
	expressio							
	ns							
	("such							
	as")							
	c.Differe	3:7,		x				

nt names 3:11

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elements

d.Referri 3:11

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claim

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f.Unbased 3:14

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	ve ("thick")							
6.	Lack of antecedent and/or support in specification	3:6, 3:7	x	x	x	x		x
	a. not described at all	3:6, 3:7	x	x	x		x	x
	b. Inconsistent with specification	3:6, 3:7	x			x	x	x
	c. Misdescriptive	3:6, 3:7		x			x	x
	d. Omits material limitations	3:6, 3:7						x
7.	Lack of antecedent and/or support in drawings	3:6	x	x				
8.	Catalog of elements	3:193: 24, 8:5	x	x		x	x	
	Lack of cooperation							
	a. Whole claim is	3:19	x	x		x	x	

	mere catalogue				
	b. Only some elements not connected	3:19	x	x	x
	(especially in dependent claims)				
9.	Functional too broad	3:21, 3:22	x	x	x
	a.No structure to support function ("adapted to be reciprocated")	3:21, 3:22	x	x	
	b.Single "means" claim	3:253: 25.1		x	
	c.Claiming result only	3:22			
	d. "Whereby" clause which does not necessarily	3:23		x	

	follow from rest of claims							
	e.Failure to distingui sh over prior art set forth in specifica tion		x			x		x
10.	Double inclusion of elements (especial ly in dependent claimscla im previousl y recites "reservoi r," then recites "casing" and "pipe," which are "the reservoir ")	3:22, 3:25 3: 25.1, 6:7	x	x		x		x
11.	Surplusag	2:7		x	x		x	x

	e (laudator y statement s, i.e., "new," "better, " etc.					
12.	Markush	6:2	x	x		x
	a.Mechani cal group	6:2	x			
	b.Chemica ls not in art- recognize d class	6:2	x			
13.	Product- by- process is proper although product can be described	5:2		x		x
	otherwise					
14.	Obvious method of making product (i.e., novelty only in product)	4:4	x			

15. Trademark and proprietary material	6:3					
16. Positively reciting workpiece	3:3					
17. Positively reciting holes, grooves, etc.	3:15			x		
18. Dependent claim errors	2:9					
a. Inconsistent with parent	2:9	x		x		x x
b. Alternative (i.e., depends on more than one independent claim)	2:9	x		x		
c. Incorrect statutory class-adding method	2:9			x		

	limitation to apparatus claim and vice versa				
	d.Improper location (not sufficiently close to parent claim)	2:3		x	x
	e.Refers to element absent in parent (see 4.b., supra)	3:11, 2:9	x		x
	f.Deletes element from parent				x
19.	Incomplete claimclaim lacks an element the specification and/or	3:193: 24, 8:7			x

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supra.

20. Negative 3:5
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21. Reference 3:10

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 "
 rejection
23. Mental 4:9
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- required
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 the steps
24. Design 5:3
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 3, supra)
25. Old 8:4
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26. Duplicate 8:2
 claiming t
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matter
27. Old
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of in
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(i.e.,
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28. Attemptin 2:6,
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(Markush
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and C";
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be "D")
29. Unnecessa x
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limitation
in
apparatus
claim

FOOTNOTES:

Footnote 1. R. Holmquist et al., *Higher-Primate Phylogeny--Why Can't We Decide?* *Molecular Biology & Evolution*, 5:201 (1988); A. Wilson, *The Molecular Basis of Evolution*, *Scientific American*, 253:164(1985).

Footnote 2. "A method according to Claim 1, wherein said predetermined termini are blunt end and said joining conditions include enzymatic ligation."

Footnote 1. These notes are not part of the suggested typical answers, but rather further comments and suggestions for students. See section 3:11.

Footnote 2. See rule 7 5(d) and section 3:2:

The... claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the descriptions...

In these problem claims, when the specification is given, watch very carefully for discrepancies between the specification and the problem claims. It would help to find the place in the specification where each term in the claim is described and underline, so as to locate ambiguities and misdescriptions. Even though the number of wheels probably is not important, it would not be *improper* to claim a pair if supported by the description.

Footnote 3. See section 3:11. This should have been "a nozzle."

Footnote 4. See note 2, *supra*.

Footnote 5. See section 3:11.

Footnote 6. See section 3:22. This may be a debatable point, as "adapted to" phrases are used fairly often in practice, but quite obviously such usage should be avoided on the Agent's Exam. Make certain that sufficient structure is included to support functional statements.

Footnote 7. The drive means does *include* a cam race (22), as well as other elements. There is nothing wrong with claiming a cam face when two are shown, if the invention can work with one. See section 3:8. Also, this is not an attempt to

claim "a hole" positively (section 3:15), since the *race* can be considered a structural unit including the walls of the groove, which actually do the guiding.

☛Footnote 8. This should read "including" rather than "includes." "Which includes" would be a satisfactory alternative. There is nothing wrong with the transitional phrase "including" rather than "comprising," although the latter is much more common, and is almost conventional for mechanical cases. See section 2:5. Note: watch for little things (section 2:2), capital letters, periods, punctuation, verb tenses.

☛Footnote 9. Rule 75(c). See section 2:9.

☛Footnote 10. See section 2:9.

☛Footnote 11. See section 3:9.

☛Footnote 12. See note 2, *supra*.

☛Footnote 13. This would probably be immaterial to the invention, but it is not improper in this context to claim too narrowly.

☛Footnote 14. See section 3:19.

☛Footnote 15. See section 2:2.

☛Footnote 16. Although it is described in the last paragraph of the description as an alternative.

☛Footnote 17. Rule 83. See section 3:6.

☛Footnote 18. Even though the suction elements are *per se* conventional, either they should be included or, preferably, the claim should be in *Jepson* form. See section 6:8.

☛Footnote 19. See section 2:7.

☛Footnote 20. Rule 75(d).

☛Footnote 21. Section 6:3.

* Reprinted as given on the Feb. 13, 1968, Exam.

* Note: there are fewer errors here than in the previous two problems, but they are more sophisticated. Also, many more require knowledge of the law.

* Reprinted as given on the Nov. 19, 1968, Exam.

* Note: some of these errors required careful study of the specifications and a good knowledge of how the device works.

* Reprinted as given on Aug. 26, 1969, Exam.

App. B Appendix B

Appendix B. The Art of Describing Structures in Patent Drawings Including a Glossary of Mechanical Terms

* Reprinted with permission from material prepared for the Practising Law Institute's Patent Agent's Examination Review Course. Mr Applebaum is Patent Counsel, United States Navy Applied Science Laboratory. Edited by John D. Kaufman.

The effective communication of facts and ideas is the essence of the role of the patent attorney or agent. As amanuensis ("the hand of another") of the inventor, the patent attorney must select from the vast wealth that constitutes the words and phrases of the language, to convey the precise meaning that is appropriate to the application at hand, in the light of the prior art of record.

Three "languages"--three stylized forms of communication--are prescribed by the Rules of Practice: The specification must fully, clearly, and concisely describe the invention (Rule 71) and thus constitutes our primary language. The claims must particularly point out and distinctly claim what the *applicant* (not someone else) regards as his invention (Rule 75), thus being a precis of the salient portions of the specification. And, third, the drawing must show every feature of the invention claimed (Rule 83), depicting what is essential in the specification and claims. It thus becomes necessary for patent students to acquire facility in each of these three "languages," and to be able to translate from one to another.

No one of the three "languages" is a logical starting point for the translation process. However, since the pictorial is a fundamental base, we can ideally commence with a drawing and translate the invention shown therein to the language of claims. The development will, however, be limited to the translation from drawings to a detailed description (or specification) to avoid premature and incomplete treatment of the substantive and procedural complexities of claim drafting, which are discussed in this treatise.

This process of translating from drawings to words involves the understanding of the elements of patent drawings (as distinguished from other drawing formats), the understanding of the elements of mechanics, and the establishment or

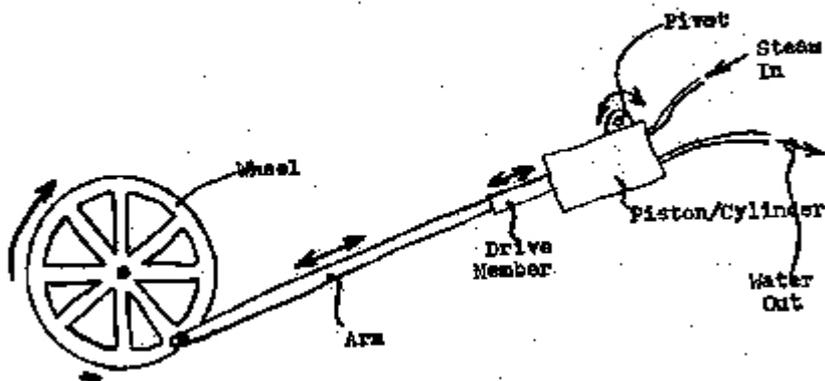
reinforcement of a basic and minimal vocabulary. With this learned, the words can be put together to provide a coherent and clear description.

First, it *must* be noted that patent drawings are stylized, simple, and generally pictorial: Extracting pertinent phrases from the Rules of Practice:

- * The drawing must show every feature of the invention.
- * When the invention is an improvement, the drawing must show the invention disconnected from the old structure, and in another view must show so much only of the old structure as will suffice to show the connection of the invention with what is old.
- * Surface shading should be open.
- * Sectional shading is by oblique parallel lines.
- * Solid black should not be used for sectional or surface shading.
- * Drawings should have the fewest lines possible consistent with clearness.
- * The plane on which a sectional view is taken should be indicated on the general view by a broken or dotted line, designated by numerals corresponding to the number of the sectional view.
- * Heavy lines on the shade side of objects should be used; light comes at 45°; from the upper left hand corner.
- * The same numeral is a reference to the same part.
- * Certain symbols, illustrated in the Rules of Practice, are accepted as conventional (these should be known).

A description of structure, in the language we call "specification," is a grouping of words and phrases (each word or phrase being identified as an *element* "island"), at times qualified by modifying appendage words and phrases (sub-elements or "peninsulas" of the island) AND LINKING WORDS AND PHRASES, COUPLING OR PROVIDING A BRIDGE FROM ONE ISLAND TO AT LEAST ONE OTHER ISLAND. Without this coupling or bridging, an "island" is left floating, and is not a proper part of the description: merely listing the "islands" *without including the coupling bridges*, results in a fatally defective description, in that it is no more than a listing or cataloging. (For example, do *not* say "... a motor, a rotary cam and a cam follower...." Instead, say "... a motor, a rotary cam driven by the motor, and a cam follower engaging the cam...." Note especially the terms below under the heading

"Placement (relation)." One may find the following useful in successfully erecting and coupling together an integral of islands, peninsulas and bridges:



FOUR QUESTIONS

1. What is it? What is the element's name?

EXAMPLE: "An arm...."

2. Where is it located?

EXAMPLE: "An arm... having one end ... mounted on... said flywheel and the other end... mounted... on said drive member..."

3. What does it do?

EXAMPLE: "An arm... having one end... mounted on... said flywheel and the other end... mounted... on said drive member, for rotating said flywheel upon reciprocation of said drive member..."

4. How does it do what it does?

EXAMPLE: "An arm freely reciprocable having one end pivotally mounted on the periphery of said flywheel and the other end fixedly mounted for reciprocation therewith on said drive member, for rotating said flywheel upon reciprocation of said drive member...."

NOTE: The "arm" as described is really a "pitman" or connecting rod as it operates, e.g., on a steam locomotive. Similar descriptive language for the wheel and drive member must have preceded the description of the arm.

To build this description of structure from the drawings, the writer must have a vocabulary of general and "mechanical" words to constitute his translation of the elements and connectives or "bridges" he sees in the drawing. The following terms, grouped loosely by function, are probably a fairly comprehensive vocabulary of many terms used in the mechanical arts and patents.

GENERAL AND MECHANICAL TERMS

The following terms are grouped loosely by function. The list is illustrative rather than comprehensive.

