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Patent It Yourself

- Conduct a patent search
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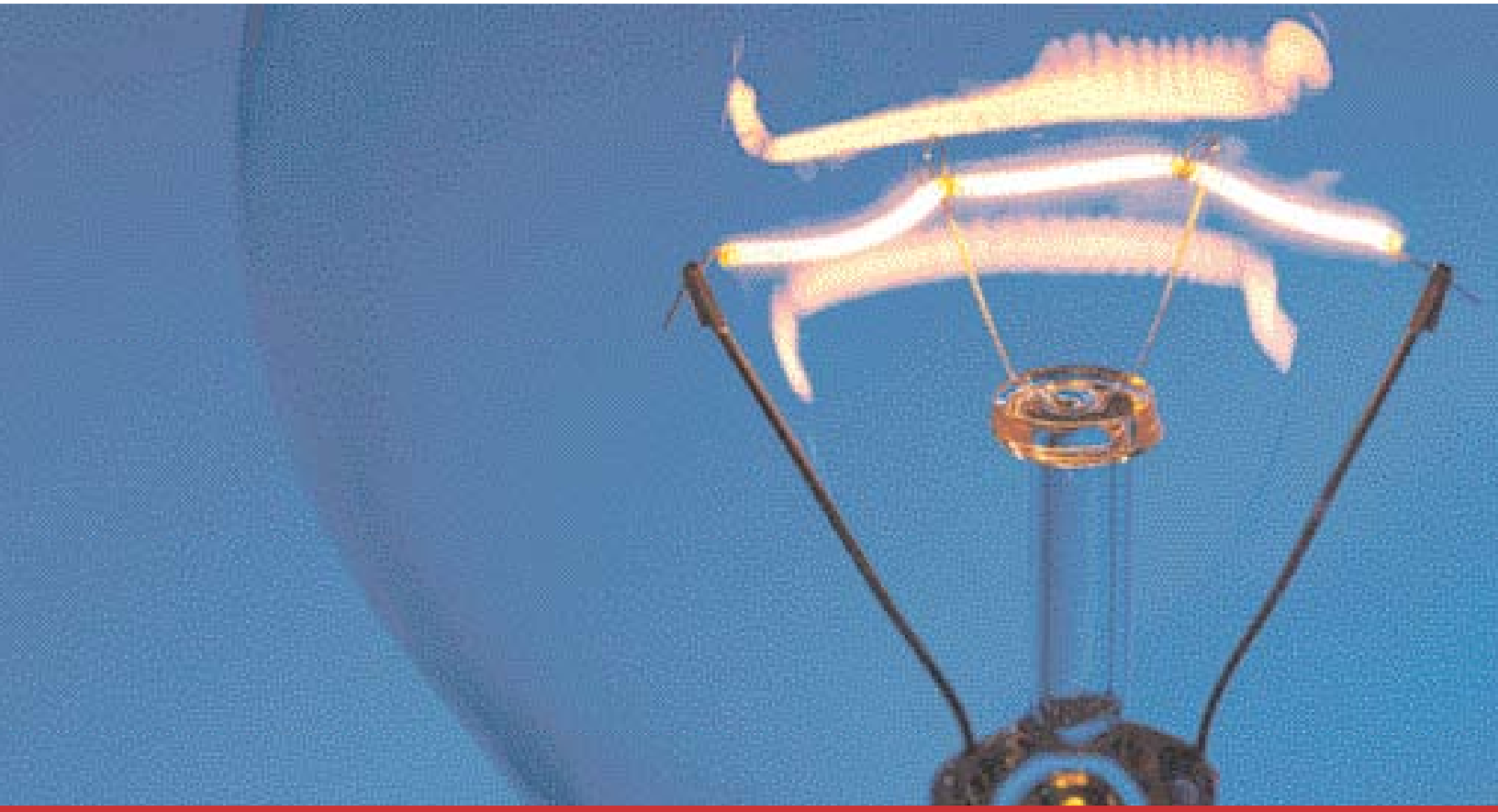
- Profit from your invention

Your Step-by-Step Guide to Filing at the U.S. Patent Office

Patent Attorney David Pressman



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15th edition

Patent It Yourself

Your Step-by-Step Guide to Filing at the U.S. Patent Office

Patent Attorney David Pressman

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Please note

We believe accurate, plain-English legal information should help you solve many of your own legal problems. But this text is not a substitute for personalized advice from a knowledgeable lawyer. If you want the help of a trained professional—and we'll always point out situations in which we think that's a good idea—consult an attorney licensed to practice in your state.

Acknowledgments

My deep thanks go to my clients, and other inventors whose creativity and genius I so greatly admire and envy. My readers have given me much valuable feedback and suggestions, and I am grateful to them as well.

I also thank the staff at Nolo, including Richard Stim, Steve Elias, Patti Gima, Stephanie Harolde, and Ralph Warner for their ideas, contributions, and support, and, especially, Terri Hearsh for substantially improving the look and feel of the book.

Finally, I thank my wife Roberta for her unflagging support and contributions.

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Appendixes

Your Legal Companion

Patent It Yourself is a guidebook that allows you, the inventor, to patent and commercially exploit your invention by yourself. It provides:

- instructions for inventing and documenting an invention, and how and when to file a Provisional Patent Application
- step-by-step guidance for obtaining a U.S. patent, together with tear-out, copyable, or downloadable forms that are necessary for each step of the process
- an overview of the procedures and requirements for getting patent protection abroad and concrete suggestions for finding the necessary resources to help you do this
- an overview of the alternative and supplementary forms of protection available for inventions, such as trade secrets, copyrights, trademarks, and unfair competition law, and
- detailed information and advice on how to commercially evaluate, market, and license your invention.

One purpose of this book is to save you money. According to the American Intellectual Property Association, the *average* cost of preparing a minimally complex patent application is approximately $8,500; preparing a relatively complex application—for example, an application for a chemical, biotech, mechanics, electronics, or data processing invention—costs between $11,500 and $15,500. You may not be able to afford these fees, and even if you can, it still pays to do it yourself. By following the instructions set out in this book, you'll not only save on attorney fees, but you'll be personally involved in every step of the patenting process. After all, you know your invention better than anyone else, and assuming you're willing and able to wade through a number of patent rules and technicalities, you're the best person to patent it.

I think of the book as a great equalizer, since it provides the know-how to enable the garage-shop or basement do-it-yourselfer to get as good a patent as a large corporation. It provides the legal tools necessary for inventors (whether large or small) to provide first-class legal protection for their work. And it especially gives the small inventor the tools to competently and efficiently protect an invention, whether or not he or she can afford a patent attorney.

A. You Don't Have to Use a Patent Attorney

In this view, many inventors believe that one must use a patent attorney to get a valid patent. This isn't true. First, the laws contain absolutely no requirement that one must have a patent attorney to file a patent application, deal with the PTO concerning the application, or to obtain the patent. In fact, PTO regulations (*Manual of Patent Examining Procedure* (MPEP), Section 707.07(j)) specifically require patent examiners to help inventors in *pro se* (no lawyer) cases. Second, and perhaps more persuasive, many hundreds of patent applications are filed and successfully prosecuted each year by *pro se* inventors.

B. A Layperson Can Do a Quality Job

The quality of a patent is mainly dependent upon four basic factors:

1. whether the patent application contains a full, clear, and accurate description that tells how to make and use the invention
2. whether the reach of the patent (technically covered in the patent "claims") is as broad as possible, given the state of prior developments in the field
3. whether the application "sells" the advantages of the invention, and
4. how an applicant handles correspondence with the PTO.

Fortunately, it takes no special legal expertise to do an excellent job for these, especially if you utilize the many checklists we have provided throughout this book.

C. Using an Attorney

Even if you do choose to work with an attorney, or have one available to you through the process, you'll find that this book allows you to take an active role in the process, do a better job of monitoring your attorney (no trivial consideration), and greatly adds to your understanding of the ways in which the law is willing to protect your invention. No matter how competent an attorney is, the client who understands what's going on will always obtain better service. Indeed, many corporate legal departments use this book to educate their inventors and support personnel to deal with patent attorneys and to protect their inventions more effectively.

I have seen a number of inventors who were victimized by their attorney (or agent) by allowing the attorney to file an application or continue prosecution at great expense even though the invention had a serious commercial drawback or was mostly anticipated by prior art. Had they considered the comments in this book, taken more interest, and followed what the attorney and/or the PTO was doing, they would have known that it would have been unwise to continue. By terminating at an earlier stage, they could have saved hundreds, or even thousands of dollars.

D. Should You Do It Yourself?

The big question is, of course, even though many if not most inventors can file and handle their own patent application, should you do so on your own or hire an expert? After all, you probably hire people to do all sorts of things for you, from fixing your car to remodeling your kitchen, that you could do yourself. The most powerful incentive for patenting it yourself is the amount of money expert help costs. Or put another way, even though most car mechanics make a pretty good living, most of them can't afford to belong to the same country club as patent attorneys. The cost factor alone may dictate your decision for you if you can't afford the $5,000 to $15,000 most attorneys now charge to prepare a patent application on a simple invention.

On the other hand, if you're fortunate enough to be able to afford an attorney and you either don't have enough time to do it yourself, you don't think you'll be able to write a detailed description of your invention in conjunction with drawings (it's easier than you think), you aren't diligent and committed enough to complete projects in a reasonable time, or you think you can't complete a detailed writing job in a fairly high-quality manner, then perhaps you should use an attorney in conjunction with *Patent It Yourself,* to monitor and enhance the attorney's work.

The above can be expressed by the following proportion:

$$\text{DIY} \quad \alpha \quad \frac{\text{AT} \bullet \text{WA} \bullet \text{D} \bullet \text{DC}}{\text{AF}}$$

which means you should be inclined to *Do It Yourself* in direct proportion to your *Available Time*, your *Writing Ability*, your *Diligence*, and your *Desire to Control* things, and in inverse proportion to your *Available Funds*. While this proportion isn't even an approach at precision, it provides the appropriate criteria and how to use them when making the do-it-yourself versus hire-an-attorney decision.

The best answer for some inventors may be to do some of both. Using this approach, diligent inventors will do much of the patent work themselves, only consulting with an attorney at an hourly rate if snags develop, or to check the patent application before submission.

Proposed Legislation That May Affect Your Patent

As this edition goes to press, important changes have been proposed in the patent rules and laws. If implemented, these changes will likely reduce the strength of patents. Some powerful entities, mainly computer, software, and financial service companies, are in favor of these changes. Other powerful entities, mainly drug companies, independent inventors, Nobel laureates, and some legislators, want to keep patents strong and thus are opposed to these changes. The winner will be determined to a large extent by the influence of each side over our legislators. Here is a status report as of this edition (February 2011).

New Rule Changes Halted: The PTO issued new rules regarding (a) the number of applications that may be permitted in a chain of continuing applications, and (b) the number of claims that may be filed. A number of organizations have sued the PTO, contending that these changes go beyond the PTO's powers. A trial court tentatively agreed and has issued a temporary injunction, ordering the PTO not to implement the new rules until the issues are resolved after a full trial. However, the appellate court reversed part of the trial court's decision, holding that the PTO may limit the number of applications in a chain. Check my blogsite at http://patentityourselfupdates.blogspot.com for further updates.

New Patent Revision Bills Stalled: Various patent revision bills are pending: One bill that would completely revise the patent statutes is pending, but has been derailed because of protests by inventors, concerned legislators, drug and biotech companies, labor unions, manufacturing and chemical companies, research universities, and a new administration. Complete information about the bill and the arguments against its provisions can be found on the Professional Inventors' Alliance site, (www.piausa.org).

While this revision has some provisions that would help independent inventors, I believe that its overall effect would be harmful. I urge you to call and write to your federal representatives and senators to urge them to oppose this bill in order to keep our patent system strong, since I believe that this is one of the main factors that has made the U.S. a technological leader. Another bill would change the patent system into a three-tiered system where every patent applicant could elect to either (a) have the patent application examined right away for a relatively large fee, (b) have it examined in the normal course for a moderate fee, or (c) have examination deferred for a number of years and not pay any examination fee until examination was requested.

I will post the resolution of these issues on the update site for *Patent It Yourself* at Nolo's site (www.nolo.com).

—David Pressman

Patent It Yourself—Quick-Start Guide

We realize that *Patent It Yourself* is a big book, and we hope you will read it from cover to cover to get a full picture of the field of patents and inventions. However if you don't have the time, this Quick-Start Guide will tell you where to look to accomplish a specific task.

Task	What to Read or Do
You've invented something and you want to protect it.	Follow the RESAM procedure (Chapter 1): **R**ecord the invention properly or file a Provisional Patent Application (Chapter 3). **E**valuate commercial potential to see if it will sell (Chapter 4). **S**earch it for patentability to see if you will be able to get a patent (Chapters 5 and 6). **A**pply for a patent (Chapters 8 through 10). **M**arket it to a suitable company (Chapter 11).
You have a patent and want to license or sell it.	Read Chapter 11 on Marketing.
You have a patent that may be infringed.	Read Chapter 15 to learn how to determine whether it's infringed and how to go after the infringer.
You have a patent and want to maintain it.	Read Chapter 15 on Maintenance Fees.
You have a patent and want to sell or license it.	Reach Chapter 16 on Assignments and Licensing.
You want to learn about all forms of intellectual property.	Read Chapters 1 and 7.
You want to determine whether your invention will sell.	Read Chapter 4 on Evaluating Commerciality.
You want to see if your invention is patentable.	Read Chapters 5 and 6 on Patentability and Searching.
You want to get a monopoly on your invention abroad.	Read Chapter 12 on Foreign Patenting.
You have a pending patent application and want to learn how to deal with the Patent Office.	Read Chapter 13 on Patent Application Prosecution and Chapter 14 on Branches of Your Application.
You want to see more reference sources for inventors.	Read Appendix 2, Resources.
You need a name for something or a definition of a patent-legal term.	See Appendix 3, Glossaries.
You want to determine a Patent Office fee.	See Appendix 4, Fee Schedule.
You need to contact the PTO.	See Appendix 5, PTO telephones, etc.
You need to determine a time limit.	See Appendix 6, Timing Chart.
You need a patent form.	See Appendix 7, Forms.

E. New Material in the Fifteenth Edition

In the fifteenth edition, you'll find information about:

- new standards for process or method claims as established in the Supreme Court's *Bilski v. Kappos* (2010)
- searching techniques for the PTO's EAST/PubWEST Search systems
- updated Google Patent Search information
- new eFiling procedures at the PTO
- venture capital funding
- changing legal trends that disfavor independent inventors
- public citation of prior art
- revised continuation rules
- patent trolls and submarine patents
- new design patent infringement standards as established in the *Egyptian Goddess, Inc. v. Swisa, Inc.* case.

F. How to Use *Patent It Yourself*

The book is organized primarily for chronological use, starting with an overview of the entire intellectual property field (which includes patents, trademarks, copyright, and trade secret law). Then it sequentially covers the steps most inventors will take to monopolize and profit from their inventions. I strongly recommend that you first read the book all the way through, skimming lightly over the many chapters that actually tell you how to do things.

In this way you'll first get an overview of the patent forest before you return and deal with the individual steps (trees) necessary to fully protect your invention.

Throughout the book I refer to a number of forms and in many instances reproduce them in the text. A tear-out or copyable version of each is also located in Appendix 7 for your use, and all PTO forms can be downloaded from the PTO website. If you don't have Internet access, I recommend that you make photocopies of PTO forms so you'll have ample spares for drafts and extra copies for your records.

Also throughout the book I refer to various statutes and governmental administrative rules, mostly in the patent area. I use standard forms of legal citation; these are interpreted as follows:

- 35 USC 102 = Title 35 of the U.S. Code, Section 102
- 37 CFR 1.111 = Title 37 of the (U.S.) Code of Federal Regulations, Section 1.111.

Title 35 of the U.S. Code (USC) contains all of the federal patent statutes and Title 37 of the U.S. Code of Federal Regulations (CFR) contains all of the federal administrative rules issued by the Patent and Trademark Office and Copyright Office that deal with patents, trademarks, and copyright matters. Part 1 of 37 CFR is concerned with patents. Thus Patent Rule 111 = 37 CFR 1.111.

In addition to the Patent Rules, the PTO publishes much more information on the patent process in its *Manual of Patent Examining Procedure* (MPEP), which is available online. Both the U.S. Code and the CFR are available in any law library and online as part of the MPEP, as indicated in Appendixes 2 and 5, Resources: Government Publications, Patent Websites, and Books of Use and Interest; and Mail, Telephone, Fax, and Email Communications With the PTO.

I've used many abbreviations throughout *Patent It Yourself* to save space and spare you the tedium of repeatedly reading long phrases. I've tried to define each abbreviation the first time I've used it and again if there is a long break before it is used again. If at any time you need to refresh your memory about a particular abbreviation, please refer to Appendix 1, Abbreviations Used in *Patent It Yourself*.

Appendix 3 provides two dictionaries. The first is a list of technical terms used in the preparation of patent applications (Glossary of Useful Technical Terms). The second list provides definitions for many of the terms used throughout this book (Glossary of Legal Terms).

The law is constantly changing. We try to update the important changes in each printing, but in the meantime you can get updates at www.patentityourself.com and www.nolo.com.

Welcome to the world of intellectual property! Good luck and successful inventing!

CHAPTER 1

Introduction to Patents and Other Intellectual Property

Inventor's Commandment 1

Prior to deciding how to proceed with any creation, you should learn and be familiar with all of the various forms of intellectual property, including utility patents, design patents, trademarks, copyright, trade secrets, and unfair competition, so that you will be able to select and employ the proper form(s) of coverage for your creation.

In this chapter I'll first introduce you to the world of "intellectual property" (IP) law, including patents, trademarks, etc. Although you may think that a patent is the only form of protection available for your creation, there are a number of other forms of IP that may be applicable. I strongly recommend you become familiar with and consider all forms of IP since you may find that you can use one or more of the other forms of IP in addition to or in lieu of a patent. This chapter presents an overview of all of the types of IP, including patents. Of course I'll honor the title of this book in subsequent chapters, which will focus on how to obtain and profit from a patent.

A. What Is a Patent and Who Can Apply for It?

Before we start, to show the importance of patents to a society, consider what Mark Twain said about patents way back in 1889:

> *"That reminds me to remark, in passing, that the very first official thing I did, in my administration—and it was on the very first day of it, too—was to start a patent office; for I knew that a country without a patent office and good patent laws was just a crab, and couldn't travel any way but sideways or backways."*
>
> ***—A Connecticut Yankee in King Arthur's Court, Chapter IX, "The Tournament."***

Have you ever thought about why the standard of living in the United States is so high? I believe it's due in part to the United States patent system, which stimulates the creative genius in the U.S. As Lincoln said, "The patent system added the fuel of interest to the fire of genius."

What is a patent? It's a right granted by the government to an inventor.

What is the nature of the patent right? A patent gives its owner—the inventor or the person or business to whom the inventor legally transfers the patent—the right to exclude others from making, using, or selling the invention "claimed" in the patent deed for approximately 17 to 18 years, provided three maintenance fees are paid. (See Chapter 9 for more on patent claims, and Chapter 15 for more on maintenance fees.) You can use this right to exclude others by notifying infringers of your patent, or if that fails, by filing a patent infringement lawsuit in federal court.

Important Definitions

While these definitions may seem elementary, I provide them here because many inventors confuse these terms, and so that you will know exactly what I mean when I use these terms later.

Also, in the patent world, a single word or comma can make the difference between allowance or rejection of a set of claims, or whether a court will hold that a device infringes a patent. All patent practitioners consider it important and usually essential to use words and punctuation precisely and accurately.

An **invention** is any new article, machine, composition, or process or new use developed by a human.

A **patent application** is a set of papers that describe an invention and that are suitable for filing in a patent office in order to apply for a patent on the invention.

A **patent** is a grant from a government that confers upon an inventor the right to exclude others from making, using, selling, importing, or offering an invention for sale for a fixed period of time. (I encounter many beginning inventors who refer to a patent application as a "patent." If I feel they won't take offense I usually correct them gently in order to start them on the path of accurate word usage.)

Who can apply for a patent? Anyone, regardless of age, nationality, mental competency, incarceration, or any other characteristic, so long as he or she is a true inventor of the invention. Even dead or insane persons may apply through their personal representative. (See Chapter 16 for more on patent ownership.)

A patent is a form of personal property and can be sold outright for a lump sum, or its owner can give anyone permission to use the invention it covers ("license it") in return for royalty payments. More on this in Chapter 16.

B. The Three Types of Patents

There are three types of patents—utility patents, design patents, and plant patents. Let's briefly look at each.

- **Utility Patents:** As we'll see in Chapters 8 to 10, a utility patent, the main type of patent, covers inventions that function in a unique manner to produce a utilitarian result. Examples of utility inventions are Velcro hook-and-loop fasteners, new drugs, electronic circuits, software that is tied to some form of hardware, semiconductor manufacturing processes, new bacteria, newly discovered genes, new animals, plants, automatic transmissions, Internet techniques and methods of doing business (provided physical things are involved), and virtually anything else under the sun that can be made by humans. To get a utility patent, one must file a patent application that consists of a detailed description telling how to make and use the invention, together with claims (formally written sentence fragments) that define the invention, drawings of the invention, formal paperwork, and a filing fee. Again, only the actual inventor can apply for a utility (or any other) patent. The front or abstract page of a typical utility patent is illustrated in Fig. 1A.
- **Design Patents:** As discussed in more detail in Chapter 10, a design patent (as opposed to a utility patent) covers the unique, ornamental, or visible shape or surface ornamentation of an article or object, even if only on a computer screen. Thus if a lamp, a building, a computer case, or a desk has a truly unique shape, its design can be design patented. Even computer screen icons and an arrangement of printing on a piece of paper can be patented. The design must be for an article that is different from an object in its natural state; thus a figure of a man would not be suitable for a design patent but if the man is an unnatural position, this can be patented. For an example, see patent Des. 440,263 (2001) to Norman. However, the uniqueness of the shape must be purely ornamental or aesthetic and part of an article. If the design is functional, then only a utility patent is proper, even if it is also aesthetic. A good example is a jet plane with a constricted waist for reducing turbulence at supersonic speeds: Although the novel shape is attractive, its functionality makes it suitable for a utility patent only.

  A useful way to distinguish between a design and a utility invention is to ask, "Will removing or smoothing out the novel features substantially impair the function of the device?" If so—as in the jet plane with the narrowed waist—this proves that the novel features have a significant functional purpose, so a utility patent is indicated. If not—as in a woodshop wall clock that is shaped like a circular saw blade, or a phone that is shaped like a shoe—a design patent is indicated. Two useful questions to ask are:

  - Is the novel feature(s) there for structural or functional reasons, or only for the purpose of ornamentation? and
  - Does the novel feature make it look better or work better? (If the novel feature fulfills both purposes, the utilitarian function always prevails.)

  Sometimes the state of the art, rather than the nature of the novelty, will determine whether a design or utility patent is proper for an invention. If a new feature of a device performs a novel function, then a utility patent is proper. However, if the state of the art is such that the general nature of the feature and its function is old, but the feature has a novel shape that is an aesthetic improvement, then only a design patent will be proper.

  The design patent application must consist primarily of drawings, along with formal paperwork and a filing fee.
- **Plant Patents:** A plant patent covers asexually reproducible plants (that is, through the use of grafts and cuttings), such as flowers (35 USC 161). Sexually reproducible plants (that is, those that use pollination), can be monopolized under the Plant Variety Protection Act (7 USC 2321). Both sexually and asexually reproducible plants can now also be monopolized by utility patent (35 USC 101). Plant patents are a comparatively recent innovation (1930). Luther Burbank, the great botanist of Santa Rosa, California, goaded Congress to act, stating, "We plant inventors cannot patent a new plum, though the man who makes an automobile horn can get a patent and retire to Southern California and wear silk underclothes the rest of his life."

C. The Novelty and Unobviousness Requirement

With all three types of patents, a patent examiner in the Patent and Trademark Office (PTO) must be convinced that your invention satisfies the "novelty" and "unobviousness" requirements of the patent laws.

The novelty requirement is easy to satisfy: Your invention must be different from what is already known to the public. Any difference, however slight, will suffice. (Note: When I refer to your invention, I am referring to the manner in which it is "claimed" in your patent. The claims, as we'll discuss later, define your invention.)

Novelty, however, is only one small hurdle to overcome. In addition to being novel, the examiner must also be convinced that your invention is "unobvious." This means

United States Patent [19]

Holmes

[11] **Patent Number: 4,949,887**

[45] **Date of Patent: Aug. 21, 1990**

[54] **INSULATED MULTI-USE SEAT CUSHION WITH CLOSABLE HAND AND FOOT OPENINGS**

[76] Inventor: **William A. Holmes**, 209 Highland Ave., Piedmont, Calif. 94611-3709

[21] Appl. No.: **132,982**

[22] Filed: **Dec. 15, 1987**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 867,453, May 28, 1986, abandoned.

[51] **Int. Cl.**[5] **A61G 1/00**

[52] **U.S. Cl.** **224/151**; 224/205; 224/236; 2/66; 2/202; 126/204; 297/188

[58] **Field of Search** 224/151, 153, 202, 205, 224/257, 206, 207, 236, 237; 2/66, 91, 93, 108, 202, 203; 383/61, 110, 98, 99, 8; 128/382; 190/107, 102; 5/417–421; 297/230, 188, 192, 219; 126/204, 207, 208

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4,423,834	1/1984	Rush	224/151
4,604,987	8/1986	Keltner	5/421

Primary Examiner—Linda J. Sholl
Attorney, Agent, or Firm—David Pressman

[57] **ABSTRACT**

An insulated hollow cushion has a neck strap (**30**), an interior portion (**72**) sufficiently large to accommodate a portable heating source and/or hot and cold foods (**74, 76**), two side slits through which hands can be inserted for warmth, sealable flaps (**16, 20**) for closing the side slits when insulation is desired, a slit (**36**) at the top of the cushion for insertion of items into the cushion's interior, a closeable top flap (**28**) to seal the top opening for insulation purposes, and a closeable top small flap (**56**) to insulate the gap between a user's ankles when such user's feet are inserted through the top slit. The side flaps can be insulated so that they can be tucked into the side openings to narrow these openings to provide a tight seal when small hands are inserted into these openings. The insulating layer within the front (**10**) or the back panel can have multiple perforations (**92**) over an area thereof and this area can be covered, uncovered, or partially covered by a releasably closable flap (**84**), thereby to provide a "heat window" which allows maximum transmission of heat (or cold) from an internal hot (or cold) source, or partial transmission, or no more transmission than would occur through an intact insulated wall.

20 Claims, 6 Drawing Sheets

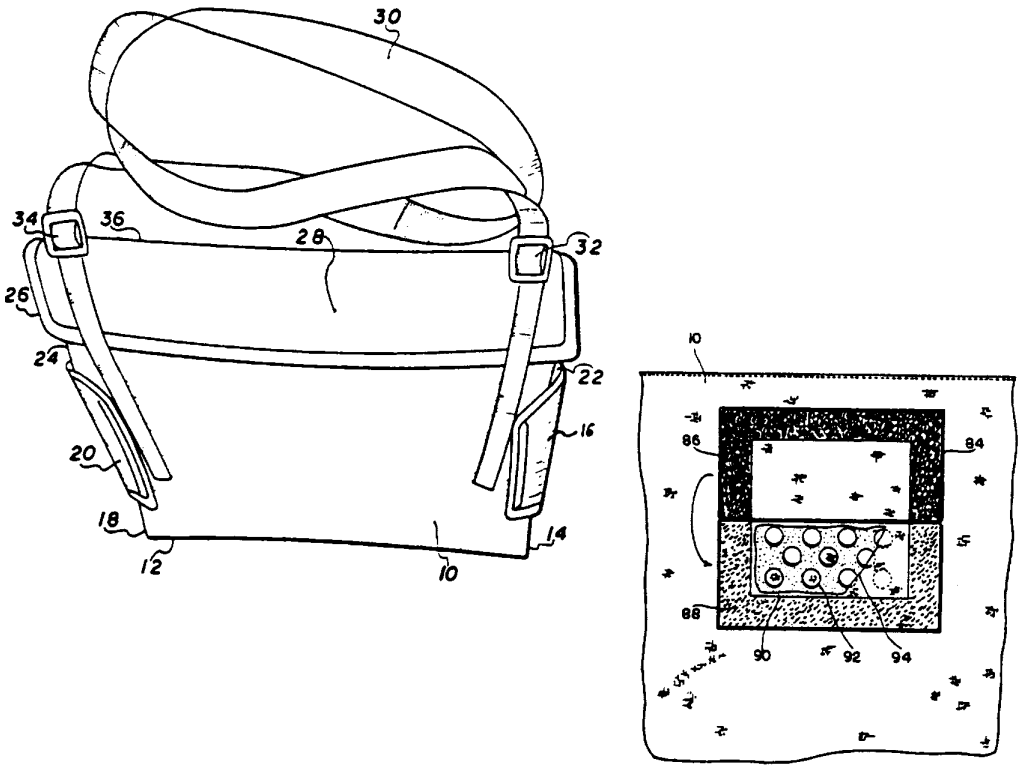


Fig. 1A—Utility Patent Abstract Page

The Life of an Invention

Although most inventors will be concerned with the rights a patent grants during its monopoly or in-force period (from the date the patent issues until it expires (20 years after the filing date)), the law actually recognizes five "rights" periods in the life of an invention.

These five periods are as follows:

1. **Invention Conceived but Not Yet Documented:** When an inventor conceives of an invention, but hasn't yet made any written, signed, dated, and witnessed record of it, the inventor has no legal rights whatsoever, only the potential for acquiring rights.
2. **Invention Documented but Patent Application Not Yet Filed:** After making a proper, signed, dated, and witnessed documentation of an invention, the inventor has valuable rights against any inventor who later conceives of the same invention and applies for a patent. An inventor who documents the building and testing of the invention has substantially greater rights than one who merely documents conception. (See Chapter 3, Section E1.) During this period the invention may also be treated as a "trade secret"—that is, kept confidential. This gives the inventor the legal right to sue and recover damages against anyone who immorally learns of the invention—for instance, through industrial spying.
3. **Patent Pending—Patent Application Filed but Not Yet Issued:** During the patent pending period, including the one-year period after a provisional patent application is filed, the inventor's rights are the same as they are in Period 2 above, with one exception noted below.* Otherwise, the inventor has no rights whatsoever against infringers—only the hope of a future monopoly, which doesn't commence until a patent issues. Most companies that manufacture a product that is the subject of a pending patent application will mark the product "patent pending" in order to warn potential copiers that if they copy the product, they may have to stop later (and thus scrap all their molds and tooling) if and when a patent issues. The Patent and Trademark Office (PTO) by law must keep all patent applications preserved in secrecy until the application is published or the patent issues (whichever comes first). The patent pending period usually lasts from one to three years.
4. **In-Force Patent—Patent Issued but Hasn't Yet Expired:** After the patent issues,* the patent owner can bring and maintain a lawsuit for patent infringement against anyone who makes, uses, or sells the invention without permission. The patent's in-force period lasts from the date it issues until 20 years from its filing date, provided maintenance fees are paid. Nearly every patent is guaranteed an in-force period of at least 17 years. In order to assure this 17-year term, the patent will be extended, if necessary, to compensate for delays resulting from failures by the PTO in processing the patent application. Also, once the patent issues, it becomes a public record or publication that can block others who file later from getting patents on the same or similar inventions—that is, it becomes "prior art" to anyone who files after its filing date.
5. **Patent Expired:** After the patent expires (20 years after the filing date, or sooner if a maintenance fee isn't paid), the patent owner has no further rights, although infringement suits can be brought for any infringement that occurred during the patent's in-force period. An expired patent remains a valid "prior-art reference" (as of its filing date) forever.

* Under the new 18-month publication statute (see Section Q2), an inventor whose application is published prior to issuance may obtain royalties from an infringer from the date of publication, provided the application later issues as a patent and the infringer had actual notice of the published application.

that at the time you came up with your invention, it would have been considered unobvious to a person skilled in the technology (called "art") involved in your creation. As we'll see in Chapter 5, unobviousness is best shown by new and unexpected, surprising, or far superior results, when compared with previous inventions and knowledge ("prior art") in the particular area of the invention. (In addition to being novel and unobvious, utility inventions must also be "in a statutory class" and be useful. More on this later.)

D. How Long Do Patent Rights Last?

How long can you, the patent owner, exclude others from infringing the exclusive rights granted by your patent? Utility and plant patents expire 20 years from the date of filing while design patents last 14 years from the date of issuance. The terms of patents for certain products whose commercial marketing has been delayed due to regulatory review (such as for drugs or food additives) can be extended beyond the statutory period.

While the term of a patent is calculated from its filing date, the monopoly period it creates—its in-force period—doesn't start until the patent issues. Effective June 2000, every patent is guaranteed an in-force period of at least 17 years. The patent term will be extended for as long as necessary to compensate for any of the following:

- any delay caused by the PTO failing to examine a new application within 14 months from filing
- any delay caused by the PTO failing to take any of the following actions within four months:
  - reply to an amendment or to an appeal brief
  - issue an allowance or Office Action after a decision on appeal, or
  - issue a patent after the issue fee is paid and any required drawings are filed
- any delay caused by the PTO failing to issue a patent within three years from filing, unless the delay was due to the applicant filing a continuation application or buying a delay to reply to an Office Action, or
- any delay due to secrecy orders, appeals, or interferences.

The patent's in-force or enforceable monopoly period starts when the patent issues, usually about one to three years after the application is filed. From the date of filing to issuance (termed the "pendency period") the inventor has no rights, with one exception: If the patent application is published, an inventor will obtain gain some "provisional" rights against an infringer. An inventor may obtain royalties from an infringer from the date of publication provided (1) the application later issues as a patent; and (2) the infringer had actual notice of the published application. (35 USC 122, 154.). When, and if, the patent later issues—whether or not the application was published—the inventor will obtain the right to prevent the continuation of any infringing activity that started during the pendency period. Relevant time periods are indicated in "The Life of an Invention," above, and in the chart in Appendix 6.

E. Patent Filing Deadlines

As we'll see in more detail in Chapter 5, in the United States you must file your patent application within one year after you first commercialize, publish, or reveal without restriction details of the invention. However most foreign countries don't have this one-year grace period, so there's some disadvantage if you sell or publish before filing. For this reason, your safest route is to file a complete U.S. patent application before you publish or commercialize your invention. Under new legislation, you are permitted to file a "provisional patent application" (PPA) describing your invention in detail, in accordance with the instructions in Chapters 3 and 8. (No claims, discussed in Chapter 9, are needed.) This PPA can be used, under most circumstances, to defeat or block a patent application or invention of someone else who may subsequently file a patent application on the same invention. However, to obtain the benefit of the PPA's filing date, a regular patent application must be filed within one year after the PPA's filing date—more on this in Chapters 7 and 8.

F. Patent Fees

How much will it cost to get a patent? Assuming you use this book and don't use any patent attorneys or agents, and not including costs of drawings, typing, photocopying, and postage, the only fees you'll have to pay are government fees.

The amounts of these fees are listed on the PTO Fee Schedule in Appendix 4. As indicated in the Schedule, most PTO fees are two-part: large entity and small entity. The large-entity fees are generally paid by large corporations, while the small-entity fees, which are half the large-entity fees, are generally paid by independent inventors. For more on this, see Chapter 10, Section E5. The names of these fees and the circumstances when they're due are as follows:

- **Utility Patents:** To file a provisional patent application, you'll have to pay a *PPA Filing Fee*. To file a regular (nonprovisional) utility patent application, you must pay a *Utility Patent Application Filing Fee*. This fee now has three components—filing fee, search fee, and examination fee—but all three must be paid together. To have the PTO issue your utility patent, you must

pay a *Utility Patent Application Issue Fee*. To keep the patent in force for its full statutory term, you must pay the PTO three maintenance fees, as follows:
  - *Maintenance Fee I*, payable 3.0 to 3.5 years after issuance
  - *Maintenance Fee II*, payable 7.0 to 7.5 years after issuance, and
  - *Maintenance Fee III*, payable 11.0 to 11.5 years after issuance.
- **Design Patents:** To file a design patent application, you must pay a *Design Patent Application Filing Fee*. To have the PTO issue your design patent, you must pay a *Design Patent Application Issue Fee*. The law doesn't require maintenance fees for design patents, and there's no PPA for a design invention.
- **Plant Patents:** To file a plant patent application, you must pay a *Plant Patent Application Filing Fee*. To have the PTO issue your plant patent, you must pay a *Plant Patent Application Issue Fee*. Again, the law doesn't require maintenance fees for plant patents, and there's no PPA for a plant invention.

G. The Scope of the Patent

The patent right extends throughout the entire U.S., its territories, and possessions. A patent is transferable by sale or gift, by will, or by descent (under the state's intestate succession (no-will) laws). The patent rights can also be licensed, that is, you can own the patent and grant anyone else, including a company, the right to make, use, or sell your invention in exchange for the payment of fees, called "royalties" (more on licensing in Chapter 16). As mentioned, the patent right is granted by the federal government, acting through the Patent and Trademark Office (a division of the Department of Commerce), in Alexandria, Virginia. The patent right is recognized and enforced by the U.S. (federal) courts.

H. How Patent Rights Can Be Lost

The patent right isn't an absolute monopoly for the period that it is in force (from the date of issuance until the expiration date—20 years from date of filing).

It can be lost if:

- maintenance fees aren't paid
- it can be proved that the patent either (a) fails adequately to teach how to make and use the invention, (b) improperly describes the invention, or (c) contains claims that are legally inadequate
- one or more prior-art references (earlier patents or other publications) are uncovered that show that the invention of the patent wasn't new or wasn't different enough when the invention was made
- the patent owner engages in certain defined types of illegal conduct, that is, commits antitrust or other violations connected with the patent, or
- the patent applicant committed "fraud on the Patent and Trademark Office (PTO)" by failing to disclose material information, such as relevant prior-art references, to the PTO during the period when the patent application was pending.

In short, the patent monopoly, while powerful, may be defeated and is limited in scope and time.

I. What Rights a Patent Grants and the Prior-Art Reference Value of a Patent

The patent grant gives its owner—one or more individuals, a partnership, corporation, or other entity to which an inventor has "assigned" (legally transferred) the invention—the right to file, maintain, and recover in a lawsuit against any person or legal entity (infringer) who makes, uses, or sells the claimed invention, or an essential part of it. If the patent owner wins the lawsuit, the judge will issue an injunction (a signed order) against the infringer, ordering the infringer not to make, use, or sell the invention any more. Also, the judge will award the patent owner damages—money to compensate the patent owner for loss due to the infringement. The amount of the damages is often the equivalent to a reasonable royalty (say 5%), based on the infringer's sales. However, if the patent owner can convince the judge that the infringer acted in bad faith—for example, infringed intentionally with no reasonable excuse—the judge can triple the damages and make the infringer pay the patent owner's attorney fees.

In addition to bringing in licensing income and enabling a manufacturer to charge more for a unique product, patents also have other uses. Some inventors file for and obtain patents mainly for vanity, or the prestige a patent brings. Others use patents to impress and obtain financing from investors. And many organizations obtain large portfolios of patents simply to assert them as a defense against any company that charges the organization with patent infringement.

The value of patents cannot be overestimated. As Dr. Edwin Land, the inventor and founder of Polaroid, stated, "The only thing that keeps us alive is our brilliance. The only way to protect our brilliance is patents." For a more concrete example, consider that in 2000 the PTO granted

over 2,800 patents to IBM, which now holds about 19,000 U.S. patents. These patents generated over $1.5 billion in revenue! In fiscal year 2005 (from 2005 July 1 to 2006 Jun 30), inventors filed 400,000 patent applications in the PTO and this rate is increasing by 6% to 10% per year!

Since the patent defines the invention monopoly very precisely, the patent owner can use the patent only against supposed infringers who make, use, or sell things or processes that fall within the defined monopoly. This means that not everyone who makes something similar to your invention will be an infringer; you can validly sue only those whose products or processes fall within the scope of the claims in your patent. (See Chapters 9, 13, and 15 for more on claims.)

In addition to its above-described use as an offensive weapon, a patent also provides a prior-art reference that will block others from getting a patent on anything disclosed in the patent. In this respect, a patent is like a periodical (magazine) article or book. This dual nature of a patent is illustrated in Fig. 1B.

When I'm Used as an Offensive Weapon	When I'm Used as a Prior-Art Reference
1. My claims can be used to stop infringers and/or obtain damages from them.	1. My specification and drawings constitute prior art, just like any magazine article or book. They can be used to prevent others from getting a patent on what I disclose.
2. My offensive rights start when I issue (or when my application is published—See Section D, above), and expire 20 years from my filing date, provided my maintenance fees are paid.	2. I'm effective as of my filing date and I remain effective as prior art forever.
3. My powers are based solely upon my claims.	3. My claims are irrelevant. Think of me simply as a book, a magazine article, or any other publication.

Fig. 1B—A Patent Can Be Used as an Offensive Weapon or as a Prior-Art Reference

J. What Can't Be Patented

Despite the large number of things that can be patented, there are some "inventions" that the law will not allow to be patented. You can't patent any process that can be performed mentally. The reason is that the law doesn't wish to limit what people can do essentially with just their brains. The same rule applies to abstract ideas; inventions that aren't reducible to or practicable in hardware form, or inventions that don't involve the manipulation of hardware or symbols (words, letters, numbers) to produce a useful result; naturally occurring articles; business forms and other printed matter per se (not associated with some hardware); scientific principles in the abstract (without hardware); inventions that won't work to produce the result claimed for them (such as perpetual motion machines); abstract algorithms that merely crunch numbers without a useful result; human beings (such as cloned humans); and atomic energy inventions. In 2010, the U.S. Supreme Court ruled that a process is not patentable unless the process is tied to a machine or transforms hardware (despite the fact that a patent statute—35 USC 101—states that "*any* new and useful process" may be patented). This decision casts a cloud over many business method patents and will prevent the patenting of many new business methods. *Bilski v Kappos,* 2010 Jun 28. See Chapter 5 for more information.

NOTE

Computer Program Note. Computer programs, including algorithms, cannot be patented per se. However, the program, software, or algorithm can be patented if it (1) is tied to a particular machine or apparatus, or (2) transforms an article into a different state or thing. Electrical signals and data are considered patentable articles if they represent physical objects or substances. For instance, if the algorithm controls a display, a memory, a keyboard, any other hardware or process, or if it processes or analyzes a signal that represents a physical quantity, then it can be patented. If the algorithm merely manipulates numbers, such as calculating π, or merely solves an algorithm, then it can't be patented. Computer programs and algorithms per se (without hardware) can alternatively be protected by copyright, and sometimes by trade secret law. For more information, see *Legal Guide to Web & Software Development*, by Stephen Fishman (Nolo).

With respect to designs, as explained, the PTO won't grant design patents on:

- any design whose novelty has significant functional utility (use a utility patent)

- ornamentation that is on the surface only, rather than forming an integral part of a device, or
- any device which has a shape that exists in nature.

K. Some Common Patent Misconceptions

Over the years that I've practiced patent law, I've come across a number of misconceptions that laypersons have about patents. As part of my effort to impart what a patent is, I want to clear up a few of the most common here at the outset.

Common Misconception: A patent gives its owner the right to practice an invention.

Fact: If you come up with an invention, you may practice (make, use, and sell) it freely, with or without a patent, provided that it's not covered by the claims of another's "in force" patent, that is, a patent that is within its 20-year term. If you have a patent on an improvement invention such as a triode (three-element vacuum tube) and someone holds a patent on a basic invention such as a diode (two-element vacuum tube), your patent will not give you any defense if the owner of the basic patent charges you with infringement. However if the owner of the basic patent wants to use your improvement invention, you may be able to work out a cross-license to avoid having to stop using and selling your own invention.

Common Misconception: Once you get a patent, you'll automatically be rich and famous.

Fact: A patent is like a hunting license: It's useful just to go after infringers. If the invention isn't commercialized, the patent is usually worthless. You won't get rich or famous from your patent unless you or someone else gets the invention into widespread commercial use. In this connection, I've met many inventors who tell me that times are rough and they need to get a patent quickly to lift them out of poverty and make things better. I always have to throw cold water on their hopes by telling them that no one should ever depend on a patent to change their life since few patents ever make money for their inventors, and even when they do, it usually takes years for a patented invention to bear fruit. It's okay to pursue your invention and a patent so long as you realize that this path is usually a long shot and time-consuming road to success.

Common Misconception: If a product has been patented, it's bound to be superior.

Fact: Although Madison Avenue would like you to believe this, in reality a patent merely means the invention is significantly different, not necessarily superior.

L. How Intellectual Property Law Provides "Offensive Rights" (and Not Protection) to Inventors

Many people speak of a patent as a form of "protection." The fact is that, as stated, a patent is an offensive weapon, rather than "protection," which is a defensive shield. To properly benefit from a patent, as we'll see in Chapter 15, the patent owner must sue or threaten to sue anyone who trespasses on the right. The patent doesn't provide any "protection" in its own right and does not give its owner a defense if the inventor infringes an earlier patent. Although the word "protection" is in common usage for all types of intellectual property, it's more accurate to say that a patent—as well as a copyright, trade secret, and trademark—gives its owner "offensive rights" against infringers. In other words the patent, copyright, trade secret, or trademark provides a tool with which you can enforce a monopoly on your creation. The distinction between protection (a defense) and offensive rights is as important in intellectual property law as it is in football or basketball: while a good defense may be valuable, you'll need a powerful offense to win the game or stop the infringer.

To help you keep this distinction in mind, I try consistently to use the term "offensive rights" instead of "protection." However, if I slip up from time to time, please remember that by protection I only mean that inventors have the right to affirmatively come forward and invoke the court's help in preventing infringement by others.

Common Misconception: If you make or sell a device on which you have a patent, your patent will protect you against the infringement claims of others.

Fact: A patent is for offensive use only and has no value in defending against infringement charges from other patents, except that your patent sometimes will have value in a counterattack if the other patent owner infringes your patent.

Common Misconception: If a product, such as a tooth whitener, says "patented," no one else can make a product with a similar function.

Fact: Most patents cover only one specific aspect or version of a product, rather than the basic function of the product. For instance, the patent on the tooth whitener may cover only a specific composition, and many other compositions that perform the same function (albeit in an inferior—or superior—way) may exist that don't infringe the patent.

M. Alternative and Supplementary Offensive Rights

As you probably realize, there are several alternative and often overlapping ways to acquire offensive rights on intellectual property. Let's think of these as different roads to the same destination. While the immediate filing of your patent application is one of these roads, it is only one. The purpose of this chapter is to provide you with a map to the other roads and to help you decide which is the best way to travel, given your circumstances.

The value of your invention can sometimes be better monopolized by using one of the other forms of intellectual property and can almost always be enhanced by simultaneously using a patent with one or more of these other forms—such as unique trade dress, a good trademark, and copyright-covered labels and instructions—and by maintaining later improvements as a trade secret.

N. Intellectual Property—The Big Picture

"Intellectual property" (sometimes called "intangible property") refers to any product of the human mind or intellect, such as an idea, invention, expression, unique name, business method, industrial process, or chemical formula, which has some value in the marketplace, and that ultimately can be reduced to a tangible form, such as a computer, a chemical, a software-based invention, a gadget, a process, etc. Intellectual property law, accordingly, covers the various legal principles that determine:

- who owns any given intellectual property
- when such owners can exclude others from commercially exploiting the property, and
- the degree of recognition that the courts are willing to afford such property (that is, whether they will enforce the owner's offensive rights).

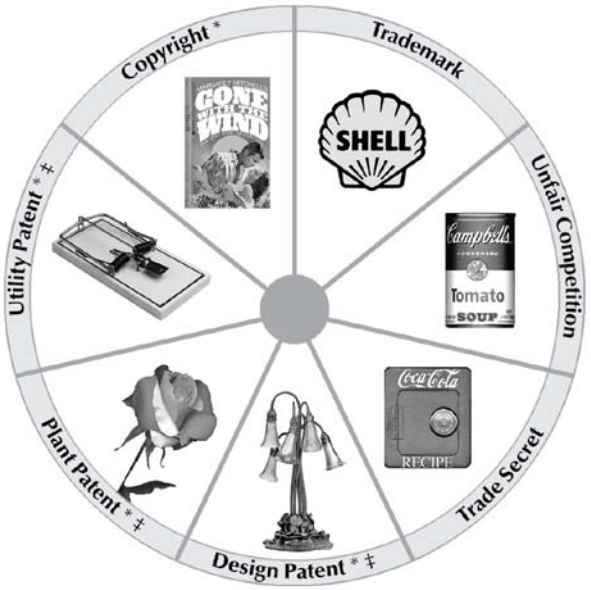
In short, intellectual property (IP) law determines when and how a person can capitalize on a creation. In recent years the role of IP has expanded greatly and will continue to do so as our society becomes more dependent upon technology and information.

Formerly, patents were the most significant part of IP law, so most attorneys who handled trademarks, copyright, trade secrets, and unfair competition, as well as patents, called themselves "patent attorneys." Nowadays, the nonpatent forms of IP law have become far more significant, so most patent attorneys now call themselves IP attorneys. This term has engendered some confusion, because many attorneys who aren't licensed to practice patent law (they only do trademark, copyright, etc.) call themselves IP attorneys. To practice patent law before the PTO, one must pass a separate "agent's exam" given by the PTO. Thus if you need someone to represent you before the PTO and you encounter an attorney who is merely identified as an "IP attorney," you must ask the attorney (or check the PTO's site) to see if the attorney is licensed to practice before the PTO.

Over the years, intellectual property law has fallen into several distinct subcategories, according to the type of "property" involved:

- **Patent Law** deals with the protection of the mental concepts or creations known as inventions—an example is the flip-top can opener. As indicated earlier, we have three types of patents: utility, design, and plant.
- **Trademark Law** deals with the degree to which the owner of a symbol (for example, a word, design, or sound) used in marketing goods or services will be afforded a monopoly over the use of the symbol (that is, offensive rights against others who try to use it). Examples of trademarks are *Ivory, Coke*, *Nolo,* the *Mercedes-Benz* star, and the *NBC* chimes. With regard to advertising slogans, while the courts generally do not regard them as trademarks, they will afford them trademark rights provided their owners have used them consistently as brand names on the goods and not just in the media. Slogans are primarily covered by copyright law and unfair competition (see below).
- **Copyright Law** grants authors, composers, programmers, artists, and the like the right to prevent others from copying or using their original expression without permission and to recover damages from those who do so. Copyright law gives me offensive rights against anyone who copies this book without my permission.
- **Trade Secret Law** deals with the acquisition of offensive rights on private knowledge that gives the owner a competitive business advantage—for example, manufacturing processes, magic techniques, and formulae. The method of producing the laser light shows and fireworks are trade secrets. Unless its owner makes substantial efforts to keep the knowledge secret, any trade secret rights will be lost.
- **Unfair Competition Law** affords offensive rights to owners of nonfunctional mental creations that don't fall within the rights offered by the four types of law just discussed, but which have nevertheless been unfairly copied by competitors. For example, "trade dress" (such as *Kodak*'s yellow film package), a business name (such as *Procter & Gamble Co.*), a unique advertising slogan (for example, "Roaches check in but they don't check out"), or a distinctive packaging label (such as *Duracell*'s copper-top energy cells) may all enjoy offensive rights under unfair competition principles.

Having covered patent law earlier in this chapter, let's now wade a little deeper into the other forms of intellectual property law, all of which are shown and briefly depicted in Fig. 1C—The Intellectual Property Mandala, below.



* One must obtain a governmental certificate (patent or registration) to enforce any offensive rights.

‡ Timing is crucial: application must be filed within one year after public exposure.

Fig. 1C—The Intellectual Property Mandala

Many clients have come to me with an invention or idea, asking if there were some easier and quicker way to protect their invention than the seven methods discussed in the IP mandala, above. Alas, I always have to disappoint them. I have included in this chapter all of the IP techniques that exist. There are no additional or secret weapons in the IP arsenal, so you will have to work with what we have.

O. Trademarks

This is the most familiar branch of intellectual property law. On a daily basis, everyone sees, uses, and makes many decisions on the basis of trademarks. For instance, you probably decided to purchase your car, your appliances, much of the packaged food in your residence, your magazines, your computer, and your watch on the basis of their trademarks, at least to some extent. I believe that trademarks originated in 16th century Britain when silversmiths began putting their initials on their products. Naturally, disreputable competitors seeking to capitalize on a well-known silversmith's reputation soon came along and counterfeited the "trade mark" on copycat silverware. Judges were called upon to punish and stop the counterfeiters of the mark and lo, trademark law was born!

1. Trademarks Defined

In its most literal meaning, a trademark is any word or other symbol that is consistently attached to, or forms part of, a product or its packaging to identify and distinguish it from others in the marketplace. In other words, a trademark is a brand name.

An example of a word trademark is *Kodak,* a brand of camera. In addition to words, trademarks can be other symbols, such as designs or logos (the Nike swoosh), sounds (the NBC chimes), smells, and even colors. For example, the PTO granted a trademark registration on a specific color used for a line of dry-cleaning ironing pads. (*Qualitex Co. v. Jacobson Products Co., Inc.,* 115 S.Ct. 1300 (1995).) The shape of an object (such as the truncated, contrasting, conical top of Cross pens) can even be a trademark, provided (1) the shape doesn't provide a superior function, and (2) the shape has become associated in the minds of the purchasing public with the manufacturer (known in trademark terms as "secondary meaning").

Many patented goods or processes are also covered by trademarks. For example, *Xerox* photocopiers have many patents on their internal parts, and also are sold under the well-known *Xerox* trademark. Without the patents, people could copy the internal parts, but *Xerox* would still have a monopoly on its valuable and widely recognized trademark.

The term "trademark" is also commonly used to mean "service marks." These are marks (words or other symbols) that are associated with services offered in the marketplace. Examples of service marks include the letters "NBC" (broadcast network services), the Blue Cross–Blue Shield emblem (medical/insurance services), and the words, Café Gratitude (restaurant services).

Two other types of trademark are: "certification marks," the identifying symbols or names used by independent groups, boards, or commissions that certify the quality of goods or services—such as the Good Housekeeping Seal of Approval; and "collective marks," identifying symbols or names showing membership in an organization—for example, the FDIC symbol indicates that a bank is a member of the government-insured banking network.

An important third category of business identifier that is often confused with trademarks is called a "trade name." In the law, trade name is the word or words under which a company does business, while a trademark is the word or other symbol under which a company sells its products or services. To understand this better, let's use *Procter & Gamble* as an example. The words *Procter & Gamble* are a

trade or company name, while *Ivory* is a trademark, that is, a brand name for *Procter & Gamble*'s white soap. However, the media often refer to trademarks as trade names. Also, many companies such as *Ford*, use the same words as a trade name and a trademark, so the difference sometimes becomes academic.

Trademarks, such as *Ivory*, enjoy offensive rights under both federal and state trademark laws. The trade name *Procter & Gamble*, however, enjoys offensive rights primarily under state law (corporation registrations, fictitious name registrations, and unfair competition law). However, a federal law can also be used to slap down a trade-name infringement as a "false designation of origin" (17 USC 1125).

2. Monopoly Rights of a Trademark Owner

Briefly, the owner of a trademark may or may not be entitled to legal offensive rights depending on how distinctive (or strong) the law considers the trademark. Trademarks that are arbitrary (*Elephant* floppy disks), fanciful (*Double Rainbow* ice cream), or coined terms (*Kodak*) are considered strong, and thus entitled to a relatively broad scope of offensive rights. On the other hand, marks that describe some function or characteristic of the product (such as "*RapidCompute* computers" or "*RelieveIt*" for an analgesic) are considered weaker and won't enjoy as broad a scope of offensive rights. Although the above differences may seem somewhat arbitrary, they really aren't. The courts give fanciful, coined, or other arbitrary marks a stronger and broader monopoly than descriptive marks because descriptive marks come close to words in common usage and the law protects everyone's right to use these. Also, the owner of a "famous" mark can prevent anyone from diluting the mark—that is, blurring or tarnishing its distinctiveness—even if the diluting mark is not used on similar goods or services.

In addition to the strong/weak mark dichotomy, trademark owners may be denied offensive rights if the trademark becomes commonly used to describe an entire class of products, that is, it becomes "generic." For example, "aspirin," once a trademark that enjoyed strong offensive rights, became a generic word (no offensive rights) for any type of over-the-counter painkiller using a certain chemical. Why? Because its owner used it improperly as a noun (such as "Buy *Aspirin*") rather than as a proper adjective (such as "Buy *Aspirin* (brand) analgesic"), and the public therefore came to view it as synonymous with the product it described.

3. Relationship of Trademark Law to Patent Law

As indicated above, trademarks are very useful in conjunction with inventions, whether patentable or not. A clever trademark can be used with an invention to provide it with a unique aspect in the marketplace so that purchasers will tend to buy the trademarked product over a generic one. For example, consider the *Crock Pot* slow cooker, *Ivory* soap, and the *Hula Hoop* exercise device. These trademarks helped make all of these products successful and market leaders even though they were not granted any basic patent. In short, a trademark provides brand-name recognition to the product and a patent provides a tool to enforce a monopoly on its utilitarian function. Since trademark rights can be kept forever (as long as the trademark continues to be used), a trademark can be a powerful means of effectively extending a monopoly initially created by a patent.

4. Overview of How Offensive Rights to Trademarks Are Acquired

Here's a list of steps you should take if you come up with a trademark and you want to acquire offensive rights to it and use it properly. Because this is a patent book, I haven't covered this topic in detail.

a. Preserve Your Mark as a Trade Secret Until You Use It

As I explain in Subsection d, below, you must take certain actions before you can acquire offensive rights in a mark. This means that during the developmental stage you must treat your trademark as a trade secret so that others won't adopt your proposed mark and use it first. (See Section Q, below, for an overview of acquiring offensive rights to trade secrets.)

b. Make Sure the Mark Isn't Generic or Descriptive

Ask yourself if the mark is generic or descriptive. A generic mark is a word or other symbol that the public already uses to designate the goods or service on which you want to use the mark. Thus you can't acquire offensive rights on "The Pill" for a birth-control pill, since it's already a generic term. A descriptive mark is similar to a generic mark in that it describes the goods, but hasn't yet gotten into widespread public use. For instance, if you came up with a new electric fork, you cannot acquire offensive rights in the mark *Electric Fork*, since it merely describes the product.

c. Make Sure Your Mark Isn't Already in Use

It's essential to select a mark that is not in use by someone else. The goodwill you develop around the mark may go up in smoke in the event of a trademark infringement

contest and you may be liable for damages as well. Even if your proposed mark isn't identical to the already-used mark, the other mark's owner can prevent you from using it if, in the eyes of the law, there is a likelihood of customer confusion. Even if there's no such likelihood, the owner of a famous mark can block a mark that is likely to tarnish the reputation of the famous mark. To determine if your mark is already in use, you'll have to make a trademark search or hire someone to do it for you.

A complete trademark search should cover registered and unregistered (common law) marks. You can search all pending and registered trademarks for free at the PTO's website (www.uspto.gov) and you can search all marks (registered and not) on a good search engine, such as Google or Bing. You can also make free searches in *The Thomas Register* in any library or online at www.thomasregister.com, and in *Gale's Trade Name Directory* and *McRae's Blue Book* (most libraries). Further, most libraries have specific trade directories, such as *The Toy Manufacturer's Directory*. For those interested in adopting a World Wide Web site or domain name, Network Solutions, Inc. (InterNIC), has an online search site at www.internic.net. Complete searches of registered and unregistered marks can be ordered through the following companies:

- *Thomson & Thomson*, (www.thomson-thomson.com), 500 Victory Road, North Quincy, MA 02171-1545, 800-692-8833, and
- The Trademark Company, (www.thetrademarkcompany.com), 344 Maple Avenue, West, #151, Vienna, VA 22180-5612, 800-906-8626.

However, you can search all pending and registered trademarks for free at the PTO's website (www.uspto.gov), which contains a searchable database of all pending and registered U.S. trademarks.

d. Use or Apply to Register Your Trademark

The first to actually use or file an intent-to-use (ITU) application to register the trademark owns it—that is, acquires offensive rights against infringers. Actual use means shipping goods or advertising services that bear the trademark (not just use in advertising). If an ITU application is filed, the trademark owner must actually use the mark before it can be registered. As a trademark owner, you can validly sue a person who later uses a similar mark for similar goods in a context that is likely to mislead the public. Contrary to popular belief, trademarks do not have to be registered for offensive rights to be acquired: Any entity that uses a mark has common law (judge-made law) rights and has superior rights over infringers of the mark, provided the entity is the first to use the mark and it's a valid mark. However, as explained in Subsection e, just below, registration can substantially add to these offensive rights.

e. Use and Register Your Trademark

If you apply to register your mark federally on the basis of your intent to use it, you will, as stated, eventually have to actually use it on your goods to get it registered. You must thus follow through by actually using it and proving such use as part of your registration application. To federally register a trademark, use the online registration procedures at the PTO website (www.uspto.gov).

If you do adopt and use a trademark on your goods before applying for registration, you should register it in your state trademark office if it's used exclusively in your state, and/or the PTO if it's used across a territorial or international border. Once your mark is federally registered, it will be much easier to sue infringers. The federal registration will cause the court to presume that you have exclusive ownership of the mark and the exclusive right to use it. If you don't register your trademark and it's infringed, you'll have much more difficulty when you go to court.

To register a trademark in your state, call or write to your Secretary of State in your state's capital for a trademark application form and instructions; the cost will be from about $50 to $120.

Trade Group Registration of Trademarks

Instead of (or in addition to) registering your trademark with one or more state trademark offices and the U.S. Patent and Trademark Office (PTO), you can register it with an appropriate specific trade organization. For example, suppose you're an automobile manufacturer and you intend to come out with a new car, the *Zenith*, in a few years. Instead of applying to register it with the PTO, whose requirements are relatively complex, whose procedures are slow, and that will keep an intent-to-use application alive for only three years (at a relatively great expense), you can register your mark with the Automobile Manufacturer's Association under a relatively simple, economical procedure. The AMA-registered mark will be published for all other members of the AMA to see, so that they will know not to use the *Zenith* mark while your registration is alive. Similarly, movie titles can be registered with a movie industry association and websites and domain names for email addresses can be registered with Internet services. So if you intend to use a trademark in a given industry, check with the industry's main association to see if you can register your mark with them as an alternative or in addition to a PTO or state registration.

f. Use Your Trademark Properly

The law considers it very important to use a trademark properly once you've adopted it as a brand name for your goods. Before it's registered, you should indicate it's a trademark by providing the superscript "TM" after the mark, for example, LeRoy™ Shoes. If it's a service mark, such as a restaurant name or a name for a service business, use the "SM" superscript—for example, "Alice's℠ Restaurant." Once the mark is federally registered, provide the superscript "®" or indicate that the mark is registered in the PTO—such as "Reg. U.S. Pat. & TM. Off."

Word trademarks should always be used as brand names on any literature. That is, they should be used as adjective modifiers in association with the general name of the goods to which they apply, and shouldn't be used as a substitute for the name of the goods. For example, if you're making and selling can openers and have adopted the trademark *Ajax*, always use the words "can opener" after *Ajax* and never refer to an *Ajax* alone. Otherwise, the name can become generic and be lost, as happened to "cellophane" and "aspirin," and as could soon happen to *Xerox*. (Doesn't it somehow feel more natural to use the word "Xerox" than "photocopy," or "Kleenex" rather than "tissue"?)

5. What Doesn't Qualify as a Trademark (for the Purpose of Developing Offensive Rights)

The courts won't enforce trademark offensive rights, nor will the PTO or state trademark offices grant trademark registrations, on the following:

- lengthy written matter (copyright is the proper form of coverage here)
- slogans that are merely informational or laudatory, such as "Proudly made in the U.S.A."
- trade names not being used as a trademark or service mark
- immoral, deceptive, scandalous, or disparaging matter
- governmental emblems, personal names, or likenesses without consent
- marks that they consider close enough to existing marks as to be likely to cause confusion
- pure surnames or purely geographical designations;
- generic terms, or
- descriptive words that do not distinguish a company's products or services.

Protection of Domain Names

A domain name is a unique "address" that connects your computer with a website. But a domain name can be more than an address; it is often the identifier for a business. A domain name may even function as a trademark (and may infringe another company's trademark). Registering a domain name does not guarantee your exclusive use of that term in commerce and—because each domain name must be unique—it is impossible for two different businesses to have the same domain name.

Keep in mind that even if a company owns a federally registered trademark, someone else may still have the right to own a domain name that includes that trademark. For example, many different companies have federally registered the trademark Executive for different goods or services. All of these companies may want http://www.executive.com, but the first one to purchase it—in this case, a software company—is the one that acquired the domain name.

When registering a domain name, a company should be sure that nobody else is using it as a trademark for similar goods and services. If another business is selling similar goods or services with a similar name, the use of the domain name can be terminated under trademark law. In addition, a domain name can be challenged if the owner is a cybersquatter—someone registering, trafficking in, or using a domain name with the intent to profit in bad faith from the goodwill of a trademark belonging to someone else. Domain name owners can sue under the Anticybersquatting Consumer Protection Act (ACPA—15 USC 1125(d)), or can arbitrate under ICANN's Uniform Dispute Resolution Policy (UDRP). While you can't recover damages from the infringer under a UDRP arbitration, the procedure is less expensive and less time-consuming (it usually takes about three to six months).

The easiest way to check if a domain name is available is at one of the dozens of online websites that have been approved to register domain names. A listing of these website registrars can be accessed at the ICANN site (http://www.icann.org). ICANN is the organization that oversees the process of approving domain name registrars. For more information, review *Trademark: Legal Care for Your Business & Product Name*, by Stephen Elias and Richard Stim (Nolo).

P. Copyright

A copyright is another offensive right given by law, this time to an author, artist, composer, or programmer. It empowers

the holder of a copyright registration to sue in federal court and to have the court issue an injunction ordering the defendant, if found liable, to cease publishing or copying the registered literary, dramatic, musical, artistic, or software works.While a patent can effectively provide offensive rights on an idea per se, assuming it's capable of being reduced to hardware form, a copyright covers only the author's or artist's particular way of expressing an idea. Thus, while a copyright can provide offensive rights on the particular arrangement of words that constitute a book or play, it can't cover the book's subject matter, message, or teachings. Put otherwise, you are free to publish any of the ideas, concepts, and information in this (or any) book, provided that you write it in your own words. But if you copy the specific wording, then you'll infringe the copyright on this book.

Some specific types of works that are covered by copyright are books, poetry, plays, songs, catalogs, photographs, computer programs, advertisements, labels, movies, maps, drawings, sculpture, prints and art reproductions, game boards and rules, and recordings. One yogi has even filed a lawsuit for infringement claiming others have copied his yoga poses. Certain materials, such as titles, slogans, lettering, ideas, plans, forms, useful things, nonoriginal material, and noncreative material (such as a list of names and telephone numbers) can't be covered through copyright. U.S. government publications, by law, aren't covered by copyright and may almost always be freely copied and sold by anyone, if desired.

The 1998 "Digital Millennium Copyright Act" supplements the Copyright Act and provides criminal penalties for those who provide technology that can circumvent copyright protection. (It leaves a "safe harbor" for Internet Service Providers who merely provide access to infringing materials.) It also provides a way to protect original boat hull designs.

While I provide a brief overview of copyright principles in the rest of this section, more complete discussions of this subject are available in *The Copyright Handbook* (for written works), *The Public Domain*, and *A Legal Guide to Web & Software Development*. Stephen Fishman wrote all of these books (Nolo).

1. What Is Copyright?

Now that we've seen what a copyright covers, what exactly is a copyright? As stated, a copyright is the offensive right that the government gives an author of any original work of expression (such as those mentioned above) to exclude others from copying or commercially using the work of expression without proper authorization.

To obtain copyright rights, the work must be "original," not merely the result of extended effort. Thus, in 1991, the Supreme Court held that a telephone company that compiled, through much work, an alphabetical directory of names and addresses could not prevent another publisher from copying the directory, since it had no originality. (*Feist Publications Inc. v. Rural Telephone Service Co.,* 111 S.Ct. 1282 (1991).) Also, a copyright cannot cover any system, method, process, concept, principle, or device, although it can cover a specific explanation or description of anything.

The copyright springs into existence the instant the work of expression first assumes some tangible form, and lasts until it expires by law (the life of the author plus 70 years, or for works made for hire, 95 years from publication or 120 years from creation, whichever is shorter). A work made for hire is one made by an employee in the course of the employment or by an independent contractor under a written work-made-for-hire contract.

How to Secure Offensive Copyright Rights in a Work

While no longer necessary for works published after March 1, 1989, it's still advisable first to place the familiar copyright notice (for example, Copyright © 2010 Amanda Author) on each published copy of the work. This tells anyone who sees the work that the copyright is being claimed, who is claiming it, and when the work was first published. (The year isn't used on pictures, sculptures, or graphic works.) This notice prevents an infringer from later claiming that the infringement was accidental.

Next you should register the work with the U.S. Copyright Office. If done in a timely manner, registration makes your case better if and when you prosecute a court action (for example, you can get minimum statutory damages and may be awarded attorney fees). It's useful to distinguish between steps (a) and (b), placing the copyright notice on the work and actually getting a copyright registration. Thus I suggest that you don't say, "I copyrighted my program," but rather say, "I put a copyright notice on my program," or "I applied for (or received) a copyright registration on my program."

2. Copyright Compared With Utility Patent

The process involved in obtaining a patent differs significantly from that of registering a copyright. A copyright is deemed to exist automatically upon creation of the work,

with no registration being necessary unless you want to sue an infringer. On the other hand, to obtain patent rights, an application must be filed with the PTO, and that office must review, approve, and issue a patent.

If a copyright is registered with the Copyright Office (which technically is part of the Library of Congress) on any copyrightable material, a certificate of registration will be granted without any significant examination as to the work's novelty. The PTO (part of the U.S. Department of Commerce), on the other hand, makes a strict and thorough novelty and unobviousness examination on all patent applications and won't grant a patent unless it considers the invention novel and unobvious.

Finally, with some exceptions, the two forms of offensive rights cover types of creation that are mutually exclusive. Simply put, things that are entitled to a patent are generally not entitled to a copyright, and vice versa. However, it's important to understand that there is a small gray area where this generalization isn't necessarily true. A few creations may be eligible for both types of coverage.

3. Areas Where Patent and Copyright Law Overlap

Let's look at these principal areas where you may be able to obtain offensive rights on intellectual property under either patent or copyright coverage, or both.

a. Computer Software

Computer programs are the best example of a type of creative work that may qualify for both a patent and copyright protection.

Viewed one way, computer programs are in fact nothing more than a series of numerical relationships (termed "routines") and as such cannot qualify for a patent (although they can, of course, be covered under the copyright laws because they have been held to constitute a creative work of expression). However, viewed from another perspective, computer programs are a set of instructions that make a machine (the computer) operate in a certain way. And, in recent years, many patents have been issued on computer programs in association with machinery or hardware. Simply put, a programmed machine, programmed system, or process may qualify for a patent if it uses an algorithm to affect some hardware or process that (1) is tied to a particular machine or apparatus, or (2) transforms an article into a different state or thing. The algorithm per se would not qualify. More on this topic in Chapters 5 and 9.

Why patent a program as opposed to simply registering a copyright on it? Because the patent affords up to 20 years of broad, hard-to-design-around offensive rights for the program, even if an infringing program is created independently. What is the drawback? It takes about two years, a considerable amount of work, and a fair amount of money, even if you do it all yourself, to obtain a patent. Because much software becomes obsolete in a much shorter time, your software may not be worth protecting by the time the patent issues. Thus, you often don't need the full term of coverage a patent offers, and money spent on obtaining one may well be wasted.

While copyrighting of programs is relatively inexpensive as well as easy to accomplish, the coverage gained isn't as broad as is offered by a patent. This is so because copyright covers only the particular way the program is written, not what it does. For instance, all major word processing programs accomplish pretty much the same tasks (such as cursor movement, screen and print formatting, search and find functions, and moving text from one location to another) but each does so through a differently expressed program, and thus each is entitled to separate copyright status. Also, a copyright isn't available against independent creators—that is, those who write a similar or even identical program without copying it from the copyrighted program. Patents, on the other hand, can be used to sue independent creators of the patented invention—that is, even if the infringer never heard of or had access to the invention.

So when choosing whether to rely on copyright or a patent for software that is tied to or transfers hardware to a machine or apparatus, the software author must weigh the broader offensive rights that a patent brings against the expense and time in obtaining one. Likewise, the ease with which copyright is obtained must be counterbalanced by the narrow nature of its coverage.

There is one further drawback to copyright for programs: If you do choose to rely on copyright rather than a patent to cover your program, and you don't bring the program, or a device embodying it in a PROM (Programmable Read-Only Memory), out for a while, you take the risk that someone else may patent it in the meantime.

b. Shapes and Designs

The inventor may also have a choice of utility patent or copyright in areas where an object's shape or design is both functional and aesthetic. Consider, for example, a new alphabet with letters that are attractive, yet which also provide more efficient, unambiguous spelling (such as the efficient alphabet that Shaw used to write *Androcles and the Lion*), or which are easier to read in subdued light. Patent or copyright can be used. The former will afford broader coverage to whatever principles can be identified and the

latter will be cheaper, quicker, and easier to obtain, but limited to the specific shapes of the letters. Note that unlike design patents, copyright can be used to cover some aesthetic shapes even if they also have a significant function.

In many areas both forms of coverage can be used together for different aspects of the creation. Thus in parlor games, the game apparatus, if sufficiently unique, can be patented, while the gameboard, rules, box, and design of the game pieces can be covered by copyright. The artwork on the box or package for almost any invention can be covered by copyright, as can the instructions accompanying the product. Also the name of the game (for example, *Dungeons & Dragons*) is a trademark and can be covered as such.

If the invention can also be considered a sculptural work, or if it's embodied or encased in a sculptural work, copyright is available for the sculpture. However, copyright can't be used for a utilitarian article, unless it has an aesthetic feature that can be separated from and can exist independently of the article. This rule, known as the "separability requirement," is very important in copyright law.

Of course, to emphasize my earlier point, both copyrights and patents generally have their exclusive domains. Assuming they don't have any aesthetic components, patents are exclusive for machines, compositions, articles, processes, and new uses per se. On the other hand, copyrights are exclusive for works of expression, such as writings, sculpture, movies, plays, recordings, and artwork, assuming they don't have any functional aspects.

c. Copyright Compared to Design Patents

There's considerable overlap here, since aesthetics are the basis of both forms of coverage. Design patents are used mainly to cover industrial designs where the shape of the object has ornamental features and the shape is inseparable from, or meaningless if separated from, the object. For example, a tire tread design, a computer case, and the workshop clock shaped like a saw blade (see Section B, above) are perfect for a design patent, but a surface decal, which could be used elsewhere, is not. In other words, if the work is purely artistic, a design patent is improper. Copyright, on the other hand, can be used for almost any artistic or written creation, whether or not it's inseparable from an underlying object, so long as the aspect of the work for which copyright is being sought is ornamental and not functional. This means copyright can be used for pure surface ornamentation, such as the artwork on a can of beans, as well as sculptural works where the "art" and the object are integrated, such as a statue. For instance, the shape of a toy was held to be properly covered by copyright since the shape played no role in how the toy functioned and since a toy wasn't considered to perform a useful function (although many parents who use toys to divert their children would disagree). The same principle should apply to "adult toys," provided they are strictly for amusement and don't have a utilitarian function.

What are the differences in the coverage afforded by design patents and copyright? Design patents are relatively expensive to obtain (the filing fee is higher, an issue fee is required—see Fee Schedule in Appendix 4), formal drawings are required, a novelty examination is required, and the rights last only 14 years. However, a design patent offers broader rights than a copyright in that it covers the aesthetic principles underlying the design. This means that someone else coming up with a similar, but somewhat changed design would probably be liable for patent infringement.

Copyright, on the other hand, provides relatively narrow offensive rights (minor changes in all of the artwork's features will usually avoid infringement), the government fee for registration is very small (see Fee Schedule), the term is long (the life of the creator plus 70 years, or a flat 95 or 120 years for works classified as made-for-hire). And as no novelty examination is performed, you're virtually assured of obtaining a copyright registration certificate if you file.

It has been said that a design patent is basically a copyright with the teeth of a patent because it can cover similar areas as copyright but provides broader offensive rights.

Because the distinctions between design patents and copyrights are especially confusing, I've provided a comparison chart to summarize the distinctions between these two forms in Fig. 1D.

4. When and How to Obtain Copyright Coverage

If you desire to obtain coverage for a copyrightable invention, program, creation, or for instructions, packaging, or artwork that goes with your invention, you don't need to do anything until the item is distributed or published. This is because, as mentioned, your copyright rights arise when your work is first put into tangible form. And, although there is no requirement for a copyright notice on your work before it's generally distributed to the public, I strongly advise you to put the proper copyright notice on any copyrightable material right away, since this will give anyone who receives the material notice that you claim copyright in it and they shouldn't reproduce it without permission.

When your material is distributed to the public, it's even more desirable (though no longer mandatory for works published after March 1, 1989) that you place a copyright notice on it to notify others that you claim copyright and to prevent infringers from claiming they were "innocent" and thus entitled to reduced damages. This notice should

	Design Patent	Copyright
Permissible for all of the following:	The aesthetic aspects of articles of manufacture, such as jewelry, furniture, musical and other instruments, and fabrics.	Literary and artistic content of written materials, lectures, periodicals, plays, musical compositions, maps, artworks, software, reproductions, photographs, prints, labels, translations, movies, sculpture.
Disadvantages:	Must prepare a formal application with ink drawings, must prosecute before the PTO with legal briefs, large filing fee and issue fees, lasts only 14 years, takes a long time (one to three years) to secure rights.	Gives a narrow scope of offensive rights, no doctrine of equivalents, no protection of concepts (only particular form of expression thereof), only good against proven actual copiers (not independent creators).
Advantages:	Broader scope of offensive rights, including doctrine of equivalents (see Chapter 15), can cover concepts, good against independent creators.	Only need fill out a simple form with samples of the actual work, no formal drawings needed, no need for legal briefs, only small filing fee, no issue fee, lasts a very long time (life + 70 years or 95–120 years), instant offensive rights.
Can't be used for:	Articles where the novel features have a utilitarian function (use utility patent); writings, flat artwork, photos, maps, drawings, programs, prints, labels, movies (use copyright); surface ornamentation, or objects with a shape which appears in nature.	Utilitarian articles, unless the aesthetic features are separable from and can exist independently of the article (toys aren't considered utilitarian), machines, processes, systems, concepts, principles, or discoveries.
Recommended for:	The aesthetic shape or layout of utilitarian articles.	Articles of manufacture that aren't utilitarian, or if utilitarian, have aesthetic aspects that can be separated and exist independently, jewelry, furniture, fabrics, literary content of written materials, lectures, periodicals, plays, maps, musical compositions, artworks, software, reproductions, photographs, prints, labels with artwork, translations, movies, sculpture.

Fig. 1D—Design Patents Compared to Copyrights

consist of the word "Copyright," followed by a "c" in a circle © (or a "p" in a circle for recordings and records), followed by the year the work is first published (widely distributed without restriction), followed by the name of the copyright owner. Thus the copyright notice on this book appears as "Copyright © 2011 David Pressman. All Rights Reserved."

If anyone infringes your copyright (that is, without your permission someone copies, markets, displays, or produces a derivative work based on your original work) and you want to go to court to prevent this from happening and collect damages, you first have to register your work with the U.S. Copyright Office. If you register the work within three months of the time your item is distributed or published, or before the infringement occurs, you may be entitled to attorney fees, costs, and damages that don't have to be proved by you (called "statutory damages"). All things considered, I strongly advise you to register your work as soon as it's published if you think you're entitled to copyright coverage. The Copyright Office, Washington, DC 20559, provides free information and forms on copyright. Call 202-707-9100 or visit www.copyright.gov.

Q. Trade Secrets

This section provides a basic definition of trade secrets, distinguishes trade secret protection from patents, lists the advantages and disadvantages of trade secret versus patenting, and tells you how to acquire and maintain trade secret rights.

1. Definition

Thanks to the intensive coverage of the high-tech industry by the media, the term "trade secret" has become virtually a

household word. You've probably heard of the case where an employee of a biotech (gene splicing) company was arrested when he tried to sell his employer's secrets to some FBI undercover agents.

What are these trade secrets and why are they valuable enough to warrant corporations paying millions of dollars to high-priced attorneys to protect them? In a sentence, a trade secret is any information, design, device, process, composition, technique, or formula that is not known generally and that affords its owner a competitive business advantage.

Among the items considered as trade secrets are:

- chemical formulas, such as the formula for the paper used to make U.S. currency
- manufacturing processes, such as the process used to form the eyes in sewing needles and the process for adhering PTFE (sold under the trademark Teflon) to a frying pan
- "magic-type" trade secrets, such as the techniques used to produce laser light shows, magician's illusions, and fireworks, and
- chemical recipes that involve both formulas and processes, such as the recipes for certain soft drinks, cosmetics, chemicals, and artificial gems; for example, Chatham, Inc., can actually make precious gems such as rubies, emeralds, and sapphires, and it relies almost exclusively on trade secrets to protect its valuable technology.

Even if the ingredients of a chemical are publicly known, the method of combining the ingredients and their sources of supply can still be a trade secret.

Obviously, since these types of information and know-how can go to the very heart of a business and its competitive position, businesses will often expend a great deal of time, energy, and money to guard their trade secrets.

When I refer to trade secrets in this book, I mean those that consist of technical information, such as in the examples given above. However, virtually every business also owns "business-information" type trade secrets, such as customer lists, names of suppliers, and pricing data. The law will enforce rights to both types of trade secrets, provided the information concerned was kept confidential and can be shown to be nonpublic knowledge and truly valuable.

More so than in any of the other intellectual property categories, the primary idea underlying trade secrets is plain common sense. If a business knows or has some information that gives it an edge over competitors, the degree of offensive rights that the law will afford to the owner of a trade secret is proportional to the business value of the trade secret and how well the owner actually kept the secret. If a company is sloppy about its secrets, the courts will reject its request for relief. Conversely, a company that takes reasonable measures to maintain the information as a secret will be afforded relief against those who wrongfully obtain the information. These central factors underlying trade secrets have profound implications for those who are seeking patents, as I discuss below.

2. Relationship of Patents to Trade Secrets

Assuming that you have kept your invention secret, you can rely on trade secret principles to enforce rights on the invention. If your invention is maintained as a trade secret and you put it into commercial use, you must file a patent application within one year of the date the invention was used commercially. If you wait over a year, any patent that you ultimately obtain will be held invalid if this fact is discovered (and you will lose trade secret protection because your invention will have been published during the application process).

The PTO treats patent applications as confidential, so it is possible to apply for a patent and still maintain the underlying information as a trade secret, at least for the first 18 months of the application period. The PTO will publish your patent application 18 months after the earliest claimed filing date, but they will not publish it if, at the time of filing, you must include a Nonpublication Request (NPR), stating that it will not be foreign-filed. (The NPR is included by checking a box on the Application Data Sheet—see Chapter 10 for more information. The 18-month publication statute was enacted in order to make U.S. patent laws more like those of foreign countries.) If you don't request nonpublication, your application will be printed verbatim after 18 months and all of your secret "know-how" becomes public and the trade secret status of your application will be lost. If you file an NPR and later decide to foreign-file the application, you must rescind the NPR within 45 days.

If you file an NPR, the information in your patent application will become publicly available only if and when a patent issues.

However, if a patent is refused so that your application is *not* published, the competition will still not know about your invention and any competitive advantage inherent in that fact can be maintained. The trade secret will remain intact. If the PTO allows your patent application, but you wish, instead of getting a patent, to preserve your invention as a trade secret, you can still choose not to pay the issue fee so that no patent will issue.

What happens if your application is not published after 18 months and a patent later issues? This public disclosure doesn't usually hurt the inventor, since the patent can be

used to prevent anyone else from commercially exploiting the underlying information.

CAUTION

If you maintain an invention as a trade secret and put it into commercial use, you *must* file any patent application within one year of the date you first used it commercially. If you wait over a year, any patent that you do ultimately obtain will be held invalid if this fact is discovered. More on the "one-year rule" in Chapter 5, Section E.

The following material discusses the pros and cons of each form of offensive rights.

3. Advantages of Trade Secret Protection

Often I advise people to choose trade secret rights over those afforded by a patent, assuming it's possible to protect the creation by either. Let's look at some of the reasons why:

- The main advantage of a trade secret is the possibility of perpetual protection. While a patent is limited by statute to 20 years from filing and isn't renewable, a trade secret will last indefinitely if not discovered. For example, some fireworks and sewing needle trade secrets have been maintained for decades.
- A trade secret can be maintained without the cost or effort involved in patenting.
- There is no need to disclose details of your invention to the public for trade secret rights (as you have to do with a patented invention).
- With a trade secret, you have definite, already existing rights and don't have to worry about whether your patent application will be allowed.
- Because a trade secret isn't distributed to the public as a patent is, no one can look at your trade secret and try to design around it, as they can with the claims of your patent.
- A trade secret can be established without naming any inventors, as must be done with a patent application. Thus no effort need be made to determine the proper inventor and a company needn't request its inventor-employee to assign (legally transfer) ownership of the trade secret to it, as is required with a patent application.
- A trade secret doesn't have to be a significant, important advance, as does a patented invention.
- A trade secret can cover more information, including many relatively minor details, whereas a patent generally covers but one broad principle and its ramifications. For example, a complicated manufacturing machine with many new designs and that incorporates several new techniques can be covered as a trade secret merely by keeping the whole machine secret. To cover it by patent, on the other hand, many expensive and time-consuming patent applications would be required, and even then the patent wouldn't cover many minor ideas in the machine.
- Trade secret rights are obtained immediately, whereas a patent takes a couple of years to obtain, in which time rapidly evolving technology can bypass the patented invention.

4. Disadvantages of Trade Secret Versus Patenting

Before you stop reading this book, please understand that I spent three years writing it and thousands of hours updating it for a good reason. Or put more clearly, there are many circumstances in which trade secret rights have significant disadvantages. In these contexts, using the rights provided by a patent is essential.

The main reason that trade secrets are often a poor way to cover your work is that they can't be maintained when the public is able to discover the information by inspecting, dissecting, or analyzing the product (called "reverse engineering"). Thus mechanical and electronic devices that are sold to the public can't be kept as trade secrets. However, the essential information contained in certain chemical compositions sold to the public (cosmetics, for example), and in computer programs (assuming they're distributed to the public in object code form), often can't be readily reverse engineered, and thus can be maintained as trade secrets. However, because very sophisticated analytic tools are now available, such as chromatographs, Auger analyzers, spectroscopes, spectrophotometers, scanning electron microscopes, and software decompilers, most things can be analyzed and copied, no matter how sophisticated or small they are. And remember, the law generally allows anyone to copy and make anything freely, unless it is patented or subject to copyright coverage, or unless its shape is its trademark, such as the shape of the Photomat huts, or unless its shape has become so well-known or distinctive as to be entitled to trade dress rights. (See Section R, below.)

Strict precautions must always be taken and continually enforced to maintain the confidentiality of a trade secret. If your trade secret is discovered either legitimately or illegally, it's generally lost forever, although you do have rights against anyone who purloins your trade secret by illegal means. You can sue the thief and any conspirators for the economic loss you suffered as a result of the thief's

actions. In practice this amount can be considerable, since it will include the economic value of the trade secret.

Since an individual who steals a trade secret rarely has sufficient assets to compensate for the loss, the trade secret owner will often pursue the thief's new employer or whatever business purchased the secrets—usually an entity with deeper pockets. Under this approach, the trade secret owner must demonstrate the employer or business knew or had a reason to know that the secret was acquired improperly. For example, when some Hitachi employees purloined some IBM trade secrets, IBM sued Hitachi as well as the individuals concerned and actually obtained millions of dollars in compensation from Hitachi. In addition, a trade secret is more difficult to sue on and enforce than a patent. A patent must be initially presumed valid by the court, but a trade secret must be proven to exist before the suit may proceed.

A trade secret can be patented by someone else who discovers it by legitimate means. For instance, suppose you invent a new formula, say for a hair treatment lotion, and keep it secret. Jane M., who is totally unconnected with you and who has never even heard of your lotion, comes up with the same formula and decides to patent it, which she does successfully. She can legitimately sue and hold you liable for infringing her patent with your own invention!

There is one exception to this principle. If you are charged with infringement of a method patent, but you invented and were commercially using the method as a trade secret at least one year before the effective filing date of a patent, you will have what is known as "prior-user rights," a full defense to the infringement charge. This is also true (and may invalidate the interloper's patent) if you sold a product produced by the method before the patent's effective filing date.

What conclusion should you draw from this discussion? Because offensive rights connected with trade secrets continue as long as the trade secret itself is maintained, and because infringement of patents on "trade-secretable" inventions is difficult to discover, if you have an invention that can be kept as a trade secret for approximately 20 years, you may be better off doing so than obtaining a patent on it.

5. Acquiring and Maintaining Trade Secret Rights

After I explain the differences between trade secret and patents, inventors will often say to me, "I've decided trade secret is the way to go; how do I get one?" The inventor is pleased to learn that as stated, acquiring and maintaining trade secret rights involves only simple, commonsense procedures and doesn't require any governmental or bureaucratic paperwork. All that is necessary is that the inventor take reasonable precautions to keep the information confidential. Also, an employer should have all employees who have access to company trade secrets sign an agreement to keep the information confidential; see Fig. 16A (in Chapter 16) for a typical employment agreement regarding trade secrets and other employer rights. Over the years the courts have devised a number of tests for determining what these reasonable precautions should be and whether a trade secret owner has taken them.

Most states now have a statute that makes the theft of a trade secret a criminal offense as well as a civil action (for instance, the Uniform Trade Secrets Act, California Civil Code § 3246 et seq.). Moreover, there is now a federal statute for the same purpose (Economic Espionage Act, 18 USC 1831 et seq.).

If you're interested in further reading on the subject, review *Nondisclosure Agreement for Inventors*, an eGuide available for download at www.nolo.com. Also, see the heading "Books of Use and Interest" in Appendix 2, Resources: Government Publications, Patent Websites, and Books of Use and Interest.

R. Unfair Competition

The area of "unfair competition" is the most difficult to explain. Although anyone who is creative, or is in a competitive business, will encounter unfair competition problems or questions from time to time, any attempts to define this area are necessarily fraught with confusion. And no wonder! The scope of unfair competition law is nebulous in the first place and is regularly being changed by judges who make new and often contradictory rulings.

1. When Unfair Competition Principles Create Offensive Rights

Fortunately, this is a patent book rather than a law school course. And, for the purpose of this book, all you really need to understand about unfair competition law can be summarized in several sentences:

- An unfair competition situation exists when one business either (a) represents or offers its goods or services in such a way as to potentially cause the class of buyers who purchase the particular type of goods or services to confuse them with goods or services offered by another business, or (b) is unjustly enriched as a result of using the fruits of the other business's labor or creativity.
- Unfair competition law is available as a source of offensive rights under common law (judge-made

law) rights, the federal "false-designation-of-origin" statute (15 USC 1125(a)), and state unfair competition statutes. One example of a state statute is California's Consumer's Legal Remedies Act (Civil Code §§ 1750-1784 and Calif. Code of Civil Procedure § 1770), which prohibits 20 categories of illegal acts, including passing off goods or services as those of another or with a deceptive representation, such as a false designation of geographical origin.

- Unfair competition can be used to cover such items as advertising symbols, methods of packaging, slogans, business names, "trade dress" (that is, anything distinctive used by a merchant to package or house its goods, such as the yellow container that has come to be identified with *Kodak* film), and titles. Also, Bette Midler successfully sued an advertising agency for using a singer whose voice sounded like Ms. Midler's. Mother Fuddrucker's restaurants sued a competitor that copied Mother's distinctive restaurant layout. And the owners of the Pebble Beach, California, golf course sued a golf course in Texas for copying Pebble Beach's distinctive layout. In other words, when the characteristics of a product or service aren't distinctive or defined enough to be considered a trademark, then unfair competition may be the appropriate way to cover it.
- If an injured party can prove that a business has engaged in unfair competition, a judge will issue an injunction (legal order) prohibiting the business from any further such activity or defining what the business can and can't do. Further, the court may award compensation (monetary damages) to the injured business (that is, the business that lost profits because of the public's confusion).

2. How Does the Law of Unfair Competition Affect You?

There are several ways in which the law of unfair competition can affect you.

- If you already have a product or service you find has been copied or pirated, and the traditional methods (patents, copyrights, trademarks, and trade secrets) are no help (perhaps because it's not patentable or it's too late to patent it, it doesn't qualify under the copyright or trademark laws, or it doesn't qualify as a trade secret), you still may be able to get relief under the doctrine of unfair competition.
- If you're contemplating coming out with a product or service, try to make it as distinctive as reasonably possible in as many ways as reasonably possible so that you'll easily be able to establish a distinctive, recognizable appearance (termed in the law as "secondary meaning"). For example, you would be wise to use unique and distinctive packaging ("trade dress"), unique advertising slogans and symbols, a unique title, a distinctive business name, and a clever advertising campaign. And the more you advertise and expose your product, and the more distinctive (different) it is, the stronger your unfair competition rights will be.

3. Comparison of Unfair Competition With Design Patents

Some inventors confuse the trade dress area of unfair competition law with design patents. Trade dress refers to the distinctive appearance of a business, a product, or product packaging, where the appearance distinguishes the product or business from other similar products or businesses but isn't significant or specific enough to be considered a trademark. The coloring of a package or label, or the layout of a business, are good examples of distinctive trade dress.

Patentable designs, on the other hand, relate to the appearance of an article that enhances its aesthetic appeal, which is more than mere surface ornamentation and which is novel and unobvious. Examples are a modernistic lamp design and the pattern of a fabric. While trade dress can be mere coloring, surface ornamentation, or a general appearance, a design patentable invention has to be a shape or appearance of a specific article which is more than a surface appearance, which relates to the overall appearance of the article, and which is different enough to be considered unobvious.

S. Acquisition of Offensive Rights in Intellectual Property—Summary Chart

The chart on the next page summarizes how an inventor or creator should acquire offense rights in every type of intellectual property.

T. Summary of Legal Remedies for Misappropriation of Various Types of Intellectual Property

Now that you're familiar with all of the types of intangible property, the chart below summarizes how to select the appropriate remedy for any type of intellectual property dispute.

Acquisition of Offensive Rights in Intellectual Property

If Your Creation Relates To:	Acquire Offensive Rights By:
An Invention. The functional aspect of any machine, article, composition, or process or new use of any of the foregoing—such as circuits, algorithms that affect some process or hardware, gadgets, business methods, apparatus, machinery, tools, devices, implements, chemical compositions, and industrial or other processes or techniques that one could discover from final product, toys, game apparatus, semiconductor devices, buildings, receptacles, and vehicles, cloth and apparel, furniture (functional structure), personal care devices, scientific apparatus, abrasives, hardware, plumbing, parts, alloys, laminates, protective coatings, drugs,[1] sporting goods, kitchen implements, locks and safes, timekeeping apparatus, cleaning implements, filters, refrigeration apparatus, environmental control apparatus, medical apparatus, new nonhuman animals, new bacteria, plant (sexually or asexually reproducible), or anything else made by humans where the novel aspects have a functional purpose.	Utility patent (use the rest of this book). File the utility patent application as soon as possible, but within one year of offer of sale or publication, and get a patent.
Design. Any new design for any tangible thing where the design is nonfunctional and is part of and not removable from the thing, such as a bottle, a computer case, jewelry, a type of material weave, a tire tread design, a building or other structure, any article, item of apparel, furniture, tool, computer screen icon, etc.	Design patent. File a design patent application as soon as possible, but within one year of offer of sale or publication, and get a design patent.
Plant. Any asexually reproduced plant.[2]	Plant patent (see PTO Rules 161-167).
Trademark. Any signifier, whether a symbol, sign, word, sound, design, device, shape, smell, mark, etc., used to distinguish goods (trademark) such as "Ajax"™ tools or distinguish services (service mark) such as FedEx. The signifier cannot be generic, for example, "electric fork," and cannot be descriptive unless adequate sales or advertising demonstrate secondary meaning.	Using it as a trademark with "™" or "℠" superscript and then registering it in state and/or federal trademark offices. Also, you can apply to register federally before using, based upon your intent to use the mark.
Copyright. Any book, poem, speech, recording, computer program, work of art (statue, painting, cartoon, label), musical work, dramatic work, pantomime and choreographic work, photograph, graphic work, motion picture, videotape, map, architectural drawing, artistic jewelry, gameboard, gameboard box and game instructions, etc.	Placing a correct copyright notice on the work, e.g., "© 1991 M. Smith"; apply for copyright registration, preferably within three months of publication. (See Section P, above.)
Trade Secret. Any information whatever that isn't generally known that will give a business advantage or is commercially useful, such as formulae, ideas, techniques, know-how, designs, materials, processes, etc.	Keep it secret; keep good records so you can prove you kept it secret. Have employees sign "nondisclosure" or "keep-confidential" agreements and identify it as proprietary information or a trade secret, such as "This document contains Ajax Co. confidential information"; or put it on an invention-disclosure–type form (see Chapter 3) and limit its dissemination using appropriate means. (See Section Q, above.)
Unfair Competition. Any distinctive design, slogan, title, shape, color, trade dress, package, business layout, etc.	Using it publicly as much as possible, in advertising, etc., so as to establish a "secondary meaning" to enable you to win an unfair competition lawsuit. (See above.)

[1] Orphan drugs (those useful in treating rare diseases) can be covered under the Orphan Drug Act, 21 USC 360; write to the Food and Drug Administration for details.

[2] Sexually reproduced plants can be monopolized under the Plant Variety Protection Act, 7 USC 2321; write to Plant Variety Protection Office, National Agriculture Library, Room 500, 10301 Baltimore Boulevard, Beltsville, MD 20705. Also, both types of plants (sexually and asexually reproducible) can be covered by utility patent.

Legal Remedies for Misappropriation of Various Types of Intellectual Property

Underlying Mental Creation	Legal Remedy for Misappropriation
Invention (machine, article, process, composition, new use)—covered by federal utility patent law.	Patent infringement litigation in federal court.
Industrial or aesthetic design—covered by federal design patent law.	Patent infringement litigation in federal court.
Brand name for a good or service; certification or collective mark or seal—covered by common law, or state or federal trademark law.	Trademark infringement litigation either before or after registration in state or federal court. Also, trademarks can be recorded with U.S. Customs and Border Protection to prevent the importation of goods with infringing marks.
Writings, music, recordings, art, software, sculpture, photos, etc.—covered by federal copyright law.	Copyright infringement litigation, after registration, in federal court.
Confidential technical or business information, not known by competitors—covered by state and federal trade secret law.	Trade secret litigation in state or federal court.
Distinctive trade dress, informative slogans, novel business layout, etc.—covered by common law, state and federal trademark and unfair competition laws.	Unfair competition or trademark litigation in state or federal court.

The enforcement of an intellectual property right requires considerable knowledge and experience. For background on intellectual property disputes (and to save money when consulting an attorney), consult the Nolo texts, below.

- **Copyright.** *The Copyright Handbook: What Every Writer Needs to Know*, by Stephen Fishman
- **Trademark.** *Trademark: Legal Care for Your Business & Product Name*, by Stephen Elias and Richard Stim.
- **Trade Secrets.** *Patent, Copyright & Trademark: An Intellectual Property Desk Reference*, by Richard Stim.

U. Invention Exploitation Flowchart

To make it easier to use this book, I recommend you follow a five-step procedure after you invent something. The procedure can be conveniently summarized by the initials RESAM (Record it, Evaluate commercial potential, Search it, Apply for a patent, and Market it). Fig. 1E shows these steps and the other overall steps for exploiting your invention and where the chapter's instructions for these steps are found.

V. Summary

The law recognizes seven ways in which intellectual property can be monopolized or clothed with offensive rights: utility patents, design patents, plant patents, trademarks, copyright, trade secrets, and unfair competition.

Utility Patents provide a government-sanctioned monopoly on utilitarian inventions. The monopoly lasts 20 years from filing, provided three maintenance fees are paid. The U.S. Patent and Trademark Office (PTO) will grant patents only on inventions that are (a) in a statutory class (machines, articles, processes, compositions, and new uses), (b) useful, (c) novel, and (d) unobvious. The PTO charges filing and issue fees and requires a formal description of the invention with drawings, forms, and claims (legal definitions of the invention). Patents provide offensive rights but are not needed to practice one's own invention and do not protect an inventor who infringes the patents of others. After a patent expires, its monopoly no longer exists and it becomes part of the vast body of prior art.

Design Patents provide a government-sanctioned monopoly on aesthetic or ornamental inventions; the monopoly lasts 14 years from issuance. No maintenance fees are required. The PTO will grant patents only on designs that are ornamental, involve more than mere surface ornamentation, not a natural object, novel, and unobvious. The PTO charges filing and issue fees and requires a brief description of the design with drawings and forms.

Plant Patents provide a government-sanctioned monopoly on asexually reproduced plants; the monopoly lasts 20 years from issuance. No maintenance fees are required. The

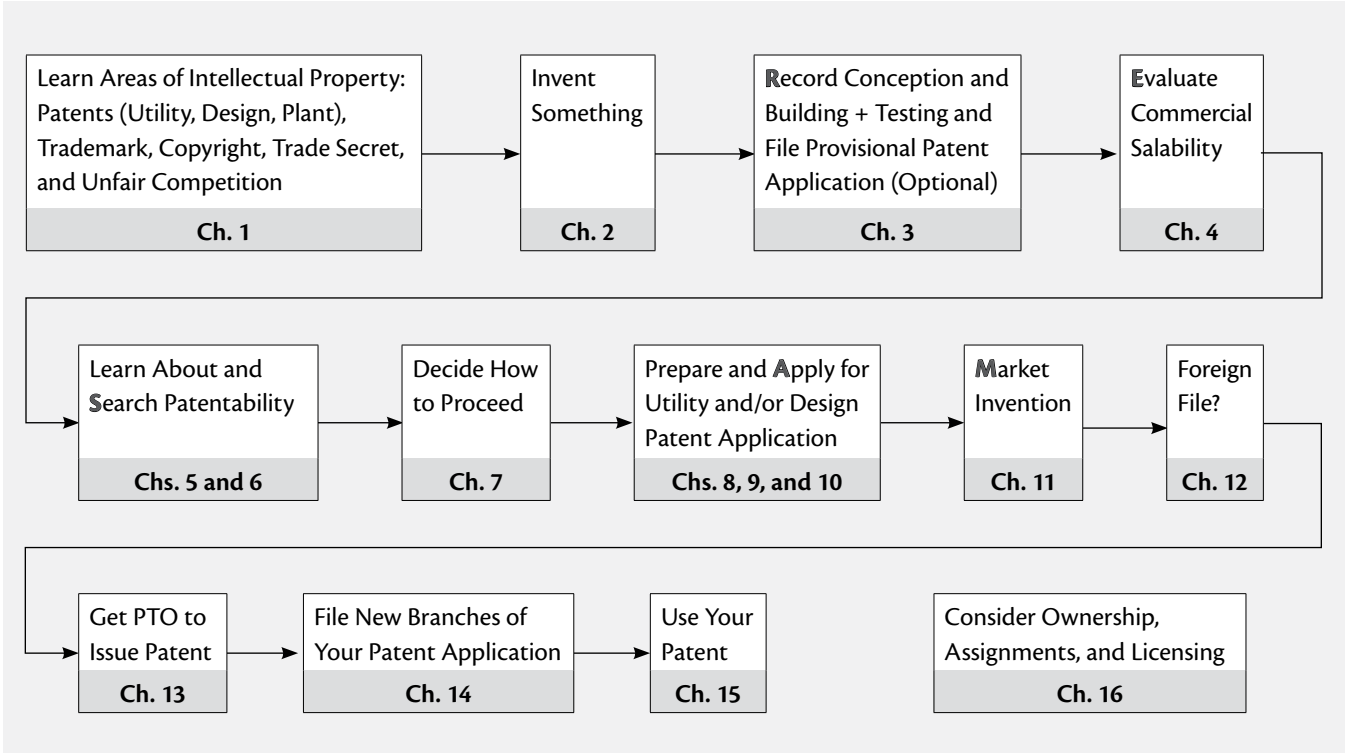


Fig. 1E—Patent Exploitation Flowchart

PTO will grant patents only on plants that are novel and unobvious. The PTO charges filing and issue fees and requires a brief description of the plant with drawings and forms.

Trademarks are signifiers (such as brand names) for goods or services. Mere use of a mark confers the user with common law monopoly rights, but it's better to register the mark with a state trademark office (intrastate use) or the PTO (interstate use). Before using, make a search of the proposed mark, considering the goods or service and the strength of mark. If confusion is not likely and the mark is not generic, the government will register it. Descriptive marks are registrable provided that the user can demonstrate sufficient sales or advertising. Before federal registration, use the mark with a "TM" superscript (™) and as a proper adjective followed by common name of goods. After registration, use the ® superscript. One can also apply to the federal government for an intent to use the mark, but one must show actual use before the PTO will register the mark.

Copyright covers works of authors, artists, photographers, composers, programmers, etc. Copyright covers only a particular form of expression of an idea, but not an idea per se. Copyright is not good for forms, TMs, slogans, methods, lists, formulae, utilitarian articles (unless artwork is separable from article), etc. On published versions of work, it's desirable to include a © notice. Copyrights last for life of the author plus 70 years, or 95 years from the date of publication in the case of a work made for hire. The work should be registered with the Copyright Office before or after publication to secure full rights.

Trade Secrets cover novel information that has some commercial advantage and is not generally known. The information must be kept secret. Trade secret rights will be lost if it is discovered by reverse engineering from the final product. Usually only chemical formulae, industrial and commercial processes, and programs with controlled distribution are covered by trade secrets. Trade secrets have a theoretically perpetual term, incur little cost, and provide definite, immediate rights. Patents are preferable over trade secrets as they can be used against independent creators, can't be avoided by reverse engineering, and enjoy more respect in the business and scientific community.

Unfair Competition is a catchall category based on judge-made law and "false-designation-of-origin" statutes to cover trade names, slogans, trade dress, unfair practices, unjust enrichment, "palming off," etc.

CHAPTER 2

The Science and Magic of Inventing

Inventor's Commandment 2

To invent successfully, be aware of problems you encounter and seek solutions. Also, take the time to study and investigate the practicality of new phenomena that occur by accident or flash of insight. Persevere with any development you believe has commercial potential.

Before we get to patents, the primary subject of this book, I provide this chapter to discuss inventions and inventing. Why do this? To begin, you may be a first-time inventor and thus have no experience in the real world of protecting and patenting inventions. I believe that you'll be a better inventor if you understand and become familiar with some successful inventors and the invention process. Also, I believe that too many first-timers get discouraged before they try enough. To inspire you to hang in there, I include here some past success stories. Hopefully, when you see that many other small, independent inventors have found their pot of gold, you'll be stimulated to press on.

Inventing can not only be profitable, but it provides things that enhance our lives, making them more interesting, pleasurable, exciting, rewarding, and educational. As the noted Swiss psychologist, Piaget, once said, "We learn most when we have to invent." Remember that everything of significance, even the chair you're probably seated in now, started with an idea in someone's brain. If you come up with something, don't dismiss it; it could turn out to be something great!

Common Misconception: The day of the small inventor is over; an independent inventor no longer has any chance to make a killing with his or her invention.

Fact: As you'll see by the examples given later in this chapter, many small, independent inventors have done extremely well with their inventions. Billions of dollars in royalties and other compensation are paid each year to independent inventors for their creations. In fact 73% of all inventions that have started new industries have come from individual inventors. So, don't be a victim of the "no-use-going-on-with-it-because-surely-someone-has-invented-it-already" syndrome. While I recommend that you don't rush blindly ahead to patent your work without making a sensible investigation of prior inventions and your creation's commercial potential (in the ways I discuss later), I urge you not to quit without giving your invention a fair chance.

Another reason for this chapter is that many inventors come up with valuable inventions, but they haven't developed them sufficiently so that they can be readily sold. If their creations could be improved with further work, they'd have a far greater chance of success. So here I'll also give some hints about such things as improving your inventions, solving problems about workability, and drawbacks.

If you've already made an invention, or are even in the business of inventing, I believe the techniques in this chapter that increase your creativity and provide additional stimulation will help you to make more and better inventions. On the other hand, I also recognize that the information in this chapter may not be particularly helpful to the experienced inventor or the corporate inventor—after all, you're already firmly in the inventing business. If you would rather skip this information for now, go to Chapter 3, where my discussion of record keeping should prove of value to even the most seasoned of inventors.

A. What I Mean by "Invention"

For the purpose of this book, an invention is any thing, process, or idea that isn't generally and currently known; which, without too much skill or ingenuity, can exist in or be reduced to tangible form or used in a tangible thing; which has some use or value to society; and which you or someone else has thought up or discovered.

Note that under this definition, an invention can be a process or even an idea, so long as it can be made tangible in some way, "without too much skill or ingenuity." On the other hand, the definition eliminates fantasies and wishes, such as time-travel or perpetual motion machines, since these obviously (at least to me) can't be made tangible.

An invention must have some use or value to society; otherwise what good is it, and how will you sell it? It must be generally unknown anywhere in the world (at the time you invent it), and it must have been thought up or discovered by you or someone else—otherwise it doesn't really have inventive value.

While you may think that an invention must be a major development to be successful, the truth is that most successful inventions are evolutionary rather than revolutionary. For example, the basic concept of the transistor was invented in the 1930s, but was not feasible enough to be successful until Drs. Brittain, Bardeen, and Shockley made some evolutionary but successful improvements in the late 1940s.

Why do I bother to define the term invention in such detail? So you'll begin to understand it and have a better feel for it, as well as to define the limits of its usage in this book. As you'll see, my primary concern is with inventions that

qualify for a patent (that is, patentable inventions). However, nonpatentable inventions can also be valuable as long as society finds them at least somewhat special and useful.

B. Inventing by Problem Recognition and Solution

Now that you know what an invention is, how do you make one? Most inventions are conceived by the following two-step procedure: (1) recognizing a problem, and (2) fashioning a solution.

Although it may seem like duck soup, recognizing a problem often amounts to about 90% of the act of conceiving the invention. "To be an inventor is to perceive need." In these situations, once the problem is recognized, conceiving the solution is easy. Consider some of the Salton products—the home peanut butter maker, for instance, or the plug-in ice cream maker for use in the freezer. In both cases, once the problem was defined (the need for an easy homemade version of a product normally purchased at the store) implementing the solution merely involved electrification and/or size reduction of an existing appliance. Once the problem was defined, any competent appliance designer could accomplish its solution. True, during the implementation of the idea, that is, the design of the actual hardware, designers and engineers often contribute the very aspects of the invention that make it ingenious and patentable. Still, the main ingredient leading to a successful outcome for most inventions consists of recognizing and defining the problem that needs to be solved. Although Edison seemed to contradict this when he said that inventing is 10% inspiration and 90% perspiration, he was referring to the whole experience of inventing, including conception, making a practicable model, and licensing or selling the invention. Here, I'm referring just to the conception part of inventing—what Edison called "inspiration."

Of course, in some contexts, the recognition of a problem plays no part in the invention. Most improvement inventions fall into this category, such as, for example, the improvement of the mechanism of a ballpoint pen to make it cheaper, more reliable, stronger, etc. But in general, you will find it most effective to go about inventing via the two-step process of identifying a problem and solving it. Or, as famed inventor Jacob Rabinow said, "You invent because something bothers you."

Let's look at some simple inventions that were made using this two-step process and which have been commercially implemented. I delineate the problem ℙ and solution 𝕊 in each instance. Where I know an Independent Inventor was responsible, I add an 𝕀.

1. **Grasscrete.** ℙ Wide expanses of concrete or asphalt in a parking lot or driveway are ugly. 𝕊 Make many cross-shaped holes in the paving and plant grass in the earth below so that the grass grows to the surface and makes the lot or driveway appear mostly green; grass is protected from the car's tires because of its subsurface position.
2. **Intermittent Windshield Wipers.** ℙ In drizzles, the slowest speed of windshield wipers was unnecessarily fast, and merely slowing the wipers was unsatisfactory, since a slow sweep was annoying. 𝕊 Provide a "drizzle" setting where the windshield wipers made normally fast sweeps but paused after each sweep. (Dr. Robert Kearns, 𝕀. Dr. Kearns's brilliantly ingenious solution earned him and his estate over $50 million in royalties, after he sued Ford, Chrysler, and others, as documented in the movie, *Flash of Genius*.)
3. **Buried Plastic Cable-Locator Strip.** ℙ Construction excavators often damage buried cables (or pipes) because surface warning signs often are removed or can't be placed over the entire buried cable. 𝕊 Bury a brightly colored plastic strip parallel to and above the cable; it serves as a warning to excavators that a cable is buried below the spot where they're digging. (This is a "new-use" invention since the plastic strip per se was obviously already in existence.)
4. **Magnetic Safety Lock for Police Pistols.** ℙ Police pistols are often fired by unauthorized persons. 𝕊 A special safety lock inside the pistol releases only when the pistol is held by someone wearing a finger ring containing a high-coercive-force samarium-cobalt magnet.
5. **Wiz-z-er™ Gyroscopic Top.** ℙ Gyroscopes are difficult to get running: they require the user to wind a string around a shaft surrounded by gimbals and then pull it steadily but forcefully to set the rotor in motion. 𝕊 Provide an enclosed gyro in the shape of a top with an extending friction tip that can be easily spun at high speed by moving it across any surface. (Paul Brown, 𝕀. Mr. Brown came up with this great invention because, while at a party, he had repeated difficulty operating a friend's son's gyro. His first royalty check from Mattel was five times his annual salary!)
6. **Dolby®** Audio Tape Hiss Elimination. ℙ Audio tapes played at low volume levels usually have an audible hiss. 𝕊 Frequency-selective companding of the audio during recording and expanding of the audio during playback to eliminate hiss. (Ray Dolby, one of the most successful 𝕀s of modern times.)

7. **Xerography.** ℙ Copying documents required messy, slow, complicated photographic apparatus. 𝕊 Xerography—the charging of a photosensitive surface in a pattern employing light reflected from the document to be copied and then using this charged surface to pick up and deposit black powder onto a blank sheet. (Chester Carlson, 𝕀. When Mr. Carlson, a patent attorney, brought his invention to Kodak, they said it could never be commercially implemented and rejected it. Undaunted, he brought it to The Haloid Co., which accepted it and changed its name to Xerox Corporation; the rest is history.)
8. **Flip-Top Can.** ℙ Cans of beverage were difficult to open, requiring a church key or can opener. 𝕊 Provide the familiar flip-top can. (Ermal Frase, 𝕀.)
9. **FM, CW, and AGC.** ℙ Information wasn't conveyable by radio due to noisy, limited frequency response and fade-out of AM reception. 𝕊 Provide CW, FM, and AGC circuitry, familiar to all electronic engineers. (Edwin Howard Armstrong, 𝕀, the genius of high fidelity.)
10. **Thermostatic Shower Head.** ℙ Shower takers sometimes get burned because they inadvertently turn on the hot water while standing under the shower. 𝕊 Provide a thermostatic cut-off valve in the supply pipe. (Alfred M. Moen, 𝕀.)
11. **VCR Plus.** ℙ Most people are too lazy or too put off by technical matters to learn how to enter a date, time, and channel into their VCR. 𝕊 With VCR Plus, each program is assigned a special code number in the newspaper and the VCR owner need merely enter the number and transmit it to the VCR.
12. **Organic Production of Acetone.** ℙ During WWI, the U.K. desperately needed acetone to make explosives, since its normal source was cut off. 𝕊 Use an anaerobic bacterium to produce acetone from locally available corn mash. (Dr. Chaim Weizmann. This invention helped save one nation and start a new one: It was instrumental in helping the U.K. and the Allies survive WWI and defeat the Germans. The U.K. rewarded Weizmann with the Balfour Declaration, which helped lead to the eventual formation of the State of Israel.)
13. **Grocery Shopping Cart.** ℙ Shoppers in grocery stores used their own small, hand-carried wicker baskets and bought only the small amounts that they could carry in the baskets, thereby necessitating several trips to the grocery and causing sales to be relatively low per customer visit. 𝕊 Provide a "grocery cart," that is, a large wire basket in a frame on wheels so that it can be rolled about and carry a large amount of groceries. (Sylvan Goldman, 𝕀. When Mr. Goldman first introduced his carts (about 1925), shoppers wouldn't use them and stores wouldn't buy them despite his extensive efforts. He eventually found a way to get his carts accepted: He hired crews of "shoppers" to wheel the carts about and fill them in his store, and also hired a woman to offer the carts to entering shoppers. Goldman then made millions from patents on his cart and its improvements (nesting carts and airport carts). This illustrates the crucial value of perseverance and marketing genius.)
14. **Belt Loops.** ℙ Until 1922, men's pants (then called pantaloons) were held up by either unsightly suspenders or an awkward rope tied around the top of the pants. 𝕊 Provide "loops" at the top of the pants so that a "belt" could be inserted through the loops. (Unknown inventor).

A list of other famous inventors and their inventions can be found at www.zoomschool.com/inventors.

The inventors of these inventions necessarily went through the problem-solution process (though not necessarily in that order) to make their invention. Even if an inventor believes the invention came spontaneously, you'll usually find that problem-solution steps were somehow involved, even if they appear to coalesce.

So, if you either don't have an invention or want to make some new ones, you should begin by ferreting out problem or "need" areas. This can often be done by paying close attention to your daily activities. How do you or others perform tasks? What problems do you encounter and how do you solve them? What needs do you perceive, even if they're as simple as wanting a full month's calendar on your calendar watch? Ask yourself if something can't be done more easily, cheaply, simply, or reliably, if it can't be made lighter, quicker, stronger, etc. Write the problems down and keep a list. Make sure you take the time to cogitate on the problems or needs you've discovered.

Sometimes the solution to the problem you identify will be a simple expedient, such as electrification or reduction in size. Generally, however, it will be more involved, as in some of the examples listed above. But you don't have to be a genius to come up with a solution. Draw on solutions from analogous or even nonanalogous fields. Experiment, meditate, look around. When a possible solution strikes you, write it down, even if it's in the middle of the night. History records a great number of important scientific and conceptual breakthroughs occurring during sleep or borderline-sleep states.

Also, remember that sometimes the "problem" may be the ordinary way something has been done for years, and which no one has ever recognized as a problem. Consider

shower heads. Although essentially the same device operated satisfactorily for about 50 years, the inventor of water-massaging shower heads recognized the deficiency of an ordinary constant spray that didn't create any massage effect. He thus developed the water-massaging head that causes the water to come out in spurts from various head orifices, thereby creating the massaging effect.

Don't hesitate to go against the grain of custom or accepted practice if that's where your invention takes you. Many widespread erroneous beliefs have abounded in the past which were just waiting to be shattered. The medical field, in particular, had numerous nonsensical practices and beliefs, such as the use of "poudrage" (pouring talcum powder onto the heart to stimulate it to heal itself), bloodletting, and blistering, and the belief that insanity could be cured by drilling holes in the head to let the demons out. In more recent times the medical establishment believed that ulcers were caused by stress and spicy foods, but Drs. Barry J. Marshall and J. Robin Warren of Australia discovered that a bacterium was the culprit, earning them a Nobel prize. As *Forbes* magazine noted (2005 Nov 14) "great breakthroughs very often come from outsiders, entrepreneurial folk, not part of the establishment of mainstream thought."

You'll probably find the going easier if you invent in fields with which you're familiar. In this way you won't tend to "reinvent the wheel." Also, think about uncrowded fields or newly emerging ones where you will find ample room for innovation. But even if you work in an established area, you will find plenty of opportunity for new inventions. For example, more patents issue on bicycles than anything else. Still, you would make millions if you could invent an automatic, continuous bicycle transmission to replace the awkward derailleur. Or how about a truly compactable bicycle (or wheelchair) which could easily be carried onto a train or into the office but worked as well as the standard variety?

The U.S. Government publishes a quarterly list of needed products requiring inventive effort. Write to the U.S. Small Business Administration Office of Technology, SBIR, 409 Third Street, SW, Washington, DC 20416. Phone: 202-205-6450.

Many inventors have discovered problems (and come up with solutions) by observing current events in the media. A few years ago there were problems with medical personnel being stuck and infected by hypodermic needles that slipped or were used against them by disturbed patients. The result—a rash of patents on safety needles. Current problem areas such as terrorism, voting machines, alternative energy, and guerrilla warfare are creating potential markets for inventive individuals. For example, a market exists for a simple, tamper-proof, easy-to-use voting machine or a foolproof way to vote online. If you have technical ability, another way to invent is to "follow the cutting edge." Biotechnology, nanotechnology, alternative energy, energy conservation, and water purification are current hot areas.

One important principle to successful inventing is to remember the acronym KISS (Keep It Simple, Stupid!). If you can successfully eliminate just one part from any machine, its manufacturer (or a competing manufacturer!) will be overjoyed: the cost of the machine will be reduced, it will be lighter, and, of course, it will be more reliable. Another way to look at this is Sandra Bekele's (an inventor-friend) admonition to (figuratively) "eliminate the corners." Or, to quote jazz great Charlie Mingus, "Anybody can make the simple complicated. Creativity is making the complicated simple."

Lastly, says highly successful toy inventor Richard Levy, don't go into inventing for money alone; you've got to enjoy the game and the hunt to make it all truly worthwhile.

C. Inventing by Magic (Accident and Flash of Genius)

When I don't understand how something is done, I sometimes call it "magic." Inventions made by "magic" don't involve the problem-solution technique that I just described; rather, they usually occur by "accident" or by "flash of genius." The PTO and the courts really don't care how you come up with an invention, so long as they can see that it wasn't already accomplished and it looks substantially different from what's been done before. In the hopelessly stilted language of the law, "Patentability shall not be negatived by the manner in which the invention was made." (35 USC 103.)

Many famous inventions have resulted from accident or coincidence. For example, Goodyear invented rubber vulcanization when he accidentally added some sulphur to a rubber melt. In the late 1800s, a chemist supposedly accidentally left a crutcher (soap-making machine) on too long, causing air to be dispersed into the soap mixture. He found that the soap floated when it hardened, thus giving birth to floatable soap bars, such as Ivory® brand. In 1912, another chemist, Jacques Brandenberger, accidentally mixed some chemicals together and spilled them, finding they hardened to a flexible, transparent sheet (later known as "cellophane"). When Alexander Fleming accidentally contaminated one of his bacterial cultures with a mold, he was sufficiently alert and scientifically minded to notice that the mold killed the bacteria, so he carried this discovery forward and isolated the active ingredient in the mold,

which later was named penicillin. (Unfortunately he didn't patent it, so he got the fame, but not the fortune.)

And in 1948, Georges de Mestral, after taking a walk in the forest of his native Switzerland, noticed some cockleburs had stuck to his pants. Being of scientific mind, he removed and examined them and figured out why they adhered so well. He applied his newly discovered knowledge and as a result invented and made a fortune from hook-and-loop fasteners, which his company sold under the trademark Velcro.

In 1938 chemist Roy Plunkett, while experimenting with refrigerant fluids at a DuPont lab in New Jersey, left some fluorine-based gas in a freezer and came back to find a solid, slippery polymer that was extremely resistant to bonding and to which nothing would stick. Known initially as PTFE, it later earned billions for DuPont under the trademark Teflon.

The law considers the fact that these inventions came about by total accident, without the exercise of any creativity by their "inventors," legally irrelevant. All other things being equal, a patent on cellophane would be just as strong as one on nylon (another former trademark), the result of 12 years' intensive and brilliant work by duPont's now-deceased genius, Dr. Wallace Carothers of Wilmington, Delaware.

Since I don't understand how the "magic" occurs, I can't tell you or even suggest how to invent by accident. Please remember, however, that in case you ever come up with an accidental development, take the time and apply the effort to study, analyze, and try to "practicalize" it. If it has potential value, treat it like any other invention; the law will.

The other type of "magical" invention I'll refer to as the product of a "flash of genius." While "flash of genius" inventions inherently solve a need, the inventive act usually occurred spontaneously and not as a result of an attack on any problem. Some examples of this type are the electric knife and the previously discussed Salton inventions which actually created their own need, the Pet Rock (not a real invention by traditional definitions, but rather a clever trademark and marketing ploy, but highly profitable just the same), Bushnell's "Pong" game, the Cabbage Patch dolls, Ruth Handler's Barbie Dolls, and a client's Audochron® clock, which announces the time by a series of countable chimes for the hours, tens of minutes, and minutes. With these inventions, the inventor didn't solve any real problem or need, but rather came up with a very novel invention which provided a new type of amusement or a means for conspicuous consumption (showing off).

Although I don't understand how the creativity in these types of cases occurs, I suggest in Section E of this chapter several techniques for stimulating and unlocking such creativity. Using these techniques, many inventors have come up with valuable inventions and profitable ideas and marketing ploys.

"Chance favors only the prepared mind."

—Louis Pasteur

D. Making Ramifications and Improvements of Your Invention

Once you've made an invention, write down the problem and solution involved. Then, try to ramify it—that is, to do it or make it in other ways so it will be cheaper, faster, better, bigger (or smaller), stronger, lighter (or heavier), longer- (or shorter-) lasting, or even just different. Why ramify?

1. Most inventors usually find that their initial solution can be improved or made more workable.
2. By conceiving of such improvements first, you can foreclose future competitors from obtaining patents on them.
3. Even if you believe your first solution is the best and most workable, your potential producers or manufacturers may not see it that way. So, it's best to have as many alternatives handy as possible.
4. When you apply for a patent, the more ramifications you have, the easier it will be to make your patent stronger. (See Chapter 8.)
5. Conversely, if the broad concept or initial embodiment of your invention is "knocked out" by a search of the "prior art" (see Chapter 5, Section E1) made by you, your searcher, or the examiner in the Patent and Trademark Office, you'll have something to fall back on, so you'll still be able to get a patent.
6. Ramifications often help you understand your basic invention better, see it in a new light, see new uses or new ways to do it, etc.
7. Ramifications can be held back and introduced later, after the basic invention has been "milked" commercially, thereby prolonging the profits, as duPont did with its Teflon®II. Be sure to try to patent the ramifications as soon as possible, however, to foreclose someone else from doing so.

In some situations, you'll find that you won't be able to ramify beyond your basic conception. But give it a try anyway, and make sure you record in writing any ramifications you do come up with as soon as possible. (See Chapter 3.)

One way to make ramifications is to pretend that a part of your device can't be made due to a law or crucial material shortage and then try to come up with a replacement.

In addition to making ramifications to your invention, you should, after you've finished with filing a patent application or you've gotten it out on the market, try to

make improvements—that is, more substantial changes. Why? There are several reasons: (1) To extend your monopoly and keep the gravy flowing longer; (2) To enhance your credibility as an inventor—if you have several patents it will make any infringer look worse in litigation and make it easier for you to win your lawsuit; (3) Improvement patents cut off avenues that another company can use to design around your base patent; (4) A bank or financier will be more likely to lend you money if you have several patents.

E. Solving Creativity Problems

Unfortunately, hardly any invention ever works right or "flies" the first time it's built. You need to build and test it to be aware of the working problems. If you don't, the first builder, whoever it is, will inevitably face them. If this is a corporation to which you've sold or licensed your invention, it's sure to create problems. If your first construction doesn't work, don't be discouraged; expect problems and expect to solve them through perseverance. If you don't believe me, consider Edison's views on this subject:

"Genius? Nothing! Sticking to it is the genius! Any other bright-minded fellow can accomplish just as much if he will stick like hell and remember nothing that's any good works by itself. You've got to make the damn thing work!… I failed my way to success… . Genius is one percent inspiration and ninety-nine percent perspiration."

If you show your invention to someone and you get static in return, don't necessarily get discouraged; the history of invention abounds with quotes from naysayers who were proved to be disastrously wrong. The enlightening book *303 of The World's Worst Predictions*, by W. Coffey (see Appendix 2, Resources: Government Publications, Patent Websites, and Books of Use and Interest), is full of amusing and insightful erroneous quotes. Here are a few teasers:

"Everything that can be invented has been invented."
—U.S. Patent Office Director, urging President McKinley to abolish the Office (1899)

"What, sir? You would make a ship sail against the wind and currents by lighting a bonfire under her decks? I pray you excuse me. I have no time to listen to such nonsense."
—Napoleon Bonaparte to Robert Fulton, after hearing Fulton's plans for a steam engine driven boat

"I think there is a world market for about five computers."
—Thomas J. Watson, IBM President (1956)

"Man won't fly for a thousand years."
—Wilbur Wright to Orville after a disappointing experiment in 1901

Many have analyzed the creative process, but so far no one has come up with a foolproof recipe or technique for innovating. However, almost all writers recommend that, unless you already have a "flash of genius," you first thoroughly prepare and familiarize yourself with the field, always keeping an open mind. Thereafter, some writers recommend you wait a while (allot an incubation period) to let your mind digest and work on the problem. Following incubation, work on the problem again and insight may come, sometimes in bits and pieces. "To discover something you've never seen before, walk the same path you walked yesterday." R.W. Emerson. Alternatively, some experts recommend that, after preparation, one make a concentrated effort, which may lead to frustration and withdrawal. But be patient, since the insight, which may be an image or a fantasy, will usually come thereafter. Of course follow-through is necessary to implement and profit from the insight or fantasy.

If you have creativity problems, such as how to make that great idea work, here are some specific techniques you can use to enhance your creativity, and hopefully solve that problem.

Frame It Differently: One of the most effective ways to solve a problem is to "frame" the problem properly. Framing is another way of describing the way in which one looks at a situation. A common example of framing a problem occurs when you try to move a bulky sofa through a small doorway. If the first way doesn't work, frame the problem differently by turning the sofa upside down and trying again. Or take another example: If you have an apparatus that includes a lever, and you can't find a design shape for the lever that the machine will accommodate, look at the situation another way; perhaps you can redesign the apparatus to eliminate the lever altogether!

Use Your Right Brain: In the course of trying to solve a problem with an invention, you may encounter a brick wall of resistance when you try to think your way logically through the problem. Such logical thinking is a linear type of process (that is, one step follows another), which utilizes our rational faculties, located in the left side of our brains. This works fine when we're operating in the realm of what we know or have experienced. However, when we need to deal with new information, ideas, and perspectives, linear thinking will often come up short. On the other hand, creativity by definition involves the application of new information to old problems and the conception of new perspectives and ideas. For this you will be most effective if

you learn to operate in a nonlinear manner, that is, use your right brain or creative faculties. Stated differently, if you think in a linear manner, you'll tend to be conservative and keep coming up with techniques which are already known. This, of course, is just what you don't want.

One way to engage your right-brain faculties in a search for a creative solution to your quandary is to pose the problem in clear terms and then forget about it and think of something completely different. For example, if you can't fit that lever in your apparatus, think of a different activity, or just take a break (how about a nice boating trip or a hike in the woods). Your subconscious will work on the problem while you're "away." Then come back to the problem and force your different activity onto your problem. In other words, try to think of the apparatus and your boating trip or hike simultaneously. You may find that a solution appears by magic (for example, you may realize a way to design the machine without the lever!).

Let Go of Assumptions: If you adhere to assumptions, you'll never innovate, since innovation, by definition, is the adoption of something new, the embarkation on an untrodden path. As Erich Fromm said, "Creativity requires the courage to let go of [assumed] certainties." So if you've got a problem, try to see what assumptions you're making (they're usually hidden) and then let them go or try to cancel them and see what you come up with.

Meditation: Another way to bring out your creativity is to meditate on the problem or meditate merely to get away from the problem. Either will help. As strange as it seems, some experts say that creativity can be enhanced during reverie by listening to a largo movement from a baroque symphony. At least you'll enjoy it! Also, the use of biofeedback machines can induce or teach deep relaxation with enhanced alpha, or even theta brain waves, a very effective stimulus to creativity.

Dreams: Some creative people find dreams the most effective way of all to solve problems. Or as Edison said: "I never invented anything; my dreams did."

Elias Howe solved the basic problem of his sewing machine in a dream. He saw some tribal warriors who ordered him to come up with a solution or they would kill him. He couldn't make a solution, so the warriors then threw their spears at him. When the spears came close, he saw that each had a hole near its tip. He awoke from the nightmare in terror, but soon realized the symbology: He put a hole near the tip of his bobbin needle and passed the thread through. Again, the rest is history.

Similarly, Mendeleev came up with the periodic table of the elements in a dream.

To stimulate creative dreaming, first immerse yourself in the problem near bedtime. Then forget about it—do something completely different and go to sleep. Your subconscious will be able to work on the problem. You'll most likely have a dream with an inspiration or insight. Then remember the dream and evaluate the insight to find out if it's correct (sometimes it won't be!).

Note that you'll forget most dreams, so keep a dream diary or notebook handy, by your bedside. Also, you'll find a pen with a built-in flashlight is also helpful. Before you go to bed, repeat fifteen times, "I'll remember my dreams." Whenever you do dream, wake up (you'll find it possible to do this if you intend to do so beforehand) and write your dreams down promptly. Once they are written down, forget about them, go back to sleep, and try to figure them out in the morning. Sometimes a week or more will pass before the meanings become clear. Or talk your dreams over with an equally inventive friend and see if he or she can get the meaning—sometimes talking about it helps.

While sleep dreams are usually the most productive, often daydreams will bring valued insight. So, don't dismiss your daydreams either!

Good luck. And pleasant dreams!