Structure

arm

bail

band

base

beam

cantilever

simple

belt

blade

blower

body

boom

branch

carriage

case

chute

column

container

conveyor

cover

device

die

drum

enclosure

finger

frame

gauges

handle

head

housing

jacket

jaw

leg

member

neck

object

particle

partition

platform

plug

rib

ring

rod

shell

shoe

shoulder

sleeve

step

strut

track

truss

upright

wall

Mounting Method

attach

bolt

couple

demountably

engage

fix

hold

lock

mount

secure

set

weld

Fastener

bolt

cable

clamp

connection

coupling

dowel

hold down

hook

joint

universal

keeper

key

latch

lock

lug

nail

nut

pin

rivet

screw

seam

Bearing

antifriction

ball

needle

roller

tapered

bushing

fulcrum

guide

journal

pivot

radial

seal

seat

sliding

support

thrust

Spring

air

bias

element

coil

helical

compression

tension

leaf

torsional

Numbers

multiplicity

plurality

Placement (relation)

adjacent

aligned

attached

axial

complementary

concentric

eccentric

contiguous

distal-proximate

divided

engaged

extended

integral

intermediate

interposed

juxtaposed

located

mating

meshing

offset

opposed

overlapping

perpendicular

parallel

positioned

projecting

removable

resting

retractable

spacer

staggered

superposed

supported

surrounding

symmetrical

Voids (having a void)

aperture

bore

cavity

chamber

duct

groove

hole

hollow

notch

opening

orifice

passage

slit

slot

Shape

A-... Z- (etc.)

("a C-shaped member")

annular

arch

arcuate

barrel

bucket

channel

circular

concave-convex

conical

corrugated

cup

cylinder

depression

disc

dome

elliptical

fin

flange

fold

fork

helical

hook

notch

oblong

oval

parabolic

plane

rectangular

round

sheet

shelf

sinusoidal

spherical

square

taper

triangular

trough

tubular

twist

web

wedge

Material properties

dense

elastic

enlarged

flexible

foraminous

insulation

opaque porous

resilient

rigid

translucent

transparent

Optical

bezel

bulb

fluorescent

incandescent

lamp

light

beam

ray

reflection

refraction

transmission

window

Fluid Flow

accumulator

aspirator

bellows

conduit

connector

convection

cylinder

piston

rod

dashpot

diaphragm

discharge

dispenser

filter

fitting

flue

gasket

hose

hydraulic

medium

nozzle

outlet

pipe

plunger

port

inlet

outlet

pump

centrifugal

gear

piston

vane

reservoir

seal

siphon

tank

tube

valve

ball-check

control

gate

shut-off

Position

angle

oblique

obtuse

bottom-top

close-open

crest

edge

external-internal

face

film

horizontal-
vertical

layer

lower-upper

normal to-parallel

rim

section

slant

surface

tilt

Materials

adhesive

concrete

cork

fabric

fibre

insulation

liquid

metal

plastic

refractory

rubber

sand

screen

wood

Electrical

contact

electrode

electromagnet

filament

insulator

lead

line cord

motor

power supply

resistance

socket

switch

transformer

wire

Rotation to translation

bell crank

cam

connection rod

crank arm

jack

radius bar

screw

winch

yoke

Translation to translation

inclined plane

lever

linkage

parallel

straight line

motion

toggle

wedge

Sequence

alternate

cyclic

interval

lag-lead

Movement

compression

downward-upward

drag

eccentric

emergent

extensible

extrude

grinding

impact

inertia

longitudinal

meeting

pressing

propelling

pulverize

sagging

severing

terminating

torque

transverse

vibrating

Rotation to rotation

brake

band

disc

shoe

chain

clutch

centrifugal

sprag

toothed

one-way

drive

belt

pulley

sheave

toothed

friction

gear

bevel

crown

internal

non-circular

pinion

right angle

spur

worm and wheel

intermittent

escapement

geneva

pawl and ratchet pendulum

journal

variable speed

flexible coupling

sprocket

If one knew all of these terms and what they mean, he would be well able to write the vast majority of mechanical patent claims, *i.e.*, to translate these key words and phrases for naming the elements (see section 3:7) and their connectives and interrelationships (see sections 3:19-3:21) into good mechanical *combination* claims.

No two writers need generate descriptions from drawings in the same manner. But these procedural steps may be useful in writing mechanical claims.

1. Start with a title. Name or define generically the thing to be described (see section 3:7).
2. List the elements and the subelements of the thing (see section 3:3). This list can be tabular, or can be marked on the drawing, with lead lines to the part or the coupling element defined.
3. Note particularly how the elements are combined or associated with each other (see sections 3:19-3:21). This is a vital step. The description must include the structure that establishes how the elements function and cooperate with each other. Otherwise, it is a mere catalog of elements (see sections 3:15 and 3:13).
4. Numerate where numeration is significant: "One, two, etc."; "a pair"; "a plurality"; "at least two"; a "first--" and later a "second--" etc. are very useful descriptions (see section 3:8). "... " when any number, one or more, will do.

Finally, and most important: Recite the elements and their connectives in a logical order, rather than at random (see section 3:18). There are many possible logical orders: Recite from the base up, as the thing might be erected. Recite in the probable sequence of assembly of the thing. Recite the elements and their connectives in the order of their operation. Or recite the main body of the element, followed by a systematic description of the appendage elements--making certain to include the connective elements. And, usually, try to avoid describing the thing when it is motion--try to describe it when it is at a rest point.

Of course, avoid all of the negative caveats as best you can: alternatives (see

section 3:13); negative limitation except for emergencies (see section 3:5); "unduly functional" expressions (see section 3:22); "vague and indefinite" expressions, including ambiguous words or "unbased comparatives" such as "large" (see sections 3:11 and 8:8); the twin evils of incompleteness (see section 8:7) and unnecessary, superfluous, needless, redundant prolixity (see section 8:9); and all the other evils described in the book.

In gaining skill in translating drawings to description, there is no substitute for practice. Write-- and then critically review your writing. Write--and critically review the writing of another as he reviews your description. The reward will be improved skill in the most vital of our efforts, which fundamentally comes down to the communication of intelligence.

Appendix C1. Primary Sources: Title 35 United States Code (Selected Sections)

35 U.S.C. ?100 Definitions

When used in this title unless the context otherwise indicates--

- (a) The term "invention" means invention or discovery.
- (b) The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.
- (c) The terms "United States" and "this country" mean the United States of America, its territories and possessions.
- (d) The word "patentee" includes not only the patentee to whom the patent was issued but also the successors in title to the patentee.
- (e) The term "third-party requester" means a person requesting ex parte reexamination under section 302 or inter partes reexamination under section 311 who is not the patent owner.

35 U.S.C. ?101 Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. ?102 Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless--

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language; or

(f) he did not himself invent the subject matter sought to be patented, or

(g) (1) during the course of an interference conducted under section or section 291, another inventor involved therein establishes, to the extent permitted in section 104, that before such person's invention thereof the invention was made by such other inventor and not abandoned, suppressed, or concealed, or

(2) before such person's invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it. In determining priority of invention under this subsection, there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

35 U.S.C. ?103 Conditions for patentability; non-obvious subject matter

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject

matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(b) (1) Notwithstanding subsection (a), and upon timely election by the applicant for patent to proceed under this subsection, a biotechnological process using or resulting in a composition of matter that is novel under section 102 and nonobvious under subsection (a) of this section shall be considered nonobvious if--

(A) claims to the process and the composition of matter are contained in either the same application for patent or in separate applications having the same effective filing date; and

(B) the composition of matter, and the process at the time it was invented, were owned by the same person or subject to an obligation of assignment to the same person.

(2) A patent issued on a process under paragraph (1)--

(A) shall also contain the claims to the composition of matter used in or made by that process, or

(B) shall, if such composition of matter is claimed in another patent, be set to expire on the same date as such other patent, notwithstanding section 154.

(3) For purposes of paragraph (1), the term "biotechnological process" means--

(A) a process of genetically altering or otherwise inducing a single- or multi-celled organism to--

(i) express an exogenous nucleotide sequence,

(ii) inhibit, eliminate, augment, or alter expression of an endogenous nucleotide sequence, or

(iii) express a specific physiological characteristic not naturally associated with said organism;

(B) cell fusion procedures yielding a cell line that expresses a specific protein, such as a monoclonal antibody; and

(C) a method of using a product produced by a process defined by subparagraph (A) or (B), or a combination of subparagraphs (A) and (B).

(c) (1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

(2) For purposes of this subsection, subject matter developed by another person and a claimed invention shall be deemed to have been owned by the same person or subject to an obligation of assignment to the same person if--

(A) the claimed invention was made by or on behalf of parties to a joint research agreement that was in effect on or before the date the claimed invention was made;

(B) the claimed invention was made as a result of activities undertaken within the scope of the joint research agreement; and

(C) the application for patent for the claimed invention discloses or is amended to disclose the names of the parties to the joint research agreement.

(3) For purposes of paragraph (2), the term "joint research agreement" means a written contract, grant, or cooperative agreement entered into by two or more persons or entities for the performance of experimental, developmental, or research work in the field of the claimed invention.

35 U.S.C. ?112 Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. §119 Benefit of earlier filing date; right of priority

(a) An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, or in a WTO member country, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign country, if the application in this country is filed within twelve months from the earliest date on which such foreign application was filed; but no patent shall be granted on any application for patent for an invention which had been patented or described in a printed publication in any country more than one year before the date of the actual filing of the application in this country, or which had been in public use or on sale in this country more than one year prior to such filing.

(b) (1) No application for patent shall be entitled to this right of priority unless a claim is filed in the Patent and Trademark Office, identifying the foreign application by specifying the application number on that foreign application, the intellectual property authority or country in or for which the application was filed, and the date of filing the application, at such time during the pendency of the application as required by the Director.

(2) The Director may consider the failure of the applicant to file a timely claim for priority as a waiver of any such claim. The Director may establish procedures, including the payment of a surcharge, to accept an unintentionally delayed claim under this section.

(3) The Director may require a certified copy of the original foreign application, specification, and drawings upon which it is based, a translation if not in the English language, and such other information as the Director considers necessary. Any such certification shall be made by the foreign intellectual property authority in which the

foreign application was filed and show the date of the application and of the filing of the specification and other papers.

(c) In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed application in the same foreign country instead of the first filed foreign application, provided that any foreign application filed prior to such subsequent application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority.

(d) Applications for inventors' certificates filed in a foreign country in which applicants have a right to apply, at their discretion, either for a patent or for an inventor's certificate shall be treated in this country in the same manner and have the same effect for purpose of the right of priority under this section as applications for patents, subject to the same conditions and requirements of this section as apply to applications for patents, provided such applicants are entitled to the benefits of the Stockholm Revision of the Paris Convention at the time of such filing.

(e) (1) An application for patent filed under section 111(a) or section 363 of this title for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in a provisional application filed under section 111(b) of this title, by an inventor or inventors named in the provisional application, shall have the same effect, as to such invention, as though filed on the date of the provisional application filed under section 111(b) of this title, if the application for patent filed under section 111(a) or section 363 of this title is filed not later than 12 months after the date on which the provisional application was filed and if it contains or is amended to contain a specific reference to the provisional application. No application shall be entitled to the benefit of an earlier filed provisional application under this subsection unless an amendment containing the specific reference to the earlier filed provisional application is submitted at such time during the pendency of the application as required by the Director. The Director may consider the failure to submit such an amendment within that time period as a waiver of any benefit under this subsection. The Director may establish procedures, including the payment of a surcharge, to accept an unintentionally delayed submission of an amendment under this subsection during the pendency of the application.

(2) A provisional application filed under section 111(b) of this title may not be relied upon in any proceeding in the Patent and Trademark Office unless the fee set forth in subparagraph (A) or (C) of section 41(a)(1) of this title has been paid.

(3) If the day that is 12 months after the filing date of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, the period of pendency of the provisional application shall be extended to the next succeeding

secular or business day.

(f) Applications for plant breeder's rights filed in a WTO member country (or in a foreign UPOV Contracting Party) shall have the same effect for the purpose of the right of priority under subsections (a) through (c) of this section as applications for patents, subject to the same conditions and requirements of this section as apply to applications for patents.