Computerized Creating: As strange as it may seem, computers can be used to enhance creativity, solve problems, bust through conceptual roadblocks, and get into the recesses of your memory. Several "mindware" or "CAT" (computer-aided thinking software) programs and books for this purpose exist, and I believe they can be of significant help in this area. The programs work by first asking you to enter lots of details of your problem or area and then they rearrange the details and suggest lots of modifications and permutations for you to consider. To find these programs and books, simply search "idea generator" in any search engine.

The Hot Tub Method: This has been used by many creative geniuses, starting with Archimedes who discovered the principle of volumetric measurement while in his tub. It works like this: When you relax in a hot tub for a long period, the heat on your body mellows you out and dilates your blood vessels so as to draw blood from your analytical brain, allowing your creative subconscious to come to the fore.

Unstructured Fanaticism: As "excellence guru" Tom Peters states, structured planners rarely come up with the really great innovations; monomaniacs who pursue a goal with unstructured fanaticism often do. So let yourself go and become an unreasonable madman—it may do the trick!

Group Brainstorming: If all else fails, get a group of friends or trusted associates together (or on a computer network) and throw the problem to the group. For some unknown reason, a group of people working together often come up with more good ideas than the same individuals

working separately. This synergistic method is often used in corporations with great success. The use of others to help innovate has been called "leveraging knowledge," since one's knowledge and abilities are multiplied by others in a group. There is even brainstorming software available now.

Increase Self-Confidence: Those with more self-confidence and self-esteem tend to be more venturesome, and hence more creative. If you suffer from low self-confidence or low self-esteem, you may wish to explore local courses or read some of the self-improvement books in Appendix 2, Resources: Government Publications, Patent Websites, and Books of Use and Interest.

20 Questions: Dixie Hammond of Focus Works in Van Nuys, California, suggested 20 questions you can ask to encourage ideas:

1. What if …?
2. Can we improve …?
3. How will a customer benefit?
4. Are we forgetting anything?
5. What is the next step?
6. What can we do better?
7. What do you think about …?
8. How can we improve quality?
9. How can we streamline?
10. What should we modify?
11. What should we replace?
12. What should we add?
13. What should we eliminate?
14. Can we make any new assumptions?
15. What will make it work?
16. What other ideas do you have?
17. What issues should we explore?
18. What patterns can you see?
19. How can we simplify?
20. Why?

Idea Tools: Most inventions don't work well as originally developed. Here are some suggestions for modifying your invention to make it work better:

- **Divide:** Divide it into smaller components or separate functions.
- **Combine:** Combine separate ideas, parts, or functions.
- **Simplify:** Simplify it—for example, by making it smoother, or streamlined.
- **Substitute:** Use different materials, parts, functions, or ingredients.
- **Add:** Add additional parts, movement, color, flavor, sound, functions, textures, or ingredients.
- **Subtract:** Remove parts or steps.
- **Reverse:** Reverse the mode of operation or position, or transpose cause and effect.
- **Minimize:** Make it smaller, lighter, or lower.
- **Maximize:** Make it bigger, stronger, better, higher, in multiples; exaggerate it.
- **Redesign:** Redesign the exterior or interior, change the symmetry, speed, shape, function, or perspective; give it new meaning.

F. Contact Other Inventors

In recent years, many inventors' organizations have developed or sprung up in order to provide inventors with information and ideas, model makers, lists of searchers, speakers, patent attorneys, etc., as well as to sponsor various seminars and trade fairs where inventions can be exhibited. One or more of these organizations may provide you with invaluable assistance in your inventing efforts.

One of the oldest and most well-known groups of inventors is the Minnesota Inventors Congress (www.invent1.org). Inventors' organizations have a reputation for honesty and provide reasonable value for the membership or other fees charged, but check for yourself before investing a significant amount of your time or money. A listing of inventor organizations, can be found at Inventor's Digest Online, www.inventorsdigest.com. (Click on "Inventor Organizations.")

You can also find inventors' groups in your area by asking the Patent and Trademark Depository Library close to you. You can find a listing of PTDLs in Chapter 6 or by visiting the PTO website (www.uspto.gov) and clicking on "PTDLs" at the bottom of the page.

If you wish to subscribe to an online mailing list in which you can contact other inventors, the InventNet Forum provides an online forum at www.inventnet.com.

G. Beware of the Novice Inventor's "PGL Syndrome"

As highly successful inventor (Whiz-z-er top) Paul Brown has discovered, many novice inventors have a very different attitude from experienced inventors. This attitude can be summarized as the "PGL (Paranoia, Greed, Laziness) syndrome." Let's discuss the components of this syndrome in more detail, since each usually is a significant hindrance for inexperienced inventors.

Paranoia: Extremely common with inexperienced inventors, paranoia (excessive suspicion of other people's motives) makes them afraid to discuss or show their invention to others—some even go as far as refusing to disclose it to a patent attorney. I do advise some measure of caution with unpatented inventions. However, once you record your invention properly (as discussed in Chapter 3),

you can and should disclose it to selected persons, provided you take adequate measures to document whom you've disclosed it to and when. Don't be as paranoid as my friend Tom who invented a very valuable stereo movie invention but kept it totally to himself out of fear of theft, only to see it patented and commercialized by someone else.

Greed/Overestimation: Most people have heard fabulous stories of successful inventors who've collected millions in royalties. For example Los Angeles orthopedic surgeon and independent inventor Dr. Gary Michelson was awarded $1.35 *billion* in a settlement with Medtronic Inc. over some spinal fusion inventions. As a result, some novice inventors think that their invention is worth millions and demand an unreasonably large royalty or lump-sum payment for their creation. This is seldom wise. It is much better to set your sights at a reasonable level (see Chapter 16) so you won't miss out on commercial opportunities.

Laziness: Some novice inventors believe that all they need to do is show their invention to a company, sign a lucrative contract, and let the money roll in. Unfortunately it hardly ever happens so easily. To be successful, you usually have to record your invention properly (Chapter 3), build and test a working model (desirable but not always necessary), file a patent application, seek out suitable companies to produce and market the invention, and work like hell to sell the invention to one of these companies.

H. Don't Bury Your Invention

If you believe that you have what will turn out to be a successful idea, but you have doubts because it's very different, or you get negative opinions from your friends, consider that Alexander Graham Bell was asked by an irate banker to remove "that toy" from his office. The "toy" was the telephone. Or if that doesn't convince you, ponder these words of Mark Twain, Albert Einstein, and John Shedd:

"The man with a new idea is a crank—until the idea succeeds."

—Mark Twain

"For an idea that does not at first seem insane, there is no hope."

—Albert Einstein

"Opportunities are seldom labeled as such."

—John Shedd

And as a recent successful inventor, Nolan Bushnell, *(Pong)* said, "Everyone who's ever taken a shower has an idea. It's the person who does something about it who makes a difference."

Don't forget that, in addition to making money if you're successful, an invention can create jobs, make our lives easier and more interesting, and eliminate drudgery. Consider the Linotype® machine, where each machine eliminated 90 manual typesetters and their arduous task and spawned a new industry and profession. Then came the computer, where each modern computer replaced nine Linotype machines, spawned another new industry and gave almost anyone the ability to create typeset documents. If you still doubt the value of inventors and inventions, consider this: without inventors and their inventions, we would still be living the way we lived 50,000 years ago!

I hope you've received my message in this chapter loud and clear. If you have a worthwhile invention, and you scrupulously follow all the advice and instructions given in this and the succeeding chapters, and persevere, I believe you'll have a very good chance of success.

"Each invention leads to new inventions and each discovery to new discoveries; invention breeds invention, science begets science, the children of knowledge produce their kind in larger and larger families; the process goes on from decade to decade, from generation to generation."

—Alfred Korzybski

I. Summary

The day of the lone inventor is not over; many successful inventions and industries have been started by independent inventors.

Most inventions are created after recognizing a problem and finding a solution. However, inventions are also made by "magic" (accident and flash of genius), the process of which is not easily analyzed.

If you make an invention, try to conceive of ramifications to enhance its value. If you have trouble solving invention problems, persevere, frame the problem differently, use nonlinear techniques, let go of assumptions, try meditation, employ your dreams, the computer, use brainstorming, inventors' organizations, and other techniques. Beware of the novice inventors' PGL Syndrome (paranoia, greed, laziness). Above all, persevere!

CHAPTER 3

Documentation and the PPA

Inventor's Commandment 3

After conceiving of an invention, you shouldn't proceed to develop, build, or test it, or reveal it to outsiders, until you (1) make a clear description of your conception on paper (using ink or typing), (2) sign and date the same, and (3) have this document signed and dated by two trustworthy people who have "Witnessed and understood" your creation.

Inventor's Commandment 4

(1) Try to build and test your invention (if at all possible) as soon as you can, (2) keep full and true written, signed, and dated records of all the efforts, correspondence, and receipts concerning your invention, especially if you build and test it, and (3) have two others sign and date that they have "Witnessed and understood" your building and testing. (As an alternative—or in addition—to documenting, building, and testing in this manner, you can use the PTO's Provisional Patent Application program, but be aware of the disadvantages and limitations of the PPA.)

A. Introduction

It's true in life generally that the better the documentation you keep, the easier it will be for you to retrieve important ideas, information, and, when necessary, proof that something happened. When it comes to inventing, good documentation is even more vital than in most other aspects of our lives. There are two distinct and important reasons why all inventors should document all of their work. The first has to do with the inventing process itself. The second involves the possibility that you will need to prove (1) that you are the inventor, and (2) when you made the invention or that you came up with the invention first. Let's examine these reasons in order.

RESOURCE

To help you properly document your invention, Nolo publishes *The Inventor's Notebook: A Patent It Yourself Companion*.

B. Documentation Is Vital to the Invention Process

It takes more than a good idea to sustain the invention process. It is absolutely essential to keep good, sound, and complete records, for two sets of reasons, the invention process (explained below) and to prove inventorship (explained in Section C).

1. Good Engineering Practice

It's good engineering practice to keep a "technical diary," containing accurate, detailed documents of your ideas, work done, and accomplishments. Good engineers and technicians record their developments in chronological order so that they can refer back to their engineering diary at any time—days, weeks, months, or even years later. First, this enables them to avoid running up the same blind alley twice. Second, good records will shed light on subsequent developments, will allow the inventor to find needed data and details of past developments, and will provide a base for new paths of exploration and ramifications, especially if failures have occurred.

2. Psychological Stimulus

Many of us come up with great ideas, especially when we're engaged in some other activity (including dreaming), and we forget to write them down. Later, we may recall that we had a brilliant idea the night before, or during the office party, but because we went back to sleep or were too busy, we forgot it. If we could get into the habit of writing down our thoughts on a piece of paper, later on we'd find that piece of paper there to bug us, almost forcing us to do something about it. So, keep a small pencil or pen and some paper with you at all times, even by your bedside, and in your wallet, and write down your thoughts as soon as they occur. Later on, you'll be glad you did.

3. Analyzation Stimulus

WWII Admiral Raborn once said, "If you can't write it down, you don't really know what you are doing."

Have you ever had an idea, plan, or concept that you really didn't fully understand yourself? I'll bet you discovered that when you tried to write a description of it, you were forced to figure it out, and only then finally realized fully or exactly what you had. Putting a description of your idea in writing forces you to think about it and crystallize it into communicable form. Note that no matter how great your

idea, and no matter how much of the work you do yourself, you'll never be able to make a nickel from it until you can communicate it to others, for example, to get a patent, to license it, or to sell the product.

"Writing forces you to think and get your thoughts straight."
—Warren Buffet

C. Documentation Is Vital to Prove Inventorship

If you keep clear, signed, dated, and witnessed documents of your creations, this will prove to others that you made the invention yourself, when you did so, and that you are a methodical, diligent, and reliable person. Who cares about the last point? While you may not be particularly interested in establishing such a reputation, you'll find it invaluable in case you ever get into any dispute over your invention. Also, when you go to license the invention, or undertake any other activity with it, as well as taking any tax deductions for your expenditures (see below), you'll find that having such documents will greatly enhance your standing with anyone who sees, evaluates, or considers your invention, or any aspect of your inventive activity.

There are six reasons why it's legally important promptly and properly to record your conception of your invention.

1. In Case of an Interference

The primary legal reason to record your inventive activities is to counter the claims of others that they invented your invention first. Many valuable inventions are independently and simultaneously conceived and brought to fruition, while others are misappropriated from the true inventor. In either case, for the first and true inventors to prevail, it's important for them to use the very specific record-keeping techniques described later in this chapter.

Unfortunately, justice isn't automatic or simple. In all countries but the U.S., if two inventors come up with the same invention and file separate patent applications, the first inventor to file will get the patent. However, under the U.S.'s "first to invent" system, the PTO will declare an "interference," a trial-like proceeding held within the PTO to determine which of two or more applicants for a patent will be awarded the right to get the patent (known as "priority"). The winner of the interference will be the first to invent—the one who can prove they first "reduced the invention to practice" (built and tested it or filed a patent application), unless the other inventor conceived of it first and was diligent in reducing it to practice.

To win an interference it is essential that you keep a signed, dated, and witnessed description of the invention. (As I'll explain later you should keep similar records if you build and test it or, as an alternative to building and testing, you file a Provisional Patent Application.) The signed, dated, and witnessed written description will prove that you came up with the invention on the date given and that you (and your coinventor(s), if any) are the actual and true inventor(s) of the creation.

> **EXAMPLE:** In 1849 Antonio Meucci invented the telephone but didn't keep accurate, signed, dated, and witnessed records. Meucci filed a patent application. Later, Alexander Graham Bell independently invented the phone, filed a later patent application, and got involved in an interference with Meucci. Bell ultimately got the patent (and credit) for inventing the telephone since Meucci did not have records that were adequate to prove that he invented it first.

2. Proof in Case of Theft

Similarly, if someone sees or hears about your invention and attempts to "steal" it by claiming it as his or her own invention (in actuality, a rare occurrence), there will probably be a lawsuit or other proceeding in which the true and first inventor must be ascertained. In such a proceeding, the side with the earliest, best, and most convincing evidence will win. 'Nuff said!

3. Proof in Case of Confusion of Inventorship

There's also, commonly, confusion as to who is the actual, true, and first inventor of a particular invention. Often several engineers or friends will be working on the same problem, and if conception isn't promptly recorded, memories fade and there will be confusion as to who is (are) the actual inventor(s). Also, bosses and other supervisors have been known to claim inventorship, or joint inventorship, in an employee's invention. If all inventors promptly recorded their inventions, signed and dated them, and got them witnessed and dated, preferably by coworkers (including bosses), there would be very few cases of such confusion of inventorship.

4. Antedate References

As we'll see later in Chapter 13, if the PTO examiner cites a "prior-art reference" against your application (that is, finds a prior publication that casts doubt on the originality

of your invention), you can eliminate that reference as prior art (that is, prevent the examiner from using it) if you filed your application within the year after the reference's publication date and (as in the case of an interference, above) you can prove that you either:

- built and tested the invention prior to the reference's effective date, or
- conceived of the invention prior to the reference's effective date and you were then diligent in "reducing it to practice" (building and testing it, or filing a provisional or regular patent application).

As I'll explain in Chapter 5, Section E, if a reference is a patent, its effective date is its filing date (or the filing date of any applicable PPA). If it's any other publication, such as a magazine article, its effective date is its publication date. This process of antedating a cited reference is called "swearing behind" the reference. Naturally, to be effective and acceptable when swearing behind a reference, your records should be detailed, clear, signed, dated, and witnessed.

5. Supporting Tax Deductions

Once you make an invention and spend any money on your creation, the IRS considers that you are "in business," thus enabling you to file a "Schedule C" or "Schedule E" (Form 1040) with your tax return to deduct all expenditures you made for your invention, from even ordinary income (not investment income) that you received. The IRS will be far more inclined to allow these deductions (assuming you're audited) if you can support them with full, clear, and accurate records of all of your invention activities, including, but not limited to, conception, building, and testing (Form 3-2 in Appendix 7), and expenditures for tools, plastics, other materials, models, etc.

6. Avoidance of Ownership Disputes

Suppose you make an invention in a specific area—say bicycles—and later you go to work for a company engaged in this area—say a bicycle manufacturer. If you haven't already filed a patent application on your bike, you'll have a very hard time proving you already made the invention before your employment with this company if you haven't kept a proper record. In this situation and in many others, the company (or an individual or other organization with whom you deal) will likely claim ownership of your prior invention under your employment (or other) agreement (see Chapter 16, Section D) unless you have the "paper" to prove prior invention.

D. Trade Secret Considerations

In Chapter 1, Section Q, you learned that an invention can qualify as a trade secret, at least for the first 18 months of the patent application period. After 18 months, the PTO will publish the patent application unless the applicant files, at the time of filing, a Nonpublication Request (NPR). Applications that are not published after 18 months will remain as trade secrets until the patent issues. Keeping an invention secret can provide its owner with certain obvious commercial advantages, and the owner may have recourse in the courts against any person who improperly discloses the secret to others.

Making a witnessed record of your invention doesn't conflict in any way with this trade-secret protection. Even if you show your invention to witnesses, this won't compromise the trade-secret status of your invention because of the implied understanding that witnesses to an invention should keep it confidential. However, I recommend that you don't merely rely on this implied understanding, but actually have your witnesses agree to keep your invention confidential. A verbal agreement is good, but a written agreement is far better and will really tie down the confidentiality of your invention. I've incorporated a nondisclosure obligation just above the signature lines in the Invention Disclosure (Form 3-2, discussed below), but you can also have your witnesses sign the "Nondisclosure Agreement" (Form 3-1, discussed below) when you give them your lab notebook or disclosure to sign.

Whether your invention is to be patented or kept as a trade secret (you can decide later—see Chapter 7), you should first record it properly so that you can prove that you invented it and that you did so as of a certain date. Since you can keep your notebook confidential, at least for the time being, no loss of any potential trade secret protection will result from your making a proper record of your conception.

CAUTION

Remember that while recording your invention can be vital in the situations outlined above, it provides only limited rights, since it won't give you any weapon to use if anyone independently comes up with your creation, or if anyone copies your invention once it's out on the market. To acquire full offensive rights in these situations, you need to obtain a patent on your invention. As discussed in Chapter 1, only a patent will give you rights against independent creators of your invention and those who copy it once it's out on the market.

E. Record Conception and the Building and Testing of Your Invention

After you conceive of your invention you should record the conception in a lab notebook or an invention disclosure as explained Section F, below. After recording conception, you should follow my Inventor's Commandment #4 at the beginning of this chapter—that is, try to build and test your invention as soon as you can and keep detailed and adequate records of your efforts. I discuss more about building and testing and how to go about it in Chapter 4, Will Your Invention Sell?

1. Keep Good Records of Building and Testing Activity

You may now well ask, if I've conceived of my invention and have properly recorded conception, why should I also build and test it? A good question. The main legal reason is in the U.S. patent statutes, specifically part (g) of 102 (35 USC 102(g)), which states:

> *"In determining priority of invention 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."*

As discussed earlier, the arcane phrase "reduction to practice" (RTP) means building and testing the hardware of the invention (called an "actual RTP") or the filing of a patent application on the invention (called a "constructive RTP," since the law construes this as an RTP). This part of Section 102 (the "first to invent" law) means that if two inventors file patent applications on the same invention, the PTO will award the patent to the one who first "reduced the invention to practice," unless the other inventor conceived of it first and was diligent in reducing it to practice. It also means that if the PTO cites a "prior art" publication having an earlier date than your filing date, you can often "swear behind" the publication if you can prove that you invented before the date of the publication. (More on this in Chapter 13.) So in order to win any possible interference, or swear behind any earlier reference, you should build and test your invention as soon as possible if you aren't going to file on it right away. (But see Section H, below, for a discussion of the Provisional Patent Application process—a legal alternative to building and testing your invention.)

There are other, nonlegal reasons for building and testing. These are stated in Sections B and C, above. Specifically, it's good engineering practice, it provides psychological stimulus, it helps you analyze the invention, and it is of inestimable aid in case of theft, or confusion of inventorship or ownership. Even more importantly, as we'll learn in Chapter 4, building and testing is vital in evaluating the invention for commercial value, including operability, suitability, usability, etc. In addition, as I'll explain in Chapter 11, if you can build and test a working model of your invention, you can use this to great advantage in selling or licensing it to a manufacturer. So try to build and test it ASAP, if at all possible

Why should you painstakingly record the activities involved in the building and testing of your invention? This is an easy question to answer. All of the reasons discussed for recording the facts of your invention in the first place are applicable here, in spades. This is because the building and testing of an invention can be as (or even more) important than its conception, especially as proof of your invention in case of theft, confusion of inventors, interferences, the need to swear behind references, and the need to establish tax deductions. However, recordation of your efforts to build and test your invention isn't necessary to obtain a patent, unless an interference or other special situation occurs that requires you to prove your development efforts.

To illustrate the value of recordation, some years ago I prepared a patent application for a client. As she was reviewing it, I got a flyer in the mail from a store listing for sale an item almost identical to that which my client wished to patent! Since the item was being sold and was published before we were able to file the application, the flyer constituted "prior art," which, on its face, would preclude my client's invention from being considered as novel and thus lead to the rejection of her application. But fortunately, my client had read this chapter and built and tested the invention, had made records of her conception and of her building and testing, and had signed and dated these and had gotten them witnessed months before. She could thus go ahead and file without fear, even though the flier was published before her filing date. This is because she could use her records to "swear behind" the flyer. Simply put, by documenting her invention and her efforts to build and test it, my client was still able to obtain a patent. On the other hand, had she failed to properly record her conception and building and testing, her application would have been barred and she would have lost all rights to patent her invention! (Note that if the flyer had been published over a year before we were able to file the patent application, we would *not* be able to swear behind the flyer because of the "One-Year Rule." See Inventor's Commandment 6 in Chapter 5.)

2. Keep Your Building and Testing Activity Confidential

If, as part of the testing of your invention, you have to order any special part or material, or if you have to reveal to or discuss your invention with anyone to get it built or documented, be cautious about how and whom you contact. And when you do make any specific revelation, have the recipient of the information about your invention (the disclosee) sign a Nondisclosure Agreement ("NDA") (Form 3-1 in Appendix 7).

Getting the Agreement Signed

Model makers and machine shops are used to signing these agreements. When you make an appointment to show your invention and you wish to have the recipient sign the agreement before viewing, it's only courteous and proper business practice to advise the recipient that you are bringing along a nondisclosure agreement (NDA) before signing. Don't spring the agreement in a surprise manner.

The agreement is completed by specifically identifying the confidential materials (documents or hardware) (the "Confidential Information"), and the name of the recipient (the Receiving Party; you're the Disclosing Party). Have the Receiving Party fill in, sign, and date the bottom of the agreement. I recommend that you give a copy of the signed NDA to the Receiving Party, as well as any extra copies that may be needed if any other persons in the Receiving Party's organization are to sign also.

Note that if you are lending confidential materials to the Receiving Party, the agreement refers to the delivery of materials to the Receiving Party as a "loan." This will give you maximum rights if the Receiving Party makes unauthorized use of or refuses to return the materials.

It's also desirable to document everything you transact with the disclosee by sending a confirmatory email after each transaction and getting receipts or acknowledgments for everything you do lend or deliver. In other words get and make a full "paper trail" of your activities.

This agreement will cover almost all situations where you need to disclose your invention or deliver proprietary materials under an NDA. However, it isn't cast in stone: If, for example, you are making more than a loan of the materials, feel free to redraft the agreement, for example, by changing "loaned" to "delivered."

CAUTION

About NDAs: While it's desirable to have disclosees sign an NDA, note that if a disclosee steals or copies your invention (rare for uncommercialized inventions), your NDA will be of little value unless you have the funds to hire a attorney to sue the invention thief. Even then the thief can (a) raise defenses that may defeat your suit (nothing is certain in the law), (b) show that you have no actual monetary damages, and (c) be judgment proof (that is, have no assets to pay you for your damages). As stated, it's best to investigate (or "vet") your disclosee beforehand by getting references and making sure that he or she is a responsible person or organization.

F. How to Record Your Invention

Hopefully, I've managed to sell you on the need to carefully and accurately record your thoughts and activities that normally occur in the course of inventing. There are several ways to do the recording. These are discussed below, together with examples.

1. The Lab Notebook

The best, most reliable, and most useful way to record an invention project (conception, building and testing, marketing, etc.) is to use a lab notebook, such as *The Inventor's Notebook*, by Fred Grissom and David Pressman (Nolo). Specifically designed for use with this book, *The Inventor's Notebook* provides organized guidance for properly documenting your invention.

If you're a prolific inventor, or are employed as an engineer or the like, you will want to record a number of inventions as you make and develop them. The best way to do this is by using a blank or lab notebook. Preferably, it should have a thick cover, with the pages bound in permanently, such as by sewing or gluing or a closed spiral binding. Also, the pages should be consecutively numbered. Lab notebooks of this type are available at engineering and laboratory supply stores, and generally have crosshatched, prenumbered pages with special lines at the bottom of each page for signatures (and signature dates) of the inventor and the witnesses. As should be apparent, the use of a bound, paginated notebook that's faithfully kept up provides a formidable piece of evidence if your inventorship or date of invention is ever called into question, for instance, in an interference proceeding or lawsuit. A bound notebook with consecutively dated, signed, and witnessed entries on sequential pages establishes almost irrefutably that you are the inventor—that is, the first to conceive the invention—on the date indicated in the notebook. Lab notebooks can be purchased through

Fisher Scientific in Pittsburgh, Pa.; call 800-766-7000 (www.fishersci.com) and ask for a reseller near you, or Scientific Notebook, Co. at 800-537-3028 (www.snco.com).

If you don't have or can't get a formal lab notebook like this, a standard bound letter-paper-size crackle-finish school copybook will serve. Just number all of the pages consecutively yourself, and don't forget the frequent dating, signing, and witnessing, even though there won't be special spaces for this. Date each entry in the notebook as of the date you and your coinventor(s), if any, make the entries and sign your name(s). If you made the entries over a day or two before you sign and date them, add a brief candid comment to this effect, such as, "I wrote the above on July 17, but forgot to sign and date it until now." Similarly, if you made and/or built the invention some time ago, but haven't made any records until now, again state the full, specific, and truthful facts and date the entry as of the date you write the entry and sign it. For example, "I thought of the above invention while trying to open a can of truffles at my sister's wedding reception July 23 (2005), but didn't write any description of it until now when I read *Patent It Yourself*."

2. How to Enter Technical Information in the Notebook

Fig. 3A is an example of a properly completed notebook page showing the recordation of conception, and Fig. 3B shows recordation of building and testing.

The sketches and diagrams should be clearly written (preferably double-spaced) in ink to preclude erasure and later-substituted entries. Your writing doesn't have to be beautiful and shouldn't be in legalese. Just make it clear enough for someone else to understand without having to read your mind. Use sketches where possible. Many inventors have told me they put off writing up their invention in a notebook or invention disclosure because they didn't know the proper "legal" terms to use, or had writer's block. However, as indicated, legalese isn't necessary or desirable. There are two very good ways to bypass writer's block:

- Rely mostly on sketches, with brief labels explaining the parts and their functions.
- Make sketches, describing them orally to a friend, and record your oral description with a tape recorder. Then go back and transcribe your description.

Do not leave any large blank spaces on a page—fill the page from top to bottom. If you do need to leave space to separate entries, or at the bottom on a page where you have insufficient space to start a new entry, draw a large cross over the blank space to preclude any subsequent entries, or, more accurately, to make it clear that no subsequent entries could have been made in your notebook.

If you make a mistake in an entry, don't attempt to erase it; merely line it out neatly and make a dated note why it was incorrect. The notation of error can be made in the margin adjacent to the correct entry, or it can be made several pages later, provided the error is referred to by page and date. Don't make cumulative changes to a single entry. If more than one change is required, enter them later with all necessary cross-references to the earlier material they supplement. Refer back to earlier material by page and date.

If possible, make all entries directly in the notebook, or copy them there from rough notes on the day the notes were made. If this isn't possible, make them as soon as practicable with a notation explaining when the actual work was done, when the entries were made, and why the delay occurred.

If you've made an invention several months ago, and are now going to record it because you've just read this book, you should date the entries in the notebook when you actually write them, but you should also write when you actually made the invention and explain the delay with honesty and candor! Since the notebook is bound, you will have to handwrite the entries in it. Again, don't worry about the quality of your prose—your goal is only to make it clear enough for someone else to understand; use labeled sketches or the tape recorder/transcription techniques given above if writer's block occurs. If handwriting is difficult for you, or if your handwriting is illegible, you can use an Invention Disclosure form (see Section G, below).

3. What Should Be Entered in the Notebook

Your notebook should be used as a "technical diary"—that is, you should record in it anything you work on of technical significance, not just inventions. The front of the notebook should have your name and address and the date you started the notebook. When you record the conception of your invention, you and anyone who later sees the notebook will find it most meaningful if you use the following headings:

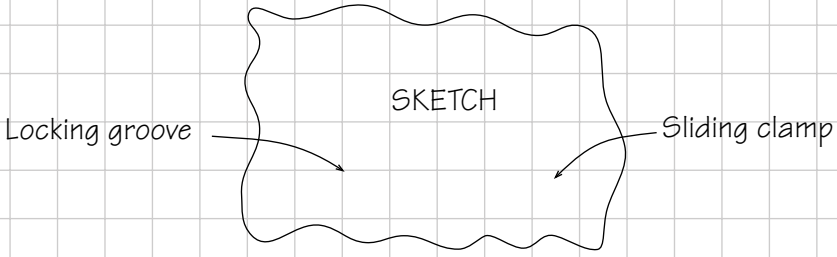
- Title (what your invention is called)
- Purpose (what purpose the invention is intended to serve)
- Description (a functional and structural description of the invention)
- Sketch (an informal sketch of the invention)
- Ramifications (include all ramifications of the invention that you have conceptualized; If you fail to include a ramification and one of your witnesses thinks of it, the witness may have to be named as a coinventor if you file a patent application)
- Novel features (include all possible novel features of the invention)

23

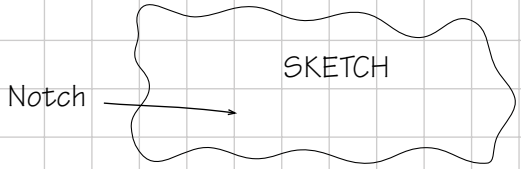
TITLE: Self-Adjusting Can Opener

PURPOSE: To provide a can opener that self-adjusts to any size can.

DESCRIPTION: The can opener has a sliding clamp with a locking groove at its edge [etc.] … I conceived of this while I was at my friend Roberta's wedding last Sunday and saw the caterer having trouble opening small and large cans with several openers…



RAMIFICATIONS: Instead of the locking groove, a special notch could be used as follows:



POSSIBLE NOVEL FEATURES: The sliding clamp with a raised frammis arm is believed entirely new. Also, [etc.]…

ADVANTAGES: This can opener would eliminate the need for separate can openers for different sized cans, thereby providing economy, ease of use, [etc.]…

INVENTOR: DATED:

Irma Inventor *20xx/8/25*

THE ABOVE CONFIDENTIAL INFORMATION IS WITNESSED AND UNDERSTOOD:

Wilfred Witness *20xx/9/25*

Alberta Attestor *20xx/9/25*

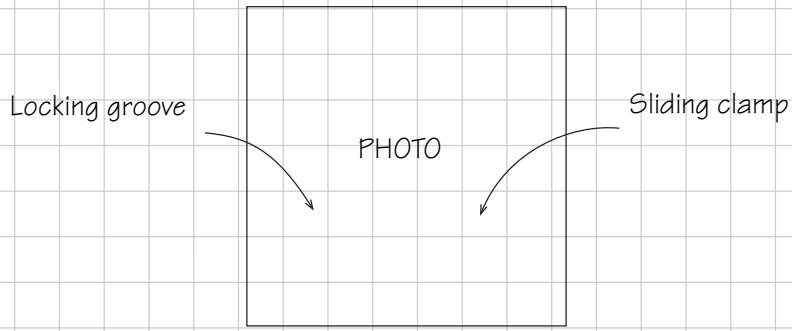
Fig. 3A—Properly Completed Notebook Page Showing Conception

TITLE: Self-Adjusting Can Opener — Building & Testing 27

REFERENCE: Conception recorded on page 23.

DESCRIPTION: A working model of this opener was made for me by Fred Smith of Model Makers, Inc., starting Sept. 1. It was finished Sept. 13. It was made of cold-rolled steel, 13 mm. thick, with brass bearings [etc.]…

Here is the photo we took on Sept. 15:



RAMIFICATIONS: We also tried a nylon hinge, but it did not work because…

TEST DESCRIPTION: We tried the opener on fifty different cans, from size __ to size __ …

TEST RESULTS: For the size __ cans, the opener worked as well as the Ajax brand, opening each can in an average time of 8.3 seconds, the same as we obtained with the Ajax brand. [etc.]…

INVENTOR: DATED:

Irma Inventor 20xx/9/27

THE ABOVE CONFIDENTAL INFORMATION IS WITNESSED AND UNDERSTOOD:

Steve Elias 20xx/9/27

Fred Friendly 20xx/9/27

Fig. 3B—Properly Completed Notebook Page Showing Building and Testing

- Closest known prior art (the closest known existing approach of which you're aware), and
- Advantages (of the invention over previous developments and/or knowledge—see the example in Fig. 3A).

Don't forget to sign and date your conception and have two witnesses also sign and date the record of conception. See Section 5, below.

To record the subsequent building and testing of your invention at a later page of the notebook, you will find it most useful to record the following items:

1. Title and Back Reference
2. Technical Description
3. Photos and/or Sketches
4. Ramifications
5. Test Description
6. Test Results
7. Conclusion.

Fig. 3B (above) shows a properly done lab notebook record of the building and testing of an invention. Don't forget to sign and date, and have your witnesses also sign and date, the building and testing record, as well as the conception record. (See Section 5, below.)

If you're skilled enough to conceive, build, and test your invention all at once, just combine all of the items of Figs. 3A and 3B as one entry in your notebook.

I strongly recommend that you record as much factual data as possible; keep conclusions to a minimum and provide them only if they are supported by factual data. Thus, if a mousetrap operated successfully, describe its operation in enough detail to convince the reader that it works. Only then should you put in a conclusion, and it should be kept brief and nonopinionated. For example, "Thus this mousetrap works faster and more reliably than the Ajax brand." Sweeping, opinionated, laudatory statements tend to give an impartial reader a negative opinion of you or your invention. However, it's useful to include the circumstances of conception, such as how you thought it up and where you were. This makes your account believable and helps refresh your memory later.

Word all entries so that they're complete and clear in themselves—that is, so that anyone can duplicate your work without further explanation. While you shouldn't use the lab notebook as a scratch pad to record every calculation and stray concept or note you make or think about, you also shouldn't make your entries so brief as to be of no value should the need for using the notebook as proof later arise. If you're in doubt as to whether to make an entry, make it; it's better to have too much than too little.

Also, you'll find it very helpful to save all of your "other paperwork" involved with the conception, building, and testing of an invention. Such paperwork includes correspondence and purchase receipts. These papers are highly trustworthy and useful as evidence, since they are very difficult to falsify. For example, if you buy a thermometer or have a machine shop make a part for you, you should save receipts and canceled checks from these expenditures since they'll tie in directly with your notebook work.

4. How to Handle Computer Printouts, Large or Formal Sketches, Photos, Charts, or Graphs Drawn on Special Paper

If you have any computer printouts or any other items that by their nature can't be entered directly in the notebook by hand, you should make or enter them on separate sheets. These, too, should be signed, dated, and witnessed and then pasted or affixed in the notebook in proper chronological order. The inserted sheet should be referred to by entries made directly in the notebook, thus tying them in to the other material. Photos or other entries that can't be signed or written should be pasted in the notebook and referenced by legends (descriptive words, such as "photo taken of machine in operation") made directly in the notebook, preferably with lead lines that extend from the notebook page over onto the photo, so as to preclude a charge of substituting subsequently made photos (see Fig. 3B). The page the photo is pasted on should be signed, dated, and witnessed in the usual manner.

If an item covers an entire page, it can be referred to on an adjacent page. It's important to affix the items to the notebook page with a permanent adhesive, such as white glue or nonyellowing (frosty) transparent tape.

If you have to draw a sketch in pencil and want to make a permanent record of it (to put in your notebook) without redrawing the sketch in ink, simply make a photocopy of the penciled sketch: voilà—a permanent copy!

If you make any drawings, photos, or prints that are too large to paste in your notebook, then you have two choices. You can fold them to notebook size and glue them into the notebook so that they can be unfolded and examined without removing them from the notebook. Or you can leave them separate from the notebook, but refer to, and describe them in the notebook. In either case, be sure to sign, date, and get witnesses to sign and date these large documents.

5. Witnessing the Notebook

As I've repeatedly stressed earlier in this chapter, it's important that the notebook entries be witnessed. This is because an inventor's own testimony, even if supported by a properly completed notebook, will often not be adequate for proving an entry date. The witnesses chosen should

be as impartial and competent as possible, which means they shouldn't be close relatives or people who have been working so closely with you as to be possible coinventors. A knowledgeable friend, business associate, or professional will make an excellent witness, provided he or she has the necessary technical ability or background to understand the invention. Generally, a witness who understands what the invention does and how it's made and used will be adequate. But if the invention is technically complex, it's best to get a witness who understands the invention's underlying theory. The witness should also be someone who's likely to be available later. Obviously, a person who's seriously ill, or of very advanced age, wouldn't be a good choice. Don't ask your patent attorney (if you are using one) to perform this function, since the courts and the PTO won't allow an attorney to represent someone and also be that person's witness.

If the invention is a very simple mechanical device, practically anyone will have the technical qualifications to be a witness. But if it involves advanced chemical or electronic concepts, obviously a person with an adequate background in the field will have to be used. The witness need not understand the theory behind the invention, but should be knowledgeable enough to understand what it does and how it works. If called upon later, the witnesses should be able to testify to their own knowledge that the physical and/or chemical facts of the entry are correct. Thus they shouldn't just be witnesses to your signature, so you should not use a notary or a layperson who just witnesses your signature, as do witnesses to a will. Rather the witnesses should actually read or view and understand the actual technical subject material in the notebook, including the actual tests if they are witnessing the building and testing (Fig. 3B). Obviously, then, you should call in your witnesses to observe your final tests and measurements so that they can later testify that they did witness them.

Should You Have Your Notebook Entries or Disclosure Notarized?

Many inventors ask if they should take their notebook or disclosure to a notary and sign it before the notary and have the document notarized. While notarization is slightly better than no witnesses at all, notarization is far inferior to live witnesses. Why? In the U.S. system of jurisprudence, the triers of fact (judge or jury) base their decisions primarily on the testimony of live witnesses, who are subject to cross examination and who understand the document in question and are not merely a "signature witness."

While one witness may be sufficient, the law gives much greater credence to two. If both are available, your case will be very strong. Also having two witnesses will enhance the likelihood of at least one of them being available to testify at a later date. Also, if a dispute occurs between two inventors, the one with the greater number of witnesses will prevail, assuming all other considerations are substantially a wash.

Some notebooks already contain, on each page, a line for the inventor's signature and date, together with the words "Witnessed and Understood" with lines for two signatures and dates. If your notebook doesn't already contain these words and signature lines, merely write them in as indicated in Figs. 3A to 3C. To really tie down the trade secret status of your invention, you should add the words "The above confidential information is" just before the words "Witnessed and Understood," as has been done on Form 3-2 and on Figs. 3A, 3B, and 3C. You and the witnesses should sign and enter the date on the appropriate lines at the end of your description of the conception of your invention and at the end of your description of your building and testing.

6. What to Do With the Notebook

Now that you've made those nice notebook records of conception and hopefully building and testing, what should you do with the notebook? Basically nothing, except to keep it in a safe place in case it's ever needed (hopefully not!) for one of the six "legal" reasons under Section C, above, and to use it liberally as needed for one of the "invention process" reasons under Section B, above.

G. Another Way to Record Conception or Building and Testing—The Invention Disclosure

Suppose you conclude that for some good reason it's too difficult or inconvenient for you to keep a notebook or technical diary. There's a second, albeit somewhat inferior, way for you to record the conception or building and testing of your invention. This is by using a document called an "Invention Disclosure."

Despite its formidable name, an Invention Disclosure is hardly different from a properly completed notebook entry of an invention. It should be a complete record of your invention, including a title, its purpose(s), advantages, a detailed description of it, in sufficient detail so that one having ordinary skill in the field of your invention will be able to make and use it, possible novel features, ramifications, details of its construction if you built it, and

Invention Disclosure

Sheet 1 of 1

Inventor(s): Irma Inventor

Address(es): 1919 Chestnut St., Philadelphia, PA 19103

Title of Invention: Self-Adjusting Can Opener

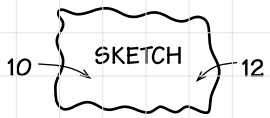
To record **Conception**, describe: 1. Circumstances of conception, 2. Purposes and advantages of invention, 3. Description, 4. Sketches, 5. Operation, 6. Ramifications, 7. Possible novel features, and 8. Closest known prior art. To record **Building and Testing**, describe: 1. Any previous disclosure of conception, 2. Construction, 3. Ramifications, 4. Operation and Tests, and 5. Test results. Include sketches and photos, where possible. Continue on additional identical copies of this sheet if necessary; inventors and witnesses should sign all sheets.

I thought of this can opener while at my friend Roberta's wedding last Sunday. I saw the caterer having trouble opening small and large cans with several openers. Thinking there was a better way, I recalled my Majestic KY3 sewing machine clamp and how it was adjustable and thought to modify the left arm to accommodate a can opener head.

My can opener will work with all sizes of cans and is actually cheaper than the most common existing one, the UR4 made by Ideal Co. of Racine, WI.

My can opener comprises a sliding clamp 10, a pincer groove 12, [etc.] as shown in the following sketch:

Sketch:



Operation: The user operates the can opener in the same way as any squeeze-and-turn opener for any size can.

Instead of sliding clamp 10, I can use a special notch as follows:

I believe that the combination of sliding clamp 10 and pincer groove 12 is a new one for can openers. Also I believe that it may be novel to provide a frammis head with my whatsit.

The Acme KZ122 can opener, mfgd. by Acme Kitchenwares of Berkeley, CA, and p. 417 of "Kitchen Tools & Their Uses" (Ready Publishers, Phila. 1981) show the closest can openers to my invention, in addition to the devices already mentioned.

Inventor(s): *Irma Inventor* Date: *20xx* / *Jul* / *6*

Date: / /

The following understand, have witnessed, and agree not to disclose the above confidential information:

Griselda Hammelfarb Date: *20xx* / *Jul* / *7*

Neonore Zimla Date: *20xx* / *Jul* / *10*

Fig. 3C—Invention Disclosure (Form 3-2 in Appendix 7)

results obtained, if any. While it might better be called an "Invention Record," in the arcane world of patents it's called a "disclosure," since an inventor often uses it to disclose an invention to others to get their opinion, have them develop it, and show what progress is being made. These entries should be made on a separate sheet of paper that has no other information on it except details of your invention and your name and address. For your convenience, Form 3-2 in Appendix 7 provides an Invention Disclosure form, and Fig. 3C illustrates how the form should be completed to record conception.

Since an Invention Disclosure isn't bound, the writing on it can, and preferably should, be printed or typed. But if you do write rather than type, just make sure your handwriting is legible. A sheet of professional or personal letterhead (if you have it) is suitable for an Invention Disclosure. Otherwise print your name, address, and telephone number at the top (or bottom, after your signature). Business letterhead is okay if the invention is to be owned by your business. If the disclosure runs to more than one page, you should write the title of your invention on the second and each succeeding page, followed by the word "continued," numbering each page and indicating the total number of pages of the entire disclosure—for example, "Page 1 of 3."

As before, the description of your invention should be signed and dated by you, marked "The above confidential information is Witnessed and Understood," and signed and dated, preferably by two witnesses, who, as before, are technically competent to understand your invention and who actually do understand and have witnessed the subject matter you have entered on your Invention Disclosure. (See Section F5, above.) If you use more than one page, each should be signed and dated by both the inventor and the witnesses.

As with the notebook, if you conceive of an invention on one date and build and test the invention later, you should make two separate invention disclosures—one to record conception and the second to record the building and testing. The second should refer to the first, and both should be signed and dated by you and the witnesses. Refer to Section F, above, to learn how to record building and testing. I haven't provided an example of an Invention Disclosure completed to show building and testing, but it would be similar to the notebook entry to record building and testing (Fig. 3B set out in Section F, above).

Also, as with the notebook, keep the disclosure in a safe place and use it as discussed in Section F6, above.

What Happened to the Document Disclosure Program?

Readers of previous editions may wonder why there is no mention of the PTO's Document Disclosure Program (DDP). (The DDP was a method of documenting conception for inventors who did not want to rely on witnesses.) In 2007, the PTO discontinued the program. I disagree with this action because the DDP was very useful to inventors who wanted to document conception and had no available witnesses. Inventors are thus forced to rely on the traditional methods of documenting conception by making an invention disclosure or notebook record of the invention, signing and dating it, and having it witnessed.

TIP

If you've conceived of or have effectively built and tested your invention on a computer, you must print out a hard copy on paper so that you and your witness can sign it properly. Computer records are too impermanent to be given legal credibility.

EXAMPLE: Nellie Nerdle, while mousing around with a drawing program on her XYZ-98000, puts some triangles, ovals, and bars together and comes up with a new brassiere design. She not only saves it on her hard disk (or memory stick) and makes a backup copy, but also makes a paper printout, signs and dates it, writes "Witnessed and Understood:" below her signature, and has her friends, Paul Pocketprotector and Gretchen Guru, sign and date as witnesses so that she'll have a permanent, signed, and dated hard copy of her invention.

H. The Provisional Patent Application—A Substitute for Building and Testing, With Some Disadvantages

CAUTION

For reasons explained in Section E, above, it's very important to build and test your invention as soon as possible. If you haven't read that section yet, do so now.

Suppose you don't have the facilities, skill, or time to build and test your invention, and you are not in a position to file

a complete utility patent application right away. In this case you may file a Provisional Patent Application (PPA) which will serve as a legal alternative to building and testing a utility invention. (The PPA is not available for designs.) Let's explore the PPA and the advantages and disadvantages of using it.

1. What a Provisional Patent Application (PPA) Is

A PPA is a short version of a regular patent application. It is used to establish an early filing date for a later-filed Regular Patent Application (RPA). A PPA must contain:

1. a detailed description of the invention telling how to make and use it
2. drawing(s), if necessary to understand how to make and use the invention
3. a cover sheet and a fee transmittal form (prepared automatically if the PPA is filed electronically)
4. a fee (small entity (SE) or large entity—see Appendix 4, Fee Schedule), and
5. a return receipt postcard (not required if PPA is filed electronically).

(The PTO no longer requires a Small-Entity Declaration.)

In actuality the term "PPA" is a misnomer, since it is a simple document deposit, not an application (a request for something). I like to call a PPA a DPED (Domestic Priority Establishing Document) to avoid confusion. Some inventors and publications have improperly referred to it as a "provisional patent." Since a PPA is not even a true application, it is not and should never be called a patent.

2. What a PPA Is Not

A PPA is not a regular patent application (RPA) and therefore cannot by itself result in a patent. For those readers already familiar with the regular patent application process described in Chapter 8, the PPA, unlike an RPA, does not require:

- a Patent Application Declaration (PAD)
- an Information Disclosure Statement (IDS)
- patent claims
- an abstract or summary
- a description of the invention's background, or
- a statement of the invention's advantages.

If you don't file an RPA within a year of your PPA's filing date, your PPA will go abandoned and will be of little value. Also, your PPA cannot provide a filing date for subject matter that is not disclosed in it.

3. What a PPA Accomplishes

You can use a PPA in several ways, but only one use—the substitute for building and testing—is relevant here, so I'll detail only this use now, but will mention the other uses briefly.

If you choose to not build and test your invention right away, or are unable to do so, the next best step would normally be to file an RPA as soon as possible. But this approach can be very costly, especially if you are not sure that your invention will bring in very much money, assuming a patent issues on it. So, assuming you decide that an RPA is not appropriate, your next best step is to file a PPA. Not only is the filing fee associated with a PPA much less than an RPA, but the cost of preparing a PPA is also less than an RPA.

Once you file a PPA, you will be considered to have reduced your invention to practice, even if you've done nothing to build and test it, assuming that:

- an RPA (and optionally one or more foreign patent applications) are filed on the invention within one year, and
- the PPA fully describes the invention claimed in the RPA.

Being able to claim the PPA's filing date as a reduction to practice means you can use that date to:

- overcome the date of any prior-art reference that is cited in opposition to your application and has a publication date that is not over a year before your filing date
- establish your invention's priority in an interference (a procedure conducted by the PTO to decide which of two or more pending patent applications that claim the same invention should receive the patent), and
- antedate any publication of the invention (that is not over a year before your filing date) so that any such publication will not be "prior art" to your subsequently filed RPA.

The table below presents the advantages and disadvantages of the PPA compared to Notebook entries showing building and testing.

4. Advantages of a PPA Over Building and Testing

In addition to the benefits of an early filing date, the PPA gives you the right to claim that your invention has "patent pending" status. In common parlance this means that you can publish, sell, or show your invention to others without fear of theft or loss of any domestic rights. (See Chapter 11, Section G.) This is because anyone who sees and steals your

invention after you file your PPA would have a later filing date than yours, so you would almost certainly be able to win any interference with the thief. To win, the thief would have to prove conception of the invention before you did, and have been diligently attempting to reduce it to practice (by filing a PPA, RPA, or building and testing it) at the very time that you filed your PPA. This would be very hard to prove unless it were true.

Assuming you prepare it properly, there are other advantages to using a PPA in place of actually building and testing the invention. These are:

- You need not incur the expense and time usually involved in building and testing an invention in order to reduce it to practice.
- You need not keep meticulous records of whatever building and testing you do accomplish.
- You need not obtain witnesses.
- You can be certain that your PPA will provide excellent proof of inventorship.
- You will be certain that your PPA's early filing date can be relied upon, provided your description of the invention in the PPA is legally sufficient as described below. (To rely on an actual reduction to practice by building and testing your invention, you have to keep adequate records of your building and testing activities and be prepared to prove the validity of these records in a court or in an interference.)
- You can file a technical article (which you might have written anyway) as a PPA. (But remember, the article, to be adequate for a PPA, must fully disclose how to make and use the invention claimed in the RPA. As stated, the RPA must be filed within one year.)
- You can file a PPA, then within one year, file an RPA, which has the practical effect of delaying examination of the RPA and extending—up to one year—your patent's expiration date. In other words a PPA gives you a filing date that does not start your 20-year patent term. Pushing your patent monopoly term ahead a year can be profitable if your invention is ahead of its time and is likely to have its best sales 20 years from now—for example, as often happens with drugs. However, if you have built and tested your invention and made a proper record of this (see Section F3), you can also safely push your monopoly ahead by filing your RPA later. (A PPA can be converted to an RPA (Rule 53(c)(3)) but I advise against doing so since the patent will expire 20 years from the filing date of the PPA rather than 20 years from the filing date of the RPA.)
- If you've filed an RPA and wish to restart your 20-year term, you can do so by converting the RPA to a PPA and then filing a second RPA. To make the conversion, file a petition (a simple request letter will do) with the prescribed conversion fee (see Fee Schedule in Appendix 4) within one year of the RPA's filing date. The PPA will take the first RPA's filing date. Then file the second RPA, also within one year of the first RPA's filing date. The second RPA should claim the benefit of the PPA's filing date. The second RPA will expire 20 years from its own filing date, so you've restarted your 20-year term about a year later, albeit at a price.
- You can refer to your invention as patent pending once you've filed a PPA. This can be a marketing advantage, especially with companies that will not discuss any invention that is not patent pending.
- Suppose you file a PPA and then, within a year, you file an RPA which claims the benefit of the PPA's filing date. If your RPA issues as a patent it will be effective as a prior-art reference as of its PPA's filing date.
- If you are able to license or sell your invention before it is time to file a PPA, your licensee or buyer will have the opportunity to prepare and file the RPA using their own lawyers.
- Preparing an RPA after you've prepared a PPA will give you a second opportunity to perfect your application.
- If you file a PPA and thereafter make any changes in the invention, you can file additional PPAs to cover the changes. You can claim the benefit of as many PPAs as you want in any RPA(s) you file, so long as all PPAs you claim priority from were filed within a year preceding the RPA's filing date.
- You can put multiple inventions in a single PPA and claim the benefit of these in separate RPAs, provided the RPAs are filed within a year after the PPA was filed.

5. Disadvantages of the PPA

Alas, every silver box seems to contain a cloud. The disadvantages of filing a PPA are as follows:

1. You may tend to forgo building and testing and lose the concomitant advantages, such as determining whether the invention is operable, practical, or useful, and having a working prototype to demonstrate to prospective manufacturers. (See Section E above.)
2. Your PPA may fail to contain a full a description of how to make and use the invention or any embodiment of it. In this case, you won't be able to rely on the PPA's filing date for the invention or any embodiment.

Comparison of PTO's Provisional Patent Application (PPA) With Disclosure (or Notebook) Showing Building and Testing	
PPA	**Signed and Dated + Witnessed and Dated Record of Building and Testing**
Plus. Ironclad evidence of date of reduction to practice (RTP) and inventorship	**Negative.** Record may be lost or witness may be unreliable or unavailable
Plus. No need to build and test invention	**Negative.** Must build and test invention
Plus. No need to find or show working invention to witnesses or have them sign	**Negative.** Must find and show working invention to witnesses and have them sign
Plus. A technical article can be used as the PPA, provided it clearly teaches how to make and use the invention	**Negative.** A technical article cannot be used unless it clearly teaches how to make and use the invention and is signed, dated, and witnessed
Plus. In case of an interference or other trial, no need to secure testimony of witnesses	**Negative.** In case of an interference or other trial, must secure testimony of witnesses
Plus. Can call invention "patent pending"	**Negative.** Cannot call invention "patent pending"
Plus. If a patent issues from a regular patent application that is based upon a PPA, the patent will be considered prior art (against later-filed patent applications) as of the PPA's filing date	**Negative.** If a regular patent application (RPA) is filed without being based upon a PPA, the actual filing date of the RPA (not the date of record) will be considered the date of the patent for prior art purposes
Plus. If the PTO finds relevant prior art that is earlier than an RPA, but not earlier than a PPA on which the RPA is based, it will usually not even cite such prior art against the RPA if it finds that the PPA clearly discloses the invention. Even if it cites such prior art, the applicant in the RPA can quickly antedate such art by citing the PPA.	**Negative.** If the PTO finds relevant prior art that is earlier than an RPA, it will cite it against the RPA. The applicant must compile evidence and submit a declaration to prove building and testing of the invention prior to the date of such prior art.
Plus. Can be used by foreign inventors to establish a "U.S. date"	
Negative. Must prepare application or paper with full disclosure teaching how to make and use invention	**Plus.** No need to prepare full disclosure so long as record shows building and testing
Negative. Must prepare cover sheet and Application Data Sheet (ADS) for PTO	**Plus.** No need to prepare any formal papers
Negative. Must send papers and PPA cover sheet with receipt postcard to PTO or file papers online	**Plus.** No need to send or file any forms or papers anywhere
Negative. Fee required to file (see Appendix 4). (However, a PPA's filing fee is much cheaper than an RPA's.)	**Plus.** No fee involved
Negative. The RPA—and any foreign applications you wish to file—must be filed one year from the PPA's filing in order to obtain the benefit of such date	**Plus.** If the RPA is filed over a year after the date of building and testing, it will still be entitled to such date provided an unreasonable time has not elapsed and the inventor has not abandoned the invention

3. You may unintentionally forgo foreign protection. This is because you cannot wait one year after filing the RPA, as is usually done, to foreign file. Instead you must make your foreign filing decision, as well as your regular U.S. filing decision, within one year after your PPA is filed. As I will discuss in Chapter 12, foreign filing is extremely expensive and few foreign filers ever earn their outlay back.
4. You may try to license or interest a manufacturer in your invention in the approximately ten-month period between the time you file the PPA and the time you must begin preparation of your RPA. Since ten months is usually too short a period to license an invention, you may get discouraged and fail to file an RPA and thus give up a potentially valuable invention.
5. If you file an RPA which claims the date of your PPA, and you do not file a Nonpublication Request (see Chapter 10), at the time you file the RPA, your RPA will be published 18 months after you file the PPA, or about six months after you file the RPA. You may not want your application published so early.
6. A PPA's date can be relied upon only if an RPA is filed within one year, while a properly witnessed record of building and testing generally can be relied upon even if the RPA is filed several years later.
7. If you file a PPA and then file an RPA claiming benefit of the PPA, but don't file a Nonpublication Request (see Chapter 10), your RPA will be published about six months after your RPA's filing date. Such a publication will destroy the trade secret status, if any, of your invention at an early date.

Note that the PTO has published the following cautions regarding PPAs:

- PPAs are not examined on their merits.
- The date of a PPA cannot be claimed if an RPA has not been filed within one year.
- A PPA cannot claim the benefit of an earlier application (foreign or domestic).
- The disclosure of a PPA must be clear and complete enough so that an ordinary person skilled in the field of the invention can make and use the invention.
- All contributors to the inventive subject matter of the PPA must be named in the PPA.
- The RPA must name at least one inventor that was named in the PPA.
- In order for an RPA to claim the date of the PPA, the PPA must be filed with the proper fee and must be complete.
- If the basic fee is not paid with the PPA, the fee can be paid later, but the PTO charges a penalty fee.
- PPAs are not available for designs.
- No subject matter can be added once the PPA is filed.
- No patent will result from the PPA unless an RPA is filed within a year or the PPA itself is converted to an RPA.

6. PPA Misconceptions

There are many common misconceptions circulating about what a PPA can accomplish. Here are some.

Common Misconception: The PTO will read and examine and reject or approve your PPA.

Fact: The PTO will never examine or read your PPA unless you need to rely on its date and ask the PTO to do so in order to obtain the benefit of the PPA's filing date.

Common Misconception: After filing your PPA, the PTO will grant you a provisional patent.

Fact: The PTO will never "accept," "grant," or "reject" your PPA on any substantive ground. There is no such thing as a "provisional patent" and your PPA will be discarded if you don't file an RPA within one year that claims the benefits of the PPA's date.

Common Misconception: You can modify your invention after filing a PPA and still claim its benefits.

Fact: If you have an invention in your RPA that isn't in your PPA, you will simply not be able to obtain the benefit of your PPA's filing date for that invention, if you ever need it. If you have an invention in your PPA that isn't in your RPA, the PTO won't care. You can put any and all inventions you want into a PPA and you can do the same with your RPA. (However if your RPA claims multiple inventions the PTO will require you to restrict the claims to one invention.)

Common Misconception: Filing a PPA provides the right to stop others.

Fact: A PPA is a simple placeholder that confers no rights, except the right to rely on its date if it's prepared properly and you file an RPA within a year.

Common Misconception: Filing a PPA is the only way to document your invention short of filing a regular patent application.

Fact: Filing a PPA is a good way to document your invention but it is not the only way. If you make a properly signed, witnessed, and dated record of building and testing (B&T) your invention, you can rely upon the date of your B&T record in any RPA that you file later. Your B&T record will give you a date of invention similar to what a PPA will give you. Unlike the PPA, the RPA does not have to be filed within one year of the date of the B&T record.

7. Should You File a PPA?

For the reasons stated above, I recommend that you file a PPA only if you are not in a position to build and test your invention, properly document your activities, and have your documentation witnessed, and one of the following four reasons applies:

1. you have a good invention on which you wish to file an RPA, but are not currently able to do so due to lack of funds or resources, or
2. you wish to lock in an early date, since you feel your invention is potentially valuable and might be independently developed by others or stolen from you, or
3. a paper or other public disclosure of your invention is going to be made and you don't have evidence sufficient to show that your "date of invention" (Chapter 5, Section E1) antedates the public disclosure, or
4. a paper or other public disclosure of your invention was already made, for example 11.5 months ago, and you don't have time to prepare and file an RPA before the one-year deadline.

8. How to Prepare and File a PPA

Ideally, the more your PPA resembles the RPA you file within the following year, the more you can be assured that you will be able to claim the PPA's filing date. Conversely, the less the PPA resembles the RPA, the more work the patent examiner will have to do to determine whether your PPA fully discloses the invention being claimed in the RPA—which means a greater chance you will be denied the PPA's filing date. And so, my general recommendation is that you follow the basic rules for writing an RPA set out in Chapter 10 (double- or 1½-spacing and with 1" margins, ample headings, short sentences, and a clear description). But, since your PPA will not be examined by the PTO unless and until you file an RPA—and then only to see whether it adequately describes the invention being claimed in the RPA—your description need not:

- be a polished presentation (it should be clearly written and understandable)
- contain claims, or
- be typed in any particular format.

As explained below, there are two ways to file a PPA with the PTO: (a) electronically using the PTO's EFS-Web procedures over the Internet (preferred), and (b) by mail (includes personal delivery in case you live near the PTO in Alexandria, VA). Whether preparing a PPA for electronic filing or mail, you will need to:

- prepare drawings, if necessary (these need not be polished, but should be understandable)
- prepare a complete description of the structure and operation of your invention
- prepare a PPA cover sheet and (if filing by mail) a fee transmittal
- (if filing by mail) prepare a receipt postcard and check or credit card authorization
- (if filing electronically) prepare an Application Data Sheet (ADS) (although it's desirable to include an ADS if filing by mail, as well).

PPAs: The Long and the Short

You can produce an adequate PPA with a minimum amount of work. How little is required? You can fully describe your invention by supplying the information contained in the Description and Operation sections of the Specification in the RPA (and drawings, if necessary). In others words, if you follow the instructions for drafting these two sections in Chapter 8, Section I, you will have an adequate PPA.

For reasons stated in this section, I recommend a richer or more fulsome PPA. This should include information contained in other sections of the RPA (the Background, Objects and Advantages, Drawing Figures, Reference Numerals, Summary, Description, Operation, at least one Claim, and the Abstract). If you follow the instructions for drafting these sections in Chapters 8 and 9, you will have a more-than-adequate PPA.

To give you an idea of the difference between the bare-bones and recommended PPA, I have prepared two PPAs using the same invention (Pat. No. 6,018,830, Adjustable Sleeping Bag With Drawcords). Fig. 3D provides an example of the bare-bones approach; while Fig. 3E shows a preferred, fulsome PPA.

Provisional Patent Application of

Robert H. Howe

for

TITLE: ADJUSTABLE SLEEPING BAG WITH DRAWCORDS

DESCRIPTION

FIG. 1 is a perspective view taken from the user's right side of a sleeping bag 11 constructed in accordance with the invention. An upper portion 12 of the bag has a drawcord 14, circumferentially mounted within a fabric casing sleeve 15, and secured by cord lock 16. Such cord arrangements are repeated at each of locations 19, 20, 21, and 22. Each sleeve 15 and each contained drawcord 14 extends only across the upper portion of the bag, from a zipper 17 on the right side of the bag, to a corresponding location 18 (FIG. 2) on the left side. The bottom portion of the bag (not shown) has no drawcords. The drawcords are made of stretchable elastic or nonstretchable material (nylon), while the sleeves are preferably made of the same material as the bag's outer shell, e.g., nylon or rayon. Such sleeves may be sewed, glued, or thermally bonded to the outside of the outer shell.

FIG. 2 is a left perspective view of the bag, showing left-side seam 18 and showing drawcord 14 mounted within sleeve 15 and secured by cord lock 16 at locations 19, 20, 21, and 22. Note that each sleeve 15 and its contained drawcord extends only over the top portion of the bag, from seam 18 to zipper 17.

FIG. 3 is a lateral cross-section through bag 11 at location 19 showing zipper 17, side seam 18, and drawcord 14 relaxed and secured by cord lock 16 while mounted within fabric casing sleeve 15. Sleeve 15 is sewn to outer shell fabric 25. Inner lining fabric 24 and insulation 23 are not compressed since drawcord 14 is relaxed. An occupant 26 of the bag is shown in a horizontal position; note that the bag fits loosely around the occupant and that there is a lot of air space between occupant 26 and the bag. A conventional underlying insulating pad or mat 27, e.g., of foam is used under the bag.

FIG. 4 is a lateral cross-section through sleeping bag 11 at location 19 with drawcord 14 tightened and secured by cord lock 16. Inner lining fabric 24 and insulation 23 are gathered

Fig. 3D—Provisional Patent Application Without Embellishments

together where they are surrounded by tightened drawcord 14. Note that the bag now fits relatively closely or tightly around occupant 26 and that there is very little air space left between occupant 26 and the bag. Insulating pad 27 is again shown under the bag.

OPERATION

In operation one uses the bag in a normal manner with insulating pad 27 under the bag. The user can, when desired, increase the warmth of the bag by tightening the drawcords and securing them with cord lock 16 (FIGS. 3 and 4). When the drawcords are tightened, five effects increase the bag's warmth:

(1) Insulating layer 23 and the inner lining fabric 24 surrounding occupant 26 become thicker.

(2) This increase in thickness also makes the bag less susceptible to the user narrowing the insulation by body movement, e.g., by poking the insulation with an elbow.

(3) The surface area of outer shell fabric 25 exposed to cold air is reduced.

(4) Since the drawcord extends only over upper portion 12 of the bag, lower portion 13 does not tend to be raised from pad 27 beneath the bag to be exposed to cold air.

(5) The air space between occupant 26 and the bag is reduced.

When the user wishes to increase the inner volume of the bag to provide greater freedom of movement (at some loss of insulating ability), it is only necessary to relax the drawcords (FIG. 3) and allow the bag to expand.

Fig. 3D—Provisional Patent Application Without Embellishments (continued)

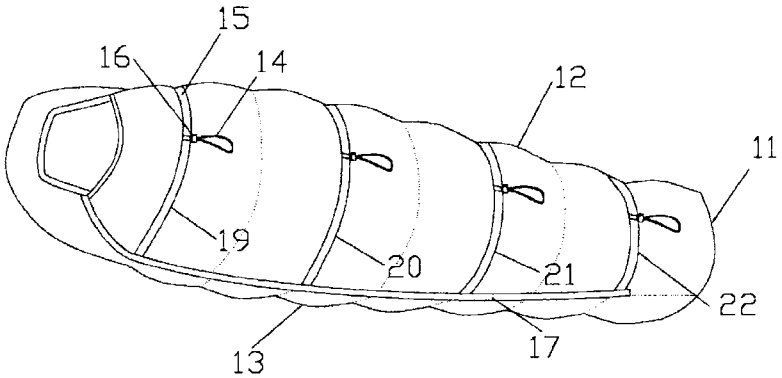


FIG. 1

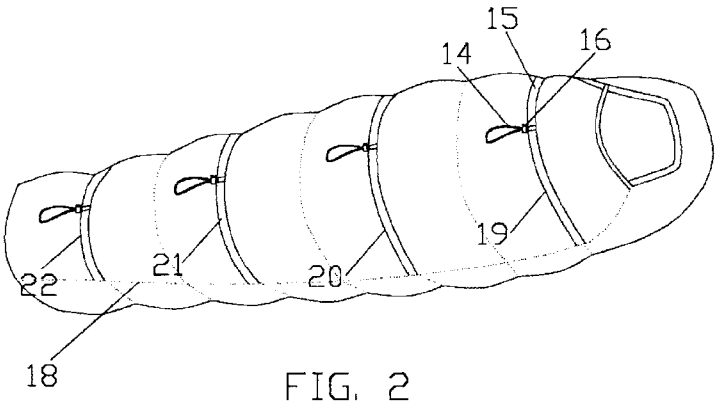


FIG. 2

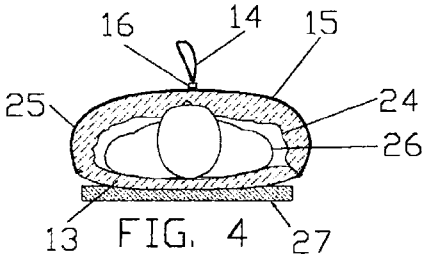


FIG. 4

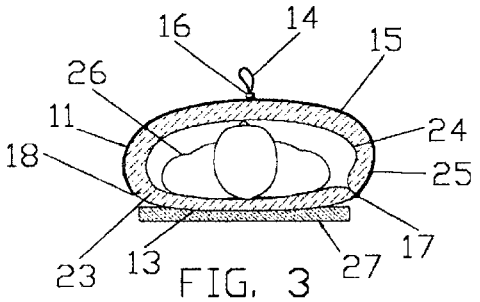


FIG. 3

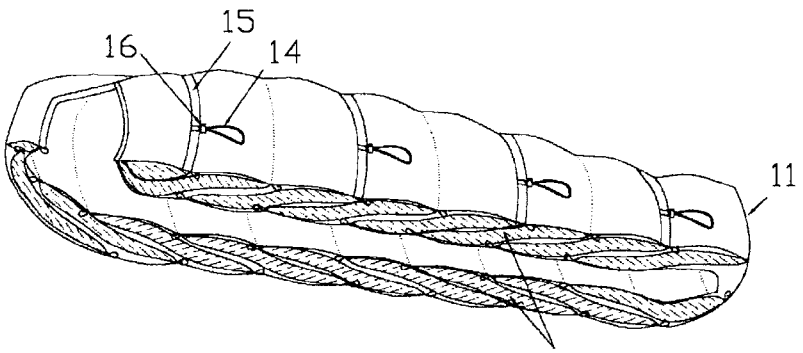


FIG. 5

Fig. 3D—Provisional Patent Application (Drawings)

Provisional Patent Application of

Robert H. Howe

For

TITLE: ADJUSTABLE SLEEPING BAG WITH DRAWCORDS

CROSS-REFERENCE TO RELATED APPLICATIONS: None.

FEDERALLY SPONSORED RESEARCH: None.

SEQUENCE LISTING: None.

BACKGROUND

This relates to sleeping bags, specifically to insulated sleeping bags having means that allow users to adjust the insulating ability and internal volume of the bags. Sleeping bags can be uncomfortable, and when they're uncomfortable, they can deny their users much-needed rest. Sleeping bag comfort is largely a matter of warmth—that is, providing the bag's user with the correct amount of insulation to suit the existing conditions—and a matter of providing the user with adequate freedom of movement. These two aspects of sleeping bag comfort can work against each other. For similarly shaped bags, the more room there is inside a bag, the more freedom of movement its user has. However, the more room inside a bag, the more air space the user's body is required to heat and the more outer bag surface is exposed to the cold. Most sleeping bags provide comfort in only a rather narrow range of temperatures. So, sleeping bag manufacturers have long sought means of effectively adjusting the suitability of sleeping bags to fit a wider range of temperatures.

Both U.S. Pat. No. 2,350,410 to Matthesius (1944) and U.S. Pat. No. 1,583,419 to Perl (1926) show sleeping wraps for infants. These bags have side cords which are tied around the upper portion of each of the wraps after an infant is placed on top of the wrap and the flat sides of the wrap are folded around the infant. With both of these wraps the cords are primarily to allow one to complete closure of the wraps. Therefore, they should not be considered sleeping bags but rather, what they clearly are—sleeping wraps for infants. Perl states, "the straps 15 will serve to prevent the possible moving and kicking of the infant from dislodging the cover portion."

Fig. 3E—Provisional Patent Application With Embellishments

Both wraps are flat, it is presumed, because it is easier and safer to lay a sometimes struggling, usually writhing infant on a flat surface and fold and tie the sides around the infant than it is to insert the infant into a bag. While the cords of these two wraps may be drawn more or less tightly about the infant before tying, neither wrap is adapted for simple adjustment of its internal volume.

One method used to optimize the warmth and roominess of a sleeping bag is shown in U.S. Pat. No. 5,473,779 to Kramer (1995), where nonadjustable, permanently attached bands of elastic material are incorporated into the portion of the bag surrounding the user's knees and legs. The object is to provide increased freedom of movement while still reducing the inner volume of the bag to optimize bag warmth. However the greater freedom of movement is provided only to the knees and legs. The bag cannot be adjusted to adapt it for cooler or warmer temperatures.

The lower portions of insulated sleeping bags are typically less insulated than the upper portions of the same bags because bag manufacturers rely on bag users to employ well-insulated mats under the sleeping bags. Bag manufacturers rely on such mats for good reasons—they are cheap, effective, and not as compressed by the weight of the user as is the insulation contained in the lower portion of a sleeping bag. If a good insulating mat is not placed under a sleeping bag, it is likely that more warmth will be lost to the ground by conduction than will be lost by convection to the air above the sleeper.

However even if a good ground pad is used with the bag shown in U.S. Pat. No. 4,888,828 to Tatsuno (1989), its effectiveness will be reduced. This is because Tatsuno uses nonadjustable elastic members that are permanently sewn into the bag in circumferential rings spaced axially along the bag. These rings totally encircle the bag and the bag's user and this presents a problem. By totally encircling the bag, each elasticized member pulls an area of the lower portion of the bag up and away from the underlying insulated pad. Thus, these areas are no longer insulated by full contact with the underlying insulating mat as they would otherwise be, but are instead exposed to cold air.

Roach, in U.S. Pat. No. 4,894,878 (1990) shows a bag with a liner whose circumferential dimension can be reduced by a zipper to create increased overlap of the bag's insulating batts and hence more insulation. However, it is difficult to reach an inside zipper to make the necessary adjustment.

Hunt, in U.S. Pat. No. 3,857,125 (1974) shows an insulated bag with inner and outer shell

Fig. 3E—Provisional Patent Application With Embellishments (continued)

layers that are differentially cut, except in a small portion of the bag, that provides more freedom of movement for the user's shoulders. This differential cut, Hunt claims, minimizes compression of the insulation when body pressures are exerted against the outer shell. Hunt also claims that the inner shell provides self-adjusting inward lofting of the insulation in the shoulder and chin areas. Hunt's bag provides a hood that surrounds the user's face. Hunt positions the adjustable end of a drawcord used to tighten this hood at one side of the user's face and sews the drawcord to the bag at the other side of the user's face. This, it is claimed, allows the user to independently adjust the tightness of that part of the hood that is above the face. While the effectiveness of providing separate adjustability in areas that are so close together is debatable, one thing is certain: Hunt's bag in no way addresses the need for a bag with adjustability in the fit of the upper insulation.

Demini Sports, of Amsterdam, Holland, has sold a sleeping bag since the early 1970s with drawcords which encircle the bag at spaced locations along the bag. However these bags suffer from the same defect as Tatsuno's, above. I.e., since the means for compressing the bag completely encircle it, they draw the lower portion of the bag away from the underlying insulating ground pad, which, as stated, users normally provide under this type of bag.

In conclusion, insofar as I am aware, no sleeping bag formerly developed provides volume adjustability to a user without the defect of drawing the lower portion of the bag away from the underlying insulating ground pad.

SUMMARY

An improved sleeping bag, has adjustable drawcords attached to the outer shell fabric. These drawcords extend only over the top portion of the bag. Cord locks are provided to tighten the drawcords to any desired degree of warmth. The drawcords are encased in drawcord sheaths extending only across the upper portion of the bag. This allows a user to reduce the inner air space of the bag without reducing the effectiveness of the insulation of the lower portion of the bag and without the discomfort of inner encircling drawcords.

Accordingly several advantages are to provide an improved sleeping bag, to provide means of increasing the warmth of a sleeping bag during cooler weather, to provide a bag with increased freedom of movement during warmer weather, and to provide a more user-friendly, yet economical sleeping bag. Still further advantages will become apparent from a study of the

Fig. 3E—Provisional Patent Application With Embellishments (continued)

following description and the accompanying drawings.

DRAWINGS

FIG. 1 is a perspective right-side view of a sleeping bag constructed in accordance with the invention, showing the upper half of the bag.

FIG. 2 is a perspective left-side view of the sleeping bag of FIG. 1.

FIG. 3 is a lateral cross-sectional view of the sleeping bag of FIGS. 1 and 2 with the drawcord relaxed.

FIG. 4 is a lateral cross-sectional view of the sleeping bag of FIGS. 1 and 2 with the drawcord tightened.

FIG. 5 is a perspective view of the bag taken from above, showing its insulation.

DETAILED DESCRIPTION

FIG. 1 is a perspective view taken from the user's right side of a sleeping bag 11 constructed in accordance with one embodiment. An upper portion 12 of the bag has a drawcord 14, circumferentially mounted within a fabric casing sleeve 15, and secured by cord lock 16. Such cord arrangements are repeated at each of locations 19, 20, 21, and 22. Each sleeve 15 and each contained drawcord 14 extends only across the upper portion of the bag, from a zipper 17 on the right side of the bag, to a corresponding location 18 (FIG. 2) on the left side. The bottom portion of the bag (not shown) has no drawcords. The drawcords are made of stretchable elastic or nonstretchable material (nylon), while the sleeves are preferably made of the same material as the bag's outer shell, e.g., nylon or rayon. Such sleeves may be sewed, glued, or thermally bonded to the outside of the outer shell.

FIG. 2 is a left perspective view of the bag, showing left-side seam 18 and showing drawcord 14 mounted within sleeve 15 and secured by cord lock 16 at locations 19, 20, 21, and 22. Note that each sleeve 15 and its contained drawcord extends only over the top portion of the bag, from seam 18 to zipper 17.

FIG. 3 is a lateral cross-section through bag 11 at location 19 showing zipper 17, side seam 18, and drawcord 14 relaxed and secured by cord lock 16 while mounted within fabric casing sleeve 15. Sleeve 15 is sewn to outer shell fabric 25. Inner lining fabric 24 and insulation 23

Fig. 3E—Provisional Patent Application With Embellishments (continued)

are not compressed since drawcord 14 is relaxed. An occupant 26 of the bag is shown in a horizontal position; note that the bag fits loosely around the occupant and that there is a lot of air space between occupant 26 and the bag. A conventional underlying insulating pad or mat 27, e.g., of foam is used under the bag.

FIG. 4 is a lateral cross-section through sleeping bag 11 at location 19 with drawcord 14 tightened and secured by cord lock 16. Inner lining fabric 24 and insulation 23 are gathered together where they are surrounded by tightened drawcord 14. Note that the bag now fits relatively closely or tightly around occupant 26 and that there is very little air space left between occupant 26 and the bag. Insulating pad 27 is again shown under the bag.

REFERENCE NUMERALS

11 sleeping bag

12 upper portion of sleeping bag

13 lower portion of sleeping bag

14 drawcord

15 fabric casing sleeve

16 cord lock

17 zipper

18 side seam

19 sleeve location

20 sleeve location

21 sleeve location

22 sleeve location

23 insulation

24 inner lining fabric

25 outer shell fabric

26 occupant

27 insulating pad

Fig. 3E—Provisional Patent Application With Embellishments (continued)

OPERATION

In operation one uses the bag in a normal manner with insulating pad 27 under the bag. The user can, when desired, increase the warmth of the bag by tightening the drawcords and securing them with cord lock 16 (FIGS. 3 and 4). When the drawcords are tightened, five effects increase the bag's warmth:

(1) Insulating layer 23 and the inner lining fabric 24 surrounding occupant 26 become thicker.

(2) This increase in thickness also makes the bag less susceptible to the user narrowing the insulation by body movement, e.g., by poking the insulation with an elbow.

(3) The surface area of outer shell fabric 25 exposed to cold air is reduced.

(4) Since the drawcord extends only over upper portion 12 of the bag, lower portion 13 does not tend to be raised from pad 27 beneath the bag to be exposed to cold air.

(5) The air space between occupant 26 and the bag is reduced.

When the user wishes to increase the inner volume of the bag to provide greater freedom of movement (at some loss of insulating ability), it is only necessary to relax the drawcords (FIG. 3) and allow the bag to expand.

CLAIM

1. A sleeping bag, comprising:

an upper portion which will overlie the body of an occupant when said occupant is in a horizontal position in said sleeping bag, and

a lower portion which underlies the body of said occupant, said lower and upper portions being joined at opposite sides of said sleeping bag,

at least one drawcord attached to said upper portion of said sleeping bag, said drawcord not extending onto said lower portion of said sleeping bag, said drawcord having two ends which are attached to said respective opposite sides of said sleeping bag,

whereby (a) during cold weather, an occupant of said sleeping bag can tighten and clamp said drawcord so that the inner volume and the exposed outer surface area of said

Fig. 3E—Provisional Patent Application With Embellishments (continued)

sleeping bag can be reduced in order to better insulate said occupant, (b) contact between said lower portion and any underlying flat insulated pad will not be reduced when said drawcord is tightened, and (c) said occupant of said sleeping bag can relax the tension on said drawcord during warmer conditions and thereby increase the volume of air within said sleeping bag adjacent said occupant of said sleeping bag in order to give said occupant more freedom of movement.

ABSTRACT

A sleeping bag (11) design for providing adjustability of the inner volume and outer exposed surface area of the bag comprises sheathed drawcords (14), preferably elastic, attached only to the top or upper portion of the bag and secured by cord locks (16). A user of the bag can tighten the drawcords during cold weather, thereby providing a warmer bag by reducing the inner volume and the exposed outer surface area of the bag without reducing the thermal protection provided to the lower portion of the bag by an underlying flat insulated pad, as would be the case with drawcords fully encircling the bag. During warmer weather, the user can relax the drawcord adjustment, thereby providing the user with more freedom of movement. Thus a considerably more versatile sleeping bag is provided—that can be adjusted to provide more warmth during cold weather or more freedom of movement during warmer weather.

Fig. 3E—Provisional Patent Application With Embellishments (continued)

In keeping with my recommendation that you make your PPA look as much like your RPA as feasible, I recommend that you prepare your drawings and description as I describe in Chapter 8. Although you legally don't need to include the Background, Advantages, Description of Drawing Figures, List of Reference Numerals, Summary, Conclusion, or Abstract parts of the specification, it won't hurt if you do, and including these parts will make your PPA that much more effective if it is later examined. Your drawings can be informal drawings; they need not be inked or done carefully with a CAD program, but they (and the description) must be in permanent form (no pencil).

You also don't need to include any claims (Chapter 9). However, if possible, it is a good idea to draft some claims before filing the PPA, since this exercise will help you determine whether your detailed description includes everything necessary about your invention. Also some foreign jurisdictions may require that the application contain a claim to obtain priority.

CAUTION

Provide a Full Description of Your Invention. While it need not be well written or use any legalese, your "description" MUST comply with the full disclosure requirements—that is, it MUST clearly teach how to make and use the invention and it MUST disclose the best mode or version you currently prefer, if it has several modes or versions. To this end, I suggest you carefully review and follow Chapter 8, Section F, which discusses these requirements in detail.

Your description should be written in as simple terms as possible so that a lay judge can understand it or can be easily taught to understand it. If the invention is technical or abstruse, start your description from ground zero, assuming your reader knows nothing about the field, and then gradually move up to the minimum technical level necessary, defining all technical terms. In addition, your invention must be in a statutory class (see Chapter 5, Section C, for more on statutory classes). For software inventions, this means that the invention must be intimately involved with hardware.

If you have several inventions, you can put them all into the PPA, even if they're not related. If you know of several embodiments of any invention, put them all in, even if you have doubts about the operability of any embodiment. The PTO will never read your PPA unless they need to verify that it supports an invention or embodiment that you are claiming in an RPA that you file within one year after you file the PPA. As with the invention disclosure, I recommend that you include as many embodiments of your basic invention as you can think of, even if some may not work. For more information on preparing a Provisional Patent Application, review either *Patent Pending in 24 Hours*, by Richard Stim and David Pressman (Nolo), or check Nolo's online provisional patent program (www.nolo.com) that assists in the drafting of a PPA.

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The PTO's Internet Electronic Filing System (EFS-Web) enables patent applications, amendments, and other documents to be filed over the Internet. While the EFS works pretty well, it still requires a bit of time to learn and to convert your documents to the Portable Data Format (PDF). Nevertheless, even if you're filing just one application, it may be easier, cheaper, and faster for you to file electronically rather than mail a paper copy of the application to the PTO, which entails making a file copy

of everything, preparing several mail forms, a check or credit card authorization, and a receipt postcard, going to the post office to use Express Mail (recommended), paying the Express Mail fee, taking the risk that your application may be lost in the mails, and waiting several weeks to get your postcard back. From the above it will be obvious that EFS-Web also has many advantages. You can (1) file an application anytime and from anywhere that has Internet access, (2) obtain instant confirmation of receipt of documents and a Serial Number and Filing Date from the PTO, (3) send an application to the PTO without having to go to the post office to pay for and get an Express Mail receipt or having to wait for a postcard receipt, and (4) file an application without having to prepare an application transmittal, a fee transmittal, receipt postcard, or check or Credit Card Payment Form (CCPF).

I assume that you've prepared the Cover Letter and PPA (Drawings, and Specification (optionally including Claims and Abstract)) as instructed above. You don't have to prepare and/or file a Fee Transmittal, Fee Payment, or check (or CCPF) as you do these online as part of the EFS-Web process.

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If you can wait several weeks to file, I recommend you become a registered eFiler. You'll have to deal with red tape, including filling out a form to obtain a customer number, sending a notarized certificate to the PTO, obtaining access codes, and calling the PTO to confirm, but as a registered eFiler you'll be able to track your application's progress and file additional documents or corrections. To register go to www.uspto.gov/ebc/index.html, click Register Now, and follow the detailed instructions. If you can't wait several weeks, you can use EFS-Web to file an application as an unregistered eFiler and register later.

To file your PPA electronically (whether you're a registered eFiler or not), follow the following steps:

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- **Application Data:** On the Application Data page fill in the title of the invention, a docket number for the application of your choosing (optional, but a suitable docket number can be something like "Krypton Derailleur"), and your name and Customer Number or address. It's best to copy this data electronically from your Data Sheet so that everything will be consistent. Click Continue.
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- **Submit Application:** This page will list all of your PDF files, a *Fee-Info.pdf* file, and the filing fee. If everything is okay, click the Submit button at the bottom to bring up a Congratulations! page with an assigned Application Number, Confirmation Number, and Total Fees due. Click the YES! I want to pay now button at the bottom.
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- Receipt Postcard
- PPA Cover Sheet—PTO Form SB/16 (otherwise Form 3-3 from Appendix 7)
- Fee Transmittal—PTO Form SB/17 (Form 10-3 from Appendix 7
- Filing Fee—PTO CCPF Form 2038 (Form 10-4 from Appendix 7) or check
- Application Data Sheet (ADS) Form SB/14 (Form 3-4 from Appendix 7) (optional but desirable)
- Drawings
- Specification (optionally including Claims and Abstract).

Preparing the Cover Letter, ADS, and Fee Transmittal is not difficult. For the cover letter, fill out and print Form PTO/SB/16 (which you can download from the PTO's site). Then, fill out the Fee Transmittal (Form PTO/SB/17, also on the PTO's site. Fill out the ADS (PTO/SB/14) as instructed above. (If you don't have Internet access, use the Cover Letter Form 3-3, the Fee Transmittal Form 10-3, and the ADS form 3-4, all in Appendix 7.) You can find current fees at the PTO website, at Nolo's update site, or by calling the PTO at 800-786-9199.

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You are entitled to file as a small entity (SE) if you are an independent inventor, or you don't have an obligation to assign or license the invention to a for-profit organization with over 500 employees. If you file as an SE, you can pay half the fees of a large entity. Complete the "Check or Credit Card" line (the fee schedule is in Appendix 4). If there are coinventors only one inventor's signature and address is required.

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About a month later, you'll receive an official filing receipt from the PTO for your PPA. The filing receipt will contain your PPA's serial number, its date, the names of the inventor(s), the title, etc. It will usually contain the notation "Foreign Filing License Granted [date]," which means the PTO hasn't classified your invention under military security.

c. After You File Your PPA

If you've filed by mail you will receive a postcard receipt in a few weeks and a filing receipt a month or so after that. If you've filed electronically you'll just get a filing receipt in a month or so. Whether you filed your PPA electronically or by mail, after you get the official filing receipt you will never hear from the PTO again regarding the PPA. The ball is now in your court to file a timely RPA and to refer to your PPA if you ever need to rely on its date. Mount this in the file with your PPA. Now determine the date that is ten months after your PPA's filing date and mark this date on your calendar to remind you to consider following through with an RPA and possible foreign patent applications. A suitable reminder to write on your calendar is "Consider filing regular and foreign patent applications on PPA filed [filing date of your PPA]." Again, you won't receive any further communication from the PTO about your PPA, and if you don't file an RPA referring to your PPA within a year of your PPA's filing date, the PTO will forever disregard it. (Note, the PTO doesn't require that you file any Information Disclosure Statement (see Chapter 10, Section G,) or prior art in a PPA.)

Even though you've filed a PPA as a substitute for building and testing, you should still try to build and test it if at all possible, for reasons explained in Section E, above.

9. PPA Checklist

If you do decide to file a PPA, here is a checklist to go through before you file it electronically or by mail to make sure that you've done everything correctly. I find that many errors can be avoided if you assemble everything and wait a day and check everything again before filing.

PPA Checklist

- ☐ The specification and drawings clearly teach how to make and use all embodiments of the invention that you might later want to claim.
- ☐ Although it's not strictly necessary, I strongly recommend that your PPA be in the format of an RPA, insofar as possible, so that it includes all the parts of an RPA's specification and is written as well and as clearly as an RPA should be. Thus I recommend your PPA comply with the Drawings and Specification checklists in Chapter 8.
- ☐ Although it's not necessary, I recommend that your PPA contain at least one claim so that you will become familiar with claims and the scope of offensive rights they provide, and also prevent any challenge to your PPA by foreign patent offices for failure to claim the invention as of your earliest filing date. Chapter 9 contains full instructions for drafting claims and checklist for the claims.
- ☐ If filing by mail, the PPA Cover Letter is completed, including Express Mail section, to avoid possibility of loss in the mail and to get an instant filing date. If filing electronically the PTO's Data Sheet is completed and saved as a PDF file where you can easily retrieve it.
- ☐ If filing by mail you've included a return receipt postcard with all papers being sent listed on the back.
- ☐ You've completed an ADS if filing electronically. (Also desirable if filing by mail.)
- ☐ If filing by mail you've included a completed Fee Transmittal form.
- ☐ If filing by mail you've included a Check or Credit Card Payment Form for the filing fee. If a check is used, it is payable to "PTO." Adequate funds on deposit or adequate credit is available. If filing electronically you have typed the credit card number accurately and adequate credit is available.
- ☐ If filing by mail the parts are assembled in the above order. If filing electronically or by mail you've made hard copies for your file.
- ☐ If filing by mail, envelope is addressed to:
  Mail Stop PPA
  Commissioner for Patents
  P.O. Box 1450
  Alexandria, VA 22313-1450

(Again, it is not necessary to file an Information Disclosure Statement or any prior art with your PPA.)

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10. PPAs and Foreign Filing

The effect of PPAs on foreign filing is a bit complicated, but not difficult to understand. As we'll learn in Chapter 12, there are two types of foreign jurisdictions in the patent world: those that are members of the Paris Convention and those that are not. If you file a PPA and then file in any Convention jurisdiction (for example, the European Patent Office, Patent Cooperation Treaty (PCT), the U.K., or Japan) within a year, your application in the Convention jurisdiction will be entitled to the priority of your PPA's filing date. Thus, after you file a PPA, you can then freely publish and sell your invention without loss of any rights in any foreign Convention jurisdiction, provided you file in the foreign Convention jurisdiction within a year. Unfortunately, non-Convention countries, for example, Pakistan and Kuwait, do not provide any priority, so you must file in these countries before you publish or offer your invention for sale publicly, as fully explained in Chapter 12.

11. What If You Make Changes to the Invention?

Note that you're not allowed to amend or add anything to your PPA. Thus, if you make any changes or improvements to the invention after filing a PPA, you should file a subsequent PPA to record any changes (unless they are minor, such as a change in material). Also, if the date is close to the one-year limit from the filing date of the PPA, it probably isn't worth filing a second PPA; instead, put the changes in the RPA. Your RPA can claim the benefit of more than one PPA and several RPAs may claim the benefit of one or more PPAs. Also, if a PPA contains several inventions, the RPA need not contain them all. Conversely, the RPA may

contain several inventions even if its PPA contains only one. In this case the RPA will be entitled to the benefit of the PPA's date for only the invention(s) disclosed in the PPA.

I. Don't Sit on Your Invention After Documenting It

While documenting your invention and the building and testing of it are very important, obviously such documentation, no matter how carefully done and how thorough, will be of no value whatsoever unless you follow through and take further steps to exploit your invention, which I cover in the next chapters. Keep in mind that whatever method or methods you use to document are not as important as filing a patent application and getting the invention to market so that you can profit from your creativity. I have seen so many inventors properly document their inventions and then fail to exploit them that I felt compelled to include this admonition to make sure you don't miss the forest for the trees.

J. Don't Use a "Post Office Patent" to Document Your Invention

There's a myth that you can document the date you conceived of your invention (or even protect your invention) by mailing a description of your invention to yourself by certified (or registered) mail and keeping the sealed envelope. In fact, the law regards the use of a "Post Office Patent" as tantamount to worthless and no substitute for the signatures of live witnesses on a description of your invention, or even for the PTO's Disclosure Document Program. The PTO's Board of Appeals and Patent Interferences, which has great power in these matters, has specifically said that it gives a sealed envelope little evidentiary value.

K. Summary

Documentation of an invention is vital to protect your legal right to assist in your creation of the invention. You should record conception of the invention, then build and test it, if at all possible, and then record your building and testing. You may record conception and building and testing in a lab notebook or by means of an invention disclosure. In either case you, the inventor, should sign and date the document and have it witnessed and dated.

In lieu of or in addition to building and testing, you may also file a provisional patent application (PPA) to obtain patent pending status. The PTO will never read the PPA unless you need to rely on its date later to obtain an earlier date for a regular patent application (RPA). The filing fee for a PPA is relatively small and it need not have claims or the formality of an RPA, but to be effective, the PPA must clearly and fully teach how to make and use the invention. To obtain the benefit of the PPA's filing date, the RPA and any foreign applications must be filed within one year and claim the benefit of the PPA. You may convert an RPA to a PPA and vice versa. Your RPA may claim the benefit of several PPAs. A PPA can contain several inventions, but you can rely on only those that the PPA fully and clearly discloses. You should not use a "post office patent" to document your invention.

CHAPTER 4

Will Your Invention Sell?

Inventor's Commandment 5

To avoid needless expense and effort, don't spend significant time or money on your creation until you have thoroughly evaluated it for commercial potential, including a consideration of all of its advantages and disadvantages. You should proceed only after you are convinced that your creation can be sold profitably for a significant period of time.

A. Why Evaluate Your Invention for Salability?

Congratulations! If you've gotten this far, you've made an invention and have properly recorded your conception by a notebook or disclosure. I hope you have also built and tested it and/or filed a Provisional Patent Application (PPA) to cement a reduction-to-practice date.

Now it's time to do two more things before proceeding further: Evaluate it for commercial potential and make a patentability search. While you can do these in any order, I recommend that you do the easier or cheaper one first. Since, for most people, it's the commercial evaluation, I put this chapter first. However, if you live near the PTO, or want to see if your invention is really novel now, then go to Chapters 5 and 6 first. Also, if you're a corporate inventor, the decision as to whether a particular invention is sufficiently marketable to justify applying for a patent may not be yours. In any event I recommend that you at least skim through this material for new ideas that might help you assess your work in a different light before proceeding to Chapters 5 and 6, where I discuss patentability and searching.

The commercial evaluation is so important that I've made it an Inventor's Commandment. Why is a commercial evaluation so important? Because the next steps you take will involve the expenditure of significant money and effort. Specifically, your next step, in addition to searching the invention, is to build and test it for feasibility and cost (if possible), and then to file a patent application on the invention. Naturally, you won't want to take these substantial labor and financial risks unless you feel you have some reasonable chance that your efforts and expenditures will be justified.

Common Misconception: Anyone who gets a patent will be assured of fame and fortune.

Fact: Even if you get a patent, you still may not make any money from the invention. In fact, fewer than one out of ten patented inventions make any money for their owners, mainly because the inventor did not adequately assess the commercial prospects of the inventions at the outset and because the inventor did not promote and market the invention adequately thereafter.

> *"It is to be remembered, that the pursuit of wealth by means of new inventions is a very precarious and uncertain one; a lottery where there are many thousand tickets for each prize."*
>
> ***—Eli Whitney***

The purpose of this chapter, then, is to help you reduce the risk of a "patented failure" by assisting you in checking your invention out for salability. In fact, before you proceed with a search, or the actual filing of a patent application, I recommend that you be reasonably confident that your invention is likely to make you at least $100,000 in profits or royalties, or at least 20 times the cost of what you plan to spend for searching, building a model, and patenting. Of course if you can do the search easily, or if you're into inventing for the sheer fun of it, or if you want to get a patent to stroke your ego, you can disregard these financial requirements.

Also, if you come up with a technical breakthrough in a high-tech field, or a highly novel invention, you should consider patenting it even though you don't think it has immediate commercial value: You may be able to license or sell your early patent very profitably some years later, and it will block later inventors from patenting it.

If after reading this chapter, you're still not sure about the commercial prospects of your invention, you may want to test market it. If you haven't filed a PPA, this can legally be done for up to one year after you start test marketing, since you can file a valid patent application up to one year after the invention is first sold or offered for sale. If you have filed a PPA, you still have almost a year to test market it until you have to file an RPA to obtain the benefit of your PPA's date. A test marketing is feasible if you're able to make (or have made) reasonable quantities of your invention cheaply. Obviously, a field or use test of a working model of an invention will tell you much more than the theoretical "paper" evaluation discussed in this chapter. However, unless you have filed a PPA, you must be willing to sacrifice your foreign rights. See Chapter 12, where I explain that you'll lose most of your foreign rights if you sell or otherwise release your invention to public scrutiny before you file for a patent in the U.S.

CAUTION

If you do decide to test market the invention before filing, you must keep in mind the "one-year rule," which I'll also discuss in the next chapter. This rule, contained in Section 102 of the patent statutes (35 USC 102), requires that in order to be valid, a U.S. patent application (regular or PPA) *must* be filed within one year after you first sell your invention (this includes test marketing), offer it for sale, publish, or reveal it to others without restriction. (See Chapter 5, Section E.)

B. Start Small but Ultimately Do It Completely

When you evaluate your invention for commercial potential, try to do it on a small scale at first in order to avoid a large, wasted expenditure. For example, if you make metal parts as part of building a prototype to test operability, try to have them made of wood or cardboard by an economical prototyping technique. Also you may be able to make a virtual (computer-world) prototype. Similarly, prior to conducting extensive interviews, try to consult with a single expert to be sure you're not way out in left field. If your initial, small-scale investigation looks favorable and you don't run into any serious impediments, I advise that you then do it carefully, completely, and objectively, using the techniques of this chapter.

If after you do the full evaluation your idea looks like it has great commercial potential, but some other factor such as patentability or operability doesn't look too promising, don't make any hasty decision to drop it. Continue to explore the negative areas. On the other hand, if after a careful evaluation you are truly convinced that your invention won't be successful, don't waste any further time on it. Move on.

C. You Can't Be 100% Sure of Any Invention's Commercial Prospects

There's only one question you need to answer in commercially evaluating your invention: If my invention is manufactured and sold, or otherwise commercially implemented (for example, as a process that is put into commercial use), will it generate a significant profit? Unfortunately, no one can ever answer this question with certainty. The answer will always depend on how the invention is promoted, how well it's designed, how well it's packaged, the mood of the market, the timing of its commercial debut, and dozens of other intangible factors. For example, if the Pet Rock came out now, rather than in the 1960s, it might be a complete dud. Similarly, if bottled water was marketed in the '60s, rather than in current times, it probably would not have had as much success. Most marketing experts say that five "P" factors must all be "right" for a new product to make it: Production, Price, Position (its place in the market), Promotion, and Perseverance.

In addition to the "Five Ps," the packaging (outer box as well as the shape of the device itself) can be crucial to its success. Consider the Audochron® clock, which indicates the time by three successive groups of countable chimes. Given this technical feature only, the clock probably wouldn't have sold too well. But a talented designer put the works in a futuristic case shaped like a flattened gold sphere on a pedestal in which a plastic band at the center of the sphere lit with each chime. As a result, it became a status symbol and sold relatively large quantities at a high price; it even appeared in *Architectural Digest*, shown in a photo of a U.S. president's desk!

The trademark you select for your invention can also make a big difference as to whether it's a commercial success. If you doubt this, consider Vaseline's hand lotion. The lotion would very likely have been just another member of the bunch, consigned to mediocre sales, had not some clever marketing person come up with the trademark *Intensive Care*. This helped make it a sales leader. Ditto for the *Hula-Hoop* exercise device and the *Crock Pot* slow cooker, both of which certainly weren't hurt by evocative names. Even something as dull as roach traps were blasted into marketing stardom by the trademark *Roach Motel* and its brilliant ad campaign ("Roaches check in, but they don't check out"). Even something as prosaic as raisins were given a mighty boost with the "dancing raisins" TV campaign thought up by a marketing genius.

D. Take Time to Do a Commercial Feasibility Evaluation

Despite the marketing uncertainties, most experts believe that you can make a useful evaluation of the commercial possibilities of an untested invention if you take the time to do some scientific and objective work in four areas:

- the positive and negative marketing factors attached to your invention
- consultation with experts, potential users of the invention, marketing people, and others
- research into prior developments in the same area as your invention, and
- the operability of an actual construction of the invention.

Let's take a look at each.

1. The Positive and Negative Factors Test

Every invention, no matter how many positive factors it seems to have at first glance, inevitably has one or more significant negative ones. To evaluate the positive and negative factors objectively, carefully consider each on the list below. Using Form 4-1, Positive and Negative Factors Evaluation Sheet (a copy is in Appendix 7), assign a commercial value or disadvantage weight to each factor on a scale of –100 to +100, according to your best, carefully considered estimate. If the factor is irrelevant to your invention, assign a weight of 0.

For example, if an invention provides overwhelming cost savings in relation to its existing counterparts, assign a +80 or higher to the "Cost" factor (#1) in the positive column. But if it requires a high capital expenditure (tooling) to build, a –50 would be appropriate for this factor (#45), and so on.

The following balance scale analogy will help you to understand the positive and negative factors evaluation: Pretend the positive factors are stacked on one side of a balance scale and the negative factors are stacked on the other side, as indicated in Fig. 4A.

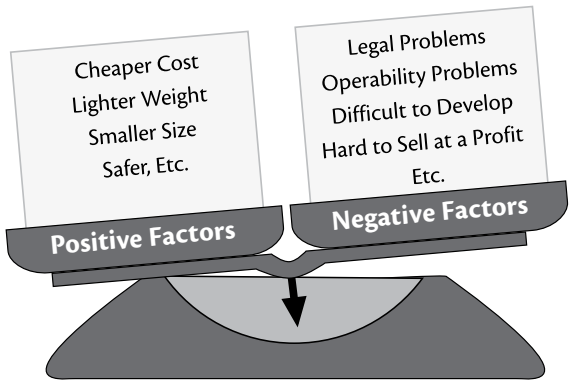


Fig. 4A—Conceptual Weighing of Positive v. Negative Factors

If the positive factors (those given a weight from +1 to +100) strongly outweigh the negative (those from –1 to –100), the arrow would swing to the right and you can regard this as a "go" indication, that is, the invention is commercially viable. Obviously this balance scale is just an analogy. It can't be used with any true quantitative accuracy because no one has yet come up with a way to assign accurate and valid weights to the factors. Nevertheless, you'll find it of great help in evaluating the commercial prospects of your invention.

Before you actually take pen (or word processor) in hand and begin your evaluation, read through the following summary of positive and negative factors.

You should consider each factor carefully, especially if you assign a negative value, even if the negative value is merely due to the need to change or design and produce new production equipment. I've seen inventions and developments that were better in every way than what already existed, but which weren't used solely because the improvement didn't justify the cost of replacing existing production equipment, or the cost associated with manufacturing and promoting the device.

The factors of your invention with negative values are generally more important and require more consideration than do those with positive values, since if your invention fails, it will obviously be one or more of the negatives that causes it. On the other hand, the positive factors will be of great value to you when convincing a patent examiner as to your invention's patentability, or when selling the invention to a potential licensee.

2. Factors Affecting the Marketability of Your Invention

1. **Cost.** Is your invention cheaper or more expensive to build or use than current counterparts? An example where making something more expensive to build would be an advantage is a credit or eligibility card; a more expensive card would be more difficult to counterfeit.
2. **Weight.** Is your invention lighter (or heavier) in weight than what is already known, and is such change in weight a benefit? For example, if you've invented a new automobile or airplane engine, a reduction in weight is a great benefit. But if you've invented a new ballast material, obviously an increase in weight (provided it doesn't come at too great a cost in money or bulk) is a benefit.
3. **Size.** Is your invention smaller or larger in size or capacity than what is already known, and is such change in size a benefit?
4. **Safety/Health Factors.** Is your invention safer or healthier to use than what is already known? Clearly there's a strong trend in government and industry to improve the safety and reduce the possible chances for injury, harm, and product liability suits in most products and processes, and this trend has given birth to many new inventions. Often a greater increase in cost and weight will be tolerated if certain safety and health benefits accrue. But beware, some safety devices cause more harm than they prevent: For example, antilock brakes have caused more skids and accidents than conventional brakes, because users tend to pump them, although they are supposed to be pressed continuously.

5. **Speed.** Is your invention able to do a job faster (or slower) than its previous counterpart, and is such change in speed a benefit? This advantage, like #6, is important in software inventions.
6. **Ease of Use.** Is your invention easier (or harder) to use (the current buzzword is "ergonomic") or learn to use than its previously known counterpart? An example of a product where an increase in difficulty of use would be a benefit is the child-proof drug container cap. This advantage is especially important if you have a software innovation: If it enables you to use the computer or any other machine more facilely, this counts a great deal.
7. **Ease of Production.** Is your invention easier or cheaper (or harder or more expensive) to manufacture than previously known counterparts? Or can it be mass-produced, whereas previously known counterparts had to be made by hand? An example of something that is more difficult to manufacture yet that is highly desirable are the new credit cards with holographic images: They're far more difficult to forge.
8. **Durability.** Does your invention last longer (or wear out sooner) than previously known counterparts? CDs, DVDs, transistors, and integrated circuits last far longer than the vinyl discs, tapes, film, and vacuum tubes that they replaced.

   But the other side of the coin can be valuable too: While built-in obsolescence is nothing to be admired, the stark economic reality is that many products, such as disposable razors, have earned their manufacturers millions by lasting for a shorter time than previously known counterparts.
9. **Repairability.** Is it easier to repair than previously known counterparts?
10. **Novelty.** Is your invention at all different from all previously known counterparts? Merely making an invention different may not appear to be an advantage per se, but it's usually a great advantage: It provides an alternative method or device for doing the job in case the first method or device ever encounters difficulties (such as from government regulation), and in case the first device or method infringes a patent that you want to avoid infringing. It also provides something for ad people to crow about.
11. **Convenience/Social Benefit/Mechanization.** Does your invention make living easier or more convenient? Many inventions with a new function provide this advantage. Although you may question the ultimate wisdom and value of such gadgets as the electric knife, the remote-control TV, and the digital-readout clock, the reality remains that, in our relatively affluent society, millions of dollars have been and are being made from devices that save labor and time (even though the time required to earn the after-tax money to buy the gadget is often greater than the time saved by using it). Even if the invention has one or more serious drawbacks, if it mechanizes a manual operation, it may still fly. Consider the Epilady® leg-hair remover: Even though its rotating spring ripped out m'lady's leg hairs in an extremely painful manner, it became a great success because it eliminated shaving and depilatories.

    Then too, many new industries have been started by making an existing invention easier and convenient to use. Henry Ford didn't invent the automobile; he just produced it in volume and made it convenient for the masses to use. Ditto for George Eastman with his camera. And in modern times, the two Steves (Jobs and Wozniak) did much the same for the computer.

    In the software field, especially nowadays, people seem willing to buy almost any program that will computerize a manual task, even if the time required to earn the money to buy the program, learn the program, and use it is much greater than the manual route.
12. **Reliability.** Is your invention apt to fail less or need repair less often than previously known devices?
13. **Ecology.** Does your invention make use of what previously were thought to be waste products? Does it reduce the use of limited natural resources? Does it produce fewer waste products, such as smoke and waste water? If so, you have an advantage that is very important nowadays and that should be emphasized strongly.
14. **Salability.** Is your invention easier to sell or market than existing counterparts?
15. **Appearance.** Does your invention provide a better-appearing design than existing counterparts?
16. **Viewability.** If your invention relates to eye use, does it present a brighter, clearer, or more viewable image? For example, a color TV with a brighter picture, or photochromic eyeglasses that automatically darken in sunlight were valuable inventions.
17. **Precision.** Does your invention operate or provide greater precision or more accuracy than existing counterparts?
18. **Noise.** Does your invention operate more quietly? Does it eliminate or turn unpleasant noise into a more acceptable sound? Noise-canceling headphones fit this bill. Or does it make noise in a desirable situation—for example, a device that produced a warning noise when a VCR cartridge was inserted in the wrong manner would be desirable.
19. **Odor.** Does your invention emanate fewer (or more) unpleasant fumes or odors? The public would benefit by adding an unpleasant odor to a poisonous or harmful substance. For example, public utilities add mercaptan

sulphur to heating and cooking gas to warn users when leaks occur.

20. **Taste.** If your invention is edible or comes into contact with the taste buds (for example, a pill or a pipe stem), does it taste better? Like the foul odor above, a foul taste can also be an advantage, such as for poisons to prevent ingestion by children, and for telephone cables to deter chewing by rodents.
21. **Market Size.** Is there a larger market for your invention than for previously known devices? Because of climatic or legal restrictions, for example, certain inventions are only usable in small geographical areas. And because of economic factors, certain inventions may be limited to the relatively affluent. If your invention can obviate these restrictions, your potential market may be greatly increased, and this can be a significant advantage.
22. **Trend of Demand.** Is the trend of demand for your device increasing? Of course you should distinguish, if possible, between a trend and a fad. The first will provide a market for your invention while the second is likely to leave you high and dry unless you catch it in the beginning stages.
23. **Seasonal Demand.** Is your invention useful no matter what the season of the year? If so, it will usually have greater demand than a seasonal invention, such as a sailboat. But sometimes this will be a negative rather than a positive, if the invention is something like skis or a holiday decoration, which does have a seasonal demand, rather than an all-year-around one.
24. **Difficulty of Market Penetration.** Is your device an improvement of a previously accepted device? If so, it will have an easier time penetrating the market and obtaining a good market share than a device that provides a completely new function.
25. **Potential Competition.** Is your invention so simple, popular, or easy to manufacture that many imitators and copiers are likely to attempt to copy it or design around it, or try to break your patent as soon as it's brought out? Or is it a relatively complex, less popular, hard-to-manufacture device, which others wouldn't be likely to produce because of such factors as the large capital outlay required for tooling and production? However, don't assume that something that's easy to copy is not worth patenting, since patents on simple devices are upheld and enforced successfully all the time.
26. **Quality.** Does your invention produce or provide a higher quality output or result than existing counterparts? For example, compact discs provide a much better audio quality than do phonorecords or magnetic tape.
27. **Excitement.** (The Neophile and the Conspicuous Consumer/Status Seeker.) Almost all humans need some form of excitement in their lives: Some obtain it by watching or participating in sports, others by the purchase of a new car or travel, and still others by the purchase of new products, such as a 50-inch TV, a laser disk player, or a friendly robotic rug vacuum. Such purchasers can be called "neophiles" (lovers of the new); their excitement comes from having and showing off their new "toy." Purchasers of expensive products, like the Mercedes-Benz or a Rolex watch, are commonly motivated by what Thorsten Veblen has called "conspicuous consumption," and what we now call "status seeking." They enjoy showing off an expensive or unique item which they've acquired. Thus, if your invention can provide consumer excitement, either through sheer newness or through evidence of a costly purchase, it has a decided advantage.
28. **Ability to Acquire Status.** Closely related to the preceding factor (Excitement), a product's ability to acquire a desirable or prestigious status will make it very successful and more profitable once it acquires a desired status among one or more groups. As Kevin Maney explains in his book, *Trade-Off: Why Some Things Catch On and Others Don't* (Broadway 2009), this is why some teens will pay $3 for a cell phone ring tone that announces their taste but will balk at paying 99 cents for a full song. Maney says that products like the iPhone, Tiffany's jewelry, certain concert tickets, and first-class airline seats can command a larger profit because of their desired status. But bear in mind that a product's status can diminish if the product or service becomes too popular or convenient.
29. **Markup.** If your invention is in an excitement category (that is, if it's very different, novel, innovative, or luxurious), it can command a very high markup, a distinct selling advantage.
30. **Inferior Performance.** Yes, I'm serious! If your invention performs worse than comparable things that are already available, this can be a great advantage, if put to the proper use. Consider the 3M Company's fabulously successful Scotch® Post-It® note pads: Their novelty is simply that they have a strip of stickum that is *inferior* to known adhesives, thus providing removable self-stick notes. Here the invention may not be so much the discovery of an inferior adhesive as the discovery of a new use for it.
31. **"Sexy" Packaging.** If your invention is or comes in a "sexy" package, or is adaptable to being sold in such a package, this can be a great advantage. Consider the

Hanes l'Eggs® stockings where the package (shaped like an egg) made the product!

32. **Miscellaneous/Obviation of Specific Disadvantages of Existing Devices.** This is a catchall to cover anything I may have missed in the previous categories. Often the specific disadvantages that your invention overcomes will be quite obvious; they should be included here, nonetheless.
33. **Long Life Cycle.** If your invention has a potentially long life cycle, that is, it can be made and sold for many years before it becomes obsolete, this is an obvious strong advantage that will justify capital expenditures for tooling and conducting a big ad campaign.
34. **Related Product Addability.** If your invention will usher in a new product line, as did the computer, where many related products, such as disk drives, printers, and software can be added, this will be an important advantage with potentially enhanced profits.
35. **Satisfies Existing Need.** If your invention will satisfy an existing, recognized need, such as preventing drug abuse, avoiding auto collisions, combating terrorism or crime, or preventing airplanes from catching fire upon crashing, your marketing difficulties will be greatly reduced.
36. **Legality.** Does your invention comply with, or will its use fail to comply with, existing laws, regulations, and product and manufacturing requirements? Or, are administrative approvals required? If your invention carries legal difficulties with it, its acceptance will be problematic no matter how great its positive advantages are. And if ecological or safety approvals are required (for example, for drugs and automobiles), this will be viewed as a distinct disadvantage by prospective buyers. Also, if the legality of a product is questionable, its manufacturer, distributor, or retailer will have difficulty in obtaining product liability insurance.
37. **Operability.** Is it likely to work readily, or will significant additional design or technical development be required to make it practicable and workable? Usually problems of operability will become abundantly clear when you try to build a working model, which you should try to do as soon as possible, even if you've filed a PPA (Chapter 3, Section H). Many great-looking inventions such as the turbine automobile engine turned out to be "techno-fizzle" when built and tested. (Don't forget to fill out another copy of Form 3-2 after you build and test it.)
38. **Development.** Is the product already designed for the market, or will such things as additional engineering, material selection, and appearance work be required?
39. **Profitability.** Because of possible requirements for exotic materials, difficult machining steps, great size, and so on, is your invention likely to be difficult to sell at a profit, or at an acceptable price level?
40. **Obsolescence.** Is the field in which your invention is used likely to be around for a long time or die out soon? If the latter, most manufacturers won't be willing to invest money in production facilities.
41. **Incompatibility.** Is your invention likely to be compatible or incompatible with existing patterns of use, customs, and so on?
42. **Product Liability Risk.** Is your invention in a "safe" area, such as a ruler, or in a problem area, such as safety devices, drugs, firearms, contact sports, and automobiles? In the latter area, the risks of lawsuits against the manufacturer, due to product malfunction or injury from use, are likely to be greater than average. For example, a client of mine invented an ingenious, economical, and highly useful device for preventing a revolver from being accidentally fired. But, alas, though he tried everywhere, he couldn't get any company to take it on because they were afraid of product liability lawsuits if the device ever failed.
43. **Market Dependence.** Is the sale of your invention dependent on a market for other goods, or is it useful in its own right? For example, an improved television tuner depends on the sale of televisions for its success, so that if the television market goes into a slump, the sales of your tuner certainly will fall also.
44. **Difficulty of Distribution.** Is your invention easy to distribute, or is it so large, fragile, or perishable that it will be difficult or costly to distribute?
45. **Service Requirements.** Is your invention free from service requirements or will it require frequent servicing and adjustment? If the latter, this is a distinct disadvantage. But consider the first commercial color TVs that, by any reasonable standard, were a service nightmare, but made millions for their manufacturers.
46. **Production Facilities.** Almost all inventions require new production facilities, a distinct disadvantage. This is because the manufacture of anything new requires new tooling and production techniques. But some inventions require only a modest change or no change, a tremendous advantage.
47. **Inertia Need Not/Must Be Overcome.** An example of a great invention that so far has failed because of user inertia is the Dvorak typewriter keyboard, which, although much faster and easier to use, was unable to overcome the awkward but entrenched Qwerty keyboard. The same goes for the easier-to-use, less

confusing, military-European time, or a decimal time system. There's a risk in introducing *any* new product, and when any invention is radically different, potential manufacturers, users, and sellers will manifest tremendous inertia, regardless of the invention's value.

48. **Minor/Great Technical Advance.** In the '60s, I got a client a very broad patent on a laser pumped by a chemical reaction explosion. We were very pleased with this patent. However, it was so advanced at the time that the technology behind it is just now being implemented in connection with the *Star Wars* defense effort. Unfortunately, the patent expired in the meantime. The same goes for the computer mouse patent, which expired in 1980, just before the concept became popular, and the roller-blade skates, the patent for which expired in 1985, just before the roller-blade craze started. An FRB-Dallas survey found that major innovations like the telephone, radio, dishwasher, color TV, microwave oven, VCR, computer, and cell phone took an average of 11.4 years to be owned by 25% of all U.S. households. The moral? Even if you have a great invention, make sure it can be commercially implemented within about 17 years.
49. **Learning Required.** If consumers will have to undergo substantial learning in order to use your invention, this is an obvious negative. An example: the early personal computers. On the other hand, some inventions, such as the automatically talking clock, make a task even easier to do and thus have an obvious strong advantage.
50. **Difficult/Easy to Promote.** If it will be difficult, expensive, or will require a long time to promote and market your invention, e.g., because it's technically complex, has subtle advantages, or is very expensive, large, or awkward, you've got an obvious disadvantage. But if it solves an omnipresent problem and is cheap and easy to market, this is a clear advantage.
51. **Lack/Presence of Market.** If no market already exists for your invention, you'll have to convince the public that they need it—that is, that you have a "product in search of a market." While not a fatal flaw, and while this type of invention can be most profitable, you (or your licensee) will have to be prepared to expend substantial sums on promotion.
52. **Crowded/Wide Open Field.** If the field is already crowded, you'll have an uphill battle.
53. **Commodities.** If you've invented a new commodity—such as a better plastic, solvent, or grain—you'll face stiff price competition from the established, already streamlined standards.
54. **Combination Products.** If you've invented a "combination product"—that is, a product with two inventions that don't really groove together, like a stapler with a built-in beverage cup holder, people won't be beating a path to your door. On the other hand, the clock-radio was just the ticket.
55. **Entrenched Competition.** Despite its overwhelming advantages, Edison had a terrible time promoting his light bulb because the gas companies fought him bitterly.
56. **Instant Anachronism.** A clever inventor in Oakland, California, invented a wonderful dictionary indexing device that made it much faster to look up any word. However, he was unable to sell it to any dictionary publisher because the dictionary is being replaced by computerized devices. His clever invention was an "instant anachronism."
57. **Prototype Availability.** Although the presence or absence of a prototype should not affect the marketability or commercial success of your invention, in reality it will! If you have a prototype available, or can make one, you'll find that your invention will be far easier to market, since potential purchasers or licensees will be much more likely to buy something that is real and tangible rather than on paper only.
58. **Broad Patent Coverage Available.** You won't be able to determine whether or not broad patent coverage is likely to be available until you complete Chapters 5 and 6, but keep this factor in mind and come back to it after you evaluate patentability. Obviously, if you can obtain broad patent coverage on your invention, this will affect profitability, because if you're the only source for a device that performs a certain function you'll be able to charge more than you would in a competitive situation. A legal monopoly is a capitalist's dream!
59. **High Sales Anticipated.** If you can anticipate a high sales volume for your invention—for example, for a device like the Hula-Hoop that is relatively simple, cheap, and easy to market—this will be a very positive factor.
60. **Visibility of Invention in Final Product.** If your invention is highly visible in or essentially constitutes the entire final product—for example the sneakers with heels that light up when walking—this will be a distinct marketing advantage to entice buyers who love the new. On the other hand, if the invention is hidden in the final product, such as a stronger frame for an automobile, this factor will not be a plus in marketing.
61. **Ease of Packaging.** If your invention is easy to package—for example, a small gadget that can be put in a cheap blister package—this will be a great aid in marketing. However, if it's difficult and expensive to package, such as a bicycle or hockey stick, this will obviously be a negative factor.

62. **Youth Market.** Young people have substantial discretionary income and tend to spend more in many product areas than the rest of the population. If your invention is something that will appeal to children or young adults, it may command more sales than something that is not attractive to this age group. In other words, a portable digital music player will sell better than an arthritis aid.
63. **Part of a Current Fad.** If your invention is part of a current fad, such as a low-carbohydrate product, a low-fat product, a spam filter, an identity-theft preventer, a bottled water, and so forth, it will be far easier to sell. For example, a few years ago when the lottery was legalized in California, a spate of lottery-number selection products appeared and sold briskly until the public's interest simmered down.
64. **Will a Contingent Fee Litigator Take Your Case?** Before filing, consider whether, if your issued patent is infringed, will there likely be enough sales of the infringing device (or process) by a financially responsible manufacturer to get a litigator to represent you on a contingent-fee arrangement. If there aren't enough sales, or if the infringers are fly-by-night, irresponsible operators, most litigators won't take your infringement case on a contingent fee basis. This is true even if you have a strong patent that is clearly infringed. In other words, the law is far more accessible when substantial amounts are likely to be recovered.

Now that you have a grasp of the factors that can influence the commercial viability of an invention, complete Form 4-1 by assigning a weight to each listed factor, either positive or negative. Also list and assign weights to any other factors you can think of which I've omitted. Then compute the sum of your factors and determine the difference to come up with a rough idea of a net value for your invention. I suggest that you continue to pursue inventions with net values of 50 and up, that you direct your efforts elsewhere if your invention has a net value of less than 0, and that you make further critical evaluation of inventions with net values between 0 and 50.

The list has many other valuable uses:

- Using the list may cause you to focus on one or more drawbacks that are serious enough to kill your invention outright.
- The list can be used to provide a way of comparing two different inventions for relative value so that you'll know which to concentrate more effort on.
- It can be used to "sell" your invention to the Patent and Trademark Office, a potential licensee, or a judge if your patent is ever involved in litigation. With respect to the PTO and the courts, as we'll see, an invention must be unobvious to be patentable, and unobviousness is best proved by new and unexpected (superior) results of the type listed above.

You now should extract all factors on the list of Form 4-1 that have any value other than 0 and write these factors and their weights on Form 4-2, the Positive and Negative Factors Summary Sheet. (A copy is in Appendix 7.) This sheet, when completed, will provide you with a concise summary of the advantages and disadvantages of your invention. You can use it in at least four valuable ways:

1. To provide you with a capsule summary of your invention for commercial evaluation purposes (this chapter);
2. To help you prepare the "selling" parts of your patent application (see Chapter 8);
3. To help you to sell or license your invention to a manufacturer (see Chapter 11); and
4. To help you to get the PTO to grant you a patent (see Chapter 13).

Don't hesitate to update or redo Forms 4-1 and 4-2 if more information comes to mind.

E. Check Your Marketability Conclusions Using the Techniques of Consultation and Research

Once you reach some tentative conclusions about the commercial viability of your invention, it's time to get a reality check.

1. How to Go About It

If your evaluation of the above positive and negative factors affecting the marketability of your invention gives the positive side the edge, I recommend that you extend your investigation by doing some consultation and research. If you continue to get positive signs, extend your search still further until you've learned all you can about the field of your invention. This knowledge will also be of great benefit when you make your patentability search, prepare your application, market your invention, and deal with the PTO.

TIP

In Section 2, below, I suggest a number of procedures to use when you're disclosing your ideas to others so that they won't be stolen and so their trade secret (TS) status will be maintained. Here, I simply warn you at the outset that you shouldn't disclose ideas and information without utilizing appropriate safeguards; otherwise you may lose them to others.

The areas of consultation and research which you should investigate include asking both nonprofessionals and experts in the particular field for an opinion, and researching the relevant literature. As you do this, keep in mind and ask about all of the positive and negative factors listed above. Your consultation efforts and research will almost surely give you more information useful in assessing many of them. If so, again don't hesitate to redo your Forms 4-1 and 4-2.

As indicated, nonprofessionals can often be an excellent source of information and advice, especially if your invention is a consumer item that they are likely to have an opportunity to purchase if it's ever mass-produced. Consult your lay friends and associates, that is, those who have no special expertise in the field in which you are interested, but whose opinion you trust and feel will be objective. Often you may find it valuable *not* to tell them that you are the inventor so you'll get a more objective evaluation. You may also want to inquire as to what price they'd be willing to pay. It's especially helpful if you've built a working model (see Section F, below) so you can show it to them and ask if they'd buy it and for what price.

Experts to be consulted in the particular field of your invention include any and all of the following who can supply you with relevant feedback:

- salespeople and buyers in stores that sell devices similar to yours
- engineers, managers, or technicians in companies in the field of your invention
- scholars, educators, or professors who do research in the area of your invention, and
- friends who are "in the business."

Naturally you may not know all of these experts. Getting to them will require the creative use of the contacts you do have so as to arrange the proper introductions. Once you do, however, most people will be flattered that you've asked for their advice and pleased to help you.

If you can afford to pay for an evaluation, you may want to consider using an independent invention evaluation service. Here are two university-based ones that I believe are reputable:

- Wisconsin Innovation Service Center, (http://academics.uww.edu/business/innovate) 262-472-1600, (about $500), and
- I^2 Innovation Institute (www.innovation-institute.com) 417-836-5671, (about $200).

After you show your invention—preferably a working model—note the initial reaction of whomever you show it to. If you hear a "Well, I'll be damned!" or "Why didn't I think of that!" you know you're on the right track. However if a consultant rejects your idea, don't blindly accept the rejection; try to find out the reason and whether it's valid. Some people don't like anything new, so develop a thick skin and an analytical approach. Keep in mind the words of Charles Brower: "A new idea is delicate. It can be killed by a sneer or a yawn; it can be stabbed to death by a quip and worried to death by a frown on the right man's brow."

For your literature search, I suggest that you start by using one or more Internet search engines, locating a research librarian who's familiar with the area of your concern. Large technical and business libraries and those associated with major universities are obvious places to start. The library literature that you should investigate includes product directories, how-to-do-it books, catalogs, general reference books, and patents if they are available. (See Chapter 6.)

Remember that the purpose of the literature search isn't to determine whether your invention is new or patentable, but rather to give you additional background in the field so you can evaluate the positive and negative factors listed above. However, while you're doing your literature search, you may find that your invention was publicly known before you invented it. This is especially likely to occur if you search the patent literature. If so, you'll either have to drop the invention, since you'll know you aren't the first inventor, or try to make a new invention by improving your first effort. You'll be surprised how much better a feel you'll have for your invention once you've done some research and become familiar with the field.

If you work for or have access to a large company, visit its purchasing department and ask for permission to look through its product catalogs. Most companies have an extensive library of such catalogs and you'll often find much relevant and valuable information there that you won't find in even the biggest and best public libraries.

TIP

This search isn't the equivalent of the "patent search" that occurs before you apply for your patent. Covered in the next chapter is the more formal patent search, which obviously will provide you with considerably more background in the area of your invention.

2. Precautions to Take During Consultation

If you do show your invention to others or discuss it with them to any extent, a degree of care is mandatory to preserve the trade secret status of your invention and to prevent theft of your ideas, or to prove it in case it occurs. (See Chapter 1, Section Q.) Remember that any of the agreements discussed below are only as good as the parties who have signed them. Thus you shouldn't disclose your invention to anyone you don't trust or whom you

feel will not be reliable. Suing someone for breaching a nondisclosure agreement is no substitute for picking a trustworthy person in the first place.

Here are some good alternatives that can be used to protect your invention from being misappropriated by others:

- Have disclosees sign a receipt or logbook entry indicating that they have seen your invention. The logbook entry can be simply a page in your inventor's notebook that says at the top, "The undersigned have seen and understood Tom Brown's confidential [name of invention] as described on pages ___ of this book, on the dates indicated." You may also want to add a "Comments" column to your book to indicate that you value their opinion. Doing this also makes it easier to ask your consultants to sign your receipt page or log notebook.
- Ask those to whom you show your invention to sign and date your disclosure as witnesses. Witnesses can hardly ever claim that they invented independently of you if they're on record as having witnessed your invention. If there are more than two or three witnesses, however, this method won't work as there won't be room in your book for more.
- Get your consultants to sign the Nondisclosure Agreement (Form 3-1). However, it may be difficult for you to ask someone who's doing you a favor to sign this agreement.
- Although inferior to the other devices listed above, send a confirming or thank-you letter before and/or after your consultation so you'll have a written, uncontradicted record that you showed your invention to the person on a specific date and that you asked it to be kept confidential. A confirmatory after-the-fact letter can simply say, "Thanks very much for looking at my [name of invention] at your office last Wednesday, July 3. This letter is to confirm that you agreed that the details of my [name of invention] should be maintained in strictest confidence. Thanks for your cooperation. Sincerely, [your name]." Make a copy of any such letter and keep a copy for your records.

While care in disclosing your invention is necessary to prevent loss of its trade secret status and theft, don't go overboard with precautions. Many new inventors get such a severe case of "inventor's paranoia" that they're afraid to disclose their brainchild to anyone, or they're willing to disclose it only with such stringent safeguards that no one will want to look at it! In practice, most stolen inventions are taken only after they're out on the market and proven successful. This is because thieves are most interested in sure things. While I don't totally approve, the late highly successful inventor Paul Brown usually showed his inventions freely: he said, "Let them steal it—they don't know how much work they're in for!"

F. Now's the Time to Build and Test It (If Possible)

Now that you have completed the conceptual process of your invention, it's time to build and test a working model (prototype), or engage someone who will do it for you for a fee.

1. Why Do It?

As stated under #37 in Section D, above, if you haven't already done so, it's very desirable to build and test a working model (prototype) of your invention, if at all possible. The reasons: A working model will give you something real to show your marketing consultants, plus valuable information about operability, cost, technical problems, and most of the other factors on the positive and negative factors list. If it's impractical to build a working model, often a nonworking model, or scale model, will give you almost as much valuable data. It's also possible to build a "virtual prototype" (computer simulation). For an explanation of this process see Jack Lander's article, "Virtual Prototyping: Alive and Well," in *Inventors Digest*, July/August 2003. As stated, don't forget to fill out another copy of Form 3-2 (Invention Disclosure) after you build and test it, in order to have a legal record of your building and testing.

CAUTION

Be Aware of the One-Year Rule. In order to obtain a patent, an inventor who offers an invention for sale, sells it, uses it publicly or commercially, shows it to others without restriction, or allows another to use the invention without restriction or obligation of secrecy, must file a patent application within one year of first disclosure, use, or sale. (See the discussion of the one-year rule in Chapter 5.) If the public use was for experimentation or if the persons exposed to the use were under an admonition of secrecy, the one-year clock does not start running. Note, the courts have held a patent invalid where an inventor showed her invention to people at a party without restrictions and filed her patent application over a year later. *Beachcombers v. Wildwood Creative Products*, 31 F.3d 1154 (Fed. Cir. 1994). If you show your invention to others and this showing is not for bona fide experimental purposes (see Chapter 5) either file a patent application within one year or have those who saw your invention sign a nondisclosure agreement (see Chapter 3).

2. If You Use a Model Maker, Use a Consultant's Agreement

If you can't build and test it yourself, many model makers, engineers, technicians, and teachers are available who will be delighted to do the job for you for a fee, or for a percentage of the action. Also there may be a workshop in your area which will supply you with tools, space, and assistance for a fee. For example, the San Francisco area hosts "Techshop," a 15,000-square-foot membership-based workshop that provides members with access to tools and equipment, instruction, and a support community (www.techshop.ws). If you do use a model maker or consultant, you should take precautions to protect the confidentiality and proprietary status of your invention. There's no substitute for checking out your consultant carefully by asking for references (assuming you don't already know the consultant by reputation or referral).

In addition, have your consultant sign a copy of the Consultant's Work Agreement (Form 4-3 in Appendix 7). Note that this Agreement includes fill-in blanks to describe the names and addresses of the inventor and consultant, the name of the project or invention (such as "New Sweater-Drying Form"), detailed description of the work to be done (such as "build a wire-frame, plastic-covered, sweater-drying collapsible form in accordance with plans in attached Exhibit A—finished form to operate smoothly and collapse to 14" x 23" x 2" (or less) size"), and manner of payment (usually ⅓ at start, ⅓ upon construction, and ⅓ on acceptance by you, the Contractor), and which state's law should govern (pick the state where you reside if the Consultant is out-of-state).

Note that I've provided (see paragraph 7) that any changes in the work to be performed or payment to be made shall be in writing. I've done this because I've been involved in many disputes where the consultant does additional or more difficult work and wants more money, but the parties' memories differ as to what changes were agreed to, if any.

The Agreement also requires the Consultant to perform in a timely manner or you can void the Agreement and pay only 50%, or have the Consultant pay an agreed-upon penalty for every day he or she is delinquent. Finally, the Agreement contains a self-explanatory provision, Item 12, regarding the Consultant's prior inventions.