(g) As used in this section--

(1) the term "WTO member country" has the same meaning as the term is defined in section 104(b)(2) of this title; and

(2) the term "UPOV Contracting Party" means a member of the International Convention for the Protection of New Varieties of Plants.

35 U.S.C. ?121 Divisional applications

If two or more independent and distinct inventions are claimed in one application, the Director may require the application to be restricted to one of the inventions. If the other invention is made the subject of a divisional application which complies with the requirements of section 120 of this title it shall be entitled to the benefit of the filing date of the original application. A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a result of such a requirement, shall not be used as a reference either in the Patent and Trademark Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application. If a divisional application is directed solely to subject matter described and claimed in the original application as filed, the Director may dispense with signing and execution by the inventor. The validity of a patent shall not be questioned for failure of the Director to require the application to be restricted to one invention.

35 U.S.C. ?134 Appeal to the Board of Patent Appeals and Interferences

(a) Patent applicant. An applicant for a patent, any of whose claims has been twice rejected, may appeal from the decision of the primary examiner to the Board of Patent Appeals and Interferences, having once paid the fee for such appeal.

(b) Patent owner. A patent owner in any reexamination proceeding may appeal from the final rejection of any claim by the primary examiner to the Board of Patent Appeals and Interferences, having once paid the fee for such appeal.

(c) Third-party. A third-party requester in an inter partes proceeding may appeal to the Board of Patent Appeals and Interferences from the final decision of the primary examiner favorable to the patentability of any original or proposed amended or new claim of a patent, having once paid the fee for such appeal.

35 U.S.C. ?161 Patent for plants

Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title.

The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided.

35 U.S.C. ?162 Description, claim

No plant patent shall be declared invalid for noncompliance with section 112 of this title if the description is as complete as is reasonably possible.

The claim in the specification shall be in formal terms to the plant shown and described.

35 U.S.C. ?171 Patents for designs

Whoever invents any new, original and ornamental design for an article of manufacture may obtain a patent therefor, subject to the conditions and requirements of this title.

The provisions of this title relating to patents for inventions shall apply to patents for designs, except as otherwise provided.

35 U.S.C. ?271 Infringement of patent

(a) Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.

(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

(c) Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process,

constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

(d) No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following:

(1) derived revenue from acts which if performed by another without his consent would constitute contributory infringement of the patent;

(2) licensed or authorized another to perform acts which if performed without his consent would constitute contributory infringement of the patent;

(3) sought to enforce his patent rights against infringement or contributory infringement;

(4) refused to license or use any rights to the patent; or

(5) conditioned the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.

(e) (1) It shall not be an act of infringement to make, use, offer to sell, or sell within the United States or import into the United States a patented invention (other than a new animal drug or veterinary biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Act of March 4, 1913) which is primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes involving site specific genetic manipulation techniques) solely for uses reasonably related to the development and submission of information under a Federal law which regulates the manufacture, use, or sale of drugs or veterinary biological products.

(2) It shall be an act of infringement to submit--

(A) an application under section 505(j) of the Federal Food, Drug, and Cosmetic Act or described in section 505(b)(2) of such Act for a drug claimed in a patent or the use of which is claimed in a patent, or

(B) an application under section 512 of such Act or under the Act of March 4, 1913

(21 U.S.C. 151-158) for a drug or veterinary biological product which is not primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes involving site specific genetic manipulation techniques and which is claimed in a patent or the use of which is claimed in a patent, if the purpose of such submission is to obtain approval under such Act to engage in the commercial manufacture, use, or sale of a drug or veterinary biological product claimed in a patent or the use of which is claimed in a patent before the expiration of such patent.

(3) In any action for patent infringement brought under this section, no injunctive or other relief may be granted which would prohibit the making, using, offering to sell, or selling within the United States or importing into the United States of a patented invention under paragraph (1).

(4) For an act of infringement described in paragraph (2)--

(A) the court shall order the effective date of any approval of the drug or veterinary biological product involved in the infringement to be a date which is not earlier than the date of the expiration of the patent which has been infringed,

(B) injunctive relief may be granted against an infringer to prevent the commercial manufacture, use, offer to sell, or sale within the United States or importation into the United States of an approved drug or veterinary biological product, and

(C) damages or other monetary relief may be awarded against an infringer only if there has been commercial manufacture, use, offer to sell, or sale within the United States or importation into the United States of an approved drug or veterinary biological product.

The remedies prescribed by subparagraphs (A), (B), and (C) are the only remedies which may be granted by a court for an act of infringement described in paragraph (2), except that a court may award attorney fees under section 285.

(5) Where a person has filed an application described in paragraph (2) that includes a certification under subsection (b)(2)(A)(iv) or (j)(2)(A)(vii)(IV) of section 505 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355), and neither the owner of the patent that is the subject of the certification nor the holder of the approved application under subsection (b) of such section for the drug that is claimed by the patent or a use of which is claimed by the patent brought an action for infringement of such patent before the expiration of 45 days after the date on which the notice given under subsection (b)(3) or (j)(2)(B) of such section was received, the courts of the United States shall, to the extent consistent with the Constitution, have subject matter jurisdiction in any action brought by such person under section 2201 of title 28 for a declaratory judgment that such patent is invalid or not infringed.

(f) (1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

(g) Whoever without authority imports into the United States or offers to sell, sells, or uses within the United States a product which is made by a process patented in the United States shall be liable as an infringer, if the importation, offer to sell, sale, or use of the product occurs during the term of such process patent. In an action for infringement of a process patent, no remedy may be granted for infringement on account of the noncommercial use or retail sale of a product unless there is no adequate remedy under this title for infringement on account of the importation or other use, offer to sell, or sale of that product. A product which is made by a patented process will, for purposes of this title, not be considered to be so made after--

(1) it is materially changed by subsequent processes; or

(2) it becomes a trivial and nonessential component of another product.

(h) As used in this section, the term "whoever" includes any State, any instrumentality of a State, and any officer or employee of a State or instrumentality of a State acting in his official capacity. Any State, and any such instrumentality, officer, or employee, shall be subject to the provisions of this title in the same manner and to the same extent as any nongovernmental entity.

(i) As used in this section, an "offer for sale" or an "offer to sell" by a person other than the patentee, or any designee of the patentee, is that in which the sale will occur before the expiration of the term of the patent.

35 U.S.C. §281 Remedy for infringement of patent

A patentee shall have remedy by civil action for infringement of his patent.

35 U.S.C. §282 Presumption of validity; defenses

A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. Notwithstanding the preceding sentence, if a claim to a composition of matter is held invalid and that claim was the basis of a determination of nonobviousness under section 103(b)(1), the process shall no longer be considered nonobvious solely on the basis of section 103(b)(1). The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.

The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

- (1) Noninfringement, absence of liability for infringement or unenforceability,
- (2) Invalidity of the patent or any claim in suit on any ground specified in part II of this title as a condition for patentability,
- (3) Invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112 or 251 of this title.
- (4) Any other fact or act made a defense by this title.

In actions involving the validity or infringement of a patent the party asserting invalidity or noninfringement shall give notice in the pleadings or otherwise in writing to the adverse party at least thirty days before the trial, of the country, number, date, and name of the patentee of any patent, the title, date, and page numbers of any publication to be relied upon as anticipation of the patent in suit or, except in actions in the United States Claims Court, as showing the state of the art, and the name and address of any person who may be relied upon as the prior inventor or as having prior knowledge of or as having previously used or offered for sale the invention of the patent in suit. In the absence of such notice proof of the said matters may not be made at the trial except on such terms as the court requires. Invalidity of the extension of a patent term or any portion thereof under section 154(b) or 156 of this title because of the material failure--

- (1) by the applicant for the extension, or
- (2) by the Director,

to comply with the requirements of such section shall be a defense in any action involving the infringement of a patent during the period of the extension of its term and shall be pleaded. A due diligence determination under section 156(d)(2) is not subject to review in such an action.

35 U.S.C. §283 Injunction

The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable.

35 U.S.C. §284 Damages

Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed. Increased damages under this paragraph shall not apply to provisional rights under section 154(d) of this title.

The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

Appendix C2. Primary Sources: Rules of Practice (Selected Sections)

37 C.F.R. §1.16 National application filing, search, and examination fees.

(a) Basic fee for filing each application under 35 U.S.C. 111 for an original patent, except design, plant, or provisional applications:

(1) For an application filed on or after December 8, 2004:

By a small entity (§1.27(a)) if the application is submitted in compliance with the Office electronic filing system (§1.27(b)(2))--\$ 75.00.

By a small entity (§1.27(a)) \$ 150.00.

By other than a small entity \$ 300.00.

(2) For an application filed before December 8, 2004:

By a small entity (?1.27(a)) \$ 395.00.

By other than a small entity \$ 790.00.

(b) Basic fee for filing each application for an original design patent:

(1) For an application filed on or after December 8, 2004:

By a small entity (?1.27(a)) \$ 100.00.

By other than a small entity \$ 200.00.

(2) For an application filed before December 8, 2004:

By a small entity (?1.27(a)) \$ 175.00.

By other than a small entity \$ 350.00.

(c) Basic fee for filing each application for an original plant patent:

(1) For an application filed on or after December 8, 2004:

By a small entity (?1.27(a)) \$ 100.00.

By other than a small entity \$ 200.00.

(2) For an application filed before December 8, 2004:

By a small entity (?1.27(a)) \$ 275.00.

By other than a small entity \$ 550.00.

(d) Basic fee for filing each provisional application:

By a small entity (?1.27(a)) \$ 100.00.

By other than a small entity \$ 200.00.

(e) Basic fee for filing each application for the reissue of a patent:

(1) For an application filed on or after December 8, 2004:

By a small entity (?1.27(a)) \$ 150.00.

By other than a small entity \$ 300.00.

(2) For an application filed before December 8, 2004:

By a small entity (?1.27(a)) \$ 395.00.

By other than a small entity \$ 790.00.

(f) Surcharge for filing any of the basic filing fee, the search fee, the examination fee, or the oath or declaration on a date later than the filing date of the application, except provisional applications:

By a small entity (?1.27(a)) \$ 65.00

By other than a small entity \$ 130.00

(g) Surcharge for filing the basic filing fee or cover sheet (?1.51(c)(1)) on a date later than the filing date of the provisional application:

By a small entity (?1.27(a)) \$ 25.00.

By other than a small entity \$ 50.00.

(h) In addition to the basic filing fee in an application, other than a provisional application, for filing or later presentation at any other time of each claim in independent form in excess of 3:

By a small entity (?1.27(a)) \$ 100.00.

By other than a small entity \$ 200.00.

(i) In addition to the basic filing fee in an application, other than a provisional application, for filing or later presentation at any other time of each claim (whether dependent or independent) in excess of 20 (note that ?1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (?1.27(a)) \$ 25.00.

By other than a small entity \$ 50.00.

(j) In addition to the basic filing fee in an application, other than a provisional application, that contains, or is amended to contain, a multiple dependent claim, per application:

By a small entity (?1.27(a)) \$ 180.00.

By other than a small entity \$ 360.00.

(k) Search fee for each application filed under 35 U.S.C. 111 on or after December 8, 2004, for an original patent, except design, plant, or provisional applications:

By a small entity (?1.27(a)) \$ 250.00.

By other than a small entity \$ 500.00.

(l) Search fee for each application filed on or after December 8, 2004, for an original design patent:

By a small entity (?1.27(a)) \$ 50.00.

By other than a small entity \$ 100.00.

(m) Search fee for each application filed on or after December 8, 2004, for an original plant patent:

By a small entity (?1.27(a)) \$ 150.00.

By other than a small entity \$ 300.00.

(n) Search fee for each application filed on or after December 8, 2004, for the reissue of a patent:

By a small entity (?1.27(a)) \$ 250.00.

By other than a small entity \$ 500.00.

(o) Examination fee for each application filed under 35 U.S.C. 111 on or after December 8, 2004, for an original patent, except design, plant, or provisional applications:

By a small entity (?1.27(a)) \$ 100.00.

By other than a small entity \$ 200.00.

(p) Examination fee for each application filed on or after December 8, 2004, for an original design patent:

By a small entity (§1.27(a)) \$ 65.00.