3. What If the Consultant Invents?

Since many consultants are quite clever, they often come up with patentable improvements, ramifications, or even better versions of the basic invention that they're hired to build, test, or develop. This naturally brings up the issue of who will own and be able to use the consultant's inventions. Having been involved in many disputes in this area, I know that an ounce of prevention—that is, a prior stipulation as to who will own any inventions the Consultant makes—can prevent many misunderstandings, arguments, and even lawsuits later on.

With this end in mind, I've written the agreement to require the Consultant to disclose all innovations made to you, to sign any patent applications which you choose to file on the Consultant's inventions, and also to assign such inventions to you. Note also that the inventions that belong to you (the Contractor) are those that arise out of the Consultant's work under the agreement, even if conceived on the Consultant's own time. This is a customary clause in employment agreements (see Chapter 16) and is provided so that the Consultant won't be able to claim that a valuable invention made under the agreement isn't yours because it was made on the Consultant's time. Generally the Consultant will be a sole inventor (who should be the only one named in the patent application if the Consultant's invention can exist independently of yours), and a joint inventor with you if the invention is closely related to or improves on yours. (More on inventorship in Chapter 10, Section E2.) This is because all of the true inventor(s) must be named as inventor(s) in all patent applications no matter who owns the application. I provide an assignment form and a Joint Owners' Agreement in Appendix 7. (See Chapter 16.)

G. The Next Step

Once you've commercially evaluated your invention—that is, garnered all your input and filled out your evaluation and summary sheets with the positive and negative factors—you're in a better position to decide whether or not to go ahead. If you decide to, your next step is to decide whether the invention will qualify for a patent under the patent laws. To do this, you should first learn the basic four legal requirements for getting a patent. (See Chapter 5.) Then, if it meets the first two of these requirements, make a formal patent search (see Chapter 6) to determine if it's sufficiently novel to satisfy the other two requirements. When you make this search, you'll also obtain valuable commercial information about prior developments in the area of your invention. E.g., if you've invented a new electric fork and your search shows 30 patents on electric forks and you've never seen any of these in the market, you should seriously question the commercial feasibility of this concept, even if it's patentable.

If, on the other hand, your commercial evaluation leaves you uncertain, though you feel there's good potential, wait a while before proceeding. The passage of time may give you a new perspective that can make your decision easier. If after

a couple of weeks you still can't make up your mind, it's probably best to proceed to the next step (the determination of patentability, including a search). If this determination discloses that your invention is already known or otherwise unpatentable, that's the end of the road. But if it shows that you have a patentable invention, you should probably attempt to patent and market it rather than let a potentially valuable and profitable idea die without being given its day in the sun.

H. Summary

You should carefully evaluate the salability of your invention before filing a patent application, because a patent alone will not make you rich or famous—the invention must also become a success in the marketplace. Test marketing is a valuable activity, but it will destroy your foreign rights if done before filing in the U.S. Also any U.S. application must be filed within one year after the invention is publicly used, put on the market, or shown publicly. Although it can't predict success with certainty, a commercial evaluation will be very valuable in deciding whether to proceed, and later when you deal with the PTO. I recommend a study of all of the commercial factors (cost, size, weight, etc.) for their positive or negative aspects and to discover any fatal considerations. Also consult with experts and consumers, but take precautions against invention theft by using the Nondisclosure Agreement and other safeguards. Building a prototype is invaluable for obtaining commercial and technical information, but if you use a model maker, you must also take precautions by using the Consultant's Agreement.

CHAPTER 5

Is It Patentable?

Design and Plant Patents

Design patent applications must cover a new, original, and ornamental design for an article of manufacture, and are examined in the same way and must pass the same unobviousness test as utility patent applications, except that the "better functioning" tests that are used to evaluate unobviousness (see Section F, below) are not used, since only the aesthetics of a design invention are relevant.

Plant patent applications are subject to the same legal requirements as utility patent applications, except that the statutory class requirement (first test) is obviously not relevant: plants provide their own statutory class. Since plant patents are relatively rare and are of very specialized interest, I won't go into detail except to set forth the additional legal requirements for getting one. They are: (1) the plant must be asexually reproduced; and (2) the plant must be a new variety. These may include cultivated sports, mutants, hybrids, and newly found seedlings, but should not be a tuber, propagated plant, bacterium, or a plant found in an uncultivated state. You may also obtain a monopoly on a sexually reproduced plant under the Plant Variety Protection Act. (For more information, see Chapter 1, Section B.)

Utility patents have been issued for man-made plants (or elements of plants) since the late 1980s. These plants can be reproduced either sexually (by seeds) or asexually (by grafts, cuttings, or other human means). Utility patents have also been issued for elements of plants, such as proteins, genes, DNA, buds, pollen, fruit, plant-based chemicals, and the processes used in the manufacture of these plant products. To obtain a utility patent, the plant must be made by humans and must fit within the statutory requirements (utility, novelty, and nonobviousness). The patent must describe and claim the specific characteristics of the plant for which offensive rights are sought. Sometimes the best way to meet this requirement is to deposit seeds or plant tissue at a specified public depository. Many countries have International Depository Authorities for such purposes.

Although a utility patent is harder and more time-consuming to acquire than a plant patent, a utility patent is considered to be a stronger form of offensive right. For example, a plant covered by a utility patent can be infringed if it is reproduced either sexually or asexually. By contrast, a plant patent can be infringed only if it is reproduced asexually from the actual plant protected by the patent.

Since the utility patent owner can thoroughly prevent others from making and using the invention, does this mean the buyer of a patented seed cannot sell the resulting plants to the public? No, because according to patent law, the seed's purchaser can sell the resulting plants but cannot manufacture the seed line.

Inventor's Commandment 6

One-Year Rule: Treat the "one-year rule" as holy. You must file your regular or provisional patent application within one year of the date on which your invention (or any product that embodies it) is first published, commercially or publicly used, sold, offered for sale, disclosed to a group of people without restriction, or allowed to be used by another without restriction. If you wish to preserve your foreign rights and prevent theft of your creation, file your patent application before you publish details of or sell your creation.

Inventor's Commandment 7

To evaluate or argue the patentability of any invention, use a two-step process. First determine what novel features (§ 102) the invention has over the closest prior-art reference(s). Novelty can be a new physical (hardware) feature, a new combination or rearrangement of two separate old features, or a new use of an old feature. Second, determine if the novelty produces any new and unexpected results or otherwise indicates unobviousness (§ 103).

Here we deal with the specific subject of what's legally patentable and what's not. Over many decades, both Congress and the courts have hammered out a series of laws and accompanying rules of interpretation that the PTO and the courts (and hence you) must use to separate the patentable wheat from the unpatentable chaff. All of these laws and rules are introduced in this chapter and then referred to repeatedly in later chapters.

Because an understanding of the material in this chapter is crucial to the rest of the book and to an understanding of patents in general, I urge you to relax and read it carefully.

A. Patentability Compared to Commercial Viability

If you assessed the commercial potential of your invention, as suggested in Chapter 4, and your invention received a passing grade, your next question probably is, "Can I get a patent on it?" The answer to this question can be crucial, since you're likely to have a difficult time commercially exploiting an invention that isn't patentable, despite its commercial feasibility. Although you may be able to realize value from an invention by selling it to a manufacturer as a trade secret (a difficult sale to make!), or by selling it yourself using a clever trademark, or (in some cases) by relying on copyright protection and unfair competition laws (as explained in Chapter 1), such approaches are usually inferior to the broad offensive rights that a patent offers. Concisely put, if your invention fails to pass the tests of this chapter, reconsider its commercial prospects and whether other areas of intellectual property will provide adequate offensive rights in the absence of a patent.

You should consider the commercial viability and patentability tests separately, since commercial success and patentability don't always coincide. Most patented inventions are not commercially successful and many inventions, such as the computer, are commercially successful but are not broadly patentable. Your invention should pass both tests before you file a patent application on it.

B. Legal Requirements for a Utility Patent

As you can see from Fig. 5A, the legal requirements for a utility patent can be represented by a mountain having four upward sections, each of which represents a separate test that every invention must pass to be awarded the patent. The PTO is required by statute to examine every utility patent application to be sure it passes each of these tests. If it does, the PTO must award the inventor(s) a patent.

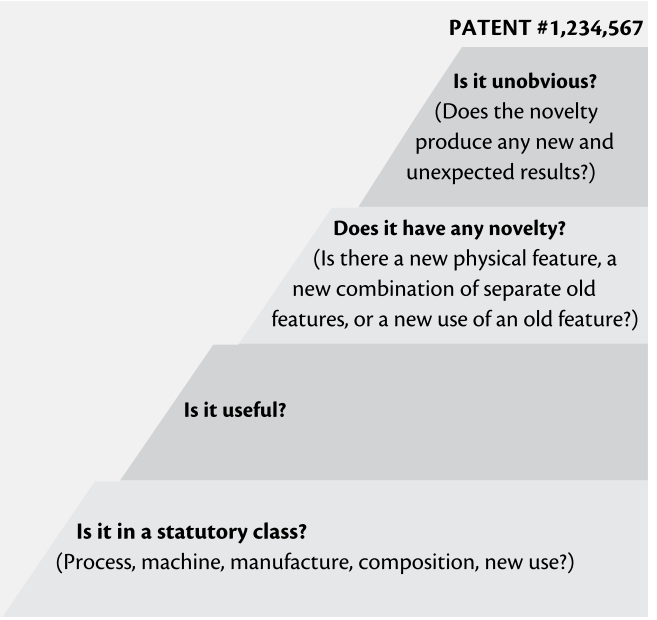


Fig. 5A—Patentability Mountain
The Four Legal Requirements for Getting a Utility Patent

The four requirements and the pertinent respective statutes are:

1. **Statutory Class:** Will the PTO consider that the invention fits into one of five classes established by Congress? (35 USC 101.) Or put specifically, will the PTO regard it as either a:
   - process (method)
   - machine
   - article of manufacture
   - composition, or
   - "new use" of one of the first four.
2. **Utility:** Can the invention properly be regarded as a useful one (or ornamental in the case of designs)? (35 USC 101.)
3. **Novelty:** Will the PTO consider that the invention is novel—that is, does it have any aspect or feature that is different in any way from all previous inventions and knowledge (that is, the relevant prior art)? (35 USC 102.)
4. **Unobviousness:** Will the PTO consider that the invention is unobvious from the standpoint of someone who has ordinary skill in the specific technology involved in the invention—that is, does it provide one or more new and unexpected results? (When dealing with designs, the question becomes: Will the PTO consider the design unobvious in an ornamental or aesthetic sense?) (35 USC 103.)

As Fig. 5A shows, the first three tests are represented by relatively short steps. The last one, unobviousness, is relatively high. This is a real-life reflection of what commonly happens to patent applications before the PTO (or to patents when they're challenged in court). In other words, the PTO will find that most inventions (1) fit within at least one statutory class, (2) have utility (or ornamentality for designs), and (3) possess novelty. However, most of the patent applications that fail to reach the patent summit (almost half of all patent applications that are filed) are rejected by the PTO because it regards the invention as obvious.

The Patent Laws

Congress derives its power to make the patent statutes from the broad wording of the U.S. Constitution (Art. 1, Section 8), which states,

"The Congress shall have power … to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

The patent statutes, passed by Congress to implement this Constitutional provision, can be found in Title 35 of the United States Code (35 USC). Patent statutes are typically referred to by the section of the USC they are put into. For example, the statute that creates the five statutory patent classes is referred to as 35 USC 101 or 35 USC § 101.

The statutes, in turn, authorize the PTO to issue its Rules of Practice (which are relatively broad, and are termed in the law 37 CFR (Code of Federal Regulations) 1.1, etc.).

The PTO also publishes its *Manual of Patent Examining Procedure* (MPEP), which is relatively specific—see Appendix 2, Resources: Government Publications, Patent Websites, and Books of Use and Interest.

Fig. 5B illustrates the relationship between these authorities. The complete MPEP is available on the PTO's website and it includes the patent statutes and the PTO's Rules of Practice. The size of each authority varies from the one sentence in the Constitution (above) to about 600,000 words in the MPEP, as illustrated below.

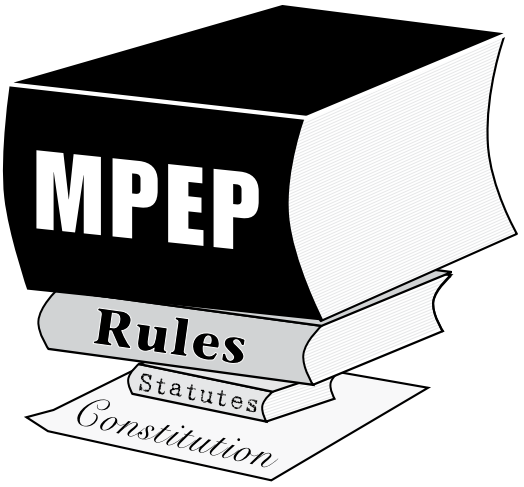


Fig. 5B—Patent Authorities

Let's now look at each of these requirements in more detail.

C. Requirement #1: The Statutory Classes

The PTO must consider your invention to fall into one of the five statutory classes in order for it to be patentable. If it does, it's "within a statutory class or category." That is, it's one of the five types of subject matter on which the law authorizes the PTO to grant a patent, assuming the other requirements for a patent are met.

Fortunately, the statutory categories established by the patent laws, although only five, are very comprehensive. Further, the Supreme Court has stated that anything under the sun that is made by humans, except for laws of nature, natural phenomena, abstract ideas, humans, and processes which do not use or transform hardware, fall within these classes. *Diamond v. Chakrabarty,* 447 U.S. 303 (1980); *Diamond v. Diehr*, 450 U.S. 175 (1981), *Bilski v. Kappos* (Supreme Court, 28 June 2010). So the statutory class requirement is rarely a problem anymore, except as noted below. As we'll discuss below, the "abstract ideas" exception is the one which precludes the patenting of abstract software algorithms. Accordingly, you'll usually be able to squeeze most inventions into at least one of them. In many instances an invention will fit into more than one category, since they overlap to some extent. This isn't a problem, since you don't have to specify the one to which your invention belongs when you file your patent application. But you should be fairly sure it does not fall into one of the exceptions below. Otherwise, the PTO may reject it under Section 101 as "nonstatutory subject matter."

Let's discuss the five statutory classes in more detail.

1. Processes, Including Software

Also termed "methods," processes are ways of doing or making things that involve more than purely mental manipulations. Processes always have one or more steps, each of which expresses some activity and manipulates or treats some physical thing. Purely manual processes were formerly regarded as nonstatutory, but now even these are being patented so long as they attain a useful result. Thus patents have recently been granted on a method of gripping a golf club and a method of using a keyboard.

a. Conventional Processes

Examples of conventional processes are heat treatments, chemical reactions for making or changing something, and ways of making products or chemicals. The PTO has even recently granted patents on processes of feeding chickens a special diet that results in better eggs, and combing the hair to cover a bald area, and analyzing essays for plagiarism. To give you an example of an extreme process patent, I represented one side in a patent lawsuit that involved a patent on a process of attaching a hairpiece to a bald person's scalp by putting suture anchors in the scalp and sewing the piece to the suture anchors. However, although surgical operations can still be patented, it no longer makes sense to do so since the law exempts medical practitioners from infringing any patent on a medical procedure per se. See Chapter 15, Section F3.

Bilski Changes Standard for Subject-Matter Patentability of Processes

For almost ten years, the standard for patentability for process or method claims was that they had to define an invention that produced a "useful, concrete, and tangible result." On 2008 Oct 30, the CAFC changed this standard in the *In re Bilski* case. The court reinterpreted Sec. 101 of the patent laws, which broadly states that statutory subject matter embraces any new and useful process, machine, manufacture, or composition of matter. In *Bilski*, they held that, to satisfy Sec. 101, all process claims must now recite a process that (1) is tied in a substantial way to a particular machine or apparatus, or (2) transforms an article into a different state or thing. The court said that electrical signals and data are considered articles if they represent physical objects or substances. They also state that the purpose of this ruling is to prevent someone from monopolizing a "fundamental principle," that is, laws of nature, natural phenomena, and abstract ideas. *Bilski* also said that processes that merely cover the transformation of legal objects, relationships, business risks, or "other such abstractions" are considered nonstatutory subject matter. However, the court also ruled that if a process is tied to a particular machine, it is statutory subject matter. The court added, "[w]e leave to future cases … whether or when recitation of a computer suffices to tie a process claim to a particular machine."

I disagree strongly with the decision because the court is usurping the role of the legislature when it effectively narrows the accepted definition of "process." This decision has cast a cloud on the validity of many patents and pending applications. If an inventor discovers a process that meets the other statutory requirements for patentability (usefulness, novelty, and unobviousness), why shouldn't the inventor be able to patent all uses of this "fundamental principle," just as inventors can now do with other fundamental discoveries in the areas of machines, articles, and compositions?

I believe that the court has failed to keep up with modern technology and hope that Congress will legislatively overrule it. I was optimistic for a Supreme Court reversal because in 1980, in the *Chakrabarty* case, the Court said, "We have cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed" and Congress had intended patentable subject matter to "include anything under the sun that is made by man." However in 2010 the U.S. Supreme Court affirmed the CAFC's holding (*Bilski v. Kappos*, 130 S.Ct. 3218, 2010 Jun 28) and effectively reneged on their earlier assertion that everything under the sun made by humans could be patented and the conservatives' oft-stated assertion that they don't write laws but merely interpret them.

They actually stated, without explanation, that *Bilski*'s invention was too abstract to patent. (Four of the judges would even have held that all business methods, even if tied to hardware, should not be patentable.) However they did leave the door open to allowing additional subject matter to be patented, such as software, diagnostic medical techniques, linear programming, data compression, and manipulation of digital signals, but left it to the PTO and the CAFC to determine in future cases. The PTO has published guidelines, but these are not clear and may not be upheld by the courts, so I believe that only another clear Supreme Court ruling or specific legislation would be able to resolve the matter. So in the meantime if you invent any method, make sure you describe and claim it so that it either (1) is tied to a particular machine or apparatus, or (2) transforms a particular article into a different state or thing.

b. Software Processes

Since most software-related inventions are claimed as processes, I'll discuss them here. However, be aware that software inventions can also be claimed as machines. As indicated in Chapter 1, algorithms that merely crunch numbers without intimately involving hardware cannot be patented since they are considered abstract ideas. (An algorithm is a step-by-step problem-solving procedure.) However, if the software or algorithm affects some hardware or process, it falls within a statutory class as a machine or a process. If it merely manipulates numbers or solves an algorithm, then the PTO will not consider it within a statutory class. For example, if the process analyzes EKG, spectrographic, seismic, or data bit signals, controls a milling machine, creates useful images on a computer screen, formats the printing of mathematical formulae, recognizes patterns or voices, or selects stocks that will beat an index, then it is considered to control hardware and is statutory subject matter. However, if the process merely crunches numbers, generates a nonuseful curve, calculates distances without any hardware involved, or involves a financing method without involving hardware, then it is considered to be nonstatutory.

However, the main patent court—the CAFC—determined that an algorithm for making a smoother diagonal line on a monitor is statutory subject matter (SSM), probably because smoother diagonal lines look better and are easier to see. (*In re Alappat,* 33 F.3d 1526 (CAFC 1994).) Also, the CAFC has held (*In re Lowry,* 32 F.3d (CAFC 1994)) that a general-purpose computer data structure that organizes information into different categories (selected from an infinite number of categories) is SSM, no doubt because humans can control the selection. And while the court first held that a process for allowing mutual funds to pool their assets into a partnership for administrative and tax advantages was held to be SSM because of its practical utility (*State Street Bank & Trust Co. v. Signature Financial Group, Inc.,* 149 F.3d 1368 (Fed. Cir. 1998), cert. denied 119 S.Ct. 851 (1999)), the court subsequently changed its mind (*Bilski v. Kappos*) and held that hardware must be substantially involved. See above.

So if you have an invention involving an algorithm, ask if it substantially involves hardware, like the examples, above. If so it's probably SSM. If not, such as if it just calculates the value of π, or manipulates numbers or shapes for the fun of it without any practical application, then it's non-SSM.

c. Internet and Business Method Patents

Until the 1998 court decision in the *State Street* case (see just above), the PTO rarely granted patents for methods

Examples of Inventions That Don't Fit Within a Statutory Class

The following are examples of "inventions" that don't fit within any statutory class and hence are nonstatutory subject matter that cannot be patented:

- Processes performed solely with one's mind (such as a method of meditation or a method of speed-reading)
- Naturally occurring phenomena and articles, even if modified somewhat, such as a shrimp with its head and vein removed
- Laws of nature, including abstract scientific or mathematical principles (John Napier's invention of logarithms in 1614 was immensely innovative and valuable, but it would never get past the bottom level of the patentability mountain. However Napier's "bones" (rods used to multiply by adding) would clearly be SSM.)
- Processes that (1) are not tied in a substantial way to a particular machine or apparatus, or (2) do not transform an article into a different state or thing. See the discussion of the *Bilski* decision, above.
- An arrangement of printed matter without some accompanying instrumentality; printed matter per se isn't patentable, but a printed label on a mattress telling how to turn it to ensure even wear, or dictionary index tabs that guide you to the desired word more rapidly, have been patented as articles of manufacture
- Methods that have no practical utility, that is, that don't produce any useful, concrete, and tangible result—for example, a method for extracting π. However, securities trading systems, credit accounting systems, etc., involving account and file postings have been held patentable
- Computer programs per se, naked computer instructions, or algorithms that don't manipulate hardware such as the algorithm for extracting π
- Ideas per se. Thoughts or goals not expressed in concrete form or usage are obviously not assignable to any of the five categories above. If you have an idea, you must show how it can be made and used in tangible form so as to be useful in the real world, even if only on paper, before the PTO will accept it. For example, an idea for a burping doll can be effectively patented by patenting a doll with a burping mechanism.
- Electrical Signals. Transitory electrical signals were held not patentable subject matter since they are not a composition or manufacture. (*In re Nuijten* (CAFC 2007 Sep 20).)

of doing business. The PTO reasoned that most business methods were abstract ideas that it traditionally refused to patent. But it gradually started granting patents on business methods and the courts validated this change in the *State Street Bank* case. The court ruled that patent laws were intended to protect *any* method, whether or not it required the aid of a computer, so long as it produced a "useful, concrete and tangible result." Thus with one stroke the court legitimized both software patents and methods of doing business, opening the way for a group of patents that have been categorized as Internet patents and business method patents. But, as noted above, the court changed its mind in the *Bilski* case, so now software and business methods are not patentable unless hardware is substantially involved.

2. Machines

Machines are devices or things used for accomplishing a task. Like processes, they usually involve some activity or motion that's performed by working parts, but in machines the emphasis is on the parts or hardware, rather than the activity per se. Put differently, while a process involves the actual steps of manipulation of an item or work piece (the machine that does the manipulation is of secondary import), a machine is the thing that does the manipulating and the steps or manner of its operation, and the process itself, or material worked upon, are of lesser import. I like to classify machines into two categories: conventional and software.

a. Conventional Machines

Examples of conventional machines are cigarette lighters, robots, sewage treatment plants, clocks, all electronic circuits, automobiles, automatic transmissions, boats, rockets, telephones, TVs, computers, VCRs, disk drives, printers, lasers, photocopiers, and a layout for a bank. In 1998, the PTO even issued a patent on an electronic signal, by itself, as a machine (U.S. Pat. No. 5,815,526). Many machine inventions can also be claimed as a process and/or as a machine. For instance, an electric circuit or a weaving machine can be claimed in terms of its actual hardware and/or as a process for manipulating an electrical signal or weaving fabrics.

b. Software Machines

As stated in the previous section ("1. Processes, Including Software"), while most software inventions are claimed and regarded as processes, they can usually also be claimed and regarded as machines. For example, a system for controlling a milling machine according to certain measured parameters of an object can be claimed and regarded either as a process or a machine. As a *process* the system would be regarded and claimed as follows: (a) measuring an object to obtain a set of measurements, and (b) controlling a milling machine according to the set of measurements. As a *machine* the system would be regarded and claimed as follows: (a) means [or an apparatus] for measuring an object to obtain a set of measurements, and (b) means [or an apparatus] for adjusting a milling machine according to the set of measurements.

Note that the first step or "means" (the mensuration or the means for measuring) can be regarded as either an action or as the hardware for performing the action. This applies equally to the second step. Sometimes a software invention can't be regarded as a machine; for example, consider the software inventions defined by the two sample claims in Chapter 9, Section G13. The two inventions relate exclusively to process-type inventions and are actually so close to being all mental steps as to be almost (but not quite!) non-SSM.

On the other hand, virtually every machine-type software invention can also be regarded as a process, since each part of a "software" machine always performs some action or step. Insofar as possible, both types of claims can and should usually be provided in a single patent application. As stated in the previous paragraph, it's not important which category (process or machine) you can subsume your software invention under, and it's usually best to claim it both ways.

As stated above, to be considered SSM, a software invention must now (1) be tied in a substantial way to a particular machine or apparatus, or (2) transform an article into a different state or thing.

TIP

As I've said, there are no clear lines between the five statutory classes. The important thing to realize is that it doesn't matter as long as your invention fits into at least one of them. Put differently, you needn't be able to tell a machine from a process to qualify for a patent.

3. Manufactures

Manufactures, sometimes termed "articles of manufacture," are items that have been made by human hands or by machines. This excludes naturally occurring things, like rocks, gold, shrimp, and wood, or slightly modified naturally occurring things, like a shrimp with its head and vein removed. But if you discover a new and unobvious use for a naturally occurring thing, such as a way to use the

molecules in a piece of gold as part of a computer memory, you can patent the invention as a new use (see below), or as a machine (the gold with the necessary hardware to make it function as a memory).

Manufactures are relatively simple things that don't have working or moving parts as prime features. Clearly, you will see some overlap between the machine and the manufacture categories. Many devices, such as mechanical pencils, cigarette lighters, and electronic circuits can be classified as either. Examples of manufactures are erasers, desks, houses, wires, tires, books, cloth, chairs, containers, transistors, dolls, hairpieces, ladders, envelopes, buildings, floppy disks, knives, hand tools, and boxes. I was recently involved with a patent on a most unusual article—a musical dildo. The PTO has even issued a patent on a vitamin-fortified egg.

4. Compositions of Matter

Compositions of matter are items such as chemical compositions, conglomerates, aggregates, or other chemically significant substances that are usually supplied in bulk (solid or particulate), liquid, or gaseous form. Examples are road-building compositions, all chemicals, gasoline, fuel gas, glue, paper, soap, drugs, microbes, animals (nonhuman), food additives, plastics, and even chicken eggs with high vitamin E (U.S. Pat. No. 5,246,717) (1993).

Although, as stated, naturally occurring things such as wood and rocks can't be patented, purified forms of naturally occurring things, such as medicinals extracted from herbs, can be. One inventor even obtained a composition of matter patent on a new element he discovered. And recently, genetically altered plants, microbes, genes, and nonhuman animals have been allowed under this category. Compositions are usually homogeneous chemical compositions or aggregates whose chemical natures are of primary importance and whose shapes are of secondary import, while manufactures are items whose physical shapes are significant, but whose chemical compositions are of lesser import.

5. New Uses of Any of the Above

A new-use invention is actually a new and unobvious process or method for using an old and known invention, whether it be an old and known process, composition, machine, or article. The inventive act here isn't the creation of a new thing or process per se, but the discovery of a new use for something that in itself is old.

If you discover a new and unobvious (unrelated) use of any old invention or thing, you can get a patent on your discovery. For example, suppose you discover that your Venetian blind cleaner can also be used as a seed planter. You obviously can't get a patent on the physical hardware that constitutes the Venetian blind cleaner, since you didn't invent it—someone already patented, invented, and/or designed it first—but you can get a patent on the specific new use (seed planting) of the old hardware. In other examples, one inventor obtained a patent on a new use for aspirin: feeding it to swine to increase their rate of growth; one got a patent on the new use of a powerful vacuum to suck prairie dogs out of the ground; and a client of mine got a patent on the new use of a simple strut in a room corner to provide a tool holder. Note, however, that if your invention has any new hardware, your invention probably should be claimed as new hardware, rather than (or in addition to) a new use of old hardware.

New use inventions are relatively rare and technically are a form of, and must be claimed as, a process. (35 USC 100(b).) However, most patent experts treat them as a distinct category. See Chapter 9 for a discussion of patent claims.

D. Requirement #2: Utility

To be patentable your invention must be useful. Problems are seldom encountered with the literal utility requirement; *any* usefulness will suffice, provided the usefulness is functional, and not aesthetic. But remember, in Chapter 4, I recommend that the usefulness of your invention be relatively great in order to pass the "commercial viability" test. It's hard for me to think of an invention that couldn't be used for some purpose. However, utility is occasionally an issue in the chemical area when an inventor tries to patent a new chemical for which a use hasn't yet been found but for which its inventor will likely find a use later. If the inventor can't state (and prove, if challenged) a realistic use, the PTO won't grant a patent on the chemical. A chemical or mechanical intermediate that can be used to produce another useful chemical or useful hardware item is itself regarded as useful—for example, a novel paper blank that can be formed into an insulated cup is considered useful. Software-based inventions usually satisfy the utility requirement, since virtually all software has a utilitarian function, even if used to create aesthetic designs on an idle monitor or to evaluate golf scores or mutual fund assets. The main problem with software-based inventions is that they may not fall (or may not be claimed in a way so that they fall) into a statutory class, as noted in the previous section. (Also see Chapter 9.) Nonetheless, a software

invention should be tested for utility just like any other invention just in case it falls into one of the "legally not useful" categories listed below.

Notwithstanding the fact that virtually all inventions are useful in the literal sense of the word, the courts have decided that some types of inventions are "not useful" as a matter of law, and patents on them are accordingly denied by the PTO. Let's look at this more closely.

1. Unsafe New Drugs

The PTO won't grant a patent on any new drug unless the applicant can show that not only is it useful in treating some condition, but also that it's relatively safe for its intended purpose. Put another way, the PTO considers an unsafe drug useless. Most drug patent applications won't be allowed unless the Food and Drug Administration (FDA) has approved tests of the drug for efficacy and safety, but drugs that are generally recognized as safe, or are in a "safe" chemical category with known safe drugs, don't need prior FDA approval to be patentable. For example, one inventor was able to patent the use of chili peppers to treat baldness since chilies were known to be safe.

2. Whimsical Inventions

Occasionally, the PTO will reject an application for a patent when it finds the invention to be totally whimsical, even though "useful" in some bizarre sense. Nevertheless, in 1937 the PTO issued a patent on a rear windshield (with tail-operated wiper) for a horse (U.S. Pat. No. 2,079,053). They regarded this as having utility as an amusement or gag.

Most patent attorneys have collections of humorous patents. I could easily fill the rest of this book with my collection, but I'll restrain myself and briefly describe just a few:

- a male chastity device (U.S. Pat. No. 587,994—1897)
- a figure-eight-shaped device to hold your big toes together to prevent sunburned inner thighs (U.S. Pat. No. 3,712,271—1973)
- dentures with individual teeth shaped like the wearer's head (U.S. Pat. No. 3,049,804—1962), and
- a dress hanger with breasts (U.S. Pat. No. D226,943—1973).

Also, even though the PTO issued U.S. Pat. No. 2,632,266 in 1953 for a fur-encircled keyhole, the censor wouldn't let me show this on a TV show.

3. Inventions Useful Only for Illegal Purposes

An important requirement for obtaining a patent, which Congress hasn't mentioned, but which the PTO and courts have brought in on their own initiative (by stretching the definition of "useful"), is legality. For example, inventions useful solely for illegal purposes, such as disabling burglar alarms, safecracking, copying currency, and defrauding the public, might be incredibly useful to some elements in our society, but the PTO won't issue patents on them. However, most inventions in this category can be described or claimed in a "legal" way. For example, a police radar detector would qualify for a patent if it's described as a tester to see if a radar is working or as a device for reminding drivers to watch their speed.

4. Immoral Inventions

In the past, the PTO has—again on its own initiative—included morality in its requirements. But, in recent years, with increased sexual liberality, the requirement is now virtually nonexistent. Thus the PTO now regularly issues patents on sexual aids, gags, and stimulants.

5. Nonoperable Inventions, Including Perpetual Motion Machines

Another facet of the useful requirement is operability. The invention must appear to the PTO to be workable before they will allow it. Thus, if your invention is a perpetual-motion machine, or a metaphysical-energy converter, or, more realistically, a very esoteric invention that looks technically questionable (it looks like it just plain won't work or violates some well-accepted physical law), your examiner will reject it as lacking utility because of inoperability. In this case you would either have to produce a logical, technical argument refuting the examiner's reasons (you can include affidavits or declarations of witnesses and experts and test results), or bring the invention in for a demonstration to prove its operability.

Operability is rarely questioned, since most patent applications cover inventions that employ known principles or hardware and will obviously work as described. If the examiner questions operability, however, you have the burden of proof. And note that all patent examiners have technical degrees (some even have Ph.D.s), so expect a very stringent test if the operability of your invention is ever questioned.

Despite the foregoing, the PTO occasionally issues a patent on what appears to be a perpetual-motion-like machine, as they did in 1979 (U.S. Pat. No. 4,151,431).

This raises an important point. The fact that a patent is granted doesn't mean that the underlying invention will work. It only means that the invention as described on paper appeared to a patent examiner to work (or that the examiner couldn't figure out why it wouldn't work).

The PTO, however, has become more careful about perpetual-energy or perpetual-motion machines. Some years ago, it denied an inventor a patent on a perpetual energy machine. The inventor took the case to the courts, but lost after the National Bureau of Standards, acting as a court expert, found the machine didn't have an efficiency of over 100%.

It's a common misconception that the PTO won't "accept" patent applications on perpetual-motion machines: The PTO will accept the application for filing (see Chapter 13), since filing and docketing are clerical functions. However, the examiner (a degreed professional) will almost certainly reject it later as inoperative (giving reasons) after a formal examination.

6. Nuclear Weapons

The invention must not be a nuclear weapon; such inventions aren't patentable because of a special statute. However, if you've invented a doomsday machine, don't be discouraged: You can be rewarded directly by making an application with the DOE (Department of Energy), formerly the Atomic Energy Commission.

7. Theoretical Phenomena

Theoretical phenomena per se, such as the phenomenon of superconductivity, the transistor effect, or the discovery of logarithms aren't patentable per se. You must describe and claim (see Chapter 9) a practical, realistic, hardware-based version of your invention for the PTO to consider it useful.

8. Aesthetic Purpose

If the invention's sole purpose or "function" is aesthetic, the PTO will reject it as lacking utility; such inventions should usually be the subject of a design patent application. A beautiful vase of unique design, a computer case whose unique shape does not make the computer operate better, and a computer program for producing a low-brightness design on an idle computer monitor, where the only novelty is the aesthetic uniqueness of the design, are examples of inventions which the law considers to lack statutory utility. However, if the design has a functional purpose then statutory utility would be present. For example, if the shape of the vase makes it easier and safer to lift, or if the shape of the computer case makes it cheaper to manufacture, or if an airplane has a unique type of fairing that enables it to fly at supersonic speeds without buffeting, then the PTO will hold there is utility.

E. Requirement #3: Novelty

Now let's look at the novelty requirement of a patent. Like "unobviousness" (discussed in Section F), this requirement is often misunderstood.

1. Prior Art

Your invention must be novel in order to qualify for a patent. In order for your invention to meet this novelty test it must have some physical or method-step difference over all prior developments that are available to the public anywhere in the world. In the realm of patent law, these prior developments and concepts are collectively referred to as "prior art." Unfortunately, like many things in the law, the determination of what is prior art can be quite complex and involved. Accordingly, before I tell you how to determine whether your invention is novel, it's vital to understand what your invention must differ from—that is, how the law defines "prior art."

a. What Is Prior Art?

According to Section 102 of the patent laws, the term "prior art" means generally the state of knowledge existing or publicly available either before the date of your invention or more than one year prior to your earliest patent application date.

b. Date of Your Invention

Clearly, in order to decide what prior art is with respect to any given invention, it's first necessary to determine the "date of your invention." Most inventors think it's the date on which one files a patent application. While this date is important, and you can always use it if you have nothing better, the U.S. has a somewhat complicated "first-to-invent" patent system (as opposed to the rest of the world's "first-to-file" system). Under the U.S. system you can usually go back earlier than your filing date if you can prove that you conceived of the invention or built and tested it earlier than your filing date. (See Chapter 3.) That is, in the U.S. your date of invention is the earliest of:

- the date you filed your patent application (provisional or regular)

- the date you can prove you built and tested your invention in the U.S. or a country that is a member of NAFTA or the WTO (World Trade Organization). Most industrial countries are members (35 USC 104), or
- the date you can prove you conceived of your invention in a NAFTA or WTO country, provided you can also prove you were diligent thereafter in building and testing it or filing a patent application on it.

So, from now on, when I refer to "your earliest provable date of invention," this will mean the earliest of the above three dates (filing, building and testing, or conception accompanied by diligence) that you can prove.

Reduction to Practice

In the law, the building and testing of an invention is called a "reduction to practice." The filing of a patent application, while not an actual reduction to practice, is termed a "constructive" reduction to practice because the law will construe it in the same way it does an actual reduction to practice. As discussed in Chapter 3, Section H, the filing of a valid Provisional Patent Application (PPA) also qualifies as a constructive reduction to practice.

The kinds of proof that the PTO and the courts typically rely on are the witnessed records of the type I described in Chapter 3. If you follow my recommendations in Chapter 3 about making proper records, you'll be able to go back to your date of conception, which usually will be at least several months before your filing date. More on this in Chapters 13 and 16.

Now that you know what your earliest date of invention is, you also know that the relevant "prior art" is the knowledge that existed prior to that date. More precisely, prior art comprises all of the items in the categories discussed below in Subsection d. Any item in any of these categories can be used against your invention at any time, either by the PTO to reject your patent application, or later on (if the PTO didn't find it or didn't give it adequate weight) to invalidate your patent in court.

c. Your Invention Must Not Be Publicly Known More Than One Year Prior to Your Filing Date—The One-Year Rule

In addition to the six categories under Subsection d, below, prior art is also knowledge about your invention that became publicly known more than one year prior to the date you file your patent application (either a regular patent application or a valid Provisional Patent Application, as described in Chapter 3, Section H). Known as the "one-year rule," the patent laws state that you must file a patent application within one year after you sell, offer for sale, commercially or publicly use or describe your invention, or allow another to use it without restriction. If you fail to file within one year of such sale, offer for sale, public, commercial, or unrestricted disclosure or use, the law bars you from obtaining a valid patent on the invention, even if you conceived and built and tested it before the sale or publication. Another way to put this, since we're talking about novelty, is that after a year following a sale, offer for sale, public or commercial use, or knowledge about your invention, the PTO will no longer consider it novel. While I've listed this "one-year rule" under the "prior art" heading for the sake of logical placement, it's so important that I've made it Inventor's Commandment #6 at the beginning of this chapter.

Foreign Filing and the One-Year Rule

While you have a year after publication or use to file in the U.S., I advise you not to do so, since most foreign countries aren't so lenient. If you think you may want to foreign file, you shouldn't offer for sale, sell, publicly use, or publish before you file in the U.S. For instance, suppose it's 2010 November 16, and you've just invented a new type of paint. If you have no intention of filing in another country, you can use, publish, or sell your invention now and still file your U.S. patent application (PPA or regular) in the U.S. any time up to 2011 November 16. However, if you think you may eventually want to foreign file on your invention, you should file an application (PPA or regular) before publicizing your invention. Then you can publish or sell the invention freely without the loss of any foreign rights in the major industrial "Convention" or treaty countries, provided you file there within one year after your U.S. filing date. This is because, under international conventions (agreements or treaties), you'll be entitled to the benefit of your U.S. filing date in such countries. In "non-Convention" countries (some small and nonindustrialized countries) you must file before you publicize the invention. (See Chapter 12.)

(The above year-month-day date format is from the International Standards Organization (ISO). It is also commonly used in computerese and trademark applications. I use it because it provides a logical descending order that facilitates calculating the one-year rule and other periods.)

d. Specifics of Prior Art

Now that we've broadly defined prior art, let's take a closer look at what it typically consists of, per 35 USC 102.

i. Prior Printed Publications Anywhere

Any printed publication, written by anyone, and from anywhere in the world, in any language, is considered valid prior art if it was published either (a) before your earliest provable date of invention (see above), or (b) over one year before you file your patent application. The term "printed publication" thus includes U.S. and foreign patents, published U.S. patent applications (effective as of their filing date), books, magazines (including trade and professional journals), Russian (or former U.S.S.R.) Inventor's Certificates, and publicly available technical papers and abstracts. Even photocopied theses, provided they were made publicly available by putting them in a college library, will constitute prior art. The PTO has even used old Dick Tracy comic strips showing a wristwatch radio as prior art!

TIP

Computer Tip. While the statute speaks of "printed" publications, I'm sure that information on computer-information utilities or networks would be considered a printed publication, provided it was publicly available.

The "prior printed publications" category is the most important category of prior art and will generally constitute most of the prior art that you'll encounter. And most of the prior printed publications that the PTO refers to (cites) when it's processing your application, and that you will encounter in your search, will be patents, mainly U.S. patents.

ii. U.S. Patents Filed by Others Prior to Your Invention's Conception

Any U.S. patent that has a filing date (or claims priority of a PPA that has a filing date) earlier than your earliest provable date of invention is considered valid prior art. This is so even if the patent issues after you file your application. For example, suppose you conceive of your invention 2010 June 9, and you file your patent application on 2010 August 9, two months later. Then, six months after your filing date, on 2011 February 9, a patent to Goldberger issues that shows all or part of your invention. If Goldberger's patent was any other type of publication, it wouldn't be prior art to your application since it was published after your filing date. However assume that Goldberger's patent application was filed on 2010 June 8, one day earlier than your date of conception. Under Section 102(e) of the patent laws, the PTO must consider the Goldberger patent as prior art to your application, since Goldberger's application was filed prior to your invention's date of conception. If a patent claims benefits of a PPA, then the PPA's filing date is considered the effective prior-art date for the patent.

TIP

A Common Misconception is that only in-force patents (that is, patents that haven't yet expired) count as prior art. This isn't true. Any earlier patent, even if it was issued 150 years ago and has long since expired, will constitute valid prior art against an invention. Otherwise, patents would have a lesser status than other publications.

iii. Prior Publicly Available Knowledge or Use of the Invention in the U.S.

Even if there's no written record of it, any public knowledge of the invention, or use of it by you or others in the U.S., which existed or occurred either (a) before your earliest provable date of invention, or (b) over one year before you file your patent application, is valid prior art. For example, an earlier heat-treating process used openly by a blacksmith in a small town, although never published or widely known, is a prior public use that will defeat your right to a patent on a similar process. It has been held that allowing even one person to use your invention without restriction will constitute public use. With respect to public knowledge, an example would be a talk at a publicly accessible technical society. Recently, even a showing of a kaleidoscope without restriction at a party with 30 attendees was held to be prior public knowledge. Or as one writer commented, "Throw a party and lose your patent rights!"

For still another example of a public use, suppose that you invented a new type of paint and you use it to paint your building in downtown San Francisco. You forget to file a patent application and leave the paint on for 13 months: It's now too late to file a valid patent application since you've used your invention publicly for over a year. Put another way, your own invention would now be prior art against any patent application you file. (But see the Experimental Exception described below.)

This public-use-and-knowledge category of prior art is almost never used by the PTO since they have no way of uncovering it; they search only patents and other publications. Occasionally, however, defendants (infringers) in patent lawsuits happen to uncover a prior public use that they then rely on to invalidate the patent.

TIP

Experimental Exception. If the prior public use was for bona fide (good faith) experimental purposes, it doesn't count as prior art. Thus suppose, in the "painted San Francisco building" example above, that you painted your building to test the durability of your new paint: each month you photographed it, kept records on its reflectivity, wear resistance, and adhesion. In this case your one-year period wouldn't be initiated (begin to run) until your bona fide experimentation stopped and you left the paint out for nonexperimental purposes.

iv. Your Prior Foreign Patents

Any foreign patent (this includes Russian (or former U.S.S.R.) Inventor's Certificates) of yours or your legal representatives that issued before your U.S. filing date and that was filed over a year before your U.S. filing date is valid prior art. This category is generally pertinent to non-U.S. residents who start the patenting process in a foreign country. If you're in this class, you must file your U.S. application either within one year after you file in the foreign country or before your foreign patent issues. However, if you want to get the benefit of a foreign filing date for your U.S. application, you should file in the U.S. within the one year after your foreign filing date. (See Chapter 12.)

v. Prior U.S. Inventor

If anyone else in the U.S. invented substantially the same invention as yours before your invention's date of conception, and the other inventor didn't abandon, suppress, or conceal it, then this other person's invention (even though no written record was made) can be used to defeat your right to a patent. This prior-art issue usually occurs when two (or more) inventors each file a patent application on the same invention. If the filing dates of the two applications are close enough, the PTO will declare an "interference" between the two competing applications in order to determine which application is entitled to the patent. (See Chapter 15.)

Common Assignee or Joint Research Agreement. However, there is a little-used exception: If your invention clears Section 102 (that is, it is novel) and the prior inventor and you were obligated to assign your inventions to the same person or organization, or both of you were parties to a joint research agreement and your application is amended to disclose the parties to the agreement, then the prior inventor's work won't be considered prior art under Section 102. See PTO Rule 104(c)(4).

vi. Prior Sale or On-Sale Status in the U.S.

Under Section 102, the law also considers certain actions by humans to be "prior art," even when no paper records exist. These actions involve the "sale" or "on-sale" category. Suppose you (or anyone else) offer to sell, actually sell, or commercially use your invention, or any product embodying your invention, in the U.S. You must file your U.S. patent application (regular or PPA) within one year after this offer, sale, or commercial use. This is another part of the "one-year rule." This means that you can make sales to test the commercial feasibility of your invention for up to a year before filing in the U.S. Again, however, I advise you not to do so, since this will defeat your right to a patent in most foreign countries, as mentioned above, and as explained in more detail in Chapter 12.

TIP

The type of sale or offer of sale that would bar your patent application must be a commercial offer to sell or a sale of actual hardware or a process embodying the invention. Such an offer or sale will start the one-year period running, even if the invention has not yet been built, so long as it has been drawn or described in reasonable detail. On the other hand, an offer to license, or sell, or an actual sale of the inventive concept (not hardware) to a manufacturer will not start the one-year period running.

Abandonment

If you "abandon" your invention by finally giving up on it in some way, and this comes to the attention of the PTO or any court charged with ruling on your patent, your application or patent will be rejected or ruled invalid. I've never personally had a case where this happened, but it has occurred.

EXAMPLE: You make a model of your invention, test it, fail to get it to work, or fail to sell it, and then consciously drop all efforts on it. Later you change your mind and try to patent it. If your abandonment becomes known, you would lose your right to a patent. But if you merely stop work on it for a number of years because of such reasons as health, finances, or lack of a crucial part, but intend to pursue it again when possible, the law would excuse your inaction and hold that you didn't abandon.

e. Summary of Prior Art

If these prior-art rules seem complicated and difficult to understand, you're not alone. Very few patent attorneys understand them fully either! Perhaps Congress will simplify Section 102 someday and enact a "first to file" law, like the rest of the world uses. (Write to your Congressperson!) In the meantime, don't worry about it if you can't understand all of the rules. All you really need to remember is that relevant prior art usually consists of:

- any published writing (including any patent) that was made publicly available either (1) before your earliest provable date of invention (see above), or (2) over one year before you can get your patent application on file
- any U.S. patent whose issue date isn't early enough to stop you but that has a filing or PPA date earlier than your earliest provable date of invention
- any relevant invention or development (whether described in writing or not) existing prior to the date your invention was conceived, or
- any public or commercial use, sale, or knowledge of the invention more than one year prior to your application filing date.

2. Any Physical or Method Step Difference Whatever Will Satisfy the Novelty Requirement

Any novel feature, no matter how trivial, will satisfy the novelty requirement. For example, suppose you've "invented" a bicycle that is painted yellow with green polka dots, each of which has a blue triangle in the center. Assume (this is easy to do) that no bicycle has been painted this way before. Your bicycle would thus clearly satisfy the requirement of novelty.

Rarely will an investigation into your invention's patentability (called a "patentability search") reveal any single prior invention or reference that could be considered a dead ringer. Of course, if your search does produce a dead-ringer reference for your invention—that is, an actual device or published description showing all the features of your invention and operating in the same way for the same purpose—obviously your patentability decision can be made immediately. Your invention lacks novelty over the "prior art." Another way of saying this is that your invention has been "anticipated" by a prior invention or conception and is thus definitely unpatentable. The concepts of anticipation and prior art are discussed in more detail in Requirement #4—unobviousness.

The law generally recognizes three types of novelty, any one of which will satisfy the novelty requirement of Section 102: (1) physical (hardware or method) difference, (2) new combination, and (3) new use.

a. Physical Differences

This is the most common way to satisfy the novelty requirement. Here your invention has some physical or structural (hardware or method) difference over the prior art. If the invention is a machine, composition, or article, it must be or have one or more parts that have a different shape, value, size, color, or composition than what's already known.

It's often difficult for inventors to distinguish between a physical difference and a new result. When I ask clients, "What's physically different about your invention?" they usually reply that theirs is lighter, faster, safer, cheaper to make or use, portable, and so on. However, these factors are new *results* or *advantages*, not physical or method step differences, and are primarily relevant to unobviousness (see Section F), not to novelty. That is, they won't help your invention satisfy the novelty requirement. Again, a new physical feature must be a hardware (including operational) difference—for example, a part with a different shape, a different material, a different size, a different arrangement of the components, etc.

Even omitting an element can be considered novel. For example, if a machine has always had four gears, and you find that it will work with three, you've satisfied the novelty requirement.

Also, the discovery of a critical area of a given prior-art range will be considered novel. That is, if a prior-art magazine article on dyeing states that a mordant will work at a temperature range of 100–150 degrees centigrade and you discover that it works five times better at 127–130 degrees centigrade, the law still considers this range novel, even though it's technically embraced by the prior art.

A physical difference can also be subtle or less apparent in the hardware sense, so that it's manifested primarily by a different mode of operation. Here are some examples: (a) an electronic amplifying circuit that looks the same, but that operates in a different mode—say Class A rather than Class B; (b) a circuit that is the same physically but is under the control of different software; (c) a pump that looks the same, but that operates at a higher pressure and hence in a different mode; and (d) a chemical reaction that takes place at a substantially different temperature or pressure. All of these will be considered novel, even though they appear the same to the eye.

NOTE

Processes Note. If your invention is a new process, you don't need any novel hardware; your physical novelty is

basically your new way of manipulating old hardware. Any novel step or steps whatever in this regard will satisfy the physical novelty requirement.

b. New Combinations

Many laypersons believe that if an invention consists entirely of old components, it can't be patented. A moment's thought will show that this couldn't be true since virtually all inventions are made of old components. Thus, the PTO will consider your invention novel even if two or more prior-art references (actual devices or published descriptions) together account for all of your invention's physical characteristics. That is, if your invention is a new combination of two old features, the law will consider it novel. (Note that for two or more old references to be legally combinable to prevent your invention from being patented, the actual hardware or parts of the references don't have to be physically combinable: only the concepts inherent in the parts need be usable together.) For example, suppose you invent a bicycle having a frame made of a new carbon-fiber alloy and the prior art includes a patent from 1870 showing your exact bicycle and a magazine article from *Technology Today* from 2005 showing your exact carbon-fiber alloy: Even though these two references taken together show every feature of your invention, your invention still is considered to be novel under Section 102 of the patent laws since you're the first to "combine" the two old concepts. That is, your bicycle would clearly be considered novel since it has a new physical feature: a frame that is made, for the first time, of a carbon-fiber alloy. For your invention to be considered as lacking novelty and thus subject to rejection under Section 102, all of its physical characteristics must exist in a single prior-art reference. This is often referred to as the "single document rule"; in other words if two separate documents are necessary to show your invention, it is novel under Section 102. But keep in mind, just because it's novel, useful, and fits within a statutory class, doesn't mean the bicycle is patentable. It still must surpass the tough test of nonobviousness (covered in the following section).

Another type of new combination which inventors frequently overlook is the new arrangement: If you come up with a new arrangement of an old combination of elements, the PTO will consider this a new combination that will satisfy the novelty requirement. For example suppose you invent an automatic transmission where, for the first time, the torque converter is placed after the gears, rather than before; the PTO will consider that this new arrangement has novelty over the previous arrangement.

> *"Invention consists in avoiding the constructing of useless combinations and in constructing the useful combinations which are in the infinite minority. To invent is to discern, to choose."*
>
> ***—Henri Poincaré***

c. New Use

As stated in Section C5, above, if you've invented a new use for an old item of hardware, or an old process, the new use will satisfy the novelty requirement, no matter how trivial the newness is. For example, Dorie invents a new vegetable cooker that, after a search, she discovers is exactly like a copper smelter invented by one Jaschik in 1830. Dorie's cooker, even though identical to Jaschik's smelter, will be considered novel, since it's for a different use. (If your invention involves novel physical hardware, technically it can't be a new-use invention.)

If you're the type of person who thinks ahead, you're probably asking yourself, "Why is he bothering with novelty—isn't this requirement inherent in unobviousness—that is, if the invention is found to be unobvious won't it also be found to be novel?" Well, you're 100% correct. If an invention is unobvious, *a fortiori* (by better reason) it must be novel. However, the law makes the determination in two steps (Sections 102 and 103), and most patent professionals have also found it far easier to first determine whether and how an invention satisfies the novelty requirement and then determine if it can be considered unobvious. This two-step process is so important that I've made it Inventor's Commandment #7. See the first page of this chapter.

F. Requirement #4: Unobviousness

We're now entering what's probably the most misunderstood and difficult-to-understand, yet most important, issue in patent law—that is, is your invention unobvious? Let's start with a "common misconception."

Common Misconception: If your invention is different from the prior art, you're entitled to get a patent on it.

Fact: Under Section 103 of the patent laws, no matter how different your invention is, you're not entitled to a patent on it unless its difference(s) over the prior art is considered "unobvious" by the PTO or the courts.

Because Section 103 is the heart of all patent laws, I am reproducing the first paragraph—the essence of the section—here:

35 USC 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 negatived by the manner in which the invention was made.

Most of the time a patentability search will produce one or more prior-art references that show devices similar to your invention, or that show several, but not all, of the physical features of your invention. That is, you will find that your invention has one or more features or differences that aren't shown in any one prior-art reference. However, even though your invention is physically different from such prior art (that is, it clears Section 102 as Section 103 states), this isn't enough to qualify for a patent. To obtain a patent, the physical (or use) differences must be substantial and significant. The legal term from Section 103 for such a difference is that it must not be "obvious" or, commonly, it must be "unobvious" or "nonobvious." That is, the differences between your invention and the prior art must not be obvious to one with ordinary skill in the "art" or field of the invention. Because this concept is so important, let's examine it in detail.

1. Unobvious to Whom?

It doesn't tell anyone much to say an invention must be unobvious. The big question is, unobvious to whom? Under Section 103, you can't get a patent if a person having ordinary skill in the field of your invention would consider the idea of the invention "obvious" at the time you came up with it.

The law considers "a person having ordinary skill in the art to which said subject matter pertains" to be a mythical worker in the field of the invention who has (1) ordinary skill, but who (2) is totally omniscient about all the prior art in his or her field. This is a pure fantasy, since no such person ever lived, or ever will, but realistically there's no other way to come even close to any objective standard for determining nonobviousness.

Let's take some examples. Assume that your invention has to do with electronics—say an improved flip-flop circuit. A Person Having Ordinary Skill In The Art (I will use the acronym, PHOSITA) would be an ordinary, average logic-circuit engineer who's intimately familiar with all prior-art logic circuits. If your invention relates to the fields of business or the Internet, say a new method of detecting phishing (attempted fraudulent discovery of a password), a PHOSITA would be an Internet software engineer of ordinary skill. If your invention has to do with chemistry, say a new photochemical process, a PHOSITA, a typical photochemical engineer with total knowledge of all photochemical processes, would be your imaginary skilled artisan. If your invention is mechanical, such as an improved cigarette lighter or belt buckle, the PTO would try to postulate a PHOSITA as a hypothetical cigarette-lighter engineer or belt-buckle designer with ordinary skill and comprehensive knowledge. If your invention is a design, say for a computer case, the PTO would invent a hypothetical computer-case designer of ordinary skill and full knowledge of all existing designs as the PHOSITA.

2. What Does "Obvious" Mean?

Most people have trouble interpreting Section 103 because of the word "obvious." If after reading my explanation you still don't understand it, don't be dismayed. Most patent attorneys, patent examiners, and judges can't agree on the meaning of the term. Many tests for unobviousness have been used and rejected by the courts over the years. The courts have often referred to "a flash of genius," and this colorful phrase became the title of a 2008 movie about the efforts of Dr. Robert Kearns to obtain compensation and recognition from Ford for manufacturing vehicles with intermittent windshield wipers, which the court held infringed his patent 3,351,836 (1967). Another colorful term that has been used is "a synergistic effect (the whole is greater than the sum of its parts)." One influential court said that unobviousness is manifested if the invention produces "unusual and surprising results." Foreign countries commonly require "an inventive step." Technically (for reasons mentioned below, I stress the term "technically"), none of these tests is used any longer. This is because the U.S. Supreme Court, which has final say in such matters, decreed in the famous 1966 case of *Graham v. John Deere*, 383 U.S. 1, 148 USPO 459 (1966); MPEP 2141, that Section 103 is to be interpreted by taking the following steps:

1. Determine the scope and content of the prior art.
2. Determine the novelty of the invention.
3. Determine the level of skill of artisans in the pertinent art.
4. Against this background, determine the obviousness or unobviousness of the inventive subject matter.
5. Also consider secondary and objective factors such as commercial success, long-felt but unsolved need, and failure of others.

Unfortunately, while in theory the Supreme Court has the last word, in practice it added nothing to our understanding of the terms "obviousness" and "unobviousness"—in the crucial step (#4), the court merely repeated the very terms (obvious and unobvious) it was seeking to define. Therefore, most attorneys and patent examiners continue to look for new and unexpected results that flow from the novel features when seeking to determine if an invention is obvious.

Despite its failure to define the term "obvious," the Supreme Court did add an important step to the process by which "obviousness" is to be determined. In Step #5, the court made clear that objective circumstances must be taken into account by the PTO or courts when deciding whether an invention is or isn't obvious. The court specifically mentioned three such circumstances: commercial success, long-felt but unsolved need, and failure of others to come up with the invention.

So, although your invention might not, strictly speaking, produce "new and unexpected results" from the standpoint of one with "ordinary skill in the art," it still may be considered unobvious if, for instance, you can show that the invention has enjoyed commercial success.

Normally, before you file a patent application you won't be able to consider commercial success as a factor in determining patentability, since I recommend (Chapter 7, Section H) that you don't sell the invention before you file. However, you can argue commercial success later to the examiner during the prosecution phase (Chapter 13) if your invention is commercially successful by then. Also, you can even consider commercial success before filing if you disregard my advice and take advantage of the "one-year rule" (Section E, above) by test-marketing your invention before filing.

Under the reasoning of the *John Deere* case, then, to decide whether or not your invention is obvious, you first should ask whether it produces "new and unexpected results" from the standpoint of one skilled in the relevant art. If it does, you've met the test for patentability. However, if there's still some doubt on this question, external circumstances may be used to bolster your position.

TIP

If you feel your head spinning, don't worry. It's natural. Because these concepts are so abstract, there's no real way to get a complete and comfortable grasp on them. However, if you take it slowly (and take a few breaks from your reading), you should have a pretty good idea of when an invention is and isn't considered "unobvious." In Section 3, directly below, I discuss examples of "unobviousness" and "obviousness." Then, in Section 4, I cover the types of arguments based on external circumstances (called "secondary factors") that can be made to bolster your contention that your invention is unobvious. I also provide a flowchart (Fig. 5C) that puts it all together in concise form.

3. Examples of Obviousness and Unobviousness

First, for some examples of unobvious inventions, consider all of the inventions listed in Chapter 2: the magnetic pistol guard, the buried plastic cable, the watch calendar sticker, "Grasscrete," the Wiz-z-er top, the shopping cart, etc. These all had (Section 102) physically novel features that (Section 103) were considered unobvious because they produced new, unexpected results—that is, results that weren't suggested or shown in the prior art.

Although generally you must make a significant physical change for your invention to be considered unobvious, often a very slight change in the shape, slope, size, or material can produce a patentable invention that operates entirely differently and produces totally unexpected results.

> **EXAMPLE:** Consider the original centrifugal vegetable juicer composed of a spinning perforated basket with a vertical sidewall and a nonperforated grater bottom. When vegetables, such as carrots, were pushed into the grater bottom, they were grated into fine pieces and juice that were thrown against the cylindrical, vertical sidewall of the basket. The juice passed through the perforations and was recovered in a container but the pieces clung to the sidewalls, adding weight to the basket and closing the perforations, making the machine impossible to run and operate after a relatively small amount of vegetables were juiced. Someone conceived of making the side of the basket slope outwardly so that while the juice was still centrifugally extracted through the perforated side of the basket, the pulp, instead of adhering to the old vertical side of the basket, was centrifugally forced up the new sloped side of the basket where it would go over the top and be diverted to a separate receptacle. Thus the juicer could be operated continuously without the pulp having to be cleaned out. Obviously, despite the fact that the physical novelty was slight—that is, it involved merely changing the slope of a basket's sidewall—the result was entirely new and unexpected, and therefore was considered unobvious.

In general such a relatively small physical difference (changing the slope of the wall of a basket in a juicer) will require a relatively great new result (ability to run the juicer

continuously) to satisfy the unobviousness requirement. On the other hand, a relatively large physical difference will need only minor new results for the PTO to consider it unobvious. That is, in Fig. 5A (The Patentability Mountain) the height of the fourth step can be shortened if the height of the third step is increased.

As indicated, new-use inventions don't involve any physical change at all in the old hardware. However, the new use must be (1) a different use of some known hardware or process, and (2) the different use must produce new, unexpected results.

> **EXAMPLE:** Again consider the Venetian blind cleaner used as a seed planter, and aspirin used as a growth stimulant, discussed in Section C5, above. In both instances, the new use was very different and provided a totally unexpected result: thus both inventions would be patentable. Also, in another interesting new-use case, the patent court in Washington, DC, held that removing the core of an ear of corn to speed freezing and thawing was unobvious over core drilling to speed drying. The court reasoned that one skilled in the art of corn processing could know that core removal speeds drying without realizing that core removal could also be used to speed freezing and thawing. Accordingly, the court held that the new result (faster freezing and thawing) was unexpected since it wasn't described or suggested in the prior art.

The courts have held that the substitution of a different, but similarly functioning, element for one of the elements in a known combination, although creating a "novel" invention, won't produce a patentable one unless the results are unexpected. For example, consider the substitution, in the 1950s, after transistors had appeared, of a transistor for a vacuum tube in an old amplifier circuit. At first blush this new combination of old elements would seem to the uninitiated to be a patentable substitution, since it provided tremendous new results (decreased power consumption, size, heat, weight, and far greater longevity). However, you'll soon realize that the result, although new, would have been entirely foreseeable and expected since, just as in the carbon-fiber/bicycle case, the power reduction and reduced-weight advantages of transistors would have been already known as soon as a transistor made its appearance. Thus, although substituting them for tubes provided many *new* results, it didn't provide the old amplifier circuit with any *unexpected* new results. Accordingly, the PTO's Board of Appeals held the new combination to be obvious to a PHOSITA at the time.

A factor that works against inventors is that to most people, many inventions seem obvious once they understand the key ideas. So sometimes we have to convince the patent examiner, a potential licensee, or even a judge, not to use hindsight and to try to view the problem without knowledge of the invention in order to understand why it's actually unobvious.

If you're still a bit misty about all this, put yourself in the shoes of an electronic engineer who, at the time of the replacement of the vacuum tube with the transistor, was skilled in designing vacuum tube circuits and was currently designing a flip-flop circuit. Along comes this newfangled "transistor" that uses no heater and weighs one-tenth as much as a comparable tube, but which provides the same degree of amplification and control as the tube did. Do you think that it wouldn't be obvious to the engineer to try substituting a transistor for the tube in that flip-flop circuit? Similarly, the PTO would consider obvious the substitution of an integrated circuit for a group of transistors in a known logic circuit, or the use of a known radio mounting bracket to hold a loudspeaker enclosure instead of a radio. The CAFC held that "the routine substitution of modern electronics to an otherwise unpatentable invention typically creates a prima facie [on its face] case of obviousness." *In re Comiskey,* 499 F.3d 1365 (2007).

The PTO will also consider as obvious the mere carrying forward of an old concept, or a change in form and degree, without a new result. For instance, when one inventor provided notches on the inner rim of a steering wheel to provide a better grip, the idea was held to be obvious because of medieval sword handles that had similar notches for the same purpose. And the use of a large pulley for a logging rig was held nonpatentable over the use of a small pulley for clotheslines. These situations are known as "obviousness by analogy."

On the other hand, one inventor merely changed the slope of a part in a papermaking (Fourdrinier) machine; as a result the machine's output increased by 25%—a dramatic, new, and unexpected result that was held patentable.

In the recipe field it's usually difficult to come up with an unobvious invention, since most ingredients and their effects are known.

> **EXAMPLE:** Lou comes up with a way to make mustard-flavored hot dog buns—admix powdered mustard with the flour. Even though Lou's recipe is novel, the PTO will almost certainly hold it to be obvious to a PHOSITA since the result of the new combination was entirely foreseeable and expected.

In sum, the PTO will usually hold that substitution of a different material, shape, color, or size is obvious. But if the substitution provides *unexpected* new results, the law will hold it to be unobvious.

The courts and the PTO will also usually consider the duplication of a part obvious unless it can see new results. For instance, in an automobile, the substitution of two banks of three cylinders with two carburetors was held obvious over a six-cylinder, single-carburetor engine, since the new arrangement had no unexpected advantages. However, the use of two water turbines to provide cross flow to eliminate axial thrust on bearings was held unobvious over a single turbine; again, an *unexpected* new result.

Similarly, making devices portable, making parts smaller or larger, faster or slower, effecting a substitution of equivalents (a roller bearing for a ball bearing), making elements adjustable, making parts integral, separable (modular), or in kit form, and other known techniques with their known advantages, will be held obvious unless new, unexpected results can be shown.

Occasionally an inventor will believe that an invention should be considered patentable because it is disposable. As a general rule, that assumption is incorrect. Making products disposable is an old and obvious expedient that has been done with cameras, razors, ballpoint pens, and cigarette lighters. Further, the term "disposable" is too vague to be used in a claim anyway since everything ultimately wears out and thus is disposable. (See Chapter 9 for more information about claims language.) However if you have found a new and unobvious way to make a product more cheaply so that it can be discarded and a new one purchased at a relatively low expense, then the novel way of making it can be patentable.