By other than a small entity \$ 130.00.

(q) Examination fee for each application filed on or after December 8, 2004, for an original plant patent:

By a small entity (§1.27(a)) \$ 80.00.

By other than a small entity \$ 160.00.

(r) Examination fee for each application filed on or after December 8, 2004, for the reissue of a patent:

By a small entity (§1.27(a)) \$ 300.00.

By other than a small entity \$ 600.00.

(s) Application size fee for any application under 35 U.S.C. 111 filed on or after December 8, 2004, the specification and drawings of which exceed 100 sheets of paper, for each additional 50 sheets or fraction thereof (see §1.52(f) for applications submitted in whole or in part on an electronic medium):

By a small entity (§1.27(a)) \$ 125.00

By other than a small entity \$ 250.00

37 C.F.R. §1.51 General requisites of an application.

(a) Applications for patents must be made to the Director of the United States Patent and Trademark Office.

(b) A complete application filed under §1.53(b) or §1.53(d) comprises:

(1) A specification as prescribed by 35 U.S.C. 112, including a claim or claims, see §§ 1.71 to 1.77;

(2) An oath or declaration, see §§ 1.63 and 1.68;

(3) Drawings, when necessary, see §§ 1.81 to 1.85; and

(4) The prescribed filing fee, search fee, examination fee, and application size fee, see §1.16.

(c) A complete provisional application filed under §1.53(c) comprises:

(1) A cover sheet identifying:

(i) The application as a provisional application,

(ii) The name or names of the inventor or inventors, (see §1.41(a)(2)),

(iii) The residence of each named inventor,

(iv) The title of the invention,

(v) The name and registration number of the attorney or agent (if applicable),

(vi) The docket number used by the person filing the application to identify the application (if applicable),

(vii) The correspondence address, and

(viii) The name of the U.S. Government agency and Government contract number (if the invention was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government);

(2) A specification as prescribed by the first paragraph of 35 U.S.C. 112, see §1.71;

(3) Drawings, when necessary, see §§ 1.81 to 1.85; and

(4) The prescribed filing fee and application size fee, see §1.16.

(d) Applicants are encouraged to file an information disclosure statement in nonprovisional applications. See §1.97 and §1.98. No information disclosure statement may be filed in a provisional application.

37 C.F.R. §1.58 Chemical and mathematical formulae and tables.

(a) The specification, including the claims, may contain chemical and mathematical formulae, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables, but the same tables may only be included in both the drawings and description portion of the specification if the application was filed under 35 U.S.C. 371. Claims may contain tables either if necessary to conform to 35 U.S.C. 112 or if otherwise found to be desirable.

(b) Tables that are submitted in electronic form (§ 1.96(c) and 1.821(c)) must maintain the spatial relationships (e.g., alignment of columns and rows) of the table

elements when displayed so as to visually preserve the relational information they convey. Chemical and mathematical formulae must be encoded to maintain the proper positioning of their characters when displayed in order to preserve their intended meaning.

(c) Chemical and mathematical formulae and tables must be presented in compliance with ?1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Typewritten characters used in such formulae and tables must be chosen from a block (nonscript) type font or lettering style having capital letters which should be at least 0.422 cm. (0.166 inch) high (e.g., preferably Arial, Times Roman, or Courier with a font size of 12), but may be no smaller than 0.21 cm. (0.08 inch) high (e.g., a font size of 6). A space at least 0.64 cm. (1/4 inch) high should be provided between complex formulae and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with a high degree of legibility.

37 C.F.R. ?1.71 Detailed description and specification of the invention.

(a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

(b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth.

(c) In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices in drawings, see ?1.84(s). The content of the notice must be limited to only those elements provided for by law. For example, "copyright 1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited and,

under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

(e) The authorization shall read as follows:

A portion of the disclosure of this patent document contains material which is subject to (copyright or mask work) protection. The (copyright or mask work) owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all (copyright or mask work) rights whatsoever.

(f) The specification must commence on a separate sheet. Each sheet including part of the specification may not include other parts of the application or other information. The claim(s), abstract and sequence listing (if any) should not be included on a sheet including any other part of the application.

(g) The specification may disclose or be amended to disclose the names of the parties to a joint research agreement (35 U.S.C. 103(c)(2)(C)).

(1) If the specification discloses or is amended to disclose the names of the parties to a joint research agreement for purposes of 35 U.S.C. 103(c)(2), the specification must also provide or be amended to provide the following information, or the location where (i.e., by reel and frame number) such information is recorded in the assignment records of the Office:

(i) The date the joint research agreement was executed; and

(ii) A concise statement of the field of the claimed invention.

(2) An amendment under paragraph (g)(1) of this section must be accompanied by the processing fee set forth ?1.17(i) if not filed within one of the following time periods:

(i) Within three months of the filing date of a national application;

(ii) Within three months of the date of entry of the national stage as set forth in ?1.491 in an international application;

(iii) Before the mailing of a first Office action on the merits; or

(iv) Before the mailing of a first Office action after the filing of a request for continued examination under ?1.114.

(3) An amendment under paragraph (g)(1) of this section filed after the date the issue fee is paid must be accompanied by the processing fee set forth ?1.17(i), and the patent may not include the names of the parties to the joint research agreement. If the patent does not include the names of the parties to the joint research agreement, the amendment to include the names of the parties to the joint research agreement will not be effective unless the patent is corrected by a certificate of correction under 35 U.S.C. 255 and ?1.322.

37 C.F.R. ?1.77 Arrangement of application elements.

(a) The elements of the application, if applicable, should appear in the following order:

- (1) Utility application transmittal form.
- (2) Fee transmittal form.
- (3) Application data sheet (see ?1.76).
- (4) Specification.
- (5) Drawings.
- (6) Executed oath or declaration.

(b) The specification should include the following sections in order:

- (1) Title of the invention, which may be accompanied by an introductory portion stating the name, citizenship, and residence of the applicant (unless included in the application data sheet).
- (2) Cross-reference to related applications (unless included in the application data sheet).
- (3) Statement regarding federally sponsored research or development.
- (4) The names of the parties to a joint research agreement.
- (5) Reference to a "Sequence Listing," a table, or a computer program listing appendix submitted on a compact disc and an incorporation-by-reference of the material on the compact disc (see ?1.52(e)(5)). The total number of compact discs including duplicates and the files on each compact disc shall be specified.

- (6) Background of the invention.
 - (7) Brief summary of the invention.
 - (8) Brief description of the several views of the drawing.
 - (9) Detailed description of the invention.
 - (10) A claim or claims.
 - (11) Abstract of the disclosure.
 - (12) "Sequence Listing," if on paper (see 1.821 through 1.825).
- (c) The text of the specification sections defined in paragraphs (b)(1) through (b)(12) of this section, if applicable, should be preceded by a section heading in uppercase and without underlining or bold type.

37 C.F.R. 1.126 Numbering of claims.

The original numbering of the claims must be preserved throughout the prosecution. When claims are canceled the remaining claims must not be renumbered. When claims are added, they must be numbered by the applicant consecutively beginning with the number next following the highest numbered claim previously presented (whether entered or not). When the application is ready for allowance, the examiner, if necessary, will renumber the claims consecutively in the order in which they appear or in such order as may have been requested by applicant.

37 C.F.R. 1.141 Different inventions in one national application.

(a) Two or more independent and distinct inventions may not be claimed in one national application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one national application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (1.75) or otherwise include all the limitations of the generic claim.

(b) Where claims to all three categories, product, process of making, and process of use, are included in a national application, a three way requirement for restriction can only be made where the process of making is distinct from the product. If the process of making and the product are not distinct, the process of using may be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the

product can be made.

37 C.F.R. ?1.146 Election of species.

In the first action on an application containing a generic claim to a generic invention (genus) and claims to more than one patentably distinct species embraced thereby, the examiner may require the applicant in the reply to that action to elect a species of his or her invention to which his or her claim will be restricted if no claim to the genus is found to be allowable. However, if such application contains claims directed to more than a reasonable number of species, the examiner may require restriction of the claims to not more than a reasonable number of species before taking further action in the application.

37 C.F.R. ?1.151 Rules applicable.

The rules relating to applications for patents for other inventions or discoveries are also applicable to applications for patents for designs except as otherwise provided.

37 C.F.R. ?1.153 Title, description and claim, oath or declaration.

(a) The title of the design must designate the particular article. No description, other than a reference to the drawing, is ordinarily required. The claim shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described. More than one claim is neither required nor permitted.

(b) The oath or declaration required of the applicant must comply with ?1.63.

37 C.F.R. ?1.154 Arrangement of application elements in a design application.

(a) The elements of the design application, if applicable, should appear in the following order:

- (1) Design application transmittal form.
- (2) Fee transmittal form.
- (3) Application data sheet (see ?1.76).
- (4) Specification.
- (5) Drawings or photographs.
- (6) Executed oath or declaration (see ?1.153(b)).

(b) The specification should include the following sections in order:

(1) Preamble, stating the name of the applicant, title of the design, and a brief description of the nature and intended use of the article in which the design is embodied.

(2) Cross-reference to related applications (unless included in the application data sheet).

(3) Statement regarding federally sponsored research or development.

(4) Description of the figure or figures of the drawing.

(5) Feature description.

(6) A single claim.

(c) The text of the specification sections defined in paragraph (b) of this section, if applicable, should be preceded by a section heading in uppercase letters without underlining or bold type.

37 C.F.R. ?1.164 Claim.

The claim shall be in formal terms to the new and distinct variety of the specified plant as described and illustrated, and may also recite the principal distinguishing characteristics. More than one claim is not permitted.

37 C.F.R. ?1.173 Reissue specification, drawings, and amendments.

(a) Contents of a reissue application. An application for reissue must contain the entire specification, including the claims, and the drawings of the patent. No new matter shall be introduced into the application. No reissue patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent, pursuant to 35 U.S.C. 251.

(1) Specification, including claims. The entire specification, including the claims, of the patent for which reissue is requested must be furnished in the form of a copy of the printed patent, in double column format, each page on only one side of a single sheet of paper. If an amendment of the reissue application is to be included, it must be made pursuant to paragraph (b) of this section. The formal requirements for papers making up the reissue application other than those set forth in this section are set out in ?1.52. Additionally, a copy of any disclaimer (?1.321), certificate of correction (Ë 1.322 through 1.324), or reexamination certificate (?1.570) issued in

the patent must be included. (See also ?1.178).

(2) Drawings. Applicant must submit a clean copy of each drawing sheet of the printed patent at the time the reissue application is filed. If such copy complies with ?1.84, no further drawings will be required. Where a drawing of the reissue application is to include any changes relative to the patent being reissued, the changes to the drawing must be made in accordance with paragraph (b)(3) of this section. The Office will not transfer the drawings from the patent file to the reissue application.

(b) Making amendments in a reissue application. An amendment in a reissue application is made either by physically incorporating the changes into the specification when the application is filed, or by a separate amendment paper. If amendment is made by incorporation, markings pursuant to paragraph (d) of this section must be used. If amendment is made by an amendment paper, the paper must direct that specified changes be made, as follows:

(1) Specification other than the claims. Changes to the specification, other than to the claims, must be made by submission of the entire text of an added or rewritten paragraph, including markings pursuant to paragraph (d) of this section, except that an entire paragraph may be deleted by a statement deleting the paragraph without presentation of the text of the paragraph. The precise point in the specification must be identified where any added or rewritten paragraph is located. This paragraph applies whether the amendment is submitted on paper or compact disc (see ? 1.52(e)(1) and 1.821(c), but not for discs submitted under ?1.821(e)).

(2) Claims. An amendment paper must include the entire text of each claim being changed by such amendment paper and of each claim being added by such amendment paper. For any claim changed by the amendment paper, a parenthetical expression "amended," "twice amended," etc., should follow the claim number. Each changed patent claim and each added claim must include markings pursuant to paragraph (d) of this section, except that a patent claim or added claim should be canceled by a statement canceling the claim without presentation of the text of the claim.

(3) Drawings. One or more patent drawings shall be amended in the following manner: Any changes to a patent drawing must be submitted as a replacement sheet of drawings which shall be an attachment to the amendment document. Any replacement sheet of drawings must be in compliance with ?1.84 and shall include all of the figures appearing on the original version of the sheet, even if only one figure is amended. Amended figures must be identified as "Amended," and any added figure must be identified as "New." In the event that a figure is canceled, the figure must be surrounded by brackets and identified as "Canceled." All changes to the drawing(s) shall be explained, in detail, beginning on a separate sheet

accompanying the papers including the amendment to the drawings.

(i) A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be included. The marked-up copy must be clearly labeled as "Annotated Marked-up Drawings" and must be presented in the amendment or remarks section that explains the change to the drawings.

(ii) A marked-up copy of any amended drawing figure, including annotations indicating the changes made, must be provided when required by the examiner.

(c) Status of claims and support for claim changes. Whenever there is an amendment to the claims pursuant to paragraph (b) of this section, there must also be supplied, on pages separate from the pages containing the changes, the status (i.e., pending or canceled), as of the date of the amendment, of all patent claims and of all added claims, and an explanation of the support in the disclosure of the patent for the changes made to the claims.

(d) Changes shown by markings. Any changes relative to the patent being reissued which are made to the specification, including the claims, upon filing, or by an amendment paper in the reissue application, must include the following markings:

(1) The matter to be omitted by reissue must be enclosed in brackets; and

(2) The matter to be added by reissue must be underlined, except for amendments submitted on compact discs (E 1.96 and 1.821(c)). Matter added by reissue on compact discs must be preceded with "<U>" and end with "</U>" to properly identify the material being added.

(e) Numbering of patent claims preserved. Patent claims may not be renumbered. The numbering of any claim added in the reissue application must follow the number of the highest numbered patent claim.

(f) Amendment of disclosure may be required. The disclosure must be amended, when required by the Office, to correct inaccuracies of description and definition, and to secure substantial correspondence between the claims, the remainder of the specification, and the drawings.

(g) Amendments made relative to the patent. All amendments must be made relative to the patent specification, including the claims, and drawings, which are in effect as of the date of filing of the reissue application.

37 C.F.R. ?1.181 Petition to the Director.

(a) Petition may be taken to the Director:

(1) From any action or requirement of any examiner in the ex parte prosecution of an application, or in the ex parte or inter partes prosecution of a reexamination proceeding which is not subject to appeal to the Board of Patent Appeals and Interferences or to the court;

(2) In cases in which a statute or the rules specify that the matter is to be determined directly by or reviewed by the Director; and

(3) To invoke the supervisory authority of the Director in appropriate circumstances. For petitions involving action of the Board of Patent Appeals and Interferences, see §41.3 of this title.

(b) Any such petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested. Briefs or memoranda, if any, in support thereof should accompany or be embodied in the petition; and where facts are to be proven, the proof in the form of affidavits or declarations (and exhibits, if any) must accompany the petition.

(c) When a petition is taken from an action or requirement of an examiner in the ex parte prosecution of an application, or in the ex parte or inter partes prosecution of a reexamination proceeding, it may be required that there have been a proper request for reconsideration (§1.111) and a repeated action by the examiner. The examiner may be directed by the Director to furnish a written statement, within a specified time, setting forth the reasons for his or her decision upon the matters averred in the petition, supplying a copy to the petitioner.

(d) Where a fee is required for a petition to the Director the appropriate section of this part will so indicate. If any required fee does not accompany the petition, the petition will be dismissed.

(e) Oral hearing will not be granted except when considered necessary by the Director.

(f) The mere filing of a petition will not stay any period for reply that may be running against the application, nor act as a stay of other proceedings. Any petition under this part not filed within two months of the mailing date of the action or notice from which relief is requested may be dismissed as untimely, except as otherwise provided. This two-month period is not extendable.

(g) The Director may delegate to appropriate Patent and Trademark Office officials the determination of petitions.

Appendix D. Glossary and Index of Patent Terms

A/AN--(1) In a claim, the indefinite article A or AN connotes "one or more." (2) Also, the indefinite article A or AN is used as modifier of an ELEMENT the first time the ELEMENT is set forth (*i.e.*, introduced) in a claim. *See*THE. (3:8, **3:11**)¹¹¹¹

AGGREGATION--(1) A lack of structural and/or functional cooperation between the various parts of an assembly; the opposite of COMBINATION. A non-cooperating assembly of parts (strictly speaking, NON-STATUTORY subject matter)-an inherent defect in a structure, qua structure, which no claim, however well drafted, can cure. (2) A COMBINATION claimed without sufficient particularity and definiteness, so that the ELEMENTS of the claim, *as claimed*, do not cooperate. A structure is not necessarily an AGGREGATION solely because all of its ELEMENTS, either in fact or as claimed, do not function simultaneously (as in a typewriter). Recent cases cast doubt on the propriety of this ground of REJECTION. *See*MPEP 706.03(i). (**3:19, 8:5, 8:6**)

ALTERNATIVE EXPRESSION--The alternative setting forth in a claim of two ELEMENTS, either (and both) of which perform the same FUNCTION in the claim, instead of a single ELEMENT to perform the FUNCTION. For example: "a spring *orpiston*-cylinder for moving the member." Usually, there is a GENERIC word covering the ALTERNATIVE ELEMENTS, in the case of the example "means for biasing," which should be used in the claim. ALTERNATIVE EXPRESSIONS *may* render a claim INDEFINITE. In some cases, ALTERNATIVE EXPRESSIONS are permissible, if the claim is not rendered INDEFINITE thereby. For example, "one *ormore* arms" (but note the connotation of A and AN). The primary use of alternative elements is in MARKUSH groupings. *See*MPEP 706.03(d). (3:8, **3:13, 4:11, 6:2, 6:9**)

AMENDMENT--A change made in or to a patent application in response to (and hopefully to avoid) a REJECTION or OBJECTION by the EXAMINER. An AMENDMENT is part of a RESPONSE and may affect claims, the DESCRIPTION or the drawings. (2:4)

ANALOGOUS ART--A REFERENCE or some PRIOR ART directed to the same necessary FUNCTION or utility as is the subject matter set forth in a claim, either the entire claim or particular elements thereof, even though the environment differs. For example, a brick cutter shown in a REFERENCE may be ANALOGOUS ART with respect to a claimed dough cutter. *See*MPEP 904.01(c).

ANTECEDENT/ANTECEDENT BASIS--A claim must be consistent with the SPECIFICATION and with itself. That is, ELEMENTS recited in the claim must find ANTECEDENT BASIS in the DESCRIPTION and within the claim, if earlier recited therein. Therefore: (1) Support for; the quality of an ELEMENT which is set forth in (and supported by) the DESCRIPTION and which is then POSITIVELY recited in a

claim. (2) A POSITIVELY recited, claimed ELEMENT to which later reference is made in the same (or in a DEPENDENT) claim. Absent an ANTECEDENT in the disclosure and/or claims as originally filed, a claim will be NEW MATTER. (3:2, 3:3, 3:6, 3:7, 3:8, 3:11, 3:22, 3:24, 3:25, 4:1, 8:5, 8:8, 8:10)

ANTICIPATED--SeeFULLY MET.

APPARATUS--(1) An adjective meaning mechanical or MACHINE-like. (2) A noun meaning a MACHINE or DEVICE, including an electrical circuit, having cooperating parts and a "rule of operation" to accomplish a useful RESULT, usually some act or operation on an ARTICLE or WORKPIECE. Sometimes contrasted with an ARTICLE OF MANUFACTURE or a PRODUCT. (**chapter 3, 2:9, 2:11, 2:12, 4:2, 4:3, 4:5, 4:6, 4:7, 5:1**)

APPARATUS LIMITATIONS IN METHOD CLAIMS--(4:6)

APPARATUS, METHOD FUNCTIONAL OF--(4:5)

ARBITRARY NAMES--(6:3)

ART--(1) A METHOD or PROCESS (pre-1952 usage). (2) Today, a field of technology, as in 35 U.S.C. ?103. See35 U.S.C. ?100(b) (4:1).

ARTICLE--A WORKPIECE. Distinguish from ARTICLE OF MANUFACTURE. (3:1, 3:1.1, 3:2)

ARTICLE OF MANUFACTURE--One of the STATUTORY CLASSES of UTILITY PATENT. Broadly, any product made by man and having industrial utility. Similar to an APPARATUS or MACHINE, but usually having no moving parts or "rule of operation." The same as a MANUFACTURE. It is often difficult to tell whether a DEVICE is a MACHINE or an ARTICLE OF MANUFACTURE, but this difficulty is immaterial. (**chapter 5; 1:3, 4:7, 5:1, 5:3, 6:2, 6:6, 6:8, 8:2, 8:3, 8:5, 8:6**)

ARTICLE OF MANUFACTURE, OBVIOUS METHOD OF MAKING--(4:4).

BODY--of a CLAIM. Narrative expository prose following the PREAMBLE and the TRANSITION of a claim and reciting the ELEMENTS of the claimed INVENTION as well as a description of how these ELEMENTS cooperate to make up the operative COMBINATION recited in the PREAMBLE. (2:4, 2:5, 2:7, 2:9, 3:1, 3:1.1, 3:2, 3:25, 4:1, 6:8, 6:10)

BROAD/BROAD CLAIM--Relates to a claim which covers or READS ON a wide range and variety of DEVICES, PROCESSES, etc., because the claim contains only few, or only general, limitations. Sometimes called "wide," especially in British

practice. A claim may be so BROAD as to be INDEFINITE (section 3:22) or to READ ON the PRIOR ART. See NARROW. (2:3, 2:4, 2:5, 2:6, 3:2, 3:3, 3:5, 3:7, 3:22, 3:25, 3:25.1, 3:26, 4:1, 5:2, 6:1, 7:1, 8:4, 8:8, 8:9)

CAFC--Abbreviation for the United States Court of Appeals for the Federal Circuit.

CATALOG--An AGGREGATION (Sense (2)) as claimed. (3:19, 6:8, 8:5)

CCPA--Abbreviation for the United States Court of Customs and Patent Appeals, superseded in 1982 by the CAFC.

CHEMICAL CLAIMS--(chapter 6; 4:7, 6:1, 6:4)

CLAIM--A description of the INVENTION (Sense (2)) protected, located at the end of every patent SPECIFICATION. The protection afforded by a patent is measured by the CLAIMS which are similar to a real property deed in function, *i.e.*, describing metes and bounds.

CLAUSE--In a CLAIM, the description of an element or elements between separating punctuation, commas, semi-colons.

CLOSED-ENDED--See CONSISTING ESSENTIALLY OF and CONSISTING OF. (2:6)

COLON-SEMICOLON FORM--A claim format in which a colon may be inserted after the TRANSITION and semicolons are used between the ELEMENTS. Such a claim format may be used: in the OUTLINE FORM; the SINGLE PARAGRAPH FORM; or in the SUB-PARAGRAPH FORM. (2:8).

COINED NAME CLAIM--A hybrid type of FINGERPRINT CLAIM in which the COINED NAME is defined and its distinctive properties, structure and METHOD of production are set forth in the DESCRIPTION (section 6:5). Such a claim may be proper in the event the COINED NAME was known in the PRIOR ART before the application was filed (which occurs only rarely). (6:4, 6:5, 6:6)

COMBINATION--(1) An interrelated group of ELEMENTS, structurally and FUNCTIONALLY tied together in a claim to an operative DEVICE to effect some useful FUNCTION or RESULT. Simultaneity of operation of the ELEMENTS is not necessary. See AGGREGATION and CATALOG. (2) A complete MACHINE, PROCESS, ARTICLE OF MANUFACTURE, COMPOSITION, etc., as distinguished from a SUBCOMBINATION thereof. (1:1, 2:4, 2:5, 2:6, 2:7, 2:8, 2:9, 2:11, 3:2, 3:3, 3:8, 3:19, 3:20, 3:21, 3:24, 3:25, 3:26, 4:1, 4:3, 4:7, 5:1, 6:1, 6:2, 6:7, 6:8, 6:10, 8:4, 8:5, 8:6, 8:9)

COMPOSITION/COMPOSITION OF MATTER--PRODUCTS wherein the chemical nature of the substances or materials used, rather than the shape or form, is the

distinguishing characteristic. A COMPOSITION may be a molecule, COMPOUND, solution, mixture, alloy, atom, etc. Sometimes contrasted with ARTICLE OF MANUFACTURE. (1:3; 2:9, 2:11, 4:6, 4:7, 6:1, 6:3, 6:4, 6:6, 6:7, 6:8)

COMPOUND--Usually, a molecule, per se. *See*COMPOSITION. (6:1, 6:2, 6:4, 6:5)

COMPRISES/COMPRIISING--TRANSITION words between the BODY of the claim and the PREAMBLE and within a clause in the body of the claim. The words mean "including the following ELEMENTS (in the BODY or the elements following the element preceding that TRANSITION word), but not excluding others." A claim or clause using either word is said to be OPEN-ENDED. Thus, "A COMPOSITION COMPRISING (or WHICH COMPRISES) A, B and C" *requires* the presence of A, B and C, but does *not* exclude other components. Hence, one who produces another COMPOSITION made up of A, B, C and D would INFRINGE. INCLUDES and HAS mean the same thing. (2:5, 3:2, 3:8, 4:1, 6:2, 6:8)

COMPUTER PROGRAMS--(4:9).