> **EXAMPLE:** Elaine discovers a new, cheap paper material that can be used to make soft, wearable underwear more cheaply so that it can be discarded after one day's use and at relatively low expense. Elaine's underwear or other garments made of her new paper material is probably patentable, as is the new paper material per se.

CAUTION

If you create what you believe to be a valuable invention, but it seems simple and obvious to you, don't assume automatically that it's legally obvious. Some very simple inventions, like the vegetable juicer and the Fourdrinier machine, have been granted very valuable patents!

NOTE

Design Patent Tip. In design cases, the design must have novel features, and the PTO must be able to regard these as unobvious to a designer of ordinary skill (a PHOSITA). If the design involves the use of known techniques that together don't produce any new and unexpected visual effect, then the PTO will consider it obvious. But if they produce a startling or unique new appearance, then the PTO will hold it to be unobvious. Since only the ornamental appearance and not the function of a design is relevant, the degree of novelty of the design will be the main determinant of unobviousness: a high degree of novelty will always be patentable, while a low degree of novelty will encounter rough sledding unless you can set forth reasons why it has a very different appearance or visual effect.

4. Secondary Factors in Determining Unobviousness

As mentioned, if the new and unexpected results of your invention are marginal, you *may* still be able to get a patent if you can show that your invention possesses one or more secondary factors that establish unobviousness. The PTO and the courts usually give these secondary factors much less weight than the "new and unexpected results" factor, but they still should be considered, especially in close cases. While the Supreme Court listed only three secondary factors in the *John Deere* case, I've compiled a list of 12 basic and ten combinatory secondary factors that the PTO and the courts actually consider. In the real world, these secondary factors must generally be dealt with only if the PTO makes a preliminary finding of obviousness or if your invention is attacked as being obvious. However, when deciding whether your invention is legally entitled to a patent, you'll have a much better idea of how easy or difficult it will be to obtain if you apply these secondary factors to your invention.

SKIP AHEAD

If you're sure that your invention is unobvious, feel free to skip this section, Section 5, and Section 6, and proceed directly to Section 7.

Although some of these secondary factors may appear similar, try to consider each independently, since the courts have recognized subtle differences between them. As part of doing this, remember that lawyers like to chop large arguments into little ones so that it will appear that there are a multitude of reasons for their position rather than just one or two. While this approach may seem silly, it's

nevertheless a fact (however sad) that the PTO and courts are used to hearing almost exclusively from lawyers (and, in the case of the PTO, from highly specialized patent agents). Accordingly, the general rule is, the more arguments you can use to claim unobviousness, the better your chances will be of getting a patent.

Now let's look at the secondary factors in detail.

Factor 1. Previous failure of others

If the invention is successful where previous workers in the field were unable to make it work, this will be of great help to your application. For instance, many previous attempts were made to use electrostatic methods for making photocopies, but all failed. Chester Carlson (a patent attorney himself) came along and successfully used an electrostatic process to make copies. This greatly enhanced his case for the patentability of his dry (xerographic) photocopying process.

Factor 2. Solves an unrecognized problem

Here the essence of your invention is probably the recognition of the problem, rather than its solution. Consider the showerhead that automatically shuts off in case of excess water temperature discussed in Chapter 2. As the problem was probably never recognized in the prior art, the solution would therefore probably be patentable.

Factor 3. Solves an insoluble problem

Suppose that for years those skilled in the art had tried and failed to solve a problem and the art and literature were full of unsuccessful "solutions." Along you come and finally find a workable solution, such as a cure for the common cold: you'd probably get a patent.

> **EXAMPLE:** Potato chips used to be sold in relatively expensive, heavy cardboard boxes that manufacturers thought were necessary to protect against chip breakage. Yet, many chips still broke. Someone thought of packaging the chips in plastic bags that were far cheaper, lighter, and actually reduced the amount of breakage. This invention also satisfies Factor 12.

Factor 4. Commercial success

If your invention has attained commercial success by the time the crucial patentability decision is made, this militates strongly in favor of patentability. Nothing succeeds like success, right?

Factor 5. Crowded art

If your invention is in a crowded field (art)—that is, a field that is mature and that contains many patents, such as electrical connectors or bicycles—a small advance will go farther toward qualifying the invention for a patent than it will in a new, blossoming art, such as monoclonal antibodies.

Factor 6. Omission of element

If you can omit an element in a prior invention without loss of capability, this will count a lot, since parts are expensive, unreliable, heavy, and labor-intensive. The best example I can think of is the elimination of the inner tube in tires.

Factor 7. Unsuggested modification

If you can modify a prior invention in a manner not suggested before, such as by increasing the slope in a paper-making machine, or by making the basket slope in a centrifugal juice extractor, this act in itself counts for patentability.

Factor 8. Unappreciated advantage

If your invention provides an advantage that was never before appreciated, it can make a difference. One inventor came up with a gas cap that was impossible to insert in a skewed manner. It was held to be patentable since it provided an advantage that was never appreciated previously.

Factor 9. Solves prior inoperability

If your invention provides an operative result where before only inoperability existed, then it has a good chance for a patent. For instance, suppose you come up with a jet fuel additive that prevents huge fires in case of a plane crash; you've got it made, since all previous fire suppressant additives have been largely unsuccessful.

Factor 10. Successful implementation of ancient idea where others failed

The best example I can think of is the Wright Brothers' airplane. For millennia humans had wanted to fly and had tried many schemes unsuccessfully. The successful implementation of such an ancient desire carries great weight when it comes to getting a patent.

Factor 11. Solution of long-felt need

Suppose you find a way to prevent tailgate-type automobile crashes. Obviously you've solved a powerful need and your

solution will be a heavy weight in your favor on the scales of patentability.

Factor 12. Contrary to prior art's teaching

If the prior art expressly teaches that something can't be done or is impractical—for example, humans can't fly without artificial propulsion motors—and you prove this teaching wrong, you've got it made. For example, one inventor realized that packaging potato chips in inexpensive bags (compared to more expensive boxes) actually decreased the amount of breakage. This contrarian discovery militated strongly in favor of nonobviousness.

5. Secondary Factors in Determining Unobviousness of Combination Inventions

Inventions that combine two or more elements known in the prior art can still be held patentable, provided that the combination can be considered unobvious—that is, it's a new combination and it produces new and unexpected results. In fact, most patents are granted on such combinations since very few truly new things are ever discovered. So let's examine some of the factors used especially to determine the patentability of "combination inventions" (that is, inventions that have two or more features that are shown in two or more prior-art references).

SKIP AHEAD

The following material is conceptually quite abstract and difficult to understand, even for patent attorneys. I'm presenting it in the interest of completeness. However, if you wish, you can safely skip it for now and proceed directly to Section 7. If the PTO or anyone else suggests that two or more prior-art references, taken together, teach that your invention is obvious, come back and read it then.

Factor 13. Synergism (2 + 2 = 5)

If the results achieved by your combination are greater than the sum of the separate results of its parts, this can indicate unobviousness. Consider the pistol trigger release (Chapter 2) where a magnetic ring must be worn to fire the pistol. The results (increased police safety) are far in excess of what magnets, rings, and pistols could provide separately.

> **EXAMPLE:** For another example, suppose that a chemist combines, through experimentation, several metals that cooperate in a new way to provide added strength without added density. If this synergistic result wasn't reasonably foreseeable by a metallurgist, the new alloy would almost certainly be patentable.

Generally, if your invention is a chemical mixture, the mixture must do more than the sum of its components. For this reason, food recipes are difficult to patent unless an ingredient does more than its usual function or produces a new and unexpected result. Or, if you come up with a new technique of cooking that produces a new and unexpected result—for example, a cookie that is chewy inside and crisp outside—you've got a good chance of prevailing. Similarly, if you combine various mechanical or electrical components, the courts and the PTO will usually consider the combination patentable if it provides more than the functions of its individual components.

As an example of an unpatentable combination without synergism, consider the combination of a radio, waffle iron, and blender in one housing. While novel and useful, this combination would be considered an aggregation and obvious, since there's no synergism or new cooperation: the combination merely provides the sum of the results of its components and each component works individually and doesn't enhance the working of any other component. On the other hand, the combination of an eraser and a pencil would be patentable (had it not already been invented) because the two elements cooperate to increase overall writing speed, a synergistic effect. The same would hold true for mounting loudspeakers in a plastic insulating picnic box, where new cooperation results: the box holds the food and provides a baffle for the speakers.

Factor 14. Combination unsuggested

If the prior art contains no suggestion, either expressed or implied, that the references should be combined, this militates in favor of patentability. Examiners in the PTO frequently are assigned to pass on patent applications for combination inventions. To find the elements of the combination claimed, they'll make a search, often using a computer, to gather enough references to show the respective elements of the combination. While the examiners frequently use such references in combination to reject the claims of the patent application on unobvious grounds, the law says clearly that it's not proper to do so unless the references themselves, or the prior art in general rather than an applicant's patent application, suggests the combination or that the results are predictable.

> **EXAMPLE:** Arthur B. files a patent application on a pastry-molding machine. The examiner cites (or your search reveals) one patent on a foot mold and another

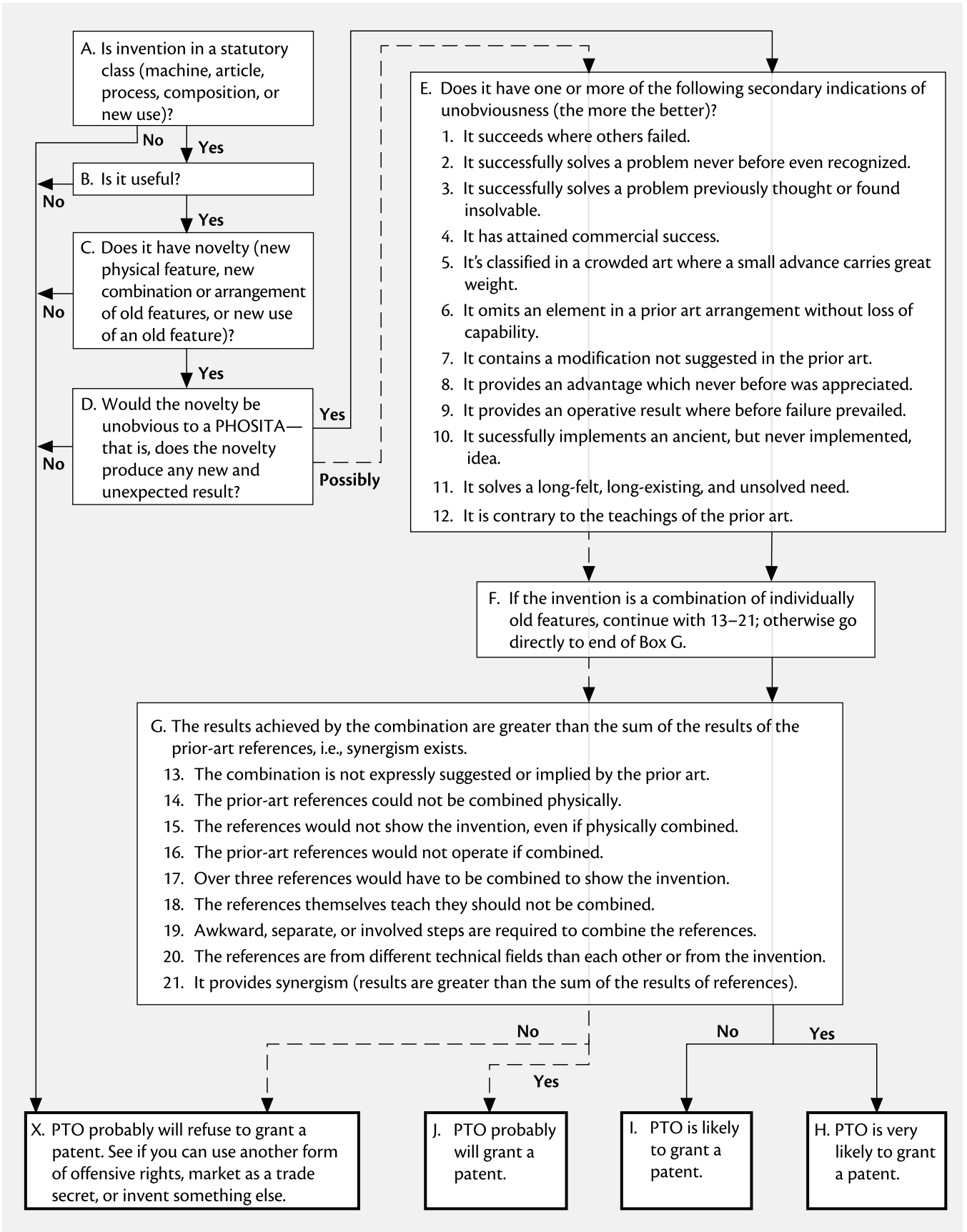


Fig. 5C—The Patentability Flowchart

on a pastry mold to show the two elements of the invention. It wouldn't be proper to "combine" these disparate references since they're from unconnected fields and thus it wouldn't be obvious to use them together against this invention.

An example of where the law would consider it obvious to combine several references is the case where, as discussed, you make a bicycle out of the lightweight carbon-fiber alloy and, as a result, your bicycle is lighter than ever before. Is your invention "unobvious"? The answer is "No," because the prior art implicitly suggests the combination by mentioning the problem of the need for lighter bikes and the lightness of the new alloy. Moreover, the result achieved by the combination would be expected from a review of existing bicycles and the new lightweight alloy. In other words, if a skilled bicycle engineer were to be shown the new, lightweight alloy, it would obviously occur to the engineer to make a bicycle out of it since bicycle engineers are always seeking to make lighter bicycles.

In KSR v. Teleflex (2007), the U.S. Supreme Court made it easier for the PTO or the courts to reject claims or hold patents invalid if those patents are based on a combination of references. Prior to this, the cases held that an invention should not be held obvious over several prior-art references unless there is a suggestion, motivation, or teaching that the references can or should be combined. This case held that there must be some apparent reason in the prior art to justify combining the references. For example, the existence of a problem can make it obvious to try various solutions. The prior art doesn't have to be directed to the precise problem, so long as the references still perform their same functions. If you argue that the combination was not suggested by the prior art, state (if applicable) that the problem solved by your invention is different and the references perform new functions in your combination and the result you achieve was not predictable.

Factor 15. Impossible to combine

This is the situation where prior-art references show the separate elements of the inventive combination, but in a way that makes it seem they would be physically impossible to combine. Stated differently, if you can find a way to do what appears to be physically impossible, then you can get a patent. For example, suppose you've invented the magnetic pistol release. The prior art shows a huge magnetic cannon firing release attached to a personnel shield. Since the step from a cannon to a small handgun is a large one, physical incompatibility might get you a patent—that is, it would be physically impossible to use a huge cannon shield magnet on a small and very differently shaped trigger finger. Note, however, that sometimes by analogy the large can properly be used on the small if a mere change in size is all that's required.

Factor 16. Different combination

Here your combination is A, B, and C, and the prior-art references show a different, albeit possibly confusingly similar combination, say A', B, and C. Since your combination hadn't been previously created, you've got a good case for patentability even though your creation is similar to an existing one. Again the last analogy holds: a personnel shield for a cannon, even though it has a magnetic firing release, is so far different from a finger ring that the prior-art combination must be regarded as different from that of the invention.

Factor 17. Prior-art references would not operate in combination

Here the prior-art references, even if combined, wouldn't operate properly, such as due to some incompatibility. Suppose you've invented a radio receiver comprising a combined tuner-amplifier and a speaker, and the prior art consists of one patent showing a crystal tuner and an advertisement showing a large loudspeaker. The prior-art elements wouldn't operate if combined because the weak crystal tuner wouldn't be able to drive the speaker adequately; thus a combination of the prior-art elements would be inoperative. This would militate strongly in favor of patentability.

Factor 18. Over three prior-art references necessary to show your invention

While not a very strong argument, if it takes more than three references to meet your inventive combination, this militates in your favor.

Factor 19. References teach away from combining

If the references themselves show or teach that they shouldn't be combined, and you're able to combine them, this militates in favor of patentability. For example, suppose a reference says that the new carbon-fiber alloy should only be used in structural members that aren't subject to sudden shocks, but you were able to make a bike out of the carbon-fiber alloy. If you're able to use it successfully to make a bike frame, which is subject to sudden shocks, you should be able to get a patent.

Factor 20. Awkward, involved combination

Suppose that to make your inventive combination, it takes the structures of three prior-art patents, one of which must be made smaller, another of which must be modified in shape, and the third of which must be made of a different material. These factors can only help you.

Factor 21. References from a different field

If the references show structures that are similar to your invention, but are in a different technical field, this militates in favor of unobviousness and hence of patentability. I used this argument successfully to get a food mold patented over a similarly shaped device for molding a horse's foot.

Factor 22. Easier to assemble or manufacture

If the novel feature(s) of your invention make it easier or cheaper to assemble or manufacture, this is an important advantage which can be used to prove unobviousness.

6. How Does a Patent Examiner Determine "Unobviousness"

Because it's usually helpful to understand how a bureaucracy operates when you're dealing with it over significant issues, let's take a minute to examine how a patent examiner proceeds when deciding whether or not your invention is obvious. When patent examiners turn to the question of whether an invention is unobvious, they first make a search and gather all of the patents that they feel are relevant or close to your invention. Then they sit down with these patents (and any prior-art references you've provided with your patent application) and see whether your invention, as described in your claims (see Chapter 9), contains any novelty (novel physical features, new combination, or new use) that isn't shown in any reference. If so, your invention satisfies Section 102—that is, it is novel.

Next they see whether your novelty produces any unexpected or surprising results. If so, they'll find that the invention is unobvious and allow your patent application. If not (this usually occurs the first time they act on your case), they'll reject your application (sometimes termed a "shotgun" or "shoot-from-the-hip" rejection) and leave it to you to show that your new features do indeed produce new, unexpected results. To do this, you can use as many of the reasons listed above that you feel are relevant. If you can convince the examiner, you'll get your patent.

If a dispute over unobviousness actually finds its way into court, however, (a common occurrence) both sides will present the testimony of patent lawyers or technical experts who fit, or most closely fit, the hypothetical job descriptions called for by the particular case. These experts will testify for or against obviousness by arguing that the invention is (or isn't) new and/or that it does (or doesn't) produce unexpected results.

Again, because the question of whether an invention is unobvious is clearly crucial to whether a patent will issue and because Sections 102 and 103 are widely confused, I have made the two-step evaluation Inventor's Commandment #7 at the beginning of this chapter.

7. Weak Versus Strong Patents

Although in this section I've covered the basic legal requirements for obtaining a patent on an invention, there is, in reality, an additional practical requirement. If the claims in your patent are easy to design around or are so narrow as to virtually preclude you from realizing commercial gain, it's virtually the same as if a patent had been denied you in the first place. I'll come back to this point when I cover how to conduct a patent search (Chapter 6) and how to draft your claims (Chapter 9).

8. The Inventor's Status Is Irrelevant

You may have noticed that in discussing the requirements for obtaining a patent, I didn't mention the inventor's status or personal qualifications (such as, the applicant should be an engineer, over 21, and so on). That is because status and personal qualifications are totally irrelevant. An invention need merely meet the four legal criteria (Section B, above). The applicant must qualify as a true inventor of the invention (discussed in Chapter 10), but his, her, or their age, sex, citizenship, country of residence, mental competence, health, physical disabilities, nationality, race, creed, religion, state of incarceration, degree of education, amount or time spent inventing, and so on, are irrelevant. The PTO recently issued a patent to a death row inventor (U.S. Pat. No. 6,260,795). Even a dead or insane person can apply (through a legal representative, of course).

The manner of making the invention is also irrelevant, as we'll see by the next Common Misconception.

Common Misconception: If a person invents something by accident, the law won't consider it to be as good an invention as if a genius had come up with it through years of hard, brilliant work.

Fact: The mental abilities of the inventor and the manner of making an invention are totally irrelevant to patentability. The invention is looked at in its own right as to whether or not it would be obvious to one skilled in the art; the

way it was made or the qualifications or competence of the applicant are never considered by the PTO.

G. The Patentability Flowchart

To get a better grasp of the admittedly slippery concept of unobviousness and the role it plays in the patent application process, consider Fig. 5C—The Patentability Flowchart. This flowchart is like a computer programmer's flowchart, except that all blocks have been made rectangular to use space more efficiently. In addition to presenting all of the criteria used by the PTO and the courts for determining whether an invention is unobvious, the chart also incorporates the first three tests (statutory class, usefulness, and novelty) of Fig. 5A. I strongly advise that you study this chart and the following description of it well, since it sums up the essence of this crucial chapter. Also, you'll want to use this chart when making your search (next chapter) and when prosecuting your patent application (Chapter 13). This chart has been designed to cover and apply to anything you might come up with, so you can and should use it to determine the patentability of any utility invention whatever. I go through the chart using a real invention and real references in Chapter 6, Section G.

Box A (Statutory Class): Assuming that you've made an invention, first determine, using the criteria discussed above, whether you can reasonably classify your invention in one of the five statutory classes indicated. If not, take the "No" output of Box A to the Box X on the left bottom of the chart.

As indicated in Box X, the PTO will probably refuse to grant you a patent, so see if you can gainfully use another form of coverage (such as trade secret, copyright, design patent, trademark, or unfair competition, as discussed in Chapters 1 and 7). If this possibility also fails, you'll have to give up on the creation and invent something else. If the invention can be classified within a statutory class ("Yes" output of Box A), move on to Box B.

Box B (Utility): Now determine, again using the criteria above, whether the invention has utility, including amusement. If not, move to Box X. If so, move on to Box C.

Box C (Novelty): Here's the important novelty determination. If an invention has any physical features that aren't present in any single prior-art reference, or if it is a new combination or rearrangement of old features, or a new use of an old feature or old hardware, no matter how trivial, it will clear Section 102—that is, it has novelty: take the "Yes" output to Box D. If not, it lacks novelty, so take the "No" output and go to Box X again.

Box D (Unobviousness Due to New and Unexpected Results): This is the heart of the chart. You should now determine whether the novelty of your invention would be unobvious to a PHOSITA, that is, does the novelty produce any new and unexpected result ("N&UR")? Use the criteria and examples presented in Sections F1 through F4, above. If you definitely feel that your invention does not provide any N&UR, take the "No" output from Box D to Box X. On the other hand, if your answer is a clear "Yes" (you're sure you have N&UR), it's likely you'll be able to get a patent. While not mandatory, I recommend that you obtain additional reasons for patentability to boost your confidence by taking the "Yes" output to Box E to consider the "secondary" factors.

If, however, at this point you can't come up with a clear "Yes" or "No" as to N&UR—that is, your invention falls somewhere between these two extremes—it can still qualify for a patent if it has one or more secondary factors. In this case, follow the broken-lined "Possibly" output of Box D to Box E to determine whether your invention qualifies for a patent, even though it doesn't produce any N&UR. From here on, if you took the "Yes" output of Box D, you'll follow a solid-line route, but if you took the "Possibly" output, you'll follow the broken-line route.

Boxes E, F, and G (Other Factors): No matter whether you take the "Yes" = solid line or "Possibly" = broken line route from Box D, you should next answer all of the questions in Box E. Then move to Box F, which tells you to answer all of the questions in Box G if you have a combination invention, or to go directly to the end of Box G if it's not a combination invention. The more questions in Boxes E and G to which you can answer "Yes," the better your chances will be. No matter how you go through Boxes E to G, there are four possibilities, identified below as 1 (A&B) and 2 (A&B).

1. N&URs exist ("Yes" from Box D—solid-line route):
   A. If you answered "Yes" to Box D and to one or more questions in Boxes E and G (there are N&URs and one or more secondary unobviousness factors), take the "Yes"/solid-line output from Box G to Box H, where you'll see that the PTO is very likely to grant you a patent.
   B. If you were not able to answer "Yes" to any question in Boxes E and F (there are N&URs, but no secondary unobviousness factors), take the "No"/solid-line output from Box G to Box I, where you'll see that you'll still be likely to get a patent, based on your N&URs (Box D).
2. Possible N&URs ("Possibly" from Box D—broken-line route):
   A. If you answered "Possibly" to Box D and "Yes" to one or more questions in Boxes E and G (you're unsure about N&URs but you have one or more secondary unobviousness factors), take the "Yes"/broken-line output from Box G to Box J, where

you'll see that the PTO will still probably grant you a patent.

B. If you answered "Possibly" to Box D, but were not able to answer "Yes" to any question in Boxes E and G (you're unsure about N&URs and there are no secondary unobviousness factors), take the "No"/broken-line output from Box G to Box X, where you'll see that you probably won't be able to get a patent. Don't give up though, if you still think you might be able to prove some secondary factors later, such as commercial success after it hits the market.

H. Don't Make Assumptions About the Law

While I've tried to explain as much as possible about patent law, I can't cover everything. So if you encounter an issue you don't know the answer to and can't find the answer in this book, I strongly suggest that you don't act on any assumptions, because you could suffer for acting on an incorrect assumption. True examples:

- LeRoy assumed that—because a regular patent application had to have at least one claim to be entitled to a filing date—his application, which had four independent claims, counted as four patent applications. He then advertised that he had four patents pending that covered his invention.
- Griselda assumed that if a prior patent showed her invention, but didn't claim it, then she was entitled to get claims to this invention allowed in her patent application.

To avoid these incorrect assumptions and the harm that could befall you, I suggest that if you can't find the answer to an issue, you look further, ask a patent attorney, call the PTO's Help Desk at 800-786-9199, or ask an inventors' organization.

I. Summary

Treat the one-year rule as holy: You must file a regular or provisional application within one year after you publicize, sell, or offer your invention for sale, or after it is used publicly, or given or shown to another to use without restriction. However, to preserve foreign rights, you should file your U.S. application before publicizing the invention.

The law has four requirements for getting a patent: (1) the invention must be in a statutory class—a machine, an article, a process, a composition, or a new use of the first four; (2) it must be useful (safe, not illegal, operable, and not a nuclear weapon); (3) it must be novel—that is, it must be different in some way from every single item or prior art (prior art means any publication, public use, or public knowledge before your date of invention, which is the earliest of the date you file a patent application or Provisional Patent Application); and (4) the novel features must be unobvious to one with ordinary skill in the art—that is, it must produce new and unexpected results or have one or more of the secondary factors of unobviousness.

CHAPTER 6

Search and You May Find

Inventor's Commandment 8

You should make (or have made) a thorough patentability search of your invention before you decide whether to file a patent application, and you should not file a patent application unless you believe your invention has—in addition to strong commercial potential—one or more novel features over the prior art which you believe the PTO will consider to be unobvious.

Since you've learned how to determine patentability from Chapter 5, you can now make a patentability search. The Patent and Trademark Office (PTO) doesn't require a search, but I strongly recommend that all inventors make (or have made) a search prior to deciding whether to file a patent application. Thus I've made the "pre-ex" (preexamination) patentability search Inventor's Commandment 8. In reality, this chapter is paradoxical, since it tells you how to look for something you hope you won't find! But don't let that affect your search. For the reasons below, you should do the search diligently and thoroughly.

A. Why Make a Patentability Search?

I've come up with 14 reasons for making a patentability search. Let's look at each of them in detail.

1. To Determine Whether You Can Get a Patent

The main reason for making a patentability search of your invention is to discover if the PTO will be likely to grant you a patent on your invention. If your search indicates that your invention is likely to qualify for a patent, you can go ahead with your development, marketing, and other work on the invention with far more confidence that your efforts will eventually produce positive results. Obviously, if a patent is ultimately granted, you will have a monopoly in the field of the invention for a number of years. Assuming, of course, that your invention has economic value, this will allow you to sell or license it for a reasonable amount, since you'll have at least some assurance that a right to exclude copiers will go with the invention.

If your patentability search indicates that a patent isn't likely to be granted, you'll have to think long and hard about whether to proceed. Most manufacturers won't want to invest the money in tooling, producing, and marketing something that their competition can freely copy, and perhaps even sell at a lower cost. As we'll see in Chapter 7, however, this isn't always true. While it's somewhat unusual, fortunes have sometimes been made manufacturing and selling unpatentable inventions.

2. To Avoid Needless Expenditures and Work

Another reason to make a patentability search has to do with time and money. It's a lot easier (and cheaper) to make a patentability search than to prepare a patent application that must contain a specification, drawings, claims, a filing fee, forms, etc. It makes sense to do a relatively small amount of work entailing a modest expenditure in order to gain useful information that may well allow you to avoid wasting considerable time and/or spending a relatively large amount of money.

3. To Provide Background to Facilitate Preparation of Your Patent Application

You'll find it far easier to prepare a patent application on your invention if you make a patentability search first. This is because a search will bring out prior-art references (prior publications including patents and literature) in the field of your invention. After reading these, you're almost sure to learn much valuable background information that will make the task of writing your patent application far easier. Patent attorneys almost always routinely review some sample patents from the field of an invention before they begin preparation of a patent application, in order to give them a "feel for the art."

4. To Know Whether to Describe and Draw Components

A patent application must contain a detailed description of your invention, in sufficient detail to enable a person with ordinary skill in the "art" involved to make and use it. If your invention has certain components with which you aren't familiar, you won't have to take the trouble to draw and describe these in detail if you find them already described in prior-art publications, including patents.

5. To Provide More Information About Operability and Design

When you make a search, you will almost always find patents in the field of your invention, possibly on inventions similar to yours. A reading of these patents will give you valuable technical information about your invention, possibly suggesting ways to make it work better and improve its design, or possibly indicating technical approaches that you should avoid.

6. To Obtain Commercial Information

The patents and other references that you uncover in your search will give you valuable commercial information about similar developments to your invention. For instance, suppose you see many patents on inventions that produce the same result as yours, and you know from your familiarity with the field that none of these has attained commercial success. In this event, you might want to reconsider the wisdom of pushing ahead with your own invention. Or you might conclude that you can do better, because the prior inventions were not commercially exploited properly or because they did not operate properly due to lack of proper components, proper materials, etc.

7. To Obtain Possible Express Proof of Unobviousness

Sometimes a search will uncover references that actually "teach away" from your invention—for example, by suggesting that your approach won't work. You can cite such a reference to the PTO to help convince the examiner to regard your invention as unobvious. (See secondary reason 3 in Chapter 5, Section F4.)

For instance, suppose you've invented a bicycle frame made of a new carbon-fiber alloy that makes your bike far lighter and stronger than any previously made. Ordinarily, as discussed in Chapter 5, Section F, the substitution of a known alternative material (here a carbon-fiber alloy for steel) would not be patentable, since the substitution would not provide any *unexpected* results. But suppose during your search you find a prior-art reference (such as an article in *Metallurgic Times*) that states that carbon-fiber should not be used for bicycle frames because it cannot absorb shocks. If you find that such alloys can be used successfully, you can cite this reference to the PTO to show that you've turned a past failure into success. Thus you'll have express, positive proof that your invention provides unexpected results and is unobvious.

8. To Define Around the Prior Art to Facilitate Prosecution

By familiarizing yourself with the prior art, you'll be able to tailor and define the general thrust, structure, and advantages of your patent application around such art and its deficiencies. This will save you work and arm you with the proper terminology and support that you may need later in the "prosecution" stage (that is, the stage where you actually try to obtain a patent from the PTO).

EXAMPLE: LeRoy invented a sturdy but edible, baked scoop for dips, including salsa. His search turned up a patent to Minerva on a similarly shaped cereal product, but which was too fragile for scooping dips. As a result of the knowledge gleaned from his search, LeRoy was able to direct his patent application to the novelty of his scoops by knocking the fragility of Minerva's product and explaining and stressing the strength of his scoops with actual (quantitative) performance figures. This enabled him to distinguish over Minerva's invention and get a patent.

More about this in Chapter 13. Also, an international application, discussed in detail in Chapter 12, requires that an invention be defined in a way that distinguishes it from the prior art. Your search will be of great help here.

9. To Learn Your Invention's Novel Features so as to Expedite Prosecution

After making a thorough search of the prior art, you'll be able to find out which of your invention's features are novel (Box C of Fig. 6E—Patentability Flowchart, below). By listing its novel features and their attendant advantages, you'll be able to recite, stress, and direct your patent application to all of those features and advantages. Also, you can tailor your claims to such novel features so as to preclude an early "final action" (see Chapter 13, Section J), expedite the ultimate allowance of your case, and avoid the need to narrow the claims which—under a decision called *Festo v. Shoketsu*—would prevent using the "doctrine of equivalents" to interpret them more broadly. (For more information on *Festo,* see Chapter 9, Section J.)

10. To Facilitate Licensing or Sale of Your Invention

When you attempt to sell or license your invention rights, your potential licensees will want to know if your patent application will be likely to get through the PTO. You can answer their concern, at least partially, by showing them your search results. This will give them confidence in your invention and will save them from having to do their own search, thereby speeding up and facilitating negotiations.

11. To Find Out What You've Really Invented

Yes, I'm serious! From over 30 years' experience I've found that many inventors don't realize or understand exactly what they've invented until they see a search report. Indeed, many inventors get a severe case of "search shock" when

their "major advance" turns out to be relatively minor. If this happens, don't give up on your brainchild, since your minor advance may be extremely valuable and vital. On the other hand, occasionally an inventor, believing that the invention is a relatively small advance and that its basic broad idea must have already been invented, is very pleased and surprised to learn from the search results that the invention's a gold mine instead of a nugget!

12. To Get a Stronger Patent

A PTO examiner will usually make a better search than you or a professional searcher will be able to do. Nevertheless, some examiners, at certain times, may miss a highly relevant reference. If anyone uncovers such a reference later, after you get your patent, and brings this reference to the attention of the PTO or any court, it may cast a cloud over, or even invalidate, your patent. However, if you find such a reference in your search, you can (and must) make a record of it in the PTO's file of your patent application, tailor your claims around it (see Chapter 9), and avoid any potential harm it may cause you later, thus making your patent stronger and less vulnerable.

13. To Get Your Patent Application Examined Ahead of Turn

For reasons explained in Chapter 10, Section I, I don't always recommend that you get your patent application issued sooner, but if you really need to speed things up, you'll be entitled to get it examined ahead of its turn if you've made a preexamination search. (See Chapter 10, Section I, for more on how to make a patent application "special" in order to speed up examination.)

14. To Determine If Your Invention Will Infringe Any In-Force Patents

The PTO doesn't care one bit about infringement and will allow your patent application even if hardware embodying your claimed invention would infringe ten in-force patents. (Note that a patent application can never infringe anything.) However, you may wish to know if your invention if made, used, sold, offered for sale, or imported, will infringe any existing patents, especially if you're considering manufacturing the invention. A search and study of the claims of all relevant in-force patents will reveal this. For more information about claims, check Chapter 9. Chapter 15 explains how to determine if a device or process infringes a claim.

B. When Not to Search

Despite my inventor's commandment about doing a patent search prior to filing, there are at least two situations where you can "skip the search."

If you are dealing in a very new or arcane field with which you're very familiar, obviously a search is highly unlikely to be profitable. For example, if you're a biotech engineer who reads all the journals and patents to keep abreast of the state of the art, the newness of your field makes it highly unlikely that you will find any early "prior art." Or, if you make semiconductors and have up-to-the-minute knowledge of all known transistor-diffusion processes, and you come up with a breakthrough transistor-diffusion process, a search will probably not produce any reference showing your idea. Before deciding not to search, however, you should be reasonably certain that you or someone else with whom you are in contact knows all there is to know about the field in question, and that you are fairly confident there is no obscure reference that shows your invention.

In addition, if you've made an improvement to an earlier invention that you've already searched, and you feel the search also covered your improvement, there's obviously no need to make a second search.

TIP

Designs. Generally I recommend not searching design inventions, since the cost and time required to make the search is greater than the time and cost to prepare a design patent application. However, if you believe that reasons 6, 7, 9, 10, 11, and/or 12 of Section A, above, may be particularly relevant to your situation, you should make a search of your design. Also, you must search your design invention if you want to petition to have your design application examined right away on the "Rocket Docket." See Chapter 10, Section J.

Common Misconception: There's no reason to make a patentability search prior to filing a patent application since the PTO will make one anyway.

Fact: Even though the PTO will make a search, there are many good reasons (see the 14 reasons, above) to make a search before filing.

C. The Two Ways to Make a Patentability Search

Basically, there are only two ways in which you can get your search done: have someone do it for you or do it yourself. If you're a conscientious worker and you have the time, and

access to a search facility, or you have computer search capability, I recommend that you do the search yourself in order to make sure that it is done thoroughly. In addition, this will save you money and enable you to accumulate valuable information

However, you may have very good reasons for hiring a professional searcher—for example, you live far from any search facility or you don't have a computer or enough time. Also, there's the procrastination factor: half the time the only way some of us will ever get a job done, even though we're capable of doing it, is to turn it over to a pro. If for geographical or other reasons you choose to hire a searcher, you'll find advice on choosing one in Section E, below. Even if you do use a searcher, read through the instructions on do-it-yourself searching in order to understand what you're paying for and to be able to recognize whether the searcher has done a thorough job.

Some inventors, because of the importance of the reasons for searching listed above, prefer to do the search themselves and also have a professional search done, just to double-check their work. I don't recommend this, since I've found that an inventor's diligent search is usually adequate. Still, if you feel insecure about your search, you might want to use a computer search as a rough double-check. Unless your computer search "knocks out" your invention, I generally do not recommend relying on the computer completely, however, because computer searches can miss valuable prior art unless you use the same search words that are in the relevant prior patents. If you do the patentability search yourself, there are three subpossibilities:

1. You can search using the EAST computer system in the PTO in Alexandria, Virginia (definitely the best database),
2. You can do an Internet computer search at home or at work, alone or combined with a professional search, or
3. You can do a PubWEST or Internet computer search in a local Patent and Trademark Depository Library. Further, wherever you search, there are two types of searches that you can make:
   - **By Classification:** You can make a search of all patents in a particular class and subclass (classification search). E.g., if you were looking for a bicycle derailleur you would look through all patents in the class "bicycles" and the subclass "derailleurs" to find anything like your derailleur. This method of searching is traditional and, while still useful, is becoming less popular and is yielding to the Keyword method because the latter is more compatible with computers.
   - **By Keyword:** You can also search for keyword combinations in all patents (Keyword search). E.g., if you were looking for a bicycle derailleur that used a sun gear you would look through all patents using the keywords "bicycle," "derailleurs," and "sun gear" to cull out all patents using these three terms. This method of searching is highly amenable to computers, but the classification method is still useful.

Paper Patents Are No Longer Searchable

In the past inventors and searchers were able to go into the PTO and search paper patents, either in the public search room or the examining division. The patents were filed in drawers or on shelves according to their class and subclass, together with foreign patents and non-patent literature. Also many PDLs had paper patents arranged by class. However the computer has now supplanted paper patents for search purposes, so that now the only way to search patents, by either Classification or Keywords, is to search a patent database by using the computer. I will review the search databases later.

D. The Quality of a Patent Search Can Vary

Like anything else, the quality of your patentability search can vary from very bad to near perfect. It can never be perfect since, because of their confidential status, there is no way to search unpublished pending patent applications. (As stated in the last chapter, a patent application that is based on an RPA or PPA that was filed before your date of invention is valid prior art against your application, even if the patent issues after you file.)

Other reasons why your search may not be perfect are:

- some prior-art references can be missing from the database you're searching ("class and subclass"—see Section I, below)
- most patent computer searches do not contain foreign, non-patent, or exotic references (such as theses, service manuals, magazines, textbooks, etc.)
- very recently issued patents may not have been placed in the computer's database yet
- a relevant reference (patent or non-patent) may not have been described using terms that conform to your view of reality—that is, because of human variability, it may be described using terms that you would not use, or even think of, or

- your invention may have either been used publicly (without being published) before your invention, or it may have been previously invented by someone else who did not abandon, suppress, or conceal it so that it has not been filed in any database.

E. How to Hire a Patent Professional

Here are some suggestions for how to find and work with a patent professional.

1. Lay Patent Searchers

A lay patent searcher is not licensed to represent inventors before the PTO, (that is because they are usually engineers but not patent agents or patent attorneys). Lay searchers, as well as attorney-agent patent searchers, can be located on the Internet or in the yellow pages of local telephone directories under "Patent Searchers." Others advertise in periodicals, such as the *Journal of the Patent and Trademark Office Society*, a publication for patent professionals edited and published by a private association of patent examiners, or *Inventor's Digest* (see Appendix 2). Although there are many good lay searchers, I have had far better results with patent attorneys and agents than with lay searchers. Attorneys and agents understand the concept of unobviousness (see previous chapter) better and thus dig in more places than might at first appear necessary. However, lay searchers have one big advantage: They charge about half of what most attorneys and agents charge. Nevertheless, before hiring *any* searcher, I would find out about the searcher's charges, technical background, on-the-job experience, usual amount of time spent on a search and where the searcher searches (in the PTO's main search room in the examining division and/or using the EAST system). Most importantly, I would also ask for the names of some clients, preferably in your city, so that you can check with them. Lay searchers do not have to be licensed by any governmental agency, so you should exercise more care in selecting one and you should be aware that they're not allowed to express opinions on patentability.

2. Patent Agents

A "patent agent" is an individual with technical training (generally an undergraduate degree in engineering or science) who is licensed by the PTO to prepare and prosecute patent applications. A patent agent can conduct a patent search and is authorized to express an opinion on patentability, but cannot represent you in court,

How to Use a Lawyer or Agent

I have seen many instances where inventors have used a patent lawyer or agent (I'll refer to them as "practitioners") to handle their patent application and have been disappointed. They may be left bereft of knowledge of the status of their application, feel gypped, and/or left with an abandoned application without good cause. Below are some things to do to make sure these misfortunes don't happen to you.

1. Before using a practitioner at any stage of the process, please review the material in this book as it can be invaluable to explain the procedures and law. It will help you make the best use of the practitioner, and will save on the practitioner fees.
2. Make sure the practitioner sends you a copy of each and every document (letter or official paper) that they generate for you or receive on your behalf.
3. Save every paper you receive from the practitioner in a file, keeping official papers, bills, and letters separate.
4. Make sure you understand everything the lawyer or agent does or proposes to do for you and why the practitioner is taking this course of action. Almost every possible action is explained in this book, but if not, ask the practitioner to explain it to you. You're paying the practitioner and are entitled to know what and why the practitioner is doing or proposes to do anything.
5. Find out in advance the cost of every task the practitioner intends to perform for you and make sure the practitioner understands that you need to approve each and every fee in advance. Have the practitioner agree to obtain your advance approval if any fee will be exceeded. You don't want any open billing. Also make sure the practitioner agrees to send you bills with disbursements itemized and kept separate from the practitioner's fees and that the bills state the basis (time or fixed rate) for the practitioner's fees.
6. If you can't communicate with the practitioner, feel that the practitioner is not acting competently, ethically, or honestly, or don't understand what the practitioner is doing and are unable to obtain an adequate explanation, find another practitioner and dismiss the old practitioner. You are entitled to dismiss your practitioner at any time (with rare exceptions) and are entitled to obtain your file without charge, if you haven't kept a copy of your papers as recommended in items 1 and 2 above. The file belongs to you.

cannot handle trademarks, and cannot handle licensing or infringement suits. All other things being equal, I recommend using an attorney rather than an agent for searching (and patent application work), since most patent attorneys have experience in licensing and litigation which will usually lead them to make wider and stronger searches for possible use in adversarial situations. However, always consider the competence of the individual, how much time he or she will spend with you, and how well you get along.

3. Patent Attorneys

A "patent attorney" or "patent lawyer" is licensed to practice both by the PTO and the attorney-licensing authority (such as the state bar, state supreme court, etc.) of at least one state. A "general" lawyer licensed to practice in one or more states, but not before the PTO, can handle copyrights and trademarks but is not authorized to prepare patent applications or use the title "patent attorney." An intellectual property attorney handles trademarks and copyrights and may or may not be licensed by the PTO to prepare and file patent applications.

4. Finding Patent Agents and Attorneys

All patent agents and attorneys registered to practice before the PTO are listed on the PTO's website at https://oedci.uspto.gov/OEDCI/GeoRegion.jsp (A&ARTP). For patent search purposes, you will want to find an attorney or agent in the Alexandria, Virginia, area (a suburb of Washington, DC). Most patent attorneys and agents who do searching in the PTO can be found in the District of Columbia section, or the Virginia section of A&ARTP under zip codes 22202 or 22301-22336. Pick one or more of these and then call or write to say you want a search made in a particular field. (Generally, hiring an attorney in your locality to do the search is a very inefficient and costly way to do the job, because the attorney or agent will have to hire an associate in or travel to Alexandria to make the search for you. This means you'll have to pay two patent professionals or travel expenses for the search.)

Of course, finding a good patent professional often involves more than checking a list. The best way is by personal referral. Ask another inventor, your employer, your local inventors' organization, a general attorney whom you like, a friend, etc. Another way to check an attorney or agent is to look at the patents they've prepared. You can find these online on the PTO site (see Section H of this chapter) by entering the attorney's name and reading some of the recent patents with the attorney's name on them. When reading the patent, see if the writing's clear, if the advantages of the invention are stressed, if the invention is explained fully, if ramifications of the invention have been discussed, and if the technical field of the invention is similar to yours. If you do find someone who seems good, make a short appointment to discuss the broad outlines of your problem. This will give you a feel for the attorney, whether the chemistry's good between the two of you, whether the fees are acceptable, etc. Ask what undergraduate degree the attorney has (almost all have undergraduate degrees in engineering or a science); you don't want to use a mechanical engineer to handle a complex computer circuit.

Your next question should be, "Will the professional help you help yourself or demand a traditional attorney-client relationship (attorney does it all and you pay for it)?" Many corporate-employed and retired patent professionals will be delighted to help you with your search, preparation, and/or prosecution of your patent application. Using this approach, you can do much of the work yourself and have the professional provide help where needed at a reasonable cost.

How to Find "Discount" Patent Attorneys and Agents

Active patent professionals (attorneys and agents) are either in private practice (a law firm or solo practice) or employed by a corporation or the government. Most patent professionals in private practice charge about $100 to $600 an hour. But many corporate-employed or semiretired patent professionals also have private clients and charge considerably less than their downtown counterparts. If you want or ever need to consult a local patent professional, you'll save money by using one of these "discount" patent professionals; their services are usually just as good or better than those of the full-priced law firm attorneys. Also, since they have much less overhead (rent, books, secretaries), they'll be more generous with their time (except that patent professionals employed by the federal government are not allowed to represent private clients). Look in the geographical region listing of A&ARTP or search by zip code for corporate-employed or retired (but still licensed) patent professionals in your area; the latter can usually be identified by their corporate addresses or addresses in a residential, rather than a downtown, neighborhood. You can expect to pay substantially more for attorneys in downtown high-rise office buildings.

When it comes to fees, you should always work these out in advance. Some patent professionals charge a flat fee for searches (and also for patent applications and amendments); others charge by the hour. If you plan to do much of the work yourself, you'll want hourly billing. If you do agree to hourly billing, be sure to first obtain an estimate of the maximum number of hours and an agreement to notify you in advance if this will be exceeded. Many patent attorneys are used to corporate clients who use an open-ended billing arrangement—that is, they bill by the hour without providing any limit or flat fee arrangement. I strongly advise you to avoid this type of billing since you can quickly become liable for far more than you may want to spend. Also, be sure it's clear who will pay for other costs associated with prosecuting a patent, such as copies, postage, drafting, filing fees, etc.

When you visit a patent attorney or agent, remember that they're not an oracle of knowledge: Don't expect to be able to lay a prototype or sketch of your invention on their desk and say, "What do you think of this?" and have them instantly tell you its commercial value and give you an opinion on patentability. First, they usually are not qualified to do a commercial evaluation. Second, they can't give you an opinion on patentability without making and analyzing a search.

F. How to Prepare Your Searcher

You'll want to use your patent searcher to maximum efficiency. Do this by sending your searcher a clear and complete description of your invention, together with easily understandable drawings. Be sure to disclose all embodiments, variations, and ramifications so that these will be searched. You won't compromise any trade-secret status of your invention (or start the one-year clock running) by such a letter since by law it's considered a confidential communication. If you wish any type of particular emphasis applied to any aspect of your search, be sure to inform the searcher of this fact. If your notebook record of your invention or your invention disclosure is clear enough, you can merely send the searcher a copy. Whether you send a copy of your notebook entries or a separate disclosure (Form 3-2), I recommend that you blank out all dates on any document you send to anyone: this will make it more difficult for any potential invention thief (extremely rare) who might gain access to your disclosure to antedate you. Fig. 6A is an example of a proper search request letter from an inventor and Figs. 6B (a, b, c) are copies of the attachments to the search request letter of Fig. 6A.

You don't need to have a patent agent or a patent attorney sign a Keep-Confidential Agreement (Chapter 3), since registered (PTO-licensed) patent professionals are strictly bound by the PTO's rules to keep all client communications confidential. However, if you feel insecure, or you are using a layperson to search, you certainly can ask your searcher to sign Form 3-1. In any case, you should always keep a "paper trail" of all disclosures you make to anyone.

G. Analyzing the Search Report

After you send out your search request, the searcher will generally take several weeks to perform the patentability search, obtain copies of the patents and other references that the searcher feels are relevant, and report back. Most search reports have four parts:

1. A description of your invention provided by the searcher to assure you that the searcher has understood your invention and to indicate exactly what has been searched.
2. A list of the patents and other references discovered during the search.
3. A brief discussion of the cited patents and other references, pointing out the relevant parts of each.
4. A list of the classes, subclasses, or keywords searched and the examiners consulted, if any.

The searcher will enclose copies of the references (usually U.S. patents, but possibly also foreign patents, magazine articles, etc.) cited in the search report and enclose a bill. Most searchers charge separately for the search, the reference copies, and the postage. If you've paid the searcher a retainer, you should be sent a refund unless your retainer was insufficient. In this case, you'll receive a bill for the balance you owe.

EXAMPLES:

- Fig. 6C is an example of a typical, competently done search report sent by Samuel Searcher, Esq., in response to Millie Inventress's letter of Fig. 6A.
- Fig. 6D(a) is a copy of page 1 (the drawing) of the Gabel patent cited in the search report.
- Fig. 6D(b) is a copy of page 2 of Gabel (the first page of Gabel's specification).
- Fig. 6D(c) is a copy of page 1 of the Le Sueur patent cited in the search report.

I haven't shown the other cited patents and the rest of the Gabel and Le Sueur patents, as these aren't necessary for our patentability determination.

You should now read the searcher's report and the references carefully. Then, determine whether your invention is patentable over the references cited in the search report. Let's use Millie's search report as an example of how to do this.

Millie Inventress
1901 JFK Boulevard
Philadelphia, PA 19103

2011 Jan 22
Samuel Searcher, Esq.
2001 Jefferson Davis Highway
Arlington, VA 22202

Patentability Search: Inventress: Napkin-Shaping Ring

Dear Mr. Searcher:

As we discussed on the phone yesterday, you were highly recommended to me as an excellent searcher by Jacob Potofsky, Esq., who is a general attorney here and a cousin of my friend, Shirley Jaschik. You said that you would be able to make a full patentability search on my above invention, including an examiner consultation and a search in the examiner's files to cover foreign and nonpatent references, for $1,000, including patent copies and postage. I have enclosed this amount as full payment in advance, per your request. You said that you would mail the search report (without an opinion on patentability) and references to me within three weeks from the date you receive this letter.

Enclosed are three sheets of drawings from my notebook (I have properly signed, witnessed, and dated records elsewhere); these sheets clearly illustrate my napkin-shaping ring invention. As you can see from the prior-art Figs 1 (A and B), previous napkin rings were simple affairs, designed merely to hold a previously rolled or folded napkin in a simple shape. In contrast, the napkin ring of my invention, shown in Fig 2, and made of metal or plastic, has a heart-shaped outer member 12, an inner leg 14, and two curved-back arms 16. As shown in Fig 3, it is used by introducing a corner 8 of a cloth napkin 10 between an end 4 of leg 4 and the adjacent portion of outer member 12. When napkin 10 is pulled partially through the ring, as indicated in Fig 4, it will be forced to assume the shape of the space between arms 16 and outer portion 12, as indicated.

Thus my napkin-shaping-and-holding ring can be used to make a napkin have an attractive, graceful shape when it is laid flat and placed adjacent to a place setting, as indicated in Fig 5. The extending portion of the napkin can also be folded up and around, as indicated in Fig 6-A, so that the napkin and its ring can be stood upright.

In addition to the specific shape shown, you should of course search the broader concept of my invention, namely a ring-shaped outer member with an inwardly extending tongue or leg that can be used to shape napkins pulled partially through the structure. I believe that I have provided you with sufficient information to fully understand the structure and workings of my invention so that you can make a search, but if any further information is needed, please don't hesitate to call me.

I understand that you will, in accordance with the ethics of your profession, keep all details of my invention strictly confidential, except to consult an examiner.

Most sincerely,
Millie Inventress
Millie Inventress (215-776-3960)
Encs.: $1,000 check, 3 sheets of drawings
(My file: :Search.ltr)

Fig. 6A—Inventor's Search Request Letter to Patent Searcher

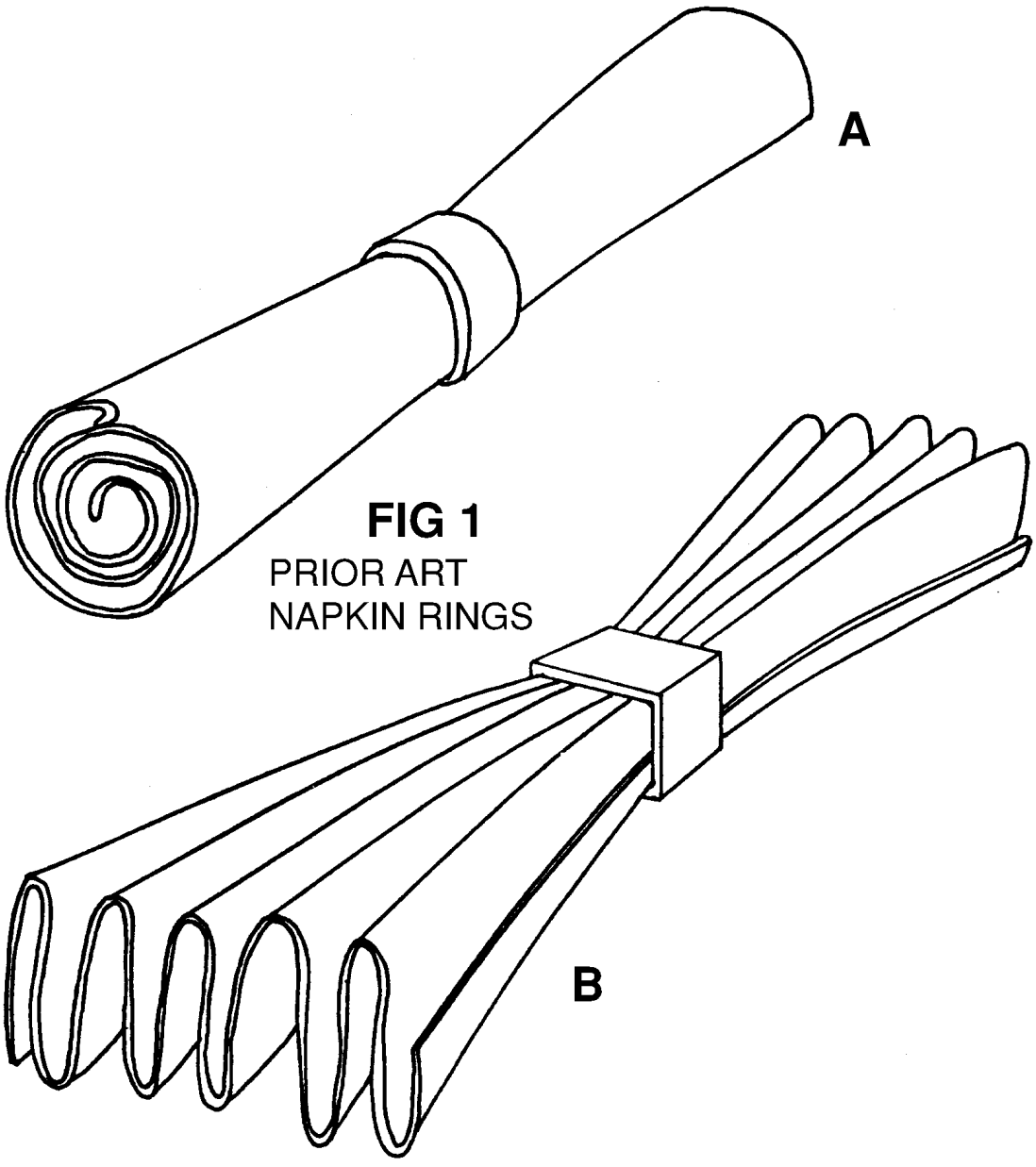


FIG 1
PRIOR ART
NAPKIN RINGS

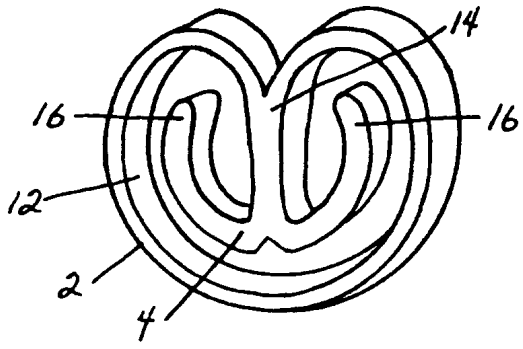


FIG 2
CIRCULAR SHAPING
RING

Fig. 6B(a)—Drawing of Invention, Part a

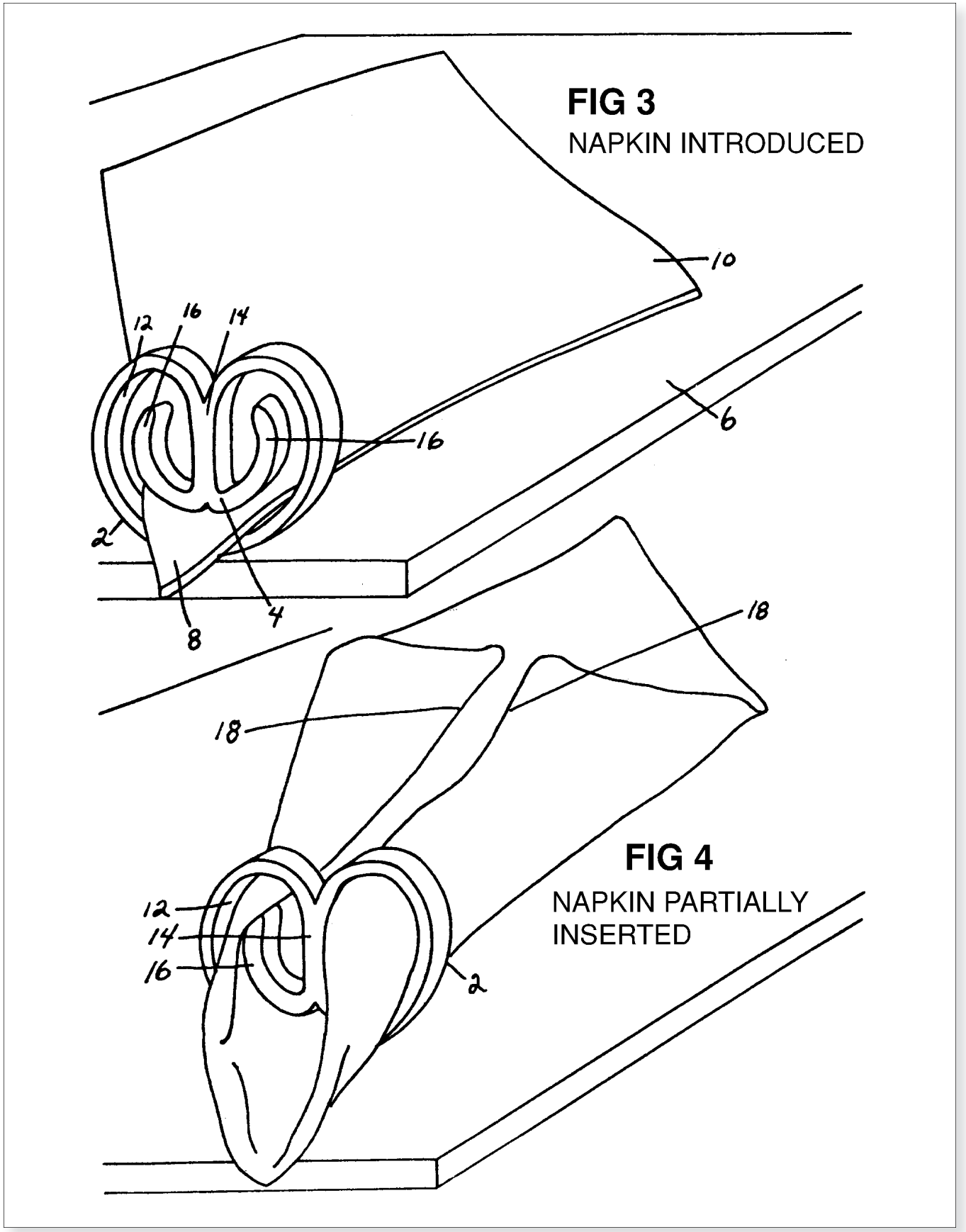


Fig. 6B(b)—Drawing of Invention, Part b

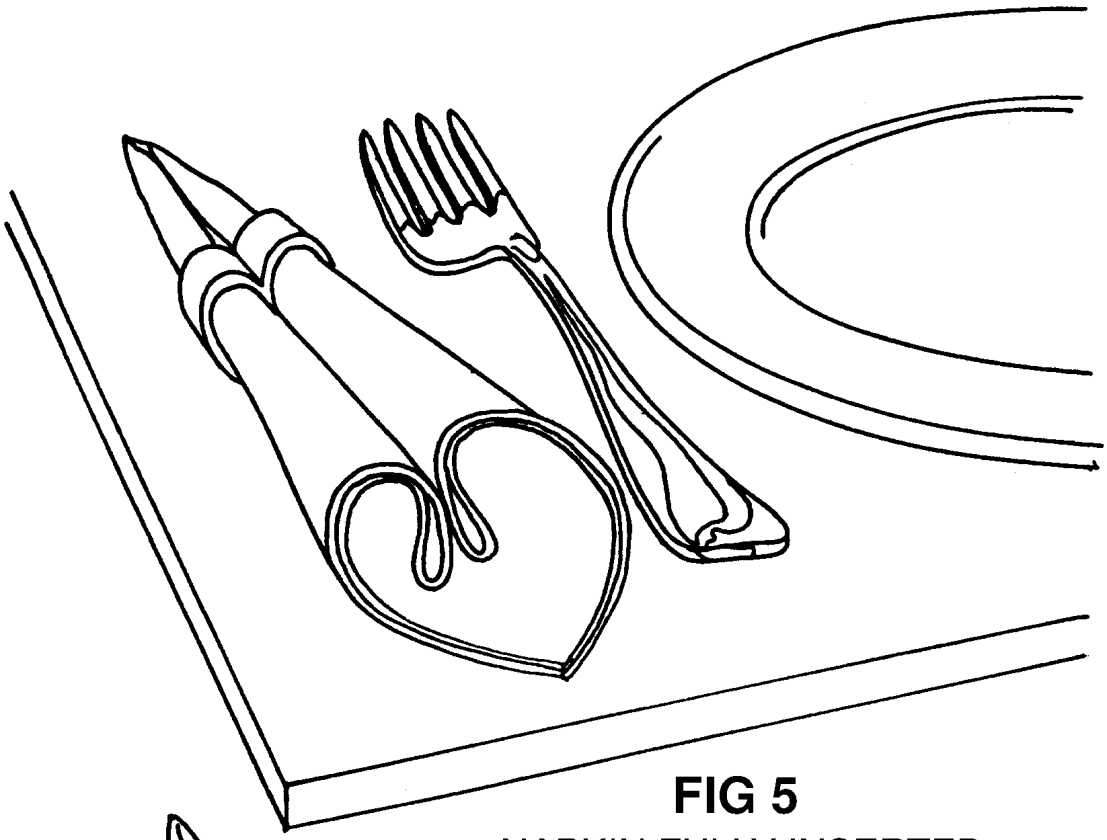


FIG 5
NAPKIN FULLY INSERTED

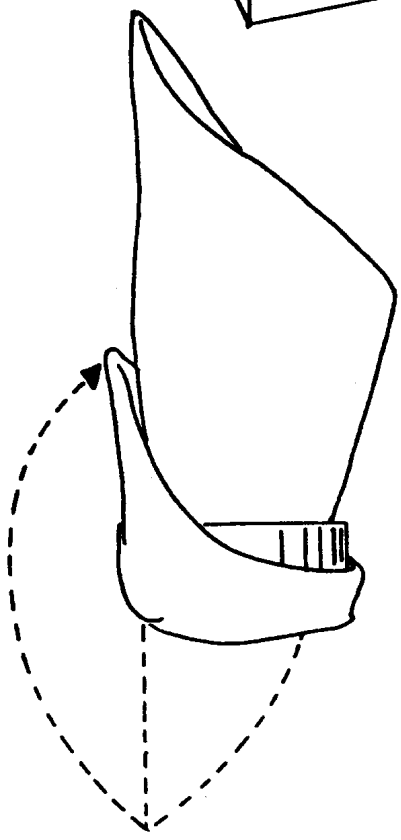


FIG 6A
TIP FOLDED UP AROUND
RING-SIDE VIEW

Fig. 6B(c)—Drawing of Invention, Part c

SAMUEL SEARCHER
Patent Attorney
2001 Jefferson Davis Highway
Arlington, VA 22202
703-521-3210
2011 Feb 21

Ms. Millie Inventress
1901 JFK Boulevard
Philadelphia, PA 19103

Search Report: Inventress: Napkin-Shaping Ring

Dear Ms. Inventress:

In response to your letter of Jan. 22, I have made a patentability search of your above invention, a napkin-shaping ring comprising an outer portion with an inwardly extending leg and flared-back arms at the end of the leg. I have also searched the broader concept of an annular member with an inward cantilevered leg for shaping a napkin that is drawn therethrough. My bill for $900, the total cost of this search, including the references and postage, is enclosed and is marked "Paid"; I thank you for your check and enclose a refund of $100.

I searched your invention in the following classes and subclasses in the actual examining divisions: 40/21, 40/142, D44/20, and 24/8. In addition, I consulted Examiner John Hayness in Group Art Unit 353 regarding this invention. Otherwise, I kept your invention strictly confidential. In my search, I thought the following references (all U.S. Patents) were most relevant, and I enclose a copy of each: **Bergmann**, 705,196 (1902); **Gabel**, 1,771,328 (1930); **Hypps**, 3,235,880 (1966); and **Le Sueur**, 3,965,591 (1976).

Bergmann shows a handkerchief holder that comprises a simple coiled ring with wavy portions.