CONSISTING ESSENTIALLY OF--A TRANSITION between the PREAMBLE and BODY of a claim and within a clause in the body of the claim. The phrase means "excluding other ELEMENTS of any essential significance to the claimed COMBINATION." More NARROW than COMPRISES, but more BROAD than CONSISTING OF. Hence, one who adds an additional component to the claimed COMBINATION may or may not INFRINGE, depending on whether the additional component substantially alters the properties of the COMPOSITION. For example, where a claim calls for "a tough, impact-resistant COMPOSITION, CONSISTING ESSENTIALLY OF A, B and C," and another adds D to the COMPOSITION, if the addition results in a COMPOSITION which is extremely brittle (*i.e.*, nonimpact-resistant) there is no INFRINGEMENT, because D's properties substantially changed the properties of the COMPOSITION. The line between CONSISTING ESSENTIALLY OF and CONSISTING OF is not clear. Use of either phrase results in what is termed a CLOSED-ENDED CLAIM. (2:6).

CONSISTING OF--A TRANSITION between the PREAMBLE and BODY of a claim and within a clause in the body of the claim. The phrase means "excluding more than traces of other than the recited ingredients." Use of the phrase results in a CLOSED-ENDED claim. Thus, "A COMPOSITION CONSISTING OF A, B and C" *requires* the presence of A, B and C, and only A, B and C. One who produces a COMPOSITION of A, B, C and D would not INFRINGE. *See*COMPRISES, CONSISTING ESSENTIALLY OF. (2:6, 2:9, 2:11, 6:62)

CONTRIBUTORY

INFRINGEMENT/CONTRIBUTORY

INFRINGER--INFRINGEMENT arising when one (the CONTRIBUTORY INFRINGER) sells a component of a patented INVENTION, or a material or APPARATUS for use in

practicing a patented PROCESS, knowing the same to be especially made and adapted for use in an INFRINGEMENT of such patent, unless what is sold is a staple article of commerce suitable for substantial non-infringing use. 35 U.S.C. ?271(c).

COUNT--A claim defining the INVENTION the priority of which is being contested in an INTERFERENCE.

DEPENDENT CLAIM--A claim which refers back to and further restricts (*i.e.*, makes more NARROW) a single preceding claim (the PARENT CLAIM), which may itself be a DEPENDENT CLAIM. 35 U.S.C. ?112, Rule 75(c). (2:3, **2:9**, **2:11**, 3:9, 3:11, 4:1, 4:6, 4:7, 6:8, 6:9, 7:1, 8:9)

DESCRIPTION--Often referred to as WRITTEN DESCRIPTION or "detailed DESCRIPTION." The SPECIFICATION of a patent or patent application is made up of drawings, a DESCRIPTION and claims. The DESCRIPTION describes the structure, composition, cooperation, function, embodiments, etc. of the INVENTION in a quite detailed, technical fashion and provides ANTECEDENT basis for the terms of the claims which define the INVENTION. (3:3, 3:6, 3:10, 5:4, 6:3)

DESIGN CLAIM--(5:1)

DEVICE--(1) A generalized word meaning "thing" or "item." (2) A MACHINE or APPARATUS. (3:1, 3:1.1, 3:2)

DOCTRINE OF EQUIVALENTS--A legal tenet holding that where a DEVICE, etc., accused of INFRINGING a claim does not include each and every ELEMENT of the CLAIM in *haec verba*, it will still INFRINGE the claim if it includes for every ELEMENT thereof either such ELEMENT or the EQUIVALENT of ELEMENTS not precisely present. *See*FILE WRAPPER ESTOPPEL. (3:25)

DOUBLE INCLUSION--Setting forth in a claim precisely the same ELEMENT twice as two different ELEMENTS, usually under two different names. (2:9, 2:11, **3:9**, 3:25, 3:25.1)

DRAWINGS, REFERENCE TO IN CLAIMS--(6:6)

DUPLICATE CLAIM--A redundant CLAIM. A CLAIM that does not "differ substantially" from another claim in the same patent or patent application. *See*Rule 75(b), MPEP 706.03(k). (7:1, **8:2**)

ELECTRICAL CIRCUIT CLAIMS--(3:26)

ELECTRICAL METHODS--(4:8)

ELEMENTS--(1) In CLAIM terminology, those things which together constitute the claimed INVENTION. In APPARATUS and ARTICLE OF MANUFACTURE claims, the ELEMENTS are the main structural parts; in METHOD claims, the ELEMENTS are steps or acts, usually GERUND phrases and clauses; in COMPOSITION claims, the ELEMENTS are chemicals or molecules. (2:5, 2:6, 2:7, 2:8, 2:9, 2:11, 3:1, 3:1.1, 3:3, 3:6, 3:7, 3:8, 3:9, 3:10, 3:11, 3:13, 3:14, 3:15, 3:18, 3:19, 3:20, 3:21, 3:25, 3:26, 4:1, 4:2, 4:3, 4:6, 5:1, 6:1, 6:8, 6:10, 7:1, 8:4, 8:7, 8:9). (2) The respective parts of an assembly.

ELEMENTS, FEATURES OF--(3:14)

ELEMENTS, NAMING OF--(3:7)

ELEMENTS, NUMBER OF--(3:8)

ELEMENTS, ORDER OF--(3:18, 4:3)

ELEMENTS, PARTS OF--(3:14)

ELEMENTS, STRUCTURAL CONNECTION OF--(3:20)

ELEMENTS, TYING TOGETHER--(3:19)

EQUIVALENT--An ELEMENT or group of ELEMENTS that either is not substantially different from, is interchangeable with, or that performs substantially the same FUNCTIONS in substantially the same manner to produce substantially the same RESULT as an ELEMENT, group of ELEMENTS or INVENTION set forth in a claim. See DOCTRINE OF EQUIVALENTS. (3:25, 4:5, 6:6)

EUROPEAN-TYPE CLAIM--A claim format, similar to a JEPSON claim format, and common in European patents. The format followed is usually: "A (name of the DEVICE and its FUNCTION) of the type having (recitation of the PRIOR ART, usually that found in a *single* REFERENCE) characterized in that (recitation of the improvement in the claim BODY)." (6:8)

EXAMINATION/EXAMINER--The EXAMINER, a Patent Office employee, studies in detail patent applications to determine if the applicant is entitled to a patent under the STATUTE. Such study is called the EXAMINATION. (1:1, 2:2, 8:7)

EXHAUSTED COMBINATION--See OLD COMBINATION. (8:4)

EXTRINSIC EVIDENCE--Evidence useful for interpreting a claim element or a claim and that is not INTRINSIC EVIDENCE; includes statements (and testimony) of experts and of persons skilled in the relevant art.

FILE WRAPPER--The official file of the Patent Office relating to the EXAMINATION of a patent application. It includes the application as filed, all formal papers and all correspondence (Office actions, RESPONSES, and the like) preceding the issuance of (or denial of) a patent. Often called PROSECUTION HISTORY. Sometimes called "file history."

FILE WRAPPER ESTOPPEL--If a patent applicant, whose claims are REJECTED (or sometimes OBJECTED to), NARROWS those claims (as by adding limiting language thereto or by making arguments interpreting the claim language in a restrictive manner) and thereafter obtains allowance of the formerly rejected claims, he may be strictly limited by the additional language or arguments, and will not be entitled to any EQUIVALENTS with respect thereto. Often called PROSECUTION HISTORY ESTOPPEL. See INFRINGE and DOCTRINE OF EQUIVALENTS.

FINGERPRINT CLAIM--A claim defining a chemical COMPOSITION in terms of its properties, such as X-ray diffraction, solubility, melting point, phase diagram, spectrum, etc., often as shown in the drawing. The use of such a claim is limited to emergency situations wherein the differences between the INVENTION and the PRIOR ART cannot be explained or described (and claimed) in the traditional terms of physical or chemical structure. Such a claim must, nevertheless, distinctly claim the INVENTION. (6:4, 6:5, 6:6)

FORM/FORMAT OF CLAIMS IN GENERAL--(chapter 2; 2:8).

FORMAL REJECTION--A REJECTION (OBJECTION) made by the EXAMINER to the form, as opposed to the substance (novelty and/or unobviousness), of a claim. A NON-ART REJECTION. (chapter 10; 7:1, 8:8)

FULLY MET--A phrase used to REJECT a claim which is completely anticipated by or shown in a single REFERENCE. This type of REJECTION is properly posited on 35 U.S.C. ?102, not on 35 U.S.C. ?103.

FUNCTION/FUNCTIONAL CLAUSE/LIMITATION--Describing an ELEMENT in terms of what it does, as opposed to what it is (i.e., its structure). See section 3:21. At times a FUNCTIONAL LIMITATION may be expressed negatively, that is, by what the ELEMENT does not do. (3:21, 3:22, 3:24, 3:25, 5:1, 6:1, 8:4, 8:8)

FUNCTIONAL ORDER--A logical ordering of the ELEMENTS of a claim which begins with the ELEMENT which first contacts the WORKPIECE. See STRUCTURAL ORDER. (3:18).

GAZETTE--See OG/OFFICIAL GAZETTE.

GENERIC/GENUS--A GENUS is a class BROADER than, or including, more than one SPECIES. "Primate" is a GENUS with respect to "man" and "ape" which are SPECIES thereof. A GENERIC claim includes within its SCOPE two or more disclosed embodiments (SPECIES). Such a claim must cover or READ ON what is comprehended in each of the SPECIES. See MPEP 806.02(d) and (e). (3:2, 3:7, 3:13, 3:25, 4:1, 5:1, 6:1, 6:2, 6:3, 6:9)

GERUND--A verbal noun expressing the action of the verb in a generalized manner; a verbal noun, ending in "-ing" and performing the function of a substantive, often taking the case phrase construction, and at the same time showing the verbal features of tense and voice, taking adverbial modifiers, and governing objects. Usually, GERUNDS are the first words of METHOD steps, the basic ELEMENTS of a METHOD claim. (4:1)

HAS/HAVING--TRANSITION words between the PREAMBLE and the BODY of a claim. Mean the same as COMPRISES/COMPRISING. (2:5, 6:8)

HOLE--Absence of material. HOLES, unlike most ELEMENTS, should usually be claimed INFERENTIALLY (Sense (1)), as "a lever having a hole." (3:14, 3:15, 3:25)

IMPROVEMENT CLAIM--(6:8)

INCLUDES/INCLUDING--TRANSITION words between the PREAMBLE and BODY of a claim. Mean the same as COMPRISES/COMPRISING. (2:5, 6:8)

INCOMPLETE--Quality of a claim which omits essential ELEMENTS or cooperative relationships. See MPEP 706.03(f). (6:10, 8:7, 8:8, 8:9)

INDEFINITE--(1) Lack of proper ANTECEDENT. (2) The quality of a claim which fails to accurately define the limits or boundaries of the INVENTION for any reason. (3) Not meeting the requirements of 35 U.S.C. § 112 to particularly point out and distinctly claim the INVENTION. (3:5, 3:11, 3:13, 3:14, 3:25, 4:1, 6:2, 8:8)

INDEPENDENT CLAIM--A claim that contains a complete description of the subject matter, without reference to any other claim. (See DEPENDENT CLAIM.) (2:9)

INDIRECT LIMITATION--Example: First reciting "a gear" and then reciting "said plastic gear" in a claim, where the same gear is meant in both instances. "Plastic" is an INDIRECT LIMITATION rendering the claim INDEFINITE. See ANTECEDENT, INFERENTIAL and POSITIVE, and MPEP 706.03(d). (3:11)

INFERENTIAL--(1) In reference to the form of claims as such, an INFERENTIAL claim is one wherein a new ELEMENT is introduced in the middle of a clause which introduces and describes another ELEMENT. See section 3:3. (2) The term is also

used to refer to the setting forth of an ELEMENT (or a limitation or feature thereof) in a claim not found in the DESCRIPTION, or an ELEMENT (or limitation of an ELEMENT) set forth definitely in the claim ("*thearm*") where not set forth earlier in the claim. *See* INDIRECT LIMITATION and sections 3:6, 3:11 and 8:8. (3) APPARATUS limitations are usually brought into METHOD claims INFERENTIALLY in the sense of meaning (1). (3:3, 3:6, 3:11, 4:6, 8:4, 8:8)

INFRINGE/INFRINGEMENT/INFRINGER--An INFRINGER INFRINGES a claim by making, using or selling in the United States that which is set forth in the claim without the authority of the patent owner. *See* 35 U.S.C. §271 and DOCTRINE OF EQUIVALENTS. Normally, the DEVICE, etc., accused of being an INFRINGEMENT must contain each and every ELEMENT of the claim. (1:2, 2:9, 2:11, 3:3, 3:25, 3:26, 6:4, 6:5, 6:7, 7:1)

INOPERATIVE--Incapable of performing an intended purpose. INOPERATIVENESS may reside in an INVENTION, *qua* INVENTION, or as claimed. *See* AGGREGATION.

IN ORDER TO--*See* WHEREBY. Often used in a manner different from WHEREBY in a MEANS-plus-FUNCTION clause, as: "means for rotating the wheel IN ORDER TO reciprocate the arm...." Usually, "IN ORDER TO reciprocate the arm" will be considered as a STRUCTURAL/FUNCTIONAL limitation and may fall under 35 U.S.C. §112, [para] 6. (3:22, 3:25)

INTERFERENCE--A proceeding in the Patent Office to determine among (a) one or more patent applicants and one or more patentees, or (b) two or more applicants, claiming the same INVENTION, which of the parties was the first inventor. The claim defining the contested INVENTION is called a COUNT. (3:23)

INTRINSIC EVIDENCE--Evidence useful for interpreting a claim element or a claim, including the specification and drawings of the patent (or application) and the prosecution history; also includes dictionaries, encyclopedias, and learned treatises, but not statements of experts or persons skilled in the art or evidence requiring authentication, credibility determination or questionable hearsay.

INTRODUCTION/INTRODUCTORY PHRASE--"I (or we) claim" or "What is claimed is." Each claim is the direct object of a SINGLE SENTENCE beginning with an INTRODUCTORY PHRASE, which appears only once, before the first claim. (2:1, 2:2, 3:1)

INVENTION--(1) As a legally significant act, the summation of conception and reduction to practice, actual or constructive. (2) Also, the thing or DEVICE invented and claimed in a patent or patent application. (3) Sometimes used (misused?) as meaning unobvious as in "what is the invention?"; meaning, what is the novel and unobvious feature(s) defined in the claim. *See* 35 U.S.C. §103. (1:3, 2:9, 2:11, 3:3,

3:6, 3:25, 4:4, 6:1, 6:5, 6:9, 7:1, 8:4, 8:5, 8:8, 8:9)

JEPSON CLAIM--A claim format for an improvement-type INVENTION wherein the old ELEMENTS are set forth in the PREAMBLE of the claim and the new or modified ELEMENTS (or new or modified COMBINATIONS thereof) are set forth in the BODY of the claim. Similar to a EUROPEAN-TYPE CLAIM. From a Patent Office decision involving an inventor named Jepson. (3:25, 6:8, 8:4)

LABEL CLAIM--A type of NEW USE CLAIM wherein a statement of the intended use of a COMPOSITION is set forth in the PREAMBLE as a PREAMBLE LIMITATION and is relied on for novelty and/or unobviousness. (6:7).

LAUDATORY STATEMENTS--Words such as "novel" or "efficiently" or "long wearing" which are generally not permitted in UTILITY claims. See section 2:7. Sometimes called SURPLUSAGE. Permitted in plant patent claims. (2:7, 5:1, 5:4)

MACHINE--One of the STATUTORY CLASSES of UTILITY PATENT. Often called "APPARATUS." A DEVICE usually having moving parts and a "rule of operation." Often contrasted with ARTICLE OF MANUFACTURE. (chapter 3; 1:3, 3:1, 3:2, 3:3, 5:1, 6:8, 8:5, 8:8)

MANUFACTURE--An ARTICLE OF MANUFACTURE. (1:3, 3:2, 8:5, 8:6)

MARKUSH CLAIM--A claim using special language as a permissible ALTERNATIVE EXPRESSION for a group of materials, articles, or steps operable therein. Used most in chemical claims but useful in mechanical, electrical, method and other types of claims. A contrived GENERIC expression where no true GENERIC expression exists. Example: "a metal selected from the group CONSISTING OF copper, silver and gold." Technically, but permissibly, violates the rule against ALTERNATIVE EXPRESSIONS. From a case, *Ex parte Markush*. (3:13, 6:1, 6:2)

MEANS--A generalized and very BROAD word used to describe, in appropriate situations, an ELEMENT of a claim. See sixth paragraph of 35 U.S.C. §112. Properly phrased as "means for (performing a specified function)." (2:9, 2:11, 3:7, 3:9, 3:11, 3:13, 3:15, 3:20, 3:25, 3:26, 4:1, 5:1, 6:1, 6:2, 6:9)

MENTAL STEPS--(4:8, 8:6).

METHOD--A procedure for transforming or reducing an ARTICLE, WORKPIECE or chemical substance to a different state or thing. METHOD, PROCESS and ART mean the same thing. METHOD is more common in mechanical and electrical claims; PROCESS is more common in chemical claims; ART today is more commonly used to mean "field of technology." (chapter 4; 2:9, 2:11, 4:1, 4:3, 4:4, 4:5, 4:8, 4:9, 6:4, 6:6, 6:7, 6:8)

METHOD CLAIMS, APPARATUS LIMITATIONS IN--(4:6)

METHOD, ELECTRICAL--(4:8)

METHOD FUNCTIONAL OF APPARATUS--(4:5)

METHOD OF MAKING AN ARTICLE OF MANUFACTURE, OBVIOUS--(4:4)

MPEP--The Manual of Patent Examining Procedure, a looseleaf booklet published by the Government Printing Office and available from the Superintendent of Documents, Box 1533, Washington, D.C. 20013. It is the EXAMINERS' "bible." (2:2) (SeeAppendix C3 for selected sections.)

MULTIPLE DEPENDENT CLAIM--A DEPENDENT CLAIM which is DEPENDENT upon more than one other, preceding CLAIM or is dependent upon another MULTIPLE DEPENDENT CLAIM. (2:11)

MULTIPLICITY--A word connoting an indefinite number, two or more; usually a fairly large number. Often thought of as being greater than a PLURALITY. (3:8)

NARROW/NARROW CLAIM--A NARROW CLAIM covers or READS ON a restricted SCOPE of DEVICES, PROCESSES, etc., because it contains either many, or quite specific, limitations. A NARROW CLAIM is usually entitled only to a NARROW range of EQUIVALENTS. SeeBROAD CLAIM, OLD COMBINATION, PICTURE CLAIM (Sense (2)) and PROLIX. (2:3, 3:2, 3:3, 4:1, 5:2, 6:1, 7:1, 8:8, 8:9)

NEGATIVE LIMITATION--A claim limitation telling what an ELEMENT is not, instead of what it is; or what it does not do, instead of what it does. (3:5, 5:1)

NEW MATTER--A term of art in Patent Law meaning any matter not "fairly" disclosed within the "four corners" (entire SPECIFICATION) of a patent application as filed. NEW MATTER may not be introduced into an application after it is filed. An ANTECEDENT for any element added to a claim after filing must be found in the original disclosure, or the claim will be, or be based upon, NEW MATTER. (6:3, 8:10)

NEW USE CLAIM--A claim to a METHOD involving some NEW USE of an old material or COMPOSITION, such as the killing of insects by spraying with DDT, DDT being old for *other* purposes. Traditionally (and under 35 U.S.C. ?100(b)), such a NEW USE may be claimed only in METHOD terminology, and the test of patentability is the novelty and unobviousness of the METHOD. SeePREAMBLE LIMITATIONS; LABEL CLAIM. (2:4, 4:7, 5:1, 6:1, 6:7, 6:10, 8:4)

NON-ART REJECTION--A REJECTION of a claim based, not on PRIOR ART (*i.e.*,

not on 35 U.S.C. § 102 and/or 103), but on the form of the claim. See FORMAL REJECTION and chapter 10. Includes REJECTIONS due to: METHOD functional of APPARATUS (section 4:5), improper NEW USE (section 8:5) and PRINTED MATTER limitations (section 8:6), and other bases covered in chapter 10. (chapter 10; 4:9, 8:4)

NON-STATUTORY--(1) Quality of the subject matter of a purported INVENTION which is not patentable under 35 U.S.C. §101, either by the precise terms thereof, or by case-law interpretation. See sections 1:3 and 8:6. (2) Also used as a ground for REJECTION of a claim to an INVENTION where the claim is inherently defective, as an OMNIBUS CLAIM (section 1:2), the claim sets forth a RESULT only (section 3:22) or the claim depends solely on printed matter for patentability (section 8:6). See FORMAL REJECTION and NON-ART REJECTION. (1:2, 1:3, 3:22, 4:9, 8:5, 8:6)

NUMBERING OF CLAIMS--(2:3)

NUMERALS, REFERENCE, IN CLAIMS--(3:10)

OBJECTION--A criticism by an EXAMINER to the form of a claim, as opposed to its substance. See NON-ART REJECTION and REJECTION. (3:5, 3:22)

OFFICIAL GAZETTE/OG--A weekly publication of the Patent Office, giving abstracts of and other information on all patents granted that week, as well as other information relating to patent and trademark practice. Now split into two volumes, one for Patents, one for Trademarks. (3:5)

OLD COMBINATION--Quality of a claim which recites an overall COMBINATION (including a SUBCOMBINATION) wherein the INVENTION resides in the SUBCOMBINATION which does not cooperate in some new and unobvious manner with the remainder of the COMBINATION. Sometimes called EXHAUSTED COMBINATION or OVERCLAIMING. A ground for REJECTION. (6:8, 6:10, 8:4, 8:7)

OMNIBUS CLAIM--A claim in formal terms, such as "My INVENTION substantially as shown and described." Not permitted in Utility patents under 35 U.S.C. §112. This form of claim is used in design patents, and in modified form in plant patents. (1:2, 5:3, 5:4, 6:4, 6:6)

OPEN-ENDED--See COMPRISES.