Gabel is most relevant; she shows a curtain folder comprising a folded metal device through which a curtain (already partially folded) is inserted and then pulled through and ironed at the exit end.

Hypps shows a necktie and holding device.

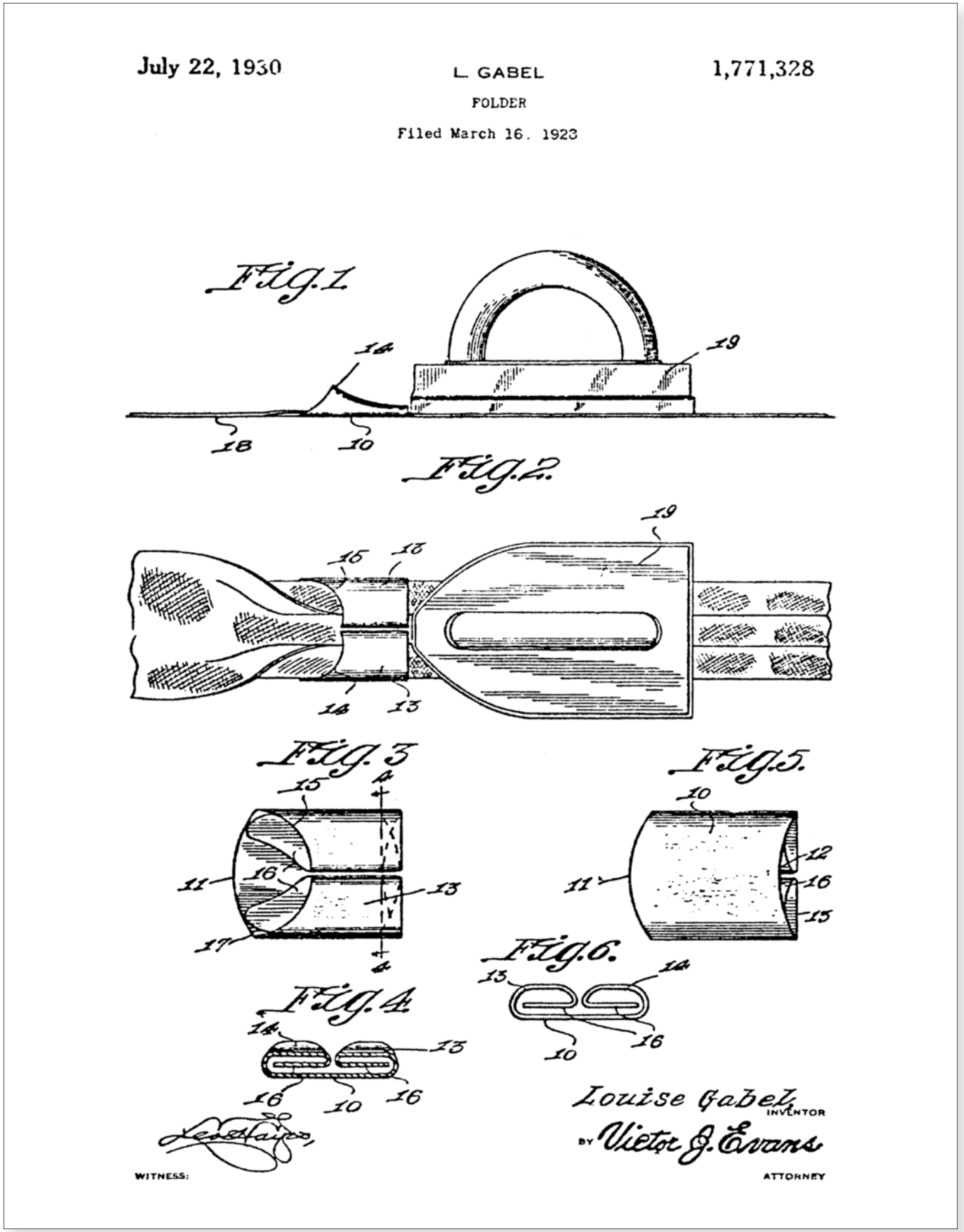
Le Sueur shows a napkin ring with magnetically attachable names.

I could not find any napkin-shaping devices as such and Examiner Hayness was not aware of any either. However, be sure to consider the Gabel patent carefully, as it appears to perform a somewhat similar function, albeit for curtains.

It was my pleasure to serve you. I wish you the best of success with your invention. Please don't hesitate to call if you have any questions.

Most sincerely,
Samuel Searcher
Samuel Searcher
Encs: $100 Check, Bill, and References

Fig. 6C—Patent Searcher's Search Report


July 22, 1930 L. GABEL 1,771,328

FOLDER

Filed March 16, 1923

Fig. 1.

Fig. 2.

Fig. 3

Fig. 5.

Fig. 6.

Fig. 4.

Louise Gabel, INVENTOR

BY Victor J. Evans

ATTORNEY

WITNESS:

Fig. 6D(a)—Drawing of Prior-Art Gabel Patent

Patented July 22, 1930 1,771,328

UNITED STATES PATENT OFFICE

LOUISE GABEL, OF COLUMBUS, NEBRASKA

FOLDER

Application filed March 16, 1928. Serial No. 262,243.

This invention relates to cloth holding devices and more particularly to a device adapted for holding cloth in the form of plaits while ironing and sewing.

An other object of the invention comprehends an enlarged entrance opening in one end of the device within which the cloth may be introduced.

A further object of the invention contemplates tongue members adapted to form creases in the cloth.

An additional object of the invention consists of a portion removed from the discharge end of the device whereby binding action of a sad iron therewith is obviated while pressing the cloth.

With the above and other objects in view, the invention further consists of the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the appended claim.

In the drawing:—

Figure 1 is a side elevation of the invention while in use and followed by a sad iron.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a top plan view of the invention per se.

Figure 4 is a sectional view taken on line 4—4 of Figure 3.

Figure 5 is a bottom plan view of the invention.

Figure 6 is a front elevation of the invention per se.

Referring to the drawing in detail, wherein like characters of reference denote corresponding parts, the reference character 10 indicates a plate member having a curved outwardly projecting forward end 11 and a concaved inner end 12.

The sides of the plate are bent upon themselves upwardly and inwardly upon the plate to provide horizontally disposed guide members 13.

As illustrated in Figures 1, 3, 4 and 6, the outermost end, namely 11, is flared to provide an enlarged entrance and to accomplish such construction the outermost ends of the guide members 13 are upwardly flared, as indicated at 14 and concaved, as indicated at 15 upon the foremost edges thereof.

Tongues 16, carried by the guide members 13, are extended reversely thereof and disposed in spaced relation to the upper side of the plate member 10. The side edges of the tongues being also spaced from the guide members. The foremost ends of the tongues 16 are rounded, as indicated at 17, and projected forwardly for greater distances than the adjacent ends of the guide members 13.

In the use and operation of the invention, lengths of cloth, such as indicated at 18, of a desired width, are partially folded along the side edges thereof and the strip per se laid upon the upper side of the plate member 10. The folded portions of the strip being adapted to repose upon the upper sides of the tongues 16 and to be projected within the spaces as defined between the tongues and the guide members. Due to the fact that the outermost end of the device is flared, an enlarged entrance is provided by means of which the cloth may be readily introduced and fed. The rounded portions 17 for the tongues also permit ease in the drawing of the cloth through the device or the sliding of the device upon the cloth. As illustrated in Figures 1 and 2 of the drawing, a sad iron, such as indicated at 19, may travel upon the cloth 18 immediately behind the device to press the folded side edges or plaits of the cloth. By the same token, the invention could be used in the formation of different kinds of braids and etc., and to effectively feed the cloth or strip to a sewing machine, in the event the plaits are to be held against displacement from the strip per se.

The concaved portion 12, upon the innermost end of the strip 10, is adapted to prevent binding action of the sad iron 19 therewith when the latter closely pursues the plate member. Such construction will also prevent injury to the strip and plaits.

Although I have shown, described and illustrated my invention as being primarily adapted for use in the manufacture of plaits, it is to be obviously understood that the invention could be effectively employed for

Fig. 6D(b)—Specification of Prior-Art Gabel Patent

United States Patent [19]

Le Sueur

[11] **3,965,591**

[45] **June 29, 1976**

[54] **NAPKIN RING**

[75] Inventor: **Alice E. J. Le Sueur,** Cobble Hill, Canada

[73] Assignee: **The Raymond Lee Organization,** New York, N.Y. ; a part interest

[22] Filed: **Nov. 26, 1974**

[21] Appl. No.: **527,216**

[52] **U.S. Cl.** ..... **40/21 R**

[51] **Int. Cl.²** **G09F 3/14**

[58] **Field of Search** ..... 40/142 A, 63, 21 A, 40/21 B, 10; 63/2; 24/8

[56] **References Cited**

UNITED STATES PATENTS

198,065	12/1877	Annin	63/1 X
2,600,505	6/1952	Jones	40/142 A
2,653,402	9/1953	Bonagura	40/21 A

FOREIGN PATENTS OR APPLICATIONS

1,308,888	10/1962	France	40/142

Primary Examiner—Louis G. Mancene
Assistant Examiner—Wenceslao J. Contreras
Attorney, Agent, or Firm—Howard I. Podell

[57] **ABSTRACT**

An open cylindrical napkin ring fitted with magnetic means for attaching an identifying name or set of initials in a recess on the outside of the ring.

3 Claims, 4 Drawing Figures

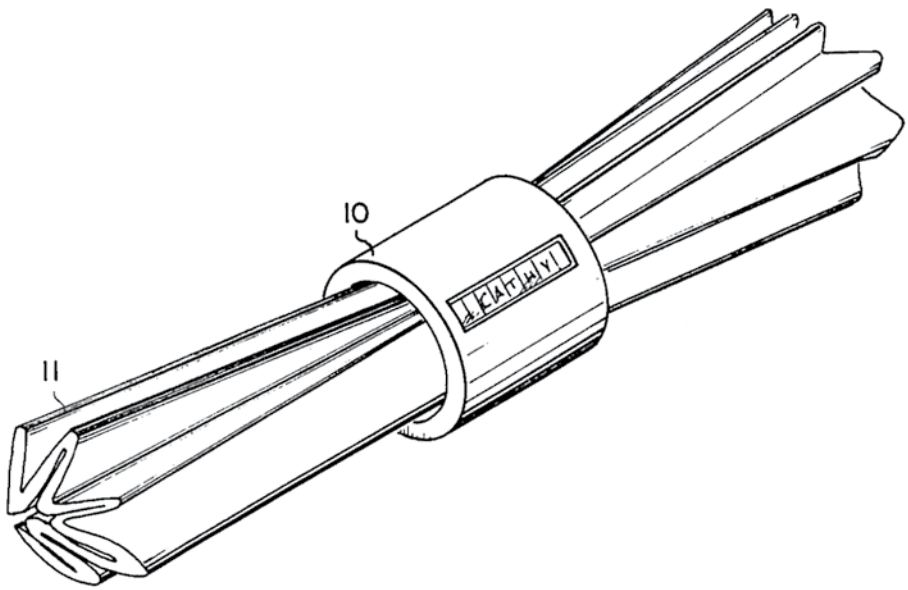


Fig. 6D(c)—Abstract Page of Prior-Art Le Sueur Patent

PATENT DOCUMENT KIND CODES

With new number formats as they appear on documents published on or after January 2, 2001. For a full explanation of document kind codes see WIPO Standard ST.16, available at http://www.wipo.int/scit/en.

New Number Format

US 6,654,321 B1

country code | document number | document code

Document Type	Before Jan. 2, 2001	On or After Jan. 2, 2001	
	Number Format	Code	Number Format
Utility Patents			
Issued patent (no pre-grant publication)	5,123,456	B1	US 6,654,321 B1
Issued patent (with pre-grant publication)	NA	B2	US 6,654,322 B2
Application (first publication)	NA	A1	US 2001/0001111 A1
Second or subsequent republication of an application	NA	A2	US 2001/0002222 A2
Correction of a published application	NA	A9	US 2001/0003333 A9
Plant Patents			
Issued patent (no pre-grant publication)	Plant 11,000	P2	US PP12,345 P2
Issued patent (with pre-grant publication)	NA	P3	US PP12,345 P3
Application (first publication)	NA	P1	US 2001/0004444 P1
Second or subsequent republication of an application	NA	P4	US 2001/0005555 P4
Correction of a published application	NA	P9	US 2001/0006666 P9
Design Patents	Des. 456,789	S	US D654,321 S
Reissue Patents	RE36,543	E	US RE12,345 E
Reexaminations			
Reexamination certificate issued from first reexamination of a patent (utility, plant, design or reissue)	B1 5,123,456 B1 Plant 11,000 B1 Des. 123,456 B1 RE12,345	C1	US 6,654,321 C1 US PP12,345 C1 US D654,321 C1 US RE12,345 C1
Reexamination certificate issued from second reexamination of a patent	B2 5,123,456 etc.	C2	US 6,654,321 C2 etc.
Reexamination certificate issued from third reexamination of a patent	B3 5,123,456 etc.	C3	US 6,654,321 C3 etc.
Other Patent Documents			
Statutory invention registration (SIR) documents	H1,234	H1	US H2345 H

Created: 1/16/01 MJW

PTDLP

Fig. 6D(d)—Patent Document Kind Codes

First, note from Fig. 6B that the napkin-shaping ring of the invention has an annular (ring-shaped) outer member with an inwardly projecting leg. The leg has flared-back arms at its free end. When a folded napkin is drawn through the ring, tip first, the arms and annular member will shape the napkin between them in an attractive manner, as indicated in Fig. 6B(c).

Of the four previous patents cited, let's assume that only Gabel and Le Sueur are of real relevance. Gabel, a patent from 1930, shows a curtain folder comprising a bent sheet-metal member. A curtain is folded slightly and is drawn through the folder that completes the folding so that the curtain can be ironed when it is drawn out of the folder. Le Sueur, a patent from 1976, shows a napkin ring with a magnetized area for holding the letters of the name of a user.

Now, as part of analyzing this sample search report, we'll use the master flowchart of Fig. 5C. To save you from having to turn the pages repeatedly, I've reproduced it below, as Fig. 6E. If any part of this chart confuses you, reread the part of Chapter 5 that explains each box in detail.

Okay, now let's work our way through the chart:

Box A: Millie's napkin-shaping ring can be classified within a statutory class as an article (or even a machine, since it shapes napkins).

Box B: It clearly has usefulness, since it provides a way for unskilled hostesses or hosts to give their napkins an attractive, uniform shape.

Box C: We must now ask whether the invention is novel—that is, physically different from any single reference. Clearly it's different from Le Sueur because of its inwardly extending leg 14. Also, it's different from Gabel because, comparing it with Gabel's Fig. 6, it's rounder and it has a complete outer ring with an inwardly extending leg, rather than a folded piece of sheet metal. It's important to compile a list of the differences (novel features) that the invention has over the prior-art references, not the differences of the references over your invention.

Box D: The question we must now ask is, "Do the novel features (the roundness of the ring, the inwardly extending leg, and the flared-back arms) provide any new and unexpected results?" After carefully comparing Gabel with Millie's invention, we can answer with a resounding "Yes!" Note that Gabel states, in her column 2, lines 62 to 66, that the strip of cloth is first partially folded along its side edge and then it is placed in the folder. In contrast, Millie's shaping ring, because of its roundness and leg, can shape a totally unfolded napkin—see Millie's Figs. 3 and 4. This is a distinct advantage, since Millie's shaper does all of the work automatically—the user does not have to specially fold the napkin. While not an earthshaking development or advance, clearly Millie's ring does provide a new result and one that is unexpected, since neither Gabel, Le Sueur, nor any other reference teaches that a napkin ring can be used to shape an unfolded napkin. Thus we take the solid-line "Yes" output of Box D to Box E.

Box E: Although not mandatory, we next check the secondary factors (1 to 22) listed in Boxes E, F, and G.

Reading through these factors, we find first that factor 2 in Box E applies—that is, the invention solves a problem (the inability of most persons to quickly and neatly fold napkins so that they have an attractive shape) that was never before even recognized. Also, we can provide affirmative answers to factors 8 and 11, since the invention provides an advantage that was never before appreciated and it solves a long-felt, but unsolved need—the need of unskilled persons to shape napkins quickly and gracefully (long felt by the more fastidious of those who hate paper napkins, at least).

Boxes F and G: Since two references are present, and each shows some part of Millie's invention, we have to answer "Yes" to Box F and proceed to Box G to consider the possible effect that a combination of these would have on the question of obviousness ("combinatory unobviousness"). In Box G we see that factors 13, 15, 18, 19, and 21 can reasonably be argued as relevant to Millie's invention. The invention has synergism (factor 21), since the results (automatic napkin folding) are greater than the sum of the references; the combination of the two references is not suggested (factor 13) by the references themselves; and even if the two references were combined, Millie's inward leg would not be shown (factor 15). The references are complete and fully functional in themselves, and hence teach by implication that they should not be combined (factor 18). And it would be awkward, requiring redesign and tooling, to combine the references (factor 19). Thus we can with conviction state that several secondary factors are present, so we take the solid-line "Yes" output of Box G to Box H.

Next, (Box H) we see that the PTO is very likely to grant a patent, and our determination on patentability is accordingly positive.

In fact, this exercise is a real case: An examiner initially rejected an application for the napkin-shaping ring as unpatentable over Gabel and Le Sueur. However, he agreed to grant a patent (U.S. Pat. No. 4,420,102) after I filed an argument forcefully stating the above considerations.

TIP

Although I've analyzed the search report to determine whether Millie's invention was patentable, it's important to remember that a weak patent isn't much better than no

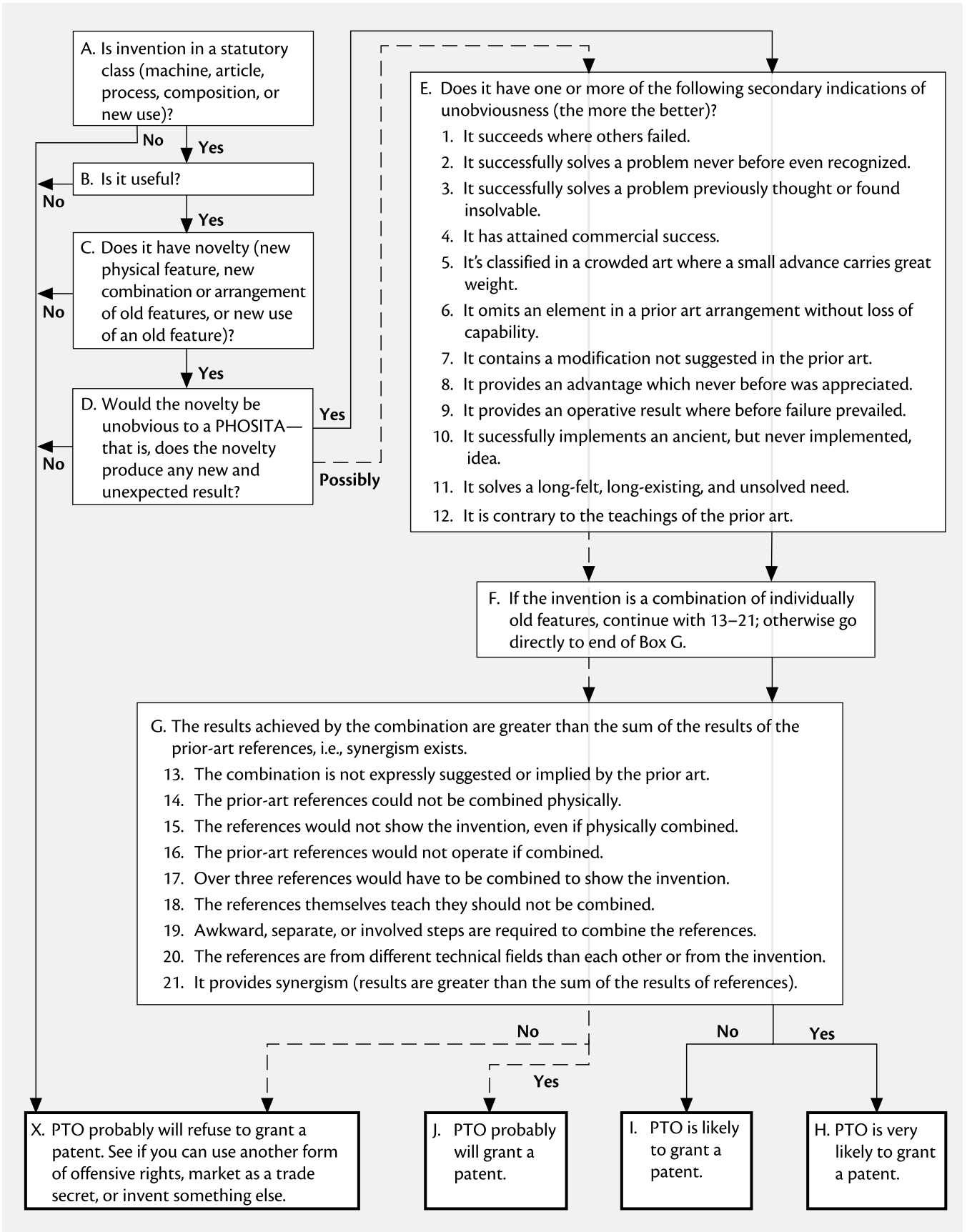


Fig. 6E—Patentability Flowchart

patent. Put differently, a very weak patent and $5 will get you a cable car ride in San Francisco. So in addition to reaching a decision on patentability, you should also walk the extra mile to determine whether your patent is likely to be of broad enough scope to make it economically worthwhile. I tell you how to do this in Section J of this chapter.

Note that we have done our own patentability evaluation—the four-part list, above—and that the search report of Fig. 6C didn't include an opinion on patentability. There are several reasons for this.

First, if your searcher is a layperson (not a patent attorney or agent), the searcher is not licensed to give opinions on patentability since this constitutes the practice of law.

Second, even if your searcher is an attorney or agent, the searcher usually won't provide an opinion on patentability because most searchers are used to working for other patent attorneys who like to form their own opinions on patentability for their clients.

Third, if the searcher's opinion on patentability is negative, a negative written opinion might be damaging to your case if you do get a patent, sue to enforce it, and the opinion is used as evidence that your patent is invalid. This would occur, for example, if your court adversary (the defendant infringer) obtains a copy of the opinion by pretrial discovery (depositions and interrogatories), shows it to the judge, and argues that since your own search came up with a negative result, this militates against the validity of your patent. However, a negative written opinion can be "worked" in court—that is, distinguished, explained, rebutted, etc.—so if you want the searcher's opinion on patentability in addition to the search, most patent attorney/agent searchers will be glad to give it to you without extra charge, or for a slight additional cost of probably not more than $300 to $600.

Fourth, armed with the knowledge you've gained from Chapter 5, you should be able to form your own opinion on patentability by now; the exercise will be fun, educational, and insightful to your invention.

Fifth, note that there's no certainty in the law. No one can ever say for certain that you'll be able to get a patent before you get it since no search can cover pending patent applications, and human responses (how your examiner will react) are very unpredictable. So take any prediction with a grain of salt.

In any case, don't hesitate to ask any questions about the searcher's practices in advance, and be sure to specify exactly what you want in your search. It's your money and you're entitled to buy or contract for whatever services you desire.

As Elihu Root said, "About half the practice of a decent lawyer consists in telling would-be clients that they are damned fools and should stop."

H. Computer Searching

Although computer searching is improving, you should do both types of computer searches (Keyword and Classification) to supplement each other because each has some deficiencies. If you do a Classification search you may use the wrong classification and if you do a Keyword search you may not search with the same keywords as the patent attorneys who wrote the relevant patents. Also, patents in some computer search databases usually go back to only 1976. This is not a problem for most high-tech inventions where there is no need to search prior to 1971. Despite the drawbacks noted, computer searching does have some advantages (more secure database, less fatigue, faster searching, etc.) that make it uniquely useful.

All computer search systems now show the drawings of prior patents and incorporate the PTO classification system. As stated, most of them can do Keyword or Classification searches.

Keyword searches can be done for combinations of keywords in the texts—specification, claims, abstract, or title—of prior patents. Such combinations are known as "Boolean" searches after George Boole, who invented the type of logic used for combinatory searches. For example, suppose you've invented the bike with a frame made of a certain carbon-fiber alloy. To make a computer Keyword or Boolean search, you select a combination of keywords to describe your invention, e.g., "bicycle" and "carbon fiber alloy." The computer will look through its data bank for any patent that contains all of these words. When it finds any patents that contain your keywords in the combination you specified in your search request, it will kick out these patents, regardless of their classifications.

If the computer reports too much data for you to conveniently examine—say it's found 200 patents with your words in combination—you should first look at one or two of the patents (the computer will show you the relevant text) to see if your invention is shown in an earlier patent (that is—your invention has been "knocked out"). If so, your search is over. If not, you'll need to narrow your search. This is easy. Simply add one or more additional keywords, say "frame," or some details of the alloy, and redo the search with these increased keywords until you've few enough patents to manually review conveniently. Also, you can narrow the search by using narrower (more specific) keywords.

If you get extremely specific, the computer is likely to report no patents, or just one or two. If this occurs, you'll need to broaden your search. This is just as easy. Merely remove one or more keywords, or broaden your present keywords, and redo the search until you get back what you want. For example, you can eliminate "bicycle" or substitute "frame" for "bicycle" to broaden the search. Note that to broaden your search (pull out more prior art), you should use fewer keywords, and to narrow your search (pull out less prior art), you should use more keywords.

To make a Classification search, you first have to find the appropriate Classes and Subclasses where the concepts of your invention might be found. See Section I below for how to do this. After you get the appropriate Classes and Subclasses, you have to browse through every patent in each Subclass to search for the possibly novel concepts of your invention. All of this can be done on a computer terminal. (Cf. the old method of making a Classification search of paper patents, where you had to look through the patents in the classifications (e.g., bike and metallurgical (carbon-fiber alloy) subs), hoping that if a relevant patent exists, someone would have classified it in either or both of these places.)

Similarity of Claims to Computer Searches

It's important that you take the time to understand the above Boolean-logic concept when making Keyword searches: you narrow your search by using additional keywords and/or making your keywords more specific; you broaden your search by using fewer keywords and/or making your keywords more general. Once you do you'll have an easy time understanding patent claims (see Chapters 9 and 13 for more information), because in claims, the more elements that are recited and/or the more specific these elements are, the narrower the coverage and vice versa.

The data that you search by computer—that is, the texts and drawing of patents—is available for free from the PTO and from several online sites. The latter are private companies that in turn get this data in the form of machine-readable tapes as a byproduct of the patent printing process from the Government Printing Office, which prints all patents. As of this writing, one free service—Google Patents—and one fee-based company, MicroPatent (www.micropatent.com) have used optical character recognition (OCR) to incorporate the data from all patents since 1836 into its data bank (although the U.S. first granted patents in 1790, the patent numbering system did not begin until 1836). While MicroPatent's OCR results are not yet accurate, Google's are and they do provide the first way to search all patents on the Internet.

Presently, the PTO's examiners use computer searching (the EAST search system) almost exclusively. As a result, we're getting better examinations and stronger patents. When computer searching is perfected and completed, I believe that patent application pendency time will be reduced from its present level of about 1.5 to three years to about six months or less, and that, more importantly, hardly any patent will ever be questioned for validity—that is, almost all patents will be virtually incontestable. (See Chapter 15 for more on patent validity.)

1. Available Computer Search Resources

Now that you get the general idea, how do you go about making a computer search? There are two ways to gain access to a computer search service's data bank:

Via the Internet on a personal computer (or terminal) with a modem—the PTO's and the EPO's websites are completely free and for others you'll have to make a suitable agreement.

Via an existing terminal that is dedicated to patent searching, such as at a large company, law firm, the PubWEST system at a PTDL, or the EAST system at the PTO.

On the Internet the PTO itself provides free Keyword searches in bibliographic format (name, title, assignee, city, state, date, etc.) back to 1976 and by patent number and current classification back to 1790. To use this service, visit www.uspto.gov/patft/index.html. To view the actual images of patents (as opposed to simple text versions of the patents) go to the link "View Patent Full-Page Images" and download and install the TIFF viewer AlternaTIFF (www.alternatiff.com) that is available for free. Then use the "Quick Search" or "Advanced Search" links to make the search using the instructions to follow. If you simply want to look up a patent by its number, go to the "Patent Number Search" link.

The EPO (http://ep.espacenet.com) provides Quick and Advanced search capabilities in three languages (English, German, and French), but for patentability searches only the Quick search in English is necessary. Searches can be made in four databases: Worldwide (which covers European countries, EPO, and U.S. patents); Japanese; EP (EPO patents); or WIPO (World Intellectual Patent Organization, which administers the PCT databases. (See Chapter 12 for more on the PCT.) To search all databases, search just the Worldwide and Japanese databases). To make a search, type the appropriate keyword combinations in the keyword

box with a suitable connector—for example, bicycle AND plastic OR wood. The dates of the databases vary; see the site for more information.

- Google Patents (www.google.com/patents) is an excellent resource that includes U.S. patents back to the beginning. I strongly recommend this site.
- Patents.com (www.patents.com) is a free search site that searches U.S. patents and patent applications and European patents back to 1975.
- Here are several fee-based organizations that offer computer searching of patent records. Several of the "for fee" databases also provide foreign patent information.
  - MicroPatent (www.micropatent.com), a commercial database of U.S. patents searchable from 1836 to the present. It also includes Japanese and International PCT patent applications from 1983, European patents from 1988, and the *Official Gazette (Patents)*. The U.S. patents before 1971 have been entered into the database by Optical Character Recognition, so expect some errors.
  - Delphion (www.delphion.com/simple) offers bibliographic and patentability search services for a fee. The system has several advantages over the PTO. Delphion's database goes back to 1971 for U.S. patents and contains the front pages of Europatents and PCT-published patent applications. However, Delphion requires a signup and charges for use and downloading patent images.
  - LexPat (www.lexis-nexis.com), a commercial database of U.S. patents searchable from 1971 to the present. In addition, the LEXPAT library offers extensive prior-art searching capability of technical journals and magazines.
  - QPAT (www.qpat.com) a database that includes U.S. patents searchable from 1974 to the present and full-text European A (1987–present) and B (1991–present) patents.
  - PatentMax (www.patentmax.com) is another commercial database similar to Questel/Orbit. The site permits batch loading.
  - Intellectual Capital Office Suite (www.patentcafe.com) is a service that uses "concept" or "semantic" searching that is more complete than traditional Boolean searching and encompasses many databases.
  - Patents.com (www.patents.com) is another good search site that goes back to 1976 and includes the maintenance-fee status (expired or in-force) and claims, abstract, or description on the front page.

2. Vocabulary Associated With Computer Searches

How do you use a search database? Assuming you're going to do the search yourself, first thoroughly study the service's instruction manual so that you'll be able to conduct your search in as little time as possible, thereby minimizing user time charges. While every system is different, and while space constraints preclude coverage of them all, the following usage terms are common to all systems. If you're going to do any patent searching, you should learn these terms now:

- A **File** is the actual name of the patent search database provided by the service; for example LEXPAT is the name and trademark for Mead Data General's patent search database; CLAIMS is Dialog's patent search file.
- A **Record** is a portion of a file; the term is used to designate a single reference, usually a patent within a database.
- A **Field** is a portion of a record, such as a patent's title, the names of the inventors, its filing date, its patent number, its claims, etc.
- A **Term** is a group or, in computerese, a "string," of characters within a field—for example, the inventor's surname, one word of the title of a patent, etc., are terms.
- A **Command** is an instruction or directive to the search system that tells it to perform a function. For example, "Search" might be a command to tell a system to look for some key search words in its database.
- **Keywords** or a **Search Terms** are the word combination that are actually searched. "Bicycle" and "carbon fiber alloy" are the keywords for our example above.
- A **Qualifier** is a symbol that is used to limit a search or the information that the search displays for your use. Normally no qualifier would be used in patentability searches, but if you're looking for a patent to a certain inventor, you could add a qualifier that limits the search to the field of the patentee's name.
- A **Wild Card Symbol** is an ending (familiar to users of sophisticated word processing programs) that is used in lieu of a word's normal ending in order to broaden a keyword. The wild card cuts off immaterial endings so that only word roots are searched. For example, if we were searching Millie's annular napkin-shaping ring, we would want our search to include the words "annular" and "annulus." Thus, instead of using both keywords and the Connector Symbol "or" (see below), we might search for "annul*" where "*" was a wild

card symbol that tells the computer to look for any word with the root "annul" and any ending.

- **Connector Words** are those (such as "or," "and," and "not") that tell the computer to look for certain defined logical combinations of keywords. For instance, if you issued a command telling the computer to search for "annulus or ring and napkin," the computer would recognize that "or" and "and" were connector words and would search for patents with the words "annulus" and "napkin," or "ring" and "napkin," in combination. Obviously, the use of more keywords joined by the Boolean "and" connector will narrow your search, because it will add more keywords to the search; this will cause the computer to pull out fewer patents, because only patents with all of the keywords connected by "and" will satisfy your search request. However, the use of more keywords joined by the "or" connector will broaden your search, because any patent with any one of the keywords joined by an "or" will be selected. The "and not" connector is seldom employed, but it can be used to narrow a search when you want to eliminate a certain class of patents that contain an unwanted keyword. (Note that when you get to writing your claims (Chapter 9), "or" and "not" are generally verboten.)
- **Proximity Symbols** are those that tell the computer to look for specified keywords, provided they are not more than a certain number of terms apart. Thus, if you told the computer to search for "napkin w/5 shaping" it would look for any patent that contained the words "napkin" and "shaping" within five words of each other, the symbol "w/5" meaning "within five words of." If no proximity symbol is used and the words are placed adjacent to each other—such as "napkin shaping"—the computer will pull out only those patents that contain these two words adjacent to each other in the order given. However, if a connector word is used—such as "napkin and shaping"—the computer will pull out any patent with both of these words, no matter where they are in the patent and no matter in what order they appear.

3. Think of Alternative Search Terms and Get the Classification

Before you approach the computer, no matter what search system you use, be prepared with a well-thought-out group of keywords and all possible synonyms or equivalents. Use a thesaurus or a visual dictionary to get synonyms. Thus, to search for Millie's napkin-shaping ring, in addition to the obvious keywords "ring," "annular," "napkin," and "shaping," think of other terms from the same and analogous fields. In addition to napkin, you could use "cloth." Or, in addition to shaping, you could use "folding" or "bending." In addition to "annulus" or "ring," you could try "device," etc. Also compile a list of all possible Class and Subclass combinations where patents on developments similar to your invention might be classified. To obtain relevant class-subclass combinations, you'll need to use the *Classification Index, Manual*, and *Definitions* as explained in Section I, part a, below.

4. Using the Computer

From here on, simply follow the instructions in the computer for gaining access to and using the database. Write down the number, Inventor, and date of all relevant patents without any consideration of obviousness. Then analyze them later, at your leisure.

5. Using Computer-Generated References to Work Backward and Forward

After making a computer search and obtaining a group of relevant references generated by the computer, it's possible (and very easy) to use these references to work back and forward and obtain additional, earlier relevant references that antedate the computer's database. How? To

Photo by Randy Rabin, Searcher

work backward, simply look at and/or order each of the "References Cited," which are listed on the abstract page (see Fig. 6D(c)) or at the end of the patent in each computer-selected patent. These references (usually patents) were cited by the PTO during prosecution of the patent and are usually very relevant. You can even look up the "References Cited" in the additional references to go back even earlier, thereby making a "tree" of references. However, the PTO didn't list the "References Cited" before the 1950s.

Another way to work backward, using a hybrid approach, is to find a patent close to your invention using the computer and then find the U.S. Class of the patent (it's 40/21R in Fig. 6D(c)) and then search all patents in this class at a PTDL, or order a list and search them online back to 1971 and in a PTDL for earlier patents.

To work forward, look up any close patent on the Delphion or EAST system and check the "Patents which cite this patent" for each close patent.

I. Do-It-Yourself Searching

Almost all preexamination searches should be made primarily in patent files (paper or using a computer). This is because patents are searchable classified according to either classification or keywords, as discussed earlier, or a detailed scheme (discussed later in this chapter). Also, now that you understand a bit about patent searching with the computer, this section will discuss how to do it. But first, you may be wondering why I recommend that searches be made primarily in patent databases, rather than in general reference or scientific files. The reason is because there are about ten times as many devices and processes shown in the patent files as in textbooks, magazines, etc., primarily because commercial practicability is not a requirement for patentability. All PTO examiners make most of their searches in the patent files for these reasons, so you should also. However, if you have access to a good non-patent data bank, such as a good technical library in the field of your invention, you can use this as a supplement or alternative to your search of the patent files.

Searching is a strange business—it's one of the few times you'll look for something with the hope that you won't find it! Thus, if you do it yourself, you should do it carefully and thoroughly. One professional searcher, Randy Rabin, recommends that for this reason one should not search his or her own invention, or at least do it with the assistance of someone who lacks any ax to grind. Searching is one of the main areas where an ounce of early work can save you pounds of later work and disappointment.

1. Getting Started at the PTO

As I have said, the best place to make a search of the patent files is in the PTO unless you have access to the files of a large company that specializes in your field. This is because the PTO's search facilities have all U.S. patents arranged on computers (the PTO's EAST system) in an easily searchable manner by classification or keyword. For example, all patents that show bicycle derailleurs can be located by searching the "derailleur" subclass or searching this keyword. All patents that show flip-flop circuits can be located by searching the "flip-flop" subclass or by searching this keyword. All patents to diuretic drug compositions can be located similarly, etc. The PTO no longer keeps foreign patents and literature on paper classified along with U.S. patents according to subject matter, however, but you still should search these areas as I will discuss. Remember (Chapter 5, Section E1) that foreign patents are valid prior art in the U.S.

Before I get to the PTO's search facilities, here's a few things to know about the PTO: All patent-related mail must be addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22213-1450. The mail is delivered to the PTO's offices in Alexandria. The PTO receives over three million pieces of mail a year, more than any other governmental agency except the IRS.

The PTO is technically part of the Department of Commerce (headquartered in Washington) but operates in an almost autonomous fashion.

The PTO employs about 5,500 examiners, all of whom have technical undergraduate degrees in such fields as electrical engineering, chemistry, or physics. Many examiners are also attorneys. The PTO also has about an equal number of clerical, supervisory, and support personnel. The Commissioner for Patents is appointed by the president, and most of the higher officials of the PTO have to be approved by Congress. Most patent examiners are well paid; a journeyman examiner (ten years' experience) usually makes $75,000 to $125,000 a year.

Assuming you do go to the PTO, get a pass and go to the public search room to use the EAST system.

The PTO gives classes on using the EAST system periodically, so it's best to take one of these classes before you start. However it is possible to make a search on EAST without formal instruction. If you need help with your search or the EAST system, you can ask any of the search assistants in the search room. For help with the search (not the EAST system) you can also ask an examiner in the actual examining division that is in charge of your art area. E.g., if you've invented a bicycle, you may go a "bicycle examiner" for assistance. You won't be endangering the

security of your invention if you ask any of these people about your search and give them all the details of your invention. They see dozens of new inventions every week, are quite used to helping searchers and others, and would be fired if they ever stole an invention. Also, the PTO's rules forbid employees from filing patent applications. In theory a PTO employee could communicate an invention to a friend or relative who could file, but it's very unlikely to occur because such a relationship could be easily discovered during patent litigation.

2. How to Do the Search—EAST Search at PTO and Internet Searches on PTO's Site

The PTO's EAST (Examiner Automated Search Tool) is available only at the PTO's Public Search Facility at Madison East, 1st Floor, 600 Dulany St., Alexandria, VA 22314, tel. 571-272-3275. Hours are Monday to Friday 8 a.m. to 8 p.m. As stated, EAST requires some training and skill to use. The PTO has about 250 EAST terminals in the public search room and gives free four-hour training sessions once per month. Also, often a user at an adjacent terminal or a search assistant can help a new user with the basics to get the new user started.

As stated, EAST is the best search tool because it can perform keyword or classification searches. In terms of speed, it is superior to a paper search because you can flip through patents displayed on the computer monitor faster than you can with the actual paper copies. You can also use EAST to do "forward" searches—that is, if a relevant patent is found, EAST can find and search through all later-issued patents in which the relevant patent is cited (referred to) as a prior-art reference. Further, it can do "backward" searches—that is, it can search through all previously issued patents that are cited as prior art in the relevant patent. You can also use EAST to search European and Japanese patents.

The PTO does not charge to use EAST, but it does charge for printing out copies of patents. (I hope that the capabilities of EAST will be soon be more widely available. In the meantime, if you want to use it you must make a trip to Alexandria.)

The PTO began issuing patents in July 1790, but in 1836 lost all of these early patents in a fire. Some of those 10,000 patents, which were not numbered, have been recovered and are now known as the "X" patents. After the fire, the PTO started numbering patents (Patent 1 issued in July 1836). As of October 2010 the PTO had issued over 7,800,000 utility patents.

I will not explain how to use EAST because this generally requires hands-on training and will not be used by most readers, who are not located near the PTO. In the following discussion I discuss how to make Classification and Keyword searches on EAST and on the Internet at the PTO's site.

a. Classification Searching

There are seven basic steps to take when conducting a Classification search of patents; these are depicted in Fig. 6F and are summarized below and then are explained in detail:

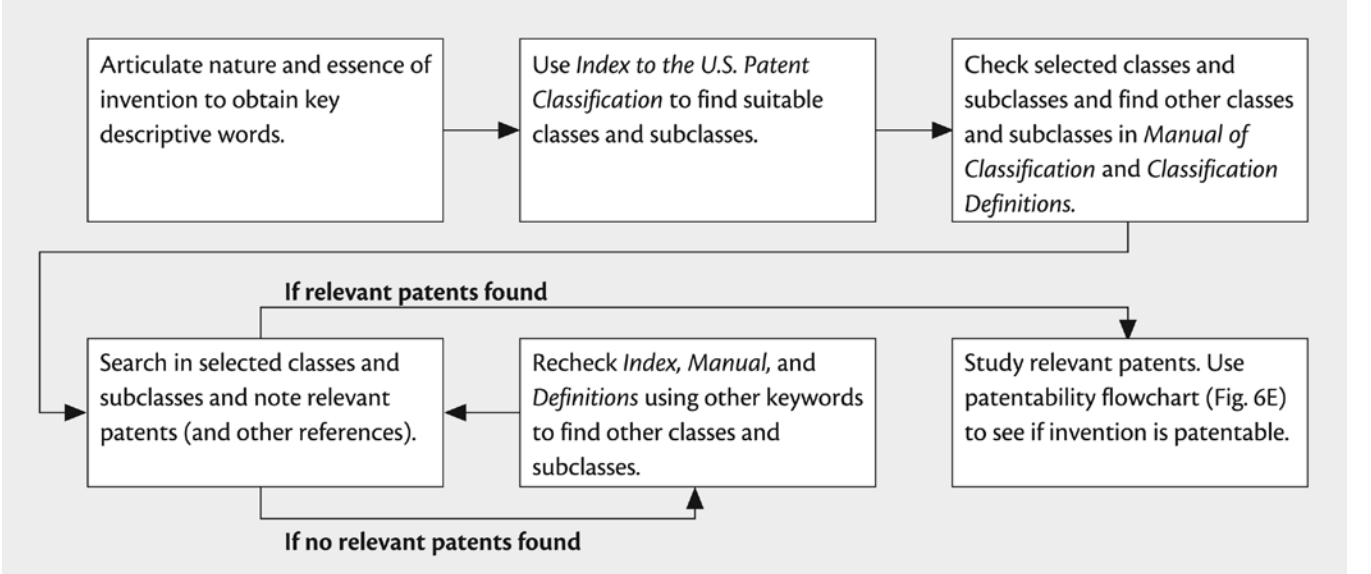


Fig. 6F—Searching Process for Paper Patents

Step 1: Write Out the nature and essence of your invention, using as many different terms as you can think of to describe it. The PTO describes this step concisely as, "Brainstorm key words related to the purpose, use, and composition of the invention."

Step 2: Find potentially relevant classification(s) for your invention. Do this by looking up your keywords in the *Index to the U.S. Patent Classification*. You can do this on EAST or on the Internet at www.uspto.gov/go/classification/uspcindex/indextouspc.htm.

Steps 3 and 4: Check the accuracy of the classification(s) in the Class Schedule and Class Definitions in the *Manual of Classification* on EAST or on the Internet at www.uspto.gov/go/classification.

Step 5: Search the patents and published patent applications in your list of relevant classes and

Step 6: Carefully review each patent in the relevant classes and subs to see whether it is relevant, that is, does it come close to the hardware, steps, or purpose of your invention? Write down the numbers, dates, and first Inventor of any patents that are relevant and obtain copies of them to study later.

Step 7: For each relevant patent that you find, check the "References Cited" in the patent to work backward and check the "Field of Search" to find additional relevant classes and subs.

Step 1: Write Out the Nature and Essence of Your Invention

As with any other classification or indexing system, your success will depend on the degree to which the words and phrases you use to define your invention coincide with the terms used by the classifier or indexer. For this reason, you should first figure out several ways to describe your invention. Start by writing down all the physical features of your invention in a brief, concise format so that you'll know exactly what to look for when searching.

For example, if you're searching a bicycle with a new type of sprocket wheel, write down "bicycle, sprocket wheel," and briefly add the details. If you're searching an electronic circuit, write down in a series of phrases like the foregoing or, in a very brief sentence, the quintessence of your invention, such as "flip-flop circuit with unijunction transistors" or some other very brief and concise description. Do the same whether your invention is a mechanical, electronic, chemical, business, Internet, or method invention.

Form 6-1 is a Searcher's Worksheet that you can use to facilitate your searching, and Fig. 6G is a completed version of Form 6-1 that you might produce if you had searched Millie Inventress's invention. Note that the invention description part of the worksheet contains a concise description of the invention for easy reference.

Once you've written a concise description of your invention, think of some alternative keywords or phrases to add to your description. Don't hesitate to define your invention in still additional ways that may come to you during your search. Then, take your worksheet with this brief description and the drawing(s) of your invention to the public search room. Even if you're not going to do your search there, use that room to find out how your invention is classified.

Step 2: Find the Relevant Classifications for Your Invention

To find the places to search your invention using the Internet, you'll need its most relevant search classification (called class and subclass). To obtain this, first review the PTO's classifications website at http://www.uspto.gov/go/classification/uspcindex/indextouspc.htm, then at the searcher's "tools" or reference publications, all of which are available in book or CD-ROM form and at the PTO website, www.uspto.gov. These consist of:

- the *Index to the U.S. Patent Classification*
- the *Manual of Classification*, and
- the *Classification Definitions*.

Again, let's slow down and look at each of these in detail.

Locating PTO Publications Online

The *Index to the U.S. Patent Classification, Manual of Classification,* and *Classification Definitions* can be searched online by accessing the PTO website (www.uspto.gov). Click "Patents," then click "Guidance, Tools and Manuals" under "Patenting Guides." All three publications can be found under "Tools and Manuals."

Index to the U.S. Patent Classification

While bearing an awkward title, this will be your main reference tool. If you want to do some of the research yourself before going to the PTO, the *Index* can be searched online (see "Locating PTO Publications Online," above). The *Index* also lists the classes alphabetically. Let's assume that you've invented a gymnastic exercising apparatus. The first thing to do is to look in the Index under "Gymnastic Devices." We come to page 9 (Fig. 6H), a typical page from the Index. It shows, among other things, that "Gymnastic Devices" are classified in class 482, subclass 23.

Manual of Classification

Now that we've found the class and subclass numbers, it's time to turn to the *Manual of Classification*, which lists the classes of invention numerically. The *Manual* can be

Searcher's Worksheet

Sheet 1 of 1

Inventor(s): Millie Inventress

Invention Description (use keywords and variations): Napkin folder—Annular member with inner leg, flared-back arms

Selected Search Classifications

Class/Sub	Description	Checked	Comments
40-21	Napkin holders	✓	very relevant—the right place
40-142	Misc. tableware	✓	mostly utensils—not too good
044-20	Napkin holders	✓	somewhat relevant
24-8	Shaping devices	✓	N.G.

Patents (and Other References) Thought Relevant

Patent # or Title	Name or Country	Date	Class/Sub	Comment
705, 196	Bergmann	1902	40-142	Plain ring
1,771,328	Gabel	1930	40-21	Curtain shaper
3,235,880	Hypps	1966	40-21	Fancy ring
3,965,59	LeSueur	1976	40-21	Ring with magnetic letters
				Consulted Examiner
				Hayness, John Ext. 353

Searcher: S. Searcher Date: 2011-1-12

Fig. 6G—Completed Searcher's Worksheet (Form 6-1 in Appendix 7)

	Class	Subclass
Billy club	42	1.16
Blowgun	124	62
Bore inspection	356	241.2
Breakdown type	42	40
Cane gun	42	52
Cattle slaughter type	42	1.12
Control calculators	235	400+
Gun training mechanism	89	41.01+
Motor operated	89	41.02+
Cotton	536	35+
Composition containing	149	94+
Over 10%	149	96+
Design	D22	100+
Grease	D08	14.1
Pistol	D22	104+
Racks	D06	552+
Sights	D22	109
Toy	D21	572+
Dummy	42	106
Ejectors	42	25
Electrically operated		
Firearms	42	84
Lighting devices	362	110+
Ordnance	89	135
Electron	313	441+
Extractors	42	16+
Firing mechanisms	42	69.01
Revolver	42	65
Upward tilting breech	42	41+
Flare	42	1.15
Fluid pressure adapter	124	58
Foob, ie fire out of battery	89	42.03
Gatling type	89	12
Grenade launchers	42	105
Gun engaging means	102	483+
Handles	89	1.42
Heaters	89	1.12
Howitzer	89	
Implement combined	42	90+
Indicators	42	1.01
K gun	89	1.1
Knife combined	42	53
Loading	89	45
Lubricating or caulking type	D08	14.1
Machine gun	89	9+
Toy	D21	573
Magazine	42	87+
Making	42	49.1+
Mechanical	124	
Mount	89	37.01+
Training mechanism	89	41.01+
Mounted	89	
Movable chambers		
Firearms	42	39.5
Ordnance	89	155
Multiple barrel	89	1.41
Nonrecoil	89	1.7
Pen and knife	42	1.09
Port ship	114	173+
Stopper	114	175
Portable	42	
Powder		
Ammunition loading with	86	
Bags	102	282
Engine starters	123	183.1
Engines	123	24 R
Forms	102	283+
Racks	211	64
Rapid fire	124	72+
Recoil operated	89	162
Recoilless	89	1.7
Rests	42	94
Revolver	42	59+
Safety mechanism	42	70.01+
Automatic guns	89	137+
Revolvers	42	66
Semiautomatic	89	4.05+
Shields	89	36.01+
Deflected ray tube	356	253+
Shotguns	42	
Sidearms	D22	
Sights	42	111+
Design	D22	109
Design,telescopic	D16	132
Optical system	356	247+
Stocks	42	71.01+
Teargas	42	1.08
Telescopic gunsight	D16	132
Toy simulating	42	54+
Ammunition	102	281
Machine gun or projector	124	29
Non-detonating	446	473
With sound	446	405+
Training in gunnery	434	16+
Trigger protectors	42	70.07
Underwater	42	1.14
Walking cane combined	4	515+
Water gun	124	56+
Toy	D21	572
Water pistol	222	79
Well tubing perforator	175	2
Y gun	89	1.1
Gussets		
Garment	2	275
Gut or Gut Treatment	8	94.11
Splitter	83	932*
Guttapercha	525	331.9+
Gutter	405	119+
Eaves trough	52	11+
Electric conductor underground structure	174	39
Road and pavement	404	2+
Support design	D08	363
Guy	52	146+
Bed spring and frame	52	272
Gymnastic Devices	482	23+
Coin controlled apparatus	194	
Design	D21	797
Gypsum	423	554
Calcining	106	722+
Coating or plastic compositions containing	106	772+
Alkali metal silicate	106	611
Gyrating		
Reciprocating sifter		
Actuating means	209	366+
Horizontal and vertical shake	209	326
Horizontal shake	209	332
Gyratory Crusher		
Jaw crushers rotary component	241	207+
Parallel flow through plural zones	241	140
Series flow through plural zones	241	156
Gyro Stabilized		
Article support	248	183.1
Furniture for ships	114	119
Gyroplane (See Aircraft)	244	17.11+
Gyroscope	74	5 R+
Acceleration measuring and testing	73	504.03
Aerial camera combined	396	13
Aircraft control	244	79
Direction indicator	33	318+
Gimbals	248	182.1+
Gun sight combined	89	202
Gyroscopic compass	33	324+
Telemetric system combined	340	870.07+
Gyroscopic light valve, photoelectric	250	231.12
Monorail rolling stock	105	141+
Suspended	105	150+
Rotary	73	504.08
Rotors	74	5.95
Rotors and flywheels	74	5.95
Ship antiroll	114	112
Ship stabilizer	114	122
Ship steering	114	144 R
Speed responsive devices	73	504.01
Torpedo	114	24
Torpedo steering	114	24
Toy	446	233+
Transmission	74	64
Velocity measuring and testing	73	504.02

Fig. 6H—Sample Page of *Index to Classification*

searched online (see "Locating PTO Publications Online"). (As stated, there are about 430 classes.) Each class is on its own page(s), together with about 300 to 400 subclasses under each class heading, for a total of about 140,000 subclasses. The *Manual* lists design as well as utility classes; the classes are not in any logical order. To see where class-subclass 482/23 fits, let's look at the first page that covers class 482. Fig. 6I is a copy of this page. It shows the first part of "Class 482—Exercise Devices." Note that subclass 23 in this class covers "Gymnastic." Under 482/23 are further subclasses that may be of interest; these cover trapezes and rings, horizontal bars, etc.

As I'll explain below, this manual is used as an adjunct to the *Index*, to check your selected classes, and to find other, closely related ones.

Classification Definitions

To check our selected class and subclass still further, we next consult a third source, known as the *Classification Definitions*. The *Classification Definitions* can be searched online (see "Locating PTO Publications Online"). At the end of each subclass definition is a cross-reference of additional places to look that correspond to such subclass.

Fig. 6J shows the classification definition for 482/23. This definition is actually a composite that I've assembled from several pages of the *Definitions*—that is, it includes definitions for class 482 per se and subclasses 23–26. Note that the class definition (482 per se), as well as many of the subclass definitions contain cross-references to other classes and subclasses. You should consider these when selecting your search areas.

Getting Classification From the PTO or a PTDL

You can get a free, informal mail-order classification of your invention for search purposes by sending a copy of your invention disclosure, with a request for suggestions of one or more search subclasses, to Search Room, Patent and Trademark Office, Washington, DC 20231. However, unless you're really stuck in obtaining subclasses, I don't recommend using this method, since you have the interest in and familiarity with your invention to do a far better job if only you put a little effort into it.

Also, to save time if you intend to go to the PTO in Alexandria, you can get the search classifications locally, online, or at a PTDL (Patent and Trademark Depository Library) by using its CD-ROM CASSIS (Classification And Search Support Information System). Instructions will be provided at the computer or by the librarian.

Be sure to spend enough time to become confidently familiar with the classification system for your invention. Check all of your subclasses in the *Manual of Classification* and the *Class Definitions* manual to be sure that you've obtained all of the right ones. Usually, two or more subclasses will be appropriate. For example, suppose your gymnastic device uses a gear with an irregular shape. Naturally, you should search in the gear classes as well as in the exercising device classes. Note that the cross-references in the exercising device classes won't refer you to "gears," since this is too specific—the cross-references in the PTO's manuals are necessarily general in nature. It's up to you to consider all aspects of your particular invention when selecting search categories.

Another excellent example of using your imagination in class and subclass selection for searching is given in the paper, "The Patent System—A Source of Information for the Engineer," by Joseph K. Campbell, Assistant Professor, Agricultural Engineering Department, Cornell University, Ithaca, New York, which was presented at the 1969 Annual Meeting of the American Society of Agricultural Engineers, North Atlantic Region. The ASAE's address is P.O. Box 229, St. Joseph, MO 49085. The publication number is NA-64-206. The article costs $7. Call 616-429-0300 for more information.

Professor Campbell postulates a hypothetical search of a machine that encapsulates or pelletizes small seeds (such as petunia or lettuce seeds) so they may be accurately planted by a mechanical planter. To find the appropriate subclasses, he first looks in the *Index of Classification* under the "seed" categories. He finds a good prospect, "Seed-Containing Compositions," and sees that the classification is Class 47 (Plant Husbandry), sub 1.

After checking this class/subclass in the *Manual of Classification* to see where it fits in the scheme of things and in the *Class Definitions* to make sure that it looks okay (it does), he would start his first search with Class 27, sub 1. Then, using his imagination, Professor Campbell also realizes that some candies, such as chocolate-covered peanuts, are actually encapsulated seeds. Thus, he also looks under the candy classifications and finds several likely prospects in Class 107: "Bread, Pastry and Confection-Making." Specifically, sub 1.25, "Composite Pills (with core)"; sub 1.7, "Feeding Solid Centers into Confectionery"; and sub 11, "Pills" look quite promising. Thus he adds class 107, subs 1.25, 1.7, and 11 to his search field. The moral is this: When you search, look not only in the obvious places, but also use your imagination to find analogous areas, as Professor Campbell does.

For another example of searching in analogous areas, consider an automobile steering wheel that you've improved

CLASS 482 EXERCISE DEVICES 482 - 1

1 **HAVING SPECIFIC ELECTRICAL FEATURE**
2 .Electrical energy generator
3 .Pace setting indicator
4 .Equipment control
5 ..Amount of resistance
6 ...Regulates rate of movement
7 ..Rate of movement
8 .Monitors exercise parameter
9 ..To create or modify exercise regimen
10 **FOR HEAD OR NECK**
11 .Face (e.g., jaw, lip, etc.)
12 **FOR THRUSTING A POINTED WEAPON (E.G., A FENCING FOIL, ETC.) OR SIMULATION THEREOF**
13 **FOR IMPROVING RESPIRATORY FUNCTION**
14 **FOR TRACK OR FIELD SPORT**
15 .Jumping, vaulting, or hurdling
16 ..Crossbar or support therefor
17 ...Including height adjustment feature
18 ..Vaulting pole or stop
19 .Starting block for runner
20 .Throwing
21 ..Discus
22 ..Shot-put
23 **GYMNASTIC**
24 .Trapeze or rings
25 .Vaulting or pommel horse
26 .Projector
27 ..Trampoline
28 ...Having foldable frame
29 ...With disparate structure
30 ..Spring board
31 ...Spring external to board
32 ...Movable fulcrum
33 .Tower or pole for swinging upon
34 .Bar or rope for balancing upon
35 .Play area climbing or traversing arrangement (i.e., for use by children)
36 ..Having upright array of horizontally extending elements
37 .Arm or hand type climbing arrangement
38 .Horizontal bar
39 ..Attached to vertical wall or associated structure
40 ...Door or door jamb
41 ..Parallel bars
42 ...Separately adjustable
43 ..Harness for supporting user
44 **HAND, WRIST, OR FINGER**
45 .Involving wrist rotation
46 ..About axis perpendicular to forearm
47 .Having individual structure engaging each finger used
48 ..Finger loop
49 .Grip
50 ..Having weight feature (e.g., dumbbell, etc.)
51 **INVOLVING USER TRANSLATION OR PHYSICAL SIMULATION THEREOF**
52 .Stair climbing
53 ..Utilizing fluid resistance
54 .Treadmill for foot travel
55 .Swimming
56 ..Out of water type
57 .Bicylcling
58 ..Utilizing fluid resistance
59 ...Gas
60 ..Completely detached from user support
61 ..Stand for converting bicycle
62 ..Including upper body exercise feature
63 ..Utilizing specific resistance generating structure
64 ...Flywheel with braking band
65 ...Wheel with edge engaging braking roller
66 .Occupant propelled support frame having movement facilitating feature for foot travel
67 ..Armpit engaging
68 ..Rolling
69 .Occupant suspended from above (e.g., by a body harness, etc.) for foot travel
70 .Having separate foot engaging members reciprocating on parallel guide tracks, e.g., Nordic skiing simulator, etc.
71 .Alpine or towed skiing
72 .Rowing
73 ..Utilizing fluid resistance
74 .Jogging accessory
75 .Elevated walking device (e.g., stilts, etc.)
76 ..Stilt having specific step
77 .Bouncing device
78 .User inside device

Fig. 6I—Sample Page of *Manual of Classification*

CLASS 482, EXERCISE DEVICES

SECTION I - CLASS DEFINITION

This class provides for apparatus intended to be operated by a human user for the purpose of: (a) facilitating the conditioning or developing of a muscle of the user by repetitive or continuous activity of the user or, (b) participating in a track, field, gymnastic, or athletic activity, unless by analogy of structure or by other function the apparatus is classified elsewhere.

(1) Note. In some of the definitions of subclasses hereunder, the phrase "significance is attributed" is used to describe a function that is the primary use of the structure of patents therein. The structure of the apparatus may be capable of use for other purposes, but the claimed disclosure of the patent so placed indicates the intended primary function of the structure as that described by the title and definition of the subclass.

(2) Note. Conditioning or developing a muscle includes helping a user, e.g., an infant or invalid, to walk or learn how to walk unless provided for elsewhere. See Subclass References to the Current Class, below.

23 **GYMNASTIC:**
This subclass is indented under the class definition. Subject matter wherein significance is attributed to the use of the apparatus for an acrobatic purpose by the user.

(1) Note. The terms "gymnastic" and "acrobatic" have come to denote and describe various pieces of equipment such as a trapeze, bar, vaulting horse, diving board, trampoline, etc., that are used in physical activities known by similar names. These activities are characterized by extreme movements of the user, who uses the equipment as a fulcrum or starting area to launch bodily through space, swing therefrom, or perform other such physical activity thereon. The significance of the apparatus is more in the activity for which the apparatus is used than in the structural differences between the apparatus (see the Class Definition, (1) Note).

SEE OR SEARCH THIS CLASS, SUBCLASS:
109, for a club type exercise device which may be used for juggling.

SEE OR SEARCH CLASS:
273, Amusement Devices: Games, particularly subclasses 441+ for a game apparatus dealing with physical ability.

24 **Trapeze or rings:**
This subclass is indented under subclass 23. Subject matter wherein the acrobatic apparatus is either (1) a short, horizontal, swingable bar suspended at each end by a flaccid strand, e.g., a rope, etc., or (2) a pair of annular objects each suspended by a flaccid strand, e.g., a rope, etc., about which the user may move in an acrobatic manner.

SEE OR SEARCH THIS CLASS, SUBCLASS:
143+, for a suspension device from which the user may freely hang.

SEE OR SEARCH CLASS:
472, Amusement Devices, particularly subclasses 118+ for an amusement swing.

25 **Vaulting or pommel horse:**
This subclass is indented under subclass 23. Subject matter wherein the acrobatic apparatus is (1) a supported body used for jumping over or for another acrobatic purpose, i.e., a vaulting horse or (2) a supported body with a pair of handles mounted thereon for an acrobatic purpose, i.e., a pommel horse.

SEE OR SEARCH THIS CLASS, SUBCLASS:
16+, for a track or field sport in which a user jumps, vaults, or hurdles over a crossbar.
34, for a bar or rope for balancing upon.
38+, for a horizontal bar used for a gymnasts purpose.

26 **Projector:**
This subclass is indented under subclass 23. Subject matter wherein the acrobatic apparatus

Fig. 6J—Sample Page of *Classification Definitions*

by adding finger ridges to improve the driver's grip. In addition to searching in the obvious area (automobile steering wheels), consider searching in any other areas where hand grips are found, such as swords, tools, and bike handlebars.

Fortunately, the cross-references in the *Class Definitions* manual will be of great help here. Also, as stated, the PTO and all PTDLs have the CASSIS system, which will be of great assistance.

Note how Sam Searcher, Esq., has completed the "Selected Search Classifications" section of the search worksheet with appropriate classes to search for prior art relevant to Millie Inventress's invention.

Steps 3 and 4: Check the Accuracy of the Relevant Classifications

Check the accuracy of the classifications you found in Step 2 by reviewing the Class Schedule and Class Definitions. Remove any classes and subs that you feel aren't relevant to your invention.

Step 5: Search the Patents and Note Relevant Prior Art (Patents and Other Publications) Under Your Classification

After obtaining a list of classes and subclasses to search, you can search through the actual patents on the Internet as well as EAST. On the Net go to http://patft.uspto.gov and click "Quick Search," enter the first class and sub in the "Term 1" box, and hit Search. Do this for each relevant class and sub under Issued Patents and Patent Applications. In the public search room, you'll have to remove bundles of patents from slot-like shelves in its huge stack area. Bring them to a table in the main search area, and search them by placing the patents in a bundle holder and flipping through them. In the examiners' search room, the patents are found in small drawers, called "shoes" by the examiners. You should remove the drawer of patents, hold it in your lap, and flip through the patents while you're seated in a chair; generally, no table will be available.

The computer will search according to your class and subclass and present you with a list of patents. As you flip through the patents on the monitor (it's far easier on EAST!), you may at first find it very difficult to understand them and to make your search. I did when as an examiner I made my first search in the PTO. Don't be discouraged! After just a few minutes the technique will become clear and you may even get to like it! You'll find it easier to understand newer patents (see Le Sueur—Fig. 6D(c)), because they have an abstract page up front that contains a brief summary of the patent and the most relevant figure or drawing.

You'll find that the older patents (see Gabel—Fig. 6D(a)) have several sheets of unlabeled drawings and a closely printed description, termed a "specification," after the drawings. However, even with older patents, you can get a brief summary of the patent by referring to the summary of the invention, which is usually found in the first or second column of the specification. Near the end of each patent, you'll find the claims (Chapter 9). See any utility patent, or Fig. 6M, below, for some examples of claims. These are formally worded, legalistic sentence fragments that usually come after and are the object of the heading words "I [or "We"] claim." As mentioned in the last chapter (and as you'll learn in detail in Chapter 9), the claims define the legal scope of offensive rights held by the owner of the patent. I have seen more confusion about claims than perhaps any other area of patent law. If you'll read and heed well the next common misconception, you'll avoid falling into what I call the "claims trap," which technically is known as a confusion of infringement with anticipation. (See "Anticipation Versus Infringement," above.)

The PTO recently added "Patent Document Kind Codes" to the numbers of patents and their other publications, in accordance with international practice. Fig. 6D(d) provides a list of these codes.

Common Misconception: If the claims of a prior patent don't cover your invention, you're free to claim it in your patent application.