ORDER OF CLAIMS--(2:3, 6:7)

OPERATIONAL EXPRESSIONS--(3:21)

OUTLINE FORMAT--A claim format in which each ELEMENT is introduced in its own

SUBPARAGRAPH which may be identified by a parenthesized number or letter. *See* section 2:8. (2:8, 4:3)

OVERCLAIMING--*See* OLD COMBINATION. (3:22, 8:4)

PARENT CLAIM--A main claim from which a DEPENDENT CLAIM depends. The parent claim may itself be INDEPENDENT or dependent. (2:9, 2:11, 3:11, 6:8)

PERIPHERAL CLAIM--The type of claim used in the United States. It defines the outer boundaries of the INVENTION. All that is within those boundaries (including all the claimed ELEMENTS and their EQUIVALENTS) will be READ ON by the claim; all that is outside the boundaries is not READ ON by the claim. *See* DOCTRINE OF EQUIVALENTS. (1:2)

PICTURE CLAIM--A claim reciting all significant structure disclosed in the description, omitting only "nuts and bolts." Thus, a very NARROW claim. (6:7, 7:1)

PLANT PATENT CLAIM--(5:4)

PLURALITY--An indefinite number, two or more. *See* MULTIPLICITY. (3:8)

POSITIVE/POSITIVELY--(1) The opposite of INFERENTIAL. A POSITIVE recitation of an ELEMENT means that the ELEMENT is introduced and fully described in a clause of a claim in which no other ELEMENT is introduced (except for a HOLE). *See* sections 3:3, 3:6, 3:11, 4:2, 4:6, 8:8. (2) The opposite of NEGATIVE. *See* NEGATIVE LIMITATION. (3:3, 3:5, 3:14, 3:25, 4:1, 6:8, 8:4)

PQ--*See* USPQ.

PREAMBLE--The initial part of a claim, the purpose of which is to name or define the thing being claimed. Often the environment in which the claimed thing will be used is set forth, as well as the WORKPIECE. *See* NEW USE CLAIM. (2:4, 2:5, 2:7, 2:9, 2:11, 3:1, 3:2, 3:3, 3:21, 3:25, 4:1, 6:1, 6:7, 6:8, 6:10)

PREAMBLE LIMITATION--Descriptive statement in a PREAMBLE such as those related to the field of use, environment, etc. Possibly helpful in distinguishing a claim over PRIOR ART. *See* NEW USE CLAIM. (3:2, 4:9, 6:7, 6:10, 8:4)

PRINTED MATTER--*See* NON-ART REJECTION, NON-STATUTORY. (4:9, 8:6)

PRIOR ART--All subject matter (patents, publications, etc.) bearing on the novelty and unobviousness of a claimed INVENTION pursuant, *inter alia*, to 35 U.S.C. Ę 102 and 103.

PROCESS--One of the STATUTORY CLASSES of UTILITY PATENT. *See*METHOD. (chapter 4; 1:3, 2:3, 4:1, 5:3, 6:3, 6:5)

PROCESS, CHEMICAL--(4:7)

PRODUCT--Synonymous with ARTICLE OF MANUFACTURE and COMPOSITION. (2:3, 6:1)

PRODUCT-BY-PROCESS--A type of claim defining a PRODUCT in terms of the PROCESS by which it is made. Generally used when the PRODUCT cannot be defined in more traditional terms. This type of claim covers the PRODUCT *only*when made by the specified PROCESS. Novelty and unobviousness must reside in the PRODUCT and not merely in the PROCESS. *See*MPEP 706.03(e). (2:9, 2:11, 3:22, 4:8, 5:1, 5:2, 6:3, 6:7)

PROLIX--Quality of a claim which is "too complete" in that it sets forth long recitations of unimportant details which hide or obscure the INVENTION. *See*MPEP 706.03(g). (8:9)

PROSECUTION HISTORY--*See*FILE WRAPPER.

PROSECUTION HISTORY ESTOPPEL--*See*FILE WRAPPER ESTOPPEL.

PUNCTUATION OF CLAIMS--(2:8)

READ ON--To encompass, comprehend or give support to; to be within the terms of. If a claim READS ON a device accused of being an INFRINGEMENT thereof, the DEVICE does INFRINGE. If a claim READS ON a REFERENCE (or, *vice versa*) the claim is either unpatentable or invalid. A claim must READ ON the DESCRIPTION of the patent or application to which it is appended for the ELEMENTS of the claim to find ANTECEDENT basis therein. (3:6, 8:8)

REFERENCE--*See*PRIOR ART. Whether a REFERENCE is available as PRIOR ART depends on 35 U.S.C. Ë 102 and 103 and case-law interpretations thereof. PRIOR ART REFERENCES may be relied on by the EXAMINER or an accused INFRINGER to attack a claim.

REFERENCE NUMERALS IN CLAIMS--(3:10).

REJECTION--Disallowance of a claim by an EXAMINER because of its substance (lack of novelty; obvious). *See*OBJECTION and PRIOR ART. (3:5, 3:22, 4:5, 8:5, 8:7, 8:8, 8:9)

RESPONSE--An applicant's answer to an Office action. Attempts to meet

REJECTIONS of and OBJECTIONS to claims either by AMENDMENT, or argument, or both.

RESTRICTION REQUIREMENT--Where the EXAMINER concludes that an application contains claims directed to more than one INVENTION, he may require the applicant to elect one INVENTION and to restrict his claims to such elected INVENTION. (6:9, 6:10)

RESULT--What the INVENTION is intended to accomplish. Claims setting forth only RESULTS are objectionable as too BROAD. (3:22, 3:23, 3:25, 4:1)

SAID--THE. Used in claims to refer back to a claim element previously introduced. Preferable to use THE. "THE SAID" is a redundancy to be avoided. (3:11)

SCOPE--Breadth; the limits of the boundaries of a PERIPHERAL CLAIM. *See*BROAD and NARROW. (chapter 8; 2:3, 2:4, 2:9, 2:11, 3:3, 3:7, 3:10, 3:14, 3:25, 5:4, 6:1, 7:1, 8:4, 8:8, 8:9)

SCOPE OF CLAIMS, VARYING--(chapter 8)

SINGLE ELEMENT CLAIM--A rare type of claim not to a COMBINATION but to one ELEMENT. Permissible if not a SINGLE MEANS CLAIM. (2:7)

SINGLE MEANS CLAIM--An impermissible claim not to a COMBINATION and having only one ELEMENT which is expressed in the form of "MEANS plus function." *See*35 U.S.C. ?112. (3:25, 4:1, 4:3, 4:7, 6:8)

SINGLE PARAGRAPH FORM--A claim format in which the ELEMENTS are not identified by indentation, letters or numerals, but are set off by commas. *See*COLON-SEMICOLON FORM, OUTLINE FORM, SUBPARAGRAPH FORM. (2:8, 3:1)

SINGLE SENTENCE RULE--In the United States, a claim must be a single sentence. *See*INTRODUCTION. (2:2, 2:7, 3:15)

SO THAT--*See*IN ORDER TO and WHEREBY. (3:22, 3:24, 3:25)

SPECIES/SPECIFIC--A SPECIES is a member of a GENUS. A SPECIES is one of the two or more alternative and mutually exclusive embodiments of an INVENTION. The different SPECIES may be structures, steps, COMPOUNDS, chemicals, etc. *See*GENERIC/GENUS. (2:9, 3:7, 3:13, 4:1, 6:4, 6:7, 6:9)

SPECIFICATION--The drawings, DESCRIPTION and claims of a patent application or patent. *See*NEW MATTER. (1:1, 3:3, 3:6, 3:7, 3:21, 3:25, 4:1, 4:9, 5:1, 6:3, 6:4, 6:5, 7:1, 8:4)

STATUTE--Title 35 of the United States Code (35 U.S.C.). (chapter 1; 1:1)

STATUTORY CLASSES--The main categories or "pigeonholes" into which a technical subject must fit in order to be potentially patentable. These categories are set forth in 35 U.S.C. § 101, 161 and 171 as interpreted by the case-law, and include PROCESS, MACHINE, MANUFACTURE, COMPOSITION OF MATTER, designs and plants. (1:3, 2:2)

STEP--A generalized word used in appropriate situations as an ELEMENT of a METHOD CLAIM. Used in step-plus-function or step-for-performing-a-function claim ELEMENT. *See*sixth paragraph of 35 U.S.C. §112. (3:25).

STRUCTURAL CONNECTION--(3:20).

STRUCTURAL ORDER--A logical ordering of the ELEMENTS of a claim which begins with a base, power source or input and proceeds structurally to an ultimate ELEMENT or output. *See*FUNCTIONAL ORDER. (3:18)

SUBCOMBINATION--An ELEMENT or group of ELEMENTS that forms a part of a primary COMBINATION. If a SUBCOMBINATION has utility by itself, it may be claimed separately from the COMBINATION. (6:10, 8:4, 8:7)

SUBCOMBINATION FORMAT--A claim format for a SUBCOMBINATION: "In a (name of COMBINATION) for (COMBINATION'S FUNCTION), an X and a Y," where X, Y is the claimed SUBCOMBINATION. An exception to the "rule" that a TRANSITION should be between the PREAMBLE and BODY of a claim. (6:10)

SUBPARAGRAPH FORM--A claim format in which each ELEMENT is introduced and defined in its own indented subparagraph. *See*COLON-SEMICOLON FORM, OUTLINE FORM, SINGLE PARAGRAPH FORM. (2:8, 3:1, 3:3, 4:3)

SUPPORT FOR CLAIMS IN SPECIFICATION AND DRAWINGS--*See*ANTECEDENT. (3:6, 3:11)

SURPLUSAGE--*See*LAUDATORY STATEMENTS. (2:7)

TABULAR FORM--Same as SUBPARAGRAPH FORM. (2:8)

THE--The definite article THE is used to refer to an ELEMENT which has been introduced earlier in a claim. Alternatively SAID may be used, meaning the same thing. (2:9, 3:11)

THEREBY--*See*WHEREBY. (3:22, 3:23)

TRADEMARKED MATERIALS--(6:3)

TRANSITION/TRANSITIONAL PHRASE--Language between the PREAMBLE and BODY of a claim. May affect the SCOPE of the claim. *See* COMPRISES, CONSISTING OF, CONSISTING ESSENTIALLY OF, INCLUDES, HAS. (2:5, **2:6**, 2:7, 3:1, 6:10)

ULTIMATE SPECIES--A SPECIES which cannot be further divided into other SPECIES. Example: Silver is an ultimate species of the genus "conductive metals." (6:9)

UNBASED COMPARATIVE--An adjective, such as "thick," "heavy," "small," etc., used in a claim wherein no basis for the use thereof (*i.e.*, thicker, heavier, smaller than what?) is set forth. The remedy is to provide a basis or relation for comparison, such as "said second member being thicker than said first member." Many words, such as resilient, flexible, etc., while, strictly speaking, UNBASED, are usually accepted without question. An UNBASED COMPARATIVE is a ground for REJECTION or OBJECTION, because its use may render a claim INDEFINITE. (3:14)

UNDUE MULTIPLICITY--Presentation of too many claims in view of the nature and SCOPE of the INVENTION. *See* Rule 75(b), MPEP 706.03(1). (2:9, 2:11, 6:2, 6:5, 7:1, 8:3)

USPQ--The *United States Patent Quarterly*, a case reporter published quarterly and advance sheets in a magazine published weekly by BNA, Inc., and covering cases on patents, trademarks, copyrights, intellectual property, etc., from any forum.

UTILITY PATENT--Patents defining INVENTIONS having industrial utility (METHOD, APPARATUS, ARTICLE OF MANUFACTURE, COMPOSITION OF MATTER) as distinguished from design patents (section 5:3) and plant patents (section 5:4). (1:2, 6:2)

VAGUE--*See* INDEFINITE. (3:14, 8:8)

VARYING SCOPE OF CLAIMS--(chapter 8)

WHEREBY--When properly used in a claim, a word introducing a clause describing the FUNCTION or operation necessarily following from previously recited structure, whether a whole claim or an ELEMENT thereof. The phrase traditionally means "it necessarily follows from the foregoing that." Such a WHEREBY clause is improper when it is used to *imply* structural or cooperational relationships which are not positively recited in the claim. (3:22, **3:23**, 3:24, 4:1)

WORKPIECE--The thing or ARTICLE operated on, altered, changed or reduced by a

claimed APPARATUS or METHOD. It should be introduced in the PREAMBLE of the claim, and/or introduced INFERENTIALLY in the BODY of the claim. (3:1, 3:2, 3:3, 3:18, 3:21, 4:1, 4:2)

WRITTEN DESCRIPTION--*See*DESCRIPTION.

FOOTNOTES:

📌Footnote *. References are to sections of the book where the term is used expressly or implicitly; **boldface numerals** indicate sections where the term is defined or discussed in detail. UPPER CASE designates terms defined in the glossary.