Fact: The claims of a patent are there solely to define the monopoly or scope of offensive rights held by the owner of the patent. Patent owners use claims mainly in licensing or in court to determine whether the patent is infringed—that is, whether the hardware that an alleged infringer makes, uses, or sells violates the patent. Thus, when you encounter a relevant patent during a search, you should not fall into the "claims trap," that is, you should not read its claims. You should treat the patent like any other publication (book, magazine article, etc.) to see if the patent's specification ("spec.") or drawings disclose (anticipate) your invention, or any part of it. Since the patent's claims merely repeat what's already in the spec. and drawings, they won't contain anything new, so you need not even read the patent's claims to understand the full technical disclosure of any patent. The spec. and drawings will almost always contain more than what is in the claims anyway. So even if a patent's claims don't cover your invention, its spec. and drawings may still disclose your invention. Since the patent is a prior publication as of its filing date, it can thus anticipate your invention, even if it doesn't claim your invention. (If you were free to claim an invention that a prior patent disclosed but did not claim, that would make patents worth less as prior art than other publications, such as magazine articles!)

Anticipation Versus Infringement

Many inventors have asked me, "How can an expired patent block me from patenting my invention?" That is, how can an expired patent be a valid prior-art reference? However, a moment's thought will show that if a patent ceased to be a valid prior-art reference when it expired, then inventors could (a) repatent the same invention approximately every 17 years, (b) patents would have a lower status than other prior-art publications, such as periodicals, which unquestionably remain valid prior art forever, and (c) inventors could patent things that were not new. If a patent ceased to be prior art when it expired then anyone could repatent the wheel, the sewing machine, etc. The misconception that a patent ceases to be a prior-art reference when it expires represents a confusion of *anticipation* with *infringement*. They are entirely separate areas in patent law and should be considered independently.

Anticipation is a situation that occurs when a proposed or new invention is discovered or found anywhere in the "prior art" (prior public use or prior publications, including the specification of any in-force or expired U.S. or foreign patent, any prior book, periodical article, etc.). Since the existence of the prior art proves the invention isn't new, the putative invention is said to be anticipated by the prior art and thus can't be patented. (35 USC 102.)

Infringement is a situation that occurs only when the claims of an in-force patent "read on" a product or process. If so, then the product or process *infringes* (violates) the patent and the patent owner may be able to negotiate licensing royalties from the infringer, or successfully sue the infringer for money damages and/or an injunction ordering the infringer to cease infringing. (35 USC 271.) (Note that a patent application can't infringe anything.)

If an invention is anticipated by a prior-art reference, that does not necessarily mean that it would infringe the reference, since the reference may be (a) a periodical article or book, which can't be infringed, (b) a foreign patent, which can't be infringed by activity in the U.S., or (c) an expired U.S. patent, which can no longer be infringed. Even if an invention is anticipated by an in-force U.S. patent, the invention usually will not infringe the patent. Why? Because the patent's claims usually will not read on the invention, most likely because the patentee was not able to get broad enough claims allowed due to even earlier prior art. The PTO is never concerned with and never takes any action with regard to any infringement; their main concern is to find anticipations to prevent the issuance of patents on old inventions.

EXAMPLE: In the early part of the 20th century, J.A. Fleming invented a two-element vacuum tube—the diode—that rectified alternating current. Then Lee De Forest added a third element—a control grid—to the diode, making a triode, which was capable of amplifying signals. Even though triodes infringed the diode patent, the Patent Office granted De Forest a patent since the PTO is not concerned with infringements. Although De Forest was not able to manufacture his triode without infringing Fleming's diode patent, Fleming was not able to make triodes without infringing De Forest's patent. Cross-licensing solved the problem, enabling each to practice the other's invention.

TIP

As was the case with De Forest's triode and Fleming's diode patent, if an invention infringes an in-force U.S. patent, the patent will not necessarily anticipate the invention.

Another reason for not reading the claims of searched patents is that they're written in such stilted legalese that they're difficult to understand. Nevertheless, some searchers do like to read claims of patents to get a quick "handle" on the patent's technical content. Also, if you make an *Official Gazette* search in a Patent and Trademark Depository or regular library (see Section K, below), you'll have to rely on claims for the most part, since most of the OGs contain only a single claim of each patent.

If you do read the claims, keep in mind three important considerations:

1. If a prior-art patent shows (that is, describes) but doesn't formally claim your invention, this doesn't mean you're free to claim it.
2. A patent contains much more technical information than what's in its claims; all of this technical information can be used as prior art, just as if the patent were an article in a technical magazine. Thus, you should use the claims only to get a "handle" on the patent; you should not regard them as a summary or synopsis of the patent's disclosure.
3. The scope of coverage you will likely be able to obtain for your invention (see Section J, below) will usually be narrower than the scope of the claims of the closely relevant prior-art patents you uncover. (See Chapter 9 to see how to determine the breadth of claims.)

Common Misconception: If your invention is covered by the claims of a prior patent, you will be liable as an infringer if you file a patent application on the invention.

Fact: Neither a patent application nor its claims can infringe a prior patent. Only the manufacture, use, sale, offer for sale, or importation of an invention in physical form can infringe. And, as previously stated, the PTO has absolutely no concern about patent infringements.

Don't think about obviousness as you search, since this may overwhelm you and detract from the quality of your investigation. Rather, at this stage, try to fish with a large net by merely looking for the physical features of your invention.

As you search, keep a careful record of all patent classes and subclasses you've searched, as indicated in Fig. 6G, above. Probably 95% of the references you encounter when you search will not be relevant. If you find relevant patents or other art, write their numbers, dates, names, or other identification, and order or download copies later. Although you need only the number to order a patent, I recommend that you write the issue date, first inventor's name, and classification as well, to double-check later in case you write down a wrong number.

If you do find an important relevant reference, don't stop; simply asterisk it (to remind you of its importance) and continue your search to the end. When you note a relevant reference, also write down its most relevant features to refresh your memory and save time later.

If you still don't find any relevant patents, double-check your search classes using *Classification Definitions*, the *Manual of Classification*, and some help from a patent examiner or assistant in the search room. If you're reasonably sure you're in the right class and still can't find any relevant references, write down the closest ones you can possibly find, even if they're not relevant. This will establish that you made the search, what the closest art is, and how novel your invention is, and you'll have references to cite on your Information Disclosure Statement (see Chapter 13, Section A) to make the PTO's file of your patent look good; you should never finish any search without coming up with at least several references. If you do consult examiners, write their names in the comments section of the worksheet.

In each subclass, you'll find patents that are directly classified there, and "cross-references" (XRs), patents primarily classified in another subclass, but also classified in your subclass because they have a feature that makes the cross-reference appropriate. Be sure to review the cross-references as well as the regular patents in each subclass.

The public search room has copiers for making instant copies of patents for a per-page fee, but if you don't need instant copies, you can get download patent copies for a fee on EAST or free on the Internet (see next paragraph). You can also buy a complete copy of any patent for one patent copy coupon, or use two coupons per patent for rush service. To do this, purchase an adequate supply of coupons from the PTO's cashier (see Appendix 4, Fee Schedule); then write down the number of each patent you select on a coupon, add your name and address, and deposit them in the appropriate box in the search room. The patents you request will be mailed to you, generally in a few days if you use one coupon per patent, or in one day if you staple two coupons together per patent. You can also acquire a copy of a patent as follows:

- To download a copy of any patent from the free patent sites, go to either Google Patents (www.google.com/patents),
- Free Patents Online (www.freepatentsonline.com),
- Free Patent Fetcher (http://free.patentfetcher.com/Patent-Fetcher-Form.php), or
- Pat2PDF (www.pat2pdf.org).

These sites will deliver a PDF copy of the entire patent right on your computer desktop. I don't recommend using the PTO's site (www.uspto.gov/patft/index.html) to download patents because it only supplies patents one page at a time in a special TIFF format that you can only view with a special free TIFF reader program.

You can also order patent copies from a private supply company such as MicroPatent (www.micropatent.com) or Thompson-Derwent (www.ThompsonDerwent.com).

Step 6: Review the Prior Art to See Whether It Anticipates Your Invention or Renders It Obvious

After you've made your search and obtained the numbers of all the pertinent references, obtain copies and study them. I recommend you write a brief summary of each relevant patent, even if it has an abstract, to force you to really understand it. Then, determine if your invention is patentable over the patents you've found. Follow the steps described earlier in this chapter (Section G) for analyzing the search report when your search is done by someone else to determine whether the prior art renders your invention obvious.

Step 7: Obtain Additional Patents and Classifications

To extend your search further and make it more complete, look at each relevant patent that you found in order to find additional patents and classifications that may be relevant. First check the "References Cited" on the first (or Abstract) page of each patent to find additional patents and other references cited against this patent while it was pending. Look up and check these patents to see if they're also relevant and if so, determine if they anticipate or render your invention obvious. Then check the "Field of Search" on the Abstract page to find additional relevant classes and subs and check the patents in these classes as you did above. It's a lot of work and will take some time, but you'll save a lot of money.

b. Keyword Searching and PubWEST

In addition to making a classification search, you can perform a keyword search of your invention on EAST, the Internet, or on PubWEST (Web-based Examiner Search Tool) terminals at all PDLs. Unfortunately the PubWEST search engine is not available to the general public on the Internet. Some PTDLs that have PubWEST charge hourly fees. PubWEST has many advantages over the PTO's Internet search facility, such as the ability to search the full text of patents back to 1920, plus EPO and Japanese patent abstracts, the ability to save searches, the ability to make proximity searches (specify distances in words between keywords), and faster searching. However PubWEST takes some time to learn, so the PubWEST literature advises that it's not worth learning unless you are a frequent patent searcher. Google Patents (see below) is far easier to use and provides many of the same features as PubWEST, plus some features that PubWEST lacks.

J. The Scope of Patent Coverage

Although you'd probably like things to be simpler, the determination of whether your invention is patentable will rarely be a "yes" or "no" one, unless your invention is a very simple device, process, or composition. Many inventions are complex enough to have some features, or some combination of features, that will be different enough to be patentable. However, your object is not merely to get a patent, but to get *meaningful* patent coverage—that is, offensive rights that are broad enough that competitors can't "design around" your patent easily. As I've said elsewhere, designing around a patent is the act of making a competitive device or process that is equivalent in function to the patented device but that doesn't infringe the patent.

Often you won't be able to get broad coverage because many "modern" inventions are actually old hat—that is, the basic ideas were known many years before and the real inventions are actually just improvements on old ones. For example, the first computer was a mechanical device invented in the 1800s by Charles Babbage. The ancient Chinese used a soybean mold to treat infections. An inventor, J.H. Loud, received a patent on a ballpoint pen in 1888. The first 3D film was shown in 1922, and the basic transistor structure was invented in the 1930s!

Simply put, you'll often find a search will indicate that your invention, while valuable, may be less of an innovation than you thought it was. You'll thus have to determine whether or not your invention is sufficiently innovative to get meaningful patent protection. In other words, your scope of coverage will depend upon how close the references that your search uncovers are to your invention—that is, how many features of your invention are shown by the references, and how they are shown. In the end, your scope of coverage will actually depend upon the breadth of the claims that you can get the PTO to allow, but this is jumping the gun at this stage; I cover claims in Chapter 9.

For an example, let's take a simple invention. As stated, in a simple invention patentability will usually be a black or white determination, and you won't have much of a problem about your scope of coverage. Suppose you've just invented a magnetically operated cat door—that is, you provide a cat with a neck-worn magnet that can operate a

release on a cat door. Your search references fail to show any magnetically operated pet release door. Thus, the neck magnet and the magnetic door release are the novel features of your invention. To get a patent, your invention would have to be limited to these specific features, since neither could be changed or eliminated while producing the same result. However, there is no harm in limiting the invention to these features, since it would be difficult for anyone to "design around" them—that is, it would be difficult or impossible for anyone to provide the same result (a cat-operated door release) without using a neck magnet and a magnetic release.

With other inventions, however, your scope of coverage won't be so broad—that is, it won't be as difficult for someone to design around it. For example, suppose you invented the centrifugal vegetable juicer mentioned previously in Chapter 5—that is, a juicer with a sloping side basket permitting the solid pulp to ride up and out so that juicing could continue without having to empty the pulp from the basket.

If the prior art were not "kind" to you—that is, your search uncovered a patent or other publication that showed a juicer with a basket with sloping sides and with a well at the top to catch and hold the pulp—your application would not be allowed if you claimed just the sloping sides (even though it would be superior to the prior art due to the complete elimination of the pulp). To get the patent, you would have to also claim another feature (say, the trough shape). Thus, by having access to the prior art you would know enough to claim your invention less broadly.

Also, suppose you've invented the napkin-shaping ring of Fig. 6B. Suppose further that Gabel did not exist and that your search uncovers only the Le Sueur patent (see Fig. 6D(c)), which shows a plain, circular napkin ring. You'd be entitled to relatively broad coverage, since your novel features are themselves broad: namely, a ring with inner parts that can shape a napkin when it is pulled through the ring.

However, assuming the Gabel patent does exist and your search uncovers it as well as Le Sueur, what are your novel features now? First, your device has a circular ring with a leg extending inwardly from the ring; neither Gabel nor Le Sueur, nor any possible combination of these references, has this combination. Second, your invention has the flaring arms that shape the napkin; these are attached to the end of the inner leg; the references also lack this feature. Thus to distinguish over Le Sueur and Gabel, you'll have to rely on far more specific features than you'd have to do if only Le Sueur existed. Hence your actual invention would be far narrower, since you'll have to limit it to the novel features that distinguish it from Gabel as well as Le Sueur. Unfortunately, this will narrow your scope of coverage, because competitors can design around you more easily than they could do if only Le Sueur existed.

As you've probably gathered by now, your scope of coverage will be determined by what novel features you need to use to distinguish your invention over the prior art and still provide new results that are different or unexpected enough to be considered unobvious. The fewer the novel features you need, the broader your invention or scope of coverage will be. Stated differently, if you need many new features, or very specific features, to define over the prior art and provide new results, it will usually be relatively easy for a competitor to use fewer or alternative features to provide the same results without infringing your patent.

You should make your scope of coverage determination by determining the fewest number or the broadest feature(s) you'll need to distinguish patentability over the prior art. Do this by a repetitive narrowing trial-and-error process: First, see what minimum feature(s) you'll need to have some novelty over the prior art—that is, enough to distinguish under Section 102 (Box C of Figs. 5C and 6E)—and then see if these would satisfy Section 103 (Boxes D, E, and G)—that is, would they provide any unexpected new results?

If you feel that your minimum number of features are enough to ascend the novelty slope of the Patentability Mountain (pictured in Fig. 5A in Chapter 5), but would not be sufficient to climb the big unobviousness slope—that is, you don't have enough features to provide new and unexpected results—then try narrowing your features or adding more until you feel that you'll have enough to make it to the patentability summit.

Common Misconception: If a search shows that your invention is not patentable, you may not manufacture or sell it.

Fact: Even if it's not patentable, you usually still can make and sell it because the prior-art reference(s) which make it not patentable probably are either expired patents or don't claim your invention. For more on how to determine if a prior, in-force patent's claims cover you, see Chapter 15, Section K.

TIP

This is another one of those aspects of patent law that may have your head spinning. Fortunately, the material covered here under determining the scope of your protection is also discussed in the different context of drafting your claims. (See Chapter 9.) By the time you read this book thoroughly, you will understand all of this a lot better.

After you evaluate your search results, you'll have a pretty good idea of the minimum number of novel features that are necessary to sufficiently distinguish your invention over the prior art. If you're in doubt that you have enough such features, or if you feel that you'd have to limit your invention to specific features to define structure that would be considered unobvious over the prior art, it probably isn't patentable, or even if patentable, it isn't worth filing on, since it would be easy to design around. One possibility, if you can't make a decision, is to pay for a professional's opinion.

On the other hand, if you've found nothing like your invention in your search, congratulations. You probably have a very broad invention, since, with the six million plus patents that have issued thus far, one or more features of almost all inventions are likely to be shown in the prior art.

K. Patent and Trademark Depository Libraries

As you may know, Patent and Trademark Depository Libraries are scattered around the country in all states and are listed below in Fig. 6K. Before going to any PTDL, call to find out their hours of operation and what search facilities they have.

1. Searching at a PTDL

Searching at a PTDL is less useful than searching at the PTO or the Internet because the EAST system at the PTO has far more capabilities than the PubWEST search facilities available at the PTDLs or the Internet searches, which are available on any computer. However the obvious advantage of the latter two is that they are local.

I like to assign percentage values to the various types of searches: I roughly estimate a good examiner's search at 90% (that is—it has about a 90% chance of standing up in court), a good search by a nonexaminer in the PTO at 80%, and a good search in a PTDL or on the Internet at 70%. (Unfortunately, as in business, there's no certainty in the law.) If your invention is in an active, contemporary field, such as a computer mouse, you should reduce the value of the two nonexaminer types of searches somewhat, due to the fact that patent applications in this field are more likely to be pending.

To make a Classification search at a PTDL in addition to using PubWEST or the Internet, you can also make an *Official Gazette* (OG) search. You should go through the same four steps given above. First, articulate your invention (in the same manner as before), and second, use the reference tools to find the relevant classes and subclasses. The third step is a review of the patents in the selected classes and subclasses. And finally, you should analyze all relevant prior-art references for their effect on your invention's patentability.

For Recent Years the *Official Gazette* Is Available in Electronic Format Only

The *Official Gazette (Patents)* (OG) was a weekly publication (paperback book) that listed the main facts (patentee, assignee, filing date, classification) plus the broadest claim and main drawing figure of every patent issued that week. It also contained pertinent notices, fees, and a list of all PTDLs (Fig. 6K). The OG notices and patents are now published each week at the PTO's website, under Official Gazette Notices and Official Gazette for Patents, respectively. Also, the complete patents are available online elsewhere on the PTO's website each week.

If you make an OG search you can search the paper (book) copies of the OGs up to about ten years ago (when the PTO stopped printing paper copies); thereafter you will have to search for them on the Internet. Each patent entry you find will contain only a single claim (or abstract) and a single figure or drawing of the patent, as indicated in Fig. 6M (a typical page from an OG).

Note that for each patent, the OG entry gives the patent number, inventor's name(s) and address(es), assignee (usually a company that the inventor has transferred ownership of the patent to), filing date, application serial number, international classification, U.S. classification, number of claims, and a sample claim or abstract. If the drawing and claim look relevant, go to the actual patent, order or download a copy of it, and study it at your leisure.

Remember that the claim found in the *Official Gazette* is not a descriptive summary of the technical information in the patent. Rather, it is the essence of the claimed invention. The full text of the patent will contain far more technical information than the claim. So, even if a patent's *Official Gazette* claim doesn't precisely describe your invention, the rest of the patent may still be relevant.

> **EXAMPLE**: When recently performing a PTDL search, a client of mine passed over a patent listed in the OG because the single drawing figure appeared to render the patent irrelevant. In fact, another drawing figure in the passed-over patent (but not found in the OG) anticipated my client's invention and was used by the PTO to reject his application (after he had spent

Reference Collection of U.S. Patents Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette* of the U.S. Patent and Trademark Office and numerical sets of patents in a variety of formats. Patent and trademark search systems in the CASSIS optical disk series are available at all PTDLs to increase access to that information. It is through the optical disk systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications that outline and provide access to the patent and trademark classification systems, as well as other documents and publications that supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of online systems, photocopying, and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours.

For the latest copy of this list, or for Web links to each PTDL, go to the PTO's *Official Gazette* site at www.uspto.gov/web/offices/com/sol/og. Then go to the latest *Official Gazette* and open "Patent and Trademark Depository Libraries."

State	Name of Library	Telephone
Alabama	Auburn University Libraries*	334-844-1737
	Birmingham Public Library	205-226-3620
Alaska	Fairbanks: Keith Mather Library	907-474-2636
Arizona	Tempe: Noble Library, Arizona State Univ.*	480-965-7010
Arkansas	Little Rock: Arkansas State Library*	501-682-2053
California	Los Angeles Public Library*	213-228-7220
	Sacramento: Cal. State Library	916-654-0069
	San Diego Public Library	619-236-5813
	San Francisco Public Library*	415-557-4500
	Sunnyvale Public Library	408-730-7300
Colorado	Denver Public Library	720-865-1711
Connecticut	Fairfield: Sacred Heart University	203-371-7726
Delaware	Newark: Univ. of Delaware Library	302-831-2965
DC	Washington: Howard Univ. Library	202-806-7252
Florida	Fort Lauderdale: Broward County Main Library*	954-357-7444
	Miami: Dade Public Library*	305-375-2665
	Orlando: Univ. of Central Florida Libraries	407-823-2562
Georgia	Atlanta: Georgia Institute of Tech.	404-385-7185
Hawaii	Honolulu: Hawaii State Public Library System*	808-586-3477
Illinois	Chicago Public Library	312-747-4450
Indiana	Indianapolis: Marion County Public Library	317-269-1741
	West Lafayette: Siegesmond Engineering Library	765-494-2872
Kansas	Wichita: Ablah Library, Wichita State Univ.*	800-572-8368
Kentucky	Louisville Free Public Library	502-574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State Univ.	225-578-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	207-581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	301-405-9157
Massachusetts	Amherst: Physical Sciences Library, Univ. of Massachusetts	413-545-2765
	Boston Public Library*	617-536-5400 Ext. 4256
Michigan	Ann Arbor: Media Union Library, University of Michigan	734-647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	231-592-3602
	Detroit Public Library (has APS Image Terminals)*▲	313-481-1391

* WEST (Web-based Examiner Search Tool—better searching) subscriber.

▲ EAST (Examiner Assisted Search Tool) subscriber.

Fig. 6K—List of Patent and Trademark Depository Libraries

Reference Collection of U.S. Patents Available for Public Use in Patent and Trademark Depository Libraries (continued)

State	Name of Library	Telephone
Minnesota	Hennepin County Library	952-847-8000
Mississippi	Jackson: Mississippi Library Commission	601-961-4111
Missouri	Kansas City: Linda Hall Library*	816-363-4600
	St. Louis Public Library*	314-352-2900
Montana	Butte: Montana College of Mineral Science & Tech. Lib.	406-496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska*	402-472-3411
Nevada	Las Vegas: Clark County Lib.	702-507-3421
	Reno: University of Nevada-Reno Library	702-784-6500 Ext. 257
New Jersey	Newark Public Library	973-733-7779
	Piscataway: Lib. of Science & Medicine, Rutgers University	732-445-2895
New Mexico	Albuquerque: University of New Mexico General Library	505-277-4412
New York	Albany: New York State Library	518-474-5355
	Buffalo and Erie County Public Lib.	716-858-7101
	New York Public Library (The Research Libraries)	212-592-7000
	Rochester Public Library	716-428-8110
	Stony Brook: Engineering Lib., State Univ. of New York	631-632-7148
North Carolina	Raleigh: D.H. Hill Library, N.C State University*	919-515-2935
	Charlotte: J.M. Atkins Library	704-687-2241
North Dakota	Grand Forks: Chester Fritz Lib., University of North Dakota	701-777-4888
Ohio	Akron: Summit Cnty Public Lib.	330-643-9075
	Cincinnati and Hamilton County, Public Library of	513-369-6932
	Cleveland Public Library*	216-623-2870
	Dayton: Paul Laurence Dunbar Library, Wright State University	937-775-3521
	Toledo/Lucas County Public Library*	419-259-5209
Oklahoma	Stillwater: Oklahoma State Univ. Center for Trade Development*	405-744-6546
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	503-768-6786
Pennsylvania	Philadelphia, The Free Library of*	215-686-5394
	Pittsburgh, Carnegie Library of	412-622-3138
	University Park: Pattee Library, Pennsylvania State University	814-865-7617
Puerto Rico	Bayamón: Univ. of Puerto Rico	787-786-5225
	Mayaguez General Library, University of Puerto Rico	787-993-0000 Ext. 3244
Rhode Island	Providence Public Library	401-455-8027
South Carolina	Clemson University Libraries	864-656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines & Tech.	605-394-1275
Tennessee	Nashville: Stevenson Science Library, Vanderbilt University	615-322-2717
Texas	Austin: McKinney Engineering Library, Univ. of Texas at Austin	512-495-4511
	Dallas Public Library*	214-670-1468
	Houston: The Fondren Library Rice University*	713-348-5483
	Lubbock: Texas Tech University	806-742-2282
	San Antonio Public Library	210-207-2500
Utah	Salt Lake City: Marriott Library, University of Utah*	801-581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	802-656-2542
Virginia	Richmond: Virginia Commonwealth University*	804-828-1104
Washington	Seattle: Engineering Library, University of Washington*	206-543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University*	304-293-4695
Wisconsin	Madison: Kurt F. Wendt Library, Univ. of Wisconsin, Madison	608-262-6845
	Milwaukee Public Library	414-286-3051
Wyoming	Cheyenne: Wyo. State Library	307-777-7281

* WEST (Web-based Examiner Search Tool—better searching) subscriber.
▲ EAST (Examiner Assisted Search Tool) subscriber.

Fig. 6K (cont'd)—List of Patent and Trademark Depository Libraries

considerable time, money, and energy preparing and filing it). The moral? Take an OG search with a grain of salt. Note well that a figure of the patent that isn't shown in the OG may be highly relevant; thus it's best to search full patents.

To make an OG search of the patents in class 272, subclass 109 (Fig. 6L), start with the first patent in this list, D-262,394X. The "D" means that the patent is a design patent and the "X" means that this patent is a cross-reference. To view patent D-262,394, look on the PTO's website under "Patent Number Searching." You'll find the patent, D-262,394, was issued in 1980. If you find it relevant, print it out and write its identifying data down on your Searcher's Worksheet, Form 6-1.

The second patent in the list, RE-25,843, is a reissue patent. Reissues are discussed in Chapter 14. For now, all you have to know is that reissues are also available on the PTO's site. Locate the patent, print it out, and list it on your worksheet if you feel it's relevant.

All of the rest of the patents in subclass 109 are regular utility patents in numerical and date order. Start with patent 9,695, which issued in the middle 1800s. You'll be able to view it easily online, in an old paper OG, or on microfilm or microfiche. Look at the patent in the usual manner to see if it's relevant. If so, write its data on your worksheet.

The Internet has full copies of patents readily accessible on any of the above sites—(each patent usually consists of several pages You can look at the full text of each patent, one by one, in a similar manner as you looked at their abstracts in the OGs. If you find that the patent is relevant, you can download and print a copy of the whole patent, or just its relevant parts, on the spot.

Alternatively, if you don't want to interrupt the flow of your searching, you can save your patent numbers and print out copies later.

After you've completed Step 3, the review of patents, then perform Step 4, the analysis and decision, in exactly the same manner as outlined above .

L. Problems Searching Software and Business Inventions

Many software experts have recently complained that the PTO has been issuing patents on software and business method inventions that aren't novel and unobvious over the prior art. I believe that there is much validity to this charge—that is, many software and business patents really don't claim a novel and unobvious invention and could be invalidated by a proper search. Part of the problem is due to differences in the PTO's database of software patents. As a result, some people even want to do away with software patents. I strongly disagree with this proposal, since this would be throwing out the baby with the bathwater.

I believe that much, if not most, future technological progress will occur in software, but without the incentive of a patent monopoly, software developers will not have an adequate incentive to innovate. There are many other arguments in favor of software patents, but they're beyond the scope of this book. Suffice it to note that I prefer strengthening the PTO's software search capability.

If you agree and want to support the continued existence of software patents, keep your eyes peeled for any legislative developments and do whatever you can to support the continued existence of software patents. Also if you have a software invention, be aware of the difficulty in doing a good search of your invention. If you search your invention in the PTO database there will be a greater chance that your search will not catch all of the relevant prior art.

One software patent resource is the Source Translation and Optimization patent website (www.bustpatents.com). The STO is directed by Gregory Aharonian, one of the PTO's most vocal critics. The site provides critiques, legal reviews, CAFC rulings, file wrappers, and infringement lawsuits relating to software patents. The STO also offers a free email newsletter.

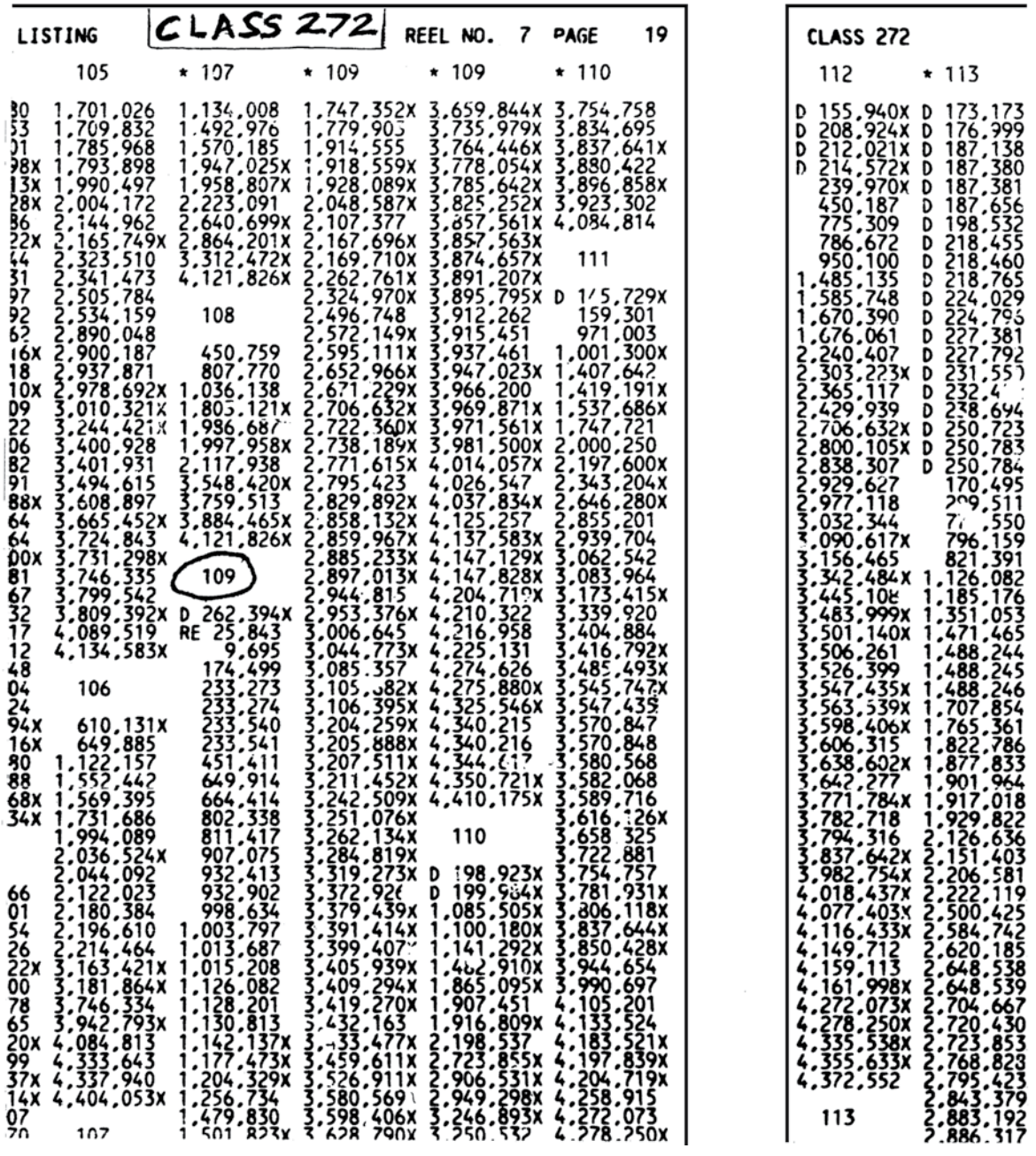
M. Searches on the Internet

Free patent searching systems are useful tools for conducting fair-to-good patent searches on inventions using recent technologies and for making free searches for inventions in older technologies. If you are willing to spend the time to do a thorough job, you can make a fairly complete search online. However, if you are unwilling or unable to spend the time, I suggest you hire a searcher, because it requires diligence to conduct a thorough patent search on the Internet.

1. Google Patents

Google Patents (www.google.com/patents) provides the most complete, most accurate, and fastest way to make online searches. Simply enter the keywords and all possible variations you can think of and it will search the entire U.S. patent database and return all relevant patents.

Fig 6N is Google Patent Search's main page. It is your gateway to about eight million searchable patents and patent applications dating back to 1836. To search from this page, enter your key search terms, such as "bicycle" and



LISTING CLASS 272 REEL NO. 7 PAGE 19

105	* 107	* 109	* 109	* 110
30 1,701,026	1,134,008	1,747,352X	3,659,844X	3,754,758
53 1,709,832	1,492,976	1,779,903	3,735,979X	3,834,695
01 1,785,968	1,570,185	1,914,555	3,764,446X	3,837,641X
98X 1,793,898	1,947,025X	1,918,559X	3,778,054X	3,880,422
13X 1,990,497	1,958,807X	1,928,089X	3,785,642X	3,896,858X
28X 2,004,172	2,223,091	2,048,587X	3,825,252X	3,923,302
86 2,144,962	2,640,699X	2,107,377	3,857,561X	4,084,814
22X 2,165,749X	2,864,201X	2,167,696X	3,857,563X	
44 2,323,510	3,312,472X	2,169,710X	3,874,657X	111
31 2,341,473	4,121,826X	2,262,761X	3,891,207X	
97 2,505,784		2,324,970X	3,895,795X	D 175,729X
92 2,534,159	108	2,496,748	3,912,262	159,301
62 2,890,048		2,572,149X	3,915,451	971,003
16X 2,900,187	450,759	2,595,111X	3,937,461	1,001,300X
18 2,937,871	807,770	2,652,966X	3,947,023X	1,407,642
10X 2,978,692X	1,036,138	2,671,229X	3,966,200	1,419,191X
D9 3,010,321X	1,805,121X	2,706,632X	3,969,871X	1,537,686X
22 3,244,421X	1,986,687	2,722,360X	3,971,561X	1,747,721
06 3,400,928	1,997,958X	2,738,189X	3,981,500X	2,000,250
82 3,401,931	2,117,938	2,771,615X	4,014,057X	2,197,600X
91 3,494,615	3,548,420X	2,795,423	4,026,547	2,343,204X
88X 3,608,897	3,759,513	2,829,892X	4,037,834X	2,646,280X
64 3,665,452X	3,884,465X	2,858,132X	4,125,257	2,855,201
64 3,724,843	4,121,826X	2,859,967X	4,137,583X	2,939,704
00X 3,731,298X		2,885,233X	4,147,129X	3,062,542
81 3,746,335	109	2,897,013X	4,147,828X	3,083,964
67 3,799,542		2,944,815	4,204,719X	3,173,415X
32 3,809,392X	D 262,394X	2,953,376X	4,210,322	3,339,920
17 4,089,519	RE 25,843	3,006,645	4,216,958	3,404,884
12 4,134,583X	9,695	3,044,773X	4,225,131	3,416,792X
48	174,499	3,085,357	4,274,626	3,485,493X
04 106	233,273	3,105,082X	4,275,880X	3,545,747X
24	233,274	3,106,395X	4,325,546X	3,547,435
94X 610,131X	233,540	3,204,259X	4,340,215	3,570,847
16X 649,885	233,541	3,205,888X	4,340,216	3,570,848
80 1,122,157	451,411	3,207,511X	4,344,617	3,580,568
88 1,552,442	649,914	3,211,452X	4,350,721X	3,582,068
68X 1,569,395	664,414	3,242,509X	4,410,175X	3,589,716
34X 1,731,686	802,338	3,251,076X		3,616,126X
1,994,089	811,417	3,262,134X	110	3,658,325
2,036,524X	907,075	3,284,819X		3,722,881
2,044,092	932,413	3,319,273X	D 198,923X	3,754,757
66 2,122,023	932,902	3,372,926	D 199,984X	3,781,931X
01 2,180,384	998,634	3,379,439X	1,085,505X	3,806,118X
54 2,196,610	1,003,797	3,391,414X	1,100,180X	3,837,644X
26 2,214,464	1,013,687	3,399,407	1,141,292X	3,850,428X
22X 3,163,421X	1,015,208	3,405,939X	1,462,910X	3,944,654
00 3,181,864X	1,126,082	3,409,294X	1,865,095X	3,990,697
78 3,746,334	1,128,201	3,419,270X	1,907,451	4,105,201
65 3,942,793X	1,130,813	3,432,163	1,916,809X	4,133,524
20X 4,084,813	1,142,137X	3,433,477X	2,198,537	4,183,521X
99 4,333,643	1,177,473X	3,459,611X	2,723,855X	4,197,839X
37X 4,337,940	1,204,329X	3,526,911X	2,906,531X	4,204,719X
14X 4,404,053X	1,256,734	3,580,569	2,949,298X	4,258,915
07	1,479,830	3,598,406X	3,246,893X	4,272,073
70 107	1,501,823X	3,628,790X	3,250,532	4,278,250X

CLASS 272

112	* 113
D 155,940X	D 173,173
D 208,924X	D 176,999
D 212,021X	D 187,138
D 214,572X	D 187,380
239,970X	D 187,381
450,187	D 187,656
775,309	D 198,532
786,672	D 218,455
950,100	D 218,460
1,485,135	D 218,765
1,585,748	D 224,029
1,670,390	D 224,796
1,676,061	D 227,381
2,240,407	D 227,792
2,303,223X	D 231,550
2,365,117	D 232,47
2,429,939	D 238,694
2,706,632X	D 250,723
2,800,105X	D 250,783
2,838,307	D 250,784
2,929,627	170,495
2,977,118	209,511
3,032,344	77,550
3,090,617X	796,159
3,156,465	821,391
3,342,484X	1,126,082
3,445,108	1,185,176
3,483,999X	1,351,053
3,501,140X	1,471,465
3,506,261	1,488,244
3,526,399	1,488,245
3,547,435X	1,488,246
3,563,539X	1,707,854
3,598,406X	1,765,361
3,606,315	1,822,786
3,638,602X	1,877,833
3,642,277	1,901,964
3,771,784X	1,917,018
3,782,718	1,929,822
3,794,316	2,126,636
3,837,642X	2,151,403
3,982,754X	2,206,581
4,018,437X	2,222,119
4,077,403X	2,500,425
4,116,433X	2,584,742
4,149,712	2,620,185
4,159,113	2,648,538
4,161,998X	2,648,539
4,272,073X	2,704,667
4,278,250X	2,720,430
4,335,538X	2,723,853
4,355,633X	2,768,823
4,372,552	2,795,423
	2,843,379
113	2,883,192
	2,886,317

Fig. 6L—List of Patents in Class 272-109 From Microfilm Printout

General and Mechanical

http://www.uspto.gov/web/patents/patog/week30/OG/GMUtility.htm

Netflix Apple .Mac Amazon eBay Yahoo! News (928) Apple (276)

United States Patent and Trademark Office

General and Mechanical:

Previous Next

Home Granted Patents Help

Class	Subclass	Patent
2	2.5	07080411
	4	07080412
	60	07080413
	424	07080414
	435	07080415
4	559	07080416
	578.1	07080417
5	86.1	07080418
	426	07080419
	640	07080420
	645	07080421
	715	07080422
7	128	07080423
15	1.7	07080424
	327.6	07080425
16	10	07080426
	110.1	07080427
	265	07080428
24	399	07080429
	578.13	07080430
29	26A	07080431
	229	07080432
	276	07080433
	281.5	07080434
	403.3	07080435
	421.1	07080436
		07080437
	428	07080438
	434	07080439
	450	07080440
	527.2	07080441
	594	07080442
	722	07080443
	740	07080444
	830	07080445
	832	07080446
	847	07080447
	852	07080448
	854	07080449
	857	07080450
	874	07080451

Full Text

US 7,080,411 B2

Print this page

PROTECTIVE GARMENT

Andrew Robert England Kerr, 524 Hagley Road West, Birmingham B68 0B7 (United Kingdom)

Filed on Dec. 23, 2003, as Appl. No. 10/743,920.

Application 10/743920 is a continuation of application No. 09/980678, filed on Oct. 31, 2001, granted, now 6,681,399.

Claims priority of application No. 9904534.6 (GB), filed on Feb. 27, 1999; and application No. 9904754.0 (GB), filed on Mar. 02, 1999.

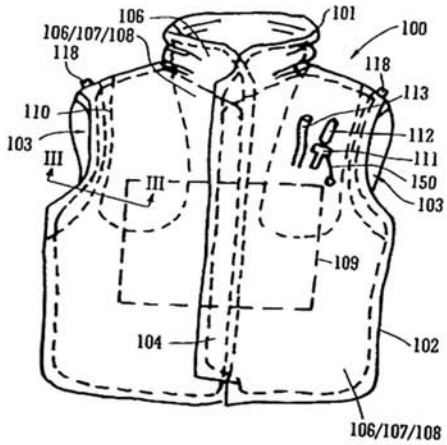
Prior Publication US 2004/0177425 A1, Sep. 16, 2004

This patent is subject to a terminal disclaimer.

Int. Cl. ***F41H 1/02*** (2006.01)

U.S. Cl. 2—2.5

24 Claims



1. A protective body garment comprising:

(a) a vest having a body with arm holes, the vest having an internal surface and an external surface, the vest having a front that, when worn, is adjacent to a wearer's chest and stomach, sides that, when worn, are adjacent to the wearer's sides, a back that, when worn, is adjacent to the wearer's back, and a pair of shoulders that, when worn, are above the wearer's shoulders;

(b) an inflatable flotation bladder in the form of a bag between the inner surface of the vest and the penetration resistant armour; and

(c) penetration resistant armour located under the external surface of the vest and over the inflatable flotation bladder;

wherein the inflatable flotation bladder is between the internal surface of the vest and the penetration resistant armour and the penetration resistant armour is between the external surface of the vest and the inflatable flotation bladder.

Fig 6M– Example From Online Publication of *Official Gazette* Showing Patent Illustration and Sample Claim

"fiberglass." You'll get a list of patents that have all of your search terms. Click on a patent to get a new page with all of the parts of the patent and a link to download a PDF of the patent. The main search page also links to a help site and to an Advanced Patent Search.

The Google Advanced Search page (Fig. 6O) is where you can refine your search to look for patents with all of your keywords, an exact phrase, only one of a group of words, or omitting a word. Also it can be used to search for patents by number, title, inventor, assignee, or a specific U.S. or international classification. You can restrict the search to U.S. patents or published U.S. patent applications, utility, design patents, etc., or by a date or issue or filing date range. All of these helpful features are free. Thank you, Google!

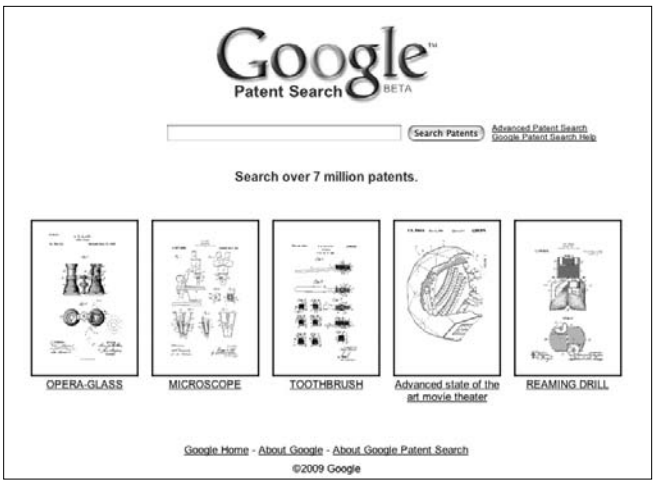


Fig. 6N—Google Patent Search (Main Page)

2. PTO Search With EPO Supplement

The PTO's system can be used to make Keyword patentability searches of U.S. patents back to 1976 and U.S. patent applications back to March 2001 when they were first published. You can also use it to make Classification searches by patent number or class and subclass of U.S. patents from 1790 to the present. It cannot be used to make a patentability search of any patents before 1976. The PTO's URL for searching services is www.uspto.gov/patft/index.html. The PTO's servers have been vastly improved, so that you can easily and quickly download and view the images of any patent back to 1790. As stated, to print any patent you will find it faster and easier to use any of the services listed above, which can deliver PDFs of entire patents, rather than one page at a time. Everything is free on the PTO's website, except for orders of patents to be sent by mail. Fig. 6P shows the main page of the PTO's search website—note that you can make the three types of searches of either patents or patent applications. In order to view and print the actual images of patents on this website you must download the AlternaTIFF viewer or use one of the free services listed above. You can do a rough extension of your patentability search of U.S. patents back to the 1920s at the EPO's site (http://ep.espacenet.com). In addition, this site also provides a searchable database for some foreign patents

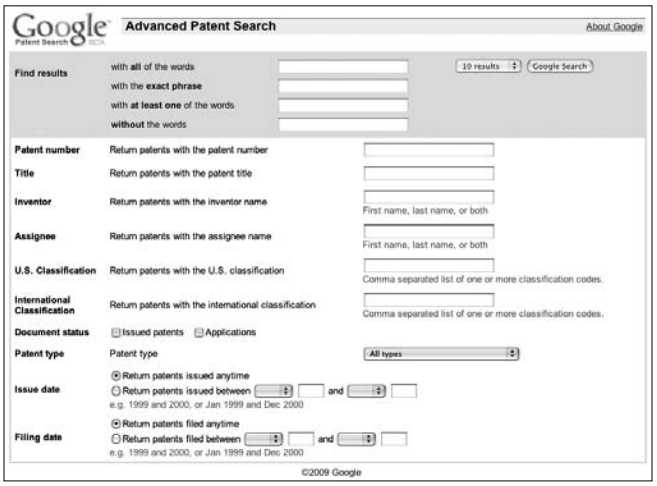


Fig. 6O—Google Advanced Patent Search

3. Limitations of the PTO and Other Systems

The fact that the PTO website only permits you to search patents issued since 1971 or 1976 (while the Google search site goes all the way back to 1836), creates an extremely important limitation. As discussed in Chapter 5, Section E, all previous inventions (prior art) are relevant when determining whether a new invention qualifies for a patent. Therefore, to be effective, a patent search must cover the

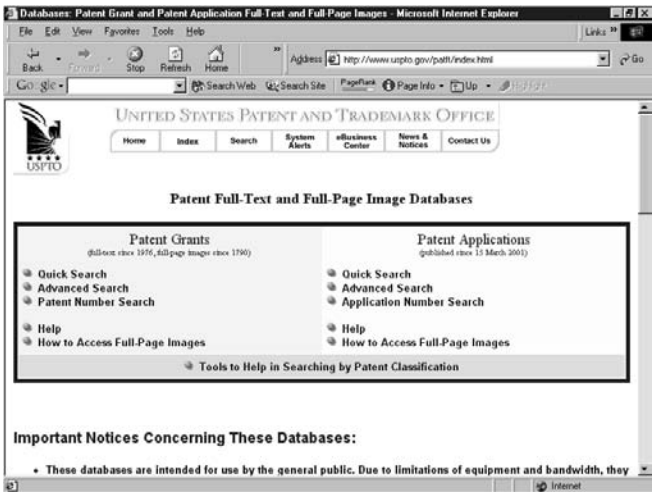


Fig. 6P—PTO Search Site (Main Page)

earliest prior art that might show your invention. Since patentability searches of the PTO system can be made back only to 1976, you can have confidence in your search results on the PTO's site only if your invention technology—for example an Internet invention—wasn't around prior to 1971 or 1976. For a low-tech invention that requires searching back beyond the 1971 date (for instance, a bicycle) these systems will only provide a fraction of the total prior art for that invention. Thus you should use Google's patent search site to search back to the first numbered U.S. patent, which issued in 1836.

A second limitation is the fact that you must depend on keywords and the PTO's classification system. Traditional patent searching uses just the classification scheme to find relevant prior art. This scheme is the result of humans grouping like inventions together and does not depend on the whimsy of which search terms you select. The keyword system, on the other hand, requires you to come up with the right words in your search request. However, patents are often written with legal-sounding terms or technical jargon in place of otherwise ordinary terms. For example, a patent for a telephone may be titled "Full Duplex Voice Telecommunication Device." Such a patent may never be found with "telephone" as the search term. This limitation is inherent in any computerized searching system based on search terms. The disadvantages of the keyword search system can to some extent be overcome by following the tips described in Section 5 below as well as by using the logic implicit in the Boolean search technique and supplementing your Keyword search with a Classification search.

4. The Ways to Search the PTO's Website

There are three ways to make a search on the PTO's website (Quick, Advanced, and Patent Number).

a. PTO Patent Number Search

To make a patent number search (better termed a patent lookup by number) on the PTO's website, go to the main search page (Fig. 6P) and click "Patent Number Search," which will take you to the "Patent Number Search" page shown in Fig. 6Q. Then enter the number of the patent you want to view. Note that utility patents need no prefix while design, plant, and reissue patents, and defensive publications (see Chapter 7) and SIRs (see Chapter 13) require the prefixes indicated. By way of example, I have entered the number of a utility patent in the "Query" box.

Next, click "Search," which will take you to the "Results" page (see Fig. 6R). This shows that the patent is available and gives its title. Next, click the patent number or title, which will take you to the "Full Text Display" page (see Fig. 6S). This page displays the entire text of the patent and all of its bibliographic data. However, only the first page of this text is shown. Scroll down to see the rest of the patent. Any of the text can be copied and pasted into a word processor for editing. This page does not display any of the drawings of the patent displayed, however.

Finally, assuming that you've downloaded and installed the AlternaTIFF viewer from the link (see Fig. 6P), you can click "Images" at the top of the page and the first (or abstract) page of the actual patent appears (see Fig. 6T). Note that in addition to the first page of the patent, some extraneous information (the PTO's logo and some navigation buttons) also appears at the top and left side of the abstract page. The buttons are used to display other pages of the patent.

If you need to obtain copies of any patent, it's best to use one of the private patent copy supply services listed above because the PTO's server can download only one page of a patent at a time. If you do want to get a copy of any patent from the PTO's site, print out the actual images using the above procedure; don't print the text version or the patent page with the extraneous information. To print just the patent images, simply click the printer icon (not shown) at the top of the page just below the patent number. (Don't click "Print" on your computer's toolbar above the page.)

The above procedure can be used to look up patent applications; just use the right-hand side as seen in Fig. 6P. If you do make a patentability search, you should search both patents and published patent applications.

b. PTO Quick Search

The PTO's "Quick Search" page allows you to enter and search two simple Boolean terms, such as *bicycle* AND *aluminum* (as shown in Fig. 6W). Note that the terms Description/Specification are selected in the Field 1 and Field 2 boxes; this is where you should make all Boolean searches. Also note that the years 1996–2001 are displayed in the "Select Years" box. In addition to these years, you should repeat the search as necessary, selecting all other year periods so as to cover all years back to 1976. (The "Quick Search" page and the "Advanced Search" page can also be used to make bibliographic searches. I will not cover these features, but you will find the use of these intuitive and it is also explained in the Help link.)

Fig. 6X shows the results of the quick search of Fig. 6W. Note that the search yielded 947 patents, which is too large a number to handle, so the search will have to be narrowed by using more specific search terms. Note that Fig. 6X displays the first 16 patents. Scrolling down and visiting subsequent page links can show the rest. To view any patent

Fig. 6Q—PTO Patent Number Search Page

Fig. 6R—PTO Patent Number Search Results Page

Fig. 6S—PTO Patent Full Text Display (Page 1)

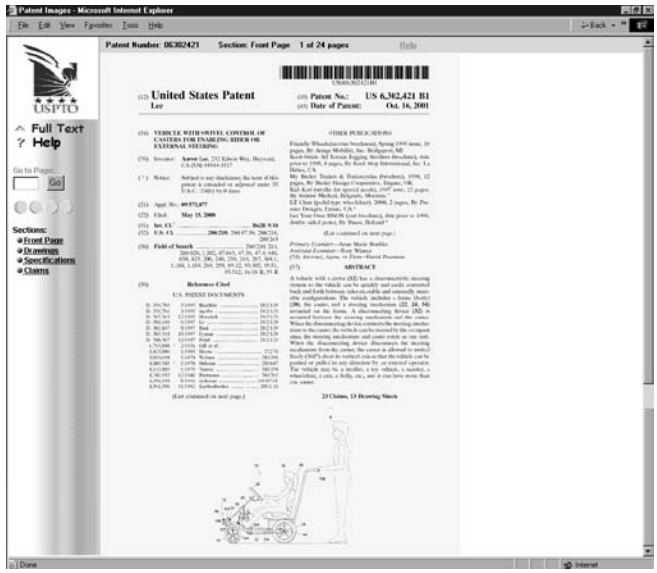


Fig. 6T—Patent Image (Page 1)

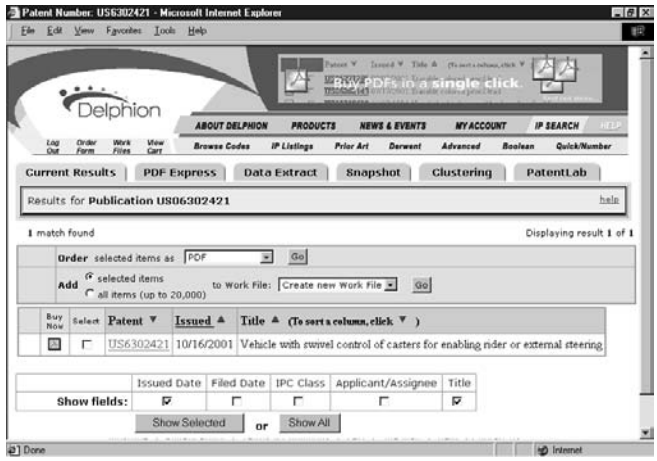


Fig. 6U—Delphion Patent Number Search Results Page

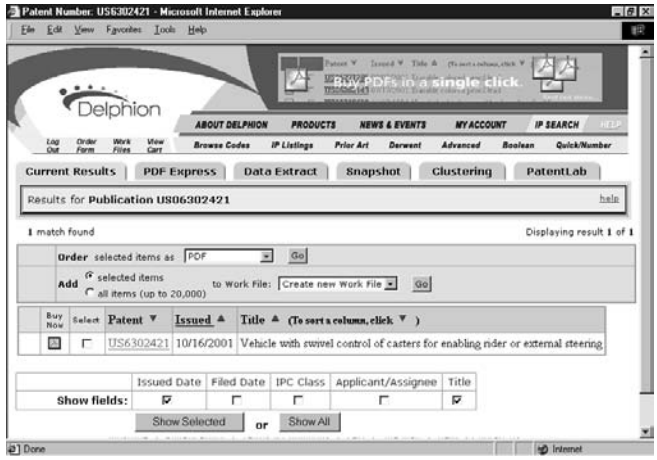


Fig. 6V—Delphion Patent Partial Text (Only Abstract and Claims Shown)

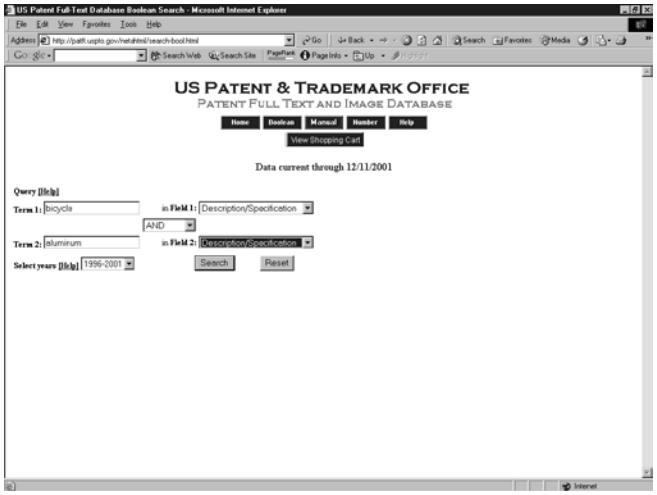


Fig. 6W—PTO Quick Text Search Page

Fig. 6X—PTO Quick Text Search Results Page

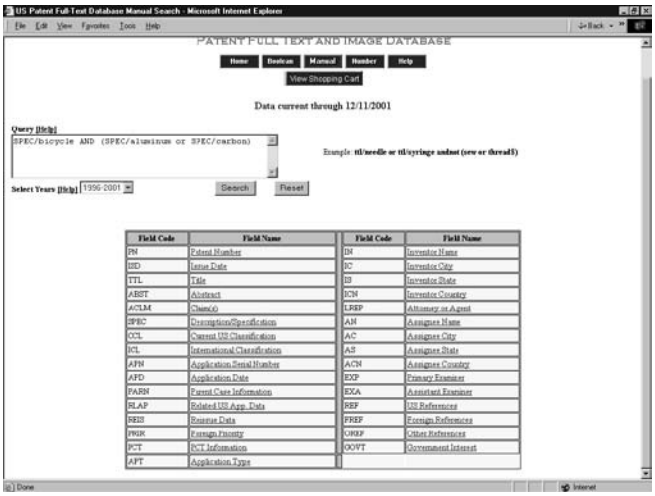


Fig. 6Y—PTO Advanced Search Page

Fig. 6Z—PTO Advanced Search Results (Page 1)

that looks interesting, click its title or number. Again, the same procedure can be used to search patent applications (use the information on the right-hand side of Fig. 6P).

Also note that in addition to the AND Boolean operator, the operators OR and ANDNOT are available. Further, nested expressions, such as *tennis* AND (*racquet* OR *racket*) are available. If you enter this query, you will retrieve a list of all patents that contain both the terms *tennis* and either *racket* or *racquet* somewhere in the document. For another example, consider the search terms *television* OR (*cathode* AND *tube*). This query would return patents containing either the word *television* OR both the words *cathode* AND *tube*. A third example is the search expression *needle* ANDNOT ((*record* AND *player*) OR sewing). This complex query will generate a list of hits that contain the word needle, but not contain any references to sewing. In addition, none of the hits would contain the combination of record AND player.

c. PTO Advanced Search

Despite its name, the "Advanced Search" page (see Fig. 6Y) really doesn't offer any more capabilities than the "Quick Search" page. The "Advanced Search" page is simply more difficult to use since it requires that you enter the search query in free form. The field must be manually typed (see Fig. 6Y). Note that the field codes must be typed before the search terms. Fig. 6Z shows part of the results of the advanced search of Fig. 6Y.

5. Important Searching Tips

Your searching can be more productive and accurate if you follow these important tips:

1. *Less is more.* The fewer words used to define a search, the broader the results, and vice versa. For example, a search done with the term "ergonomic computer mouse" found two patents; a search done with the term "computer mouse" found 157 patents; and a search done with the term "mouse" found 3,147 patents (only a maximum of the first 200 can be displayed).
2. *Use alternative terms.* A variety of different terms are often used in patents to describe similar inventions, so search with as many alternative terms as you can think of. For example, a computer mouse is also referred to as a "computer input device" or a "pointing device." Incidentally, a search done using the term "computer input device" found 91 patents, and a search using the term "pointing device" found 475 patents (only the first 200 can be displayed).
3. *Make good use of the Boolean connectors,* AND, OR, and ANDNOT, to connect words or terms in a box in any of the search methods, except for Patent Number Search. For example, "ergonomic AND mouse" can be entered in the Simple Text Search box. When Boolean connectors are used, multiple-word terms must be enclosed in quotes. For example, "ergonomic AND 'pointing device'" will search for all patents which have the word "ergonomic" AND the expression "pointing device." Boolean connectors can also be used to search for inventions with alternative terms simultaneously. For example, "computer mouse OR 'pointing device'" finds all patents with either the word "ergonomic" OR the expression "pointing device."
4. *Use wild cards*. Use the asterisk (*) as a wild card to represent any character or characters. For example, John* finds patents by all inventors with the first or last name starting with John, and ending with any character or characters, including John, Johnny, Johnson, and Johnston. Use the question mark (?) as a wild card to represent any single character. For example, ?am finds ram, cam, jam, etc.
5. *Inventor Names.* Always enter inventor names last-name first, for example, Edison Thomas.
6. *Class and References.* If you find a relevant patent, click on the Intl. Class and U.S. Class links to display patents for potentially similar inventions, and the U.S. References link to view the patents specifically cited as being similar.

Information on using more advanced search techniques can be found by clicking the search language link in the Advanced Text Search page.

6. Ordering Patent Copies

Although portions of patents are available (see Sections 1 and 2 above) and can be printed directly from the PTO's website free of charge, they must be downloaded and printed one page at a time. To view and print actual patent pages or images (as opposed to an ASCII file of the patent) from the PTO's site, you must first download and install an "AlternaTIFF" viewer from a link on the main search page (Fig. 6P). This viewer provides a bitmapped image with one page per file. If you wish to get numerous patents, this will be a time-consuming process, especially if you have a dial-up Internet service. Instead, you may download free copies of any patent or published patent application from any of the free sites listed above. You can also order paper copies of the patents from the PTO and have them delivered to you, but at a cost. To order patents click the title or number of the patent (see the list shown in Fig. 6X) which will produce a full-text view page (see Fig. 6S). Then, click "Add To Shopping Cart." Have your credit card ready

N. MicroPatent Patent Searches on the Internet

Because of its capabilities, I have included the fee-based MicroPatent service (www.micropatent.com). MicroPatent has the capability to offer full-text search of U.S. patents dating back to 1836. MicroPatent charges approximately $500 for a one-year subscription with unlimited use of their full-text searching facilities of U.S. patents and various foreign patent databases and about $100 for a 24-hour unlimited use subscription. Using the MicroPatent system is easy and intuitive, especially if you've digested the rest of this chapter. However, because the MicroPatent database has been obtained by scanning and OCR-ing the scanned U.S. patents back to 1836, it contains many errors and strange words, so be aware of its limitations before signing up. Also, it duplicates many of the capabilities of Google Patents, so I recommend that you use it only if Google Patents is unavailable or you want to leave no stone unturned.

O. NPL (Non-Patent Literature) Searches

While patent databases are the best place to make pre-examination searches of inventions, additional prior art can sometimes be found by making a search of Non-

Patent Literature, which the PTO calls NPL. NPL includes periodicals, textbooks, websites (current and obsolete), published theses, product manuals, advertisements, etc. Remember that any publication dated earlier than your date of invention can be valid prior art against your invention. There are many excellent places to search for NPL, and I list a few here:

- **General Search Engines:** The Internet has several excellent search engines, including Google (www.Google.com), Bing (www.Bing.com), Yahoo (www.Yahoo.com), Mama (www.Mama.com), and Search (www.Search.com). Each of these is used in the same manner as any of the Keyword patent searches above: you enter keyword combinations in the search box (e.g., "bicycle" and "carbon fiber alloy") and examine the NPL that the engine returns. If you get too many references, add or narrow your keywords to narrow the search and if you don't get enough references, use fewer and/or broader terms to broaden your search.
- **Specialized Search Engines:** The Internet has various specialized search engines, but generally only the scientific ones are useful for patent searching. The scientific ones solve one problem with using traditional search engines for patent searching: you often uncover many sites that are not relevant to science. For example, if you're looking for information about diesel engines, you don't want to sift through hundreds of sites selling Diesel branded clothing. A scientific search engine will filter out nonscientific sites to speed searching. Here are three: Google Scholar (http://Scholar.Google.com), Scirus (www.Scirus.com), and Defense Technical Information Center (www.DTIC.com). Scirus will also look for peer-reviewed articles (including PDF and PostScript files), and will also allow you to narrow your search to a particular author, journal, or article, or restrict your results to a specified date range. It will even find scientific conferences, abstracts, and patents. The former also provides an option to search for patents as well as NPL. DTIC is a Defense Department site that provides technical information for the military and contractors. I recommend that you select "MultiSearch" in the Search window.

P. Summary

There are many good reasons to perform a patentability search for your invention: to save needless work and expenditures; to facilitate patent application preparation prosecution; to learn more about your invention; and to facilitate licensing. To possibly avoid making a full search, make a quick preliminary search yourself in stores and catalogs.

If you hire someone to make a search, hire a competent, experienced searcher, preferably a patent agent or attorney, and prepare your searcher with a full description of your invention. In order to analyze a search report, read the cited patents and other references carefully and determine what novel features your invention has and whether these are unobvious. (Use the criteria given on the Patentability Flowchart in Chapter 5, Section G, to assist you.)

All patent searches must now be made on a computer. To search, use (a) a Patent Depository Library's computer search facilities, (b) the Internet with a personal computer, namely the free website services of Google, the PTO, and the EPO (or use a fee-based commercial service), or (c) the EAST system in the PTO. Computer searches should be made using either Keywords by looking for patents with combinations of appropriate keywords or the PTO's Classification system where you can review all the patents in a particular subject-matter class.

If you make a computer search, and you have a low-tech invention, make sure the computer's database extends all the way back to 1836.

CHAPTER 7

What Should I Do Next?

Inventor's Commandment 9

After making your commercial evaluation and search, carefully consider the following alternatives before proceeding or dropping the invention: File a Provisional Patent Application (PPA), file a Regular Patent Application (RPA), test the market for up to a year and then consider filing, keep it a trade secret, file a design patent application, use a clever trademark, use copyright coverage, and/or use distinctive "trade dress" for unfair competition coverage.

Now that you have a pretty good idea of the patentability and commercial status of your invention, it is time to make a plan for acquiring the maximum possible offensive rights under the law. While you might think that your next step would be to prepare and file a patent application, you would be wrong in doing so without first considering the information in this chapter. I suggest that your main goal should be to profit from your invention, not to get a patent. Although many inventors have made fortunes from their inventions, their successes are rare and usually an exception to the rule. Be prepared for a difficult task and pursue commercial success diligently. If you don't make it, try to avoid getting disappointed; perhaps you will have better luck in the future. In general, for most inventors my advice is not to give up your day job.

I've provided a Decision Chart (Fig. 7A) to simplify and organize your alternatives. It consists of 23 boxes with interconnecting lead lines. The numbered, light-lined boxes (even numbers from 10 to 40) represent various tasks and decisions on your route to making decisions on available options. The lettered, heavy-lined boxes (A to F and X) represent your actual options.

The numbers in parentheses in the following discussion refer to the boxes on the chart. While there are seven options, several of these can be reached by several routes. Accordingly, the following discussion is divided into more than seven sections.

A. Drop It If You Don't See Commercial Potential (Chart Route 10-12-14-X)

This route has already been covered in Chapter 4, but in order to acquaint you with the use of the chart, I'll review it again.

Referring to the chart, assuming that you've invented something (Box 10—Chapter 2) and recorded the conception properly (Box 12—Chapter 3), you should then proceed to build and test your invention as soon as practicable, or consider filing a Provisional Patent Application (Chapter 3), provided you're aware of all of the disadvantages of the PPA (Box 12). If building and testing would present appreciable difficulty, you should wait until after you evaluate your invention's commercial potential (Box 14—Chapter 4), or patentability (Box 16—Chapter 5). But always keep the building and testing as a goal; it will help you to evaluate commercial potential and may be vital in the event of an "interference" (an expensive trial proceeding in the PTO to determine who gets a patent when two inventors file patent applications on the same invention). What's more, as you'll see in Chapter 11, you'll find a working model extremely valuable when you show the invention to a manufacturer.

Your next step is stated in Box 14—investigate your invention's commercial potential using the criteria of Chapter 4. Assuming you decide that your invention has little or no commercial potential, your answer to the commercial question is "No," and you would thus follow the "No" line from Box 14 to the ultimate decision, Box X, which says "Invent something else," as already covered in Chapter 4. See how easy it is?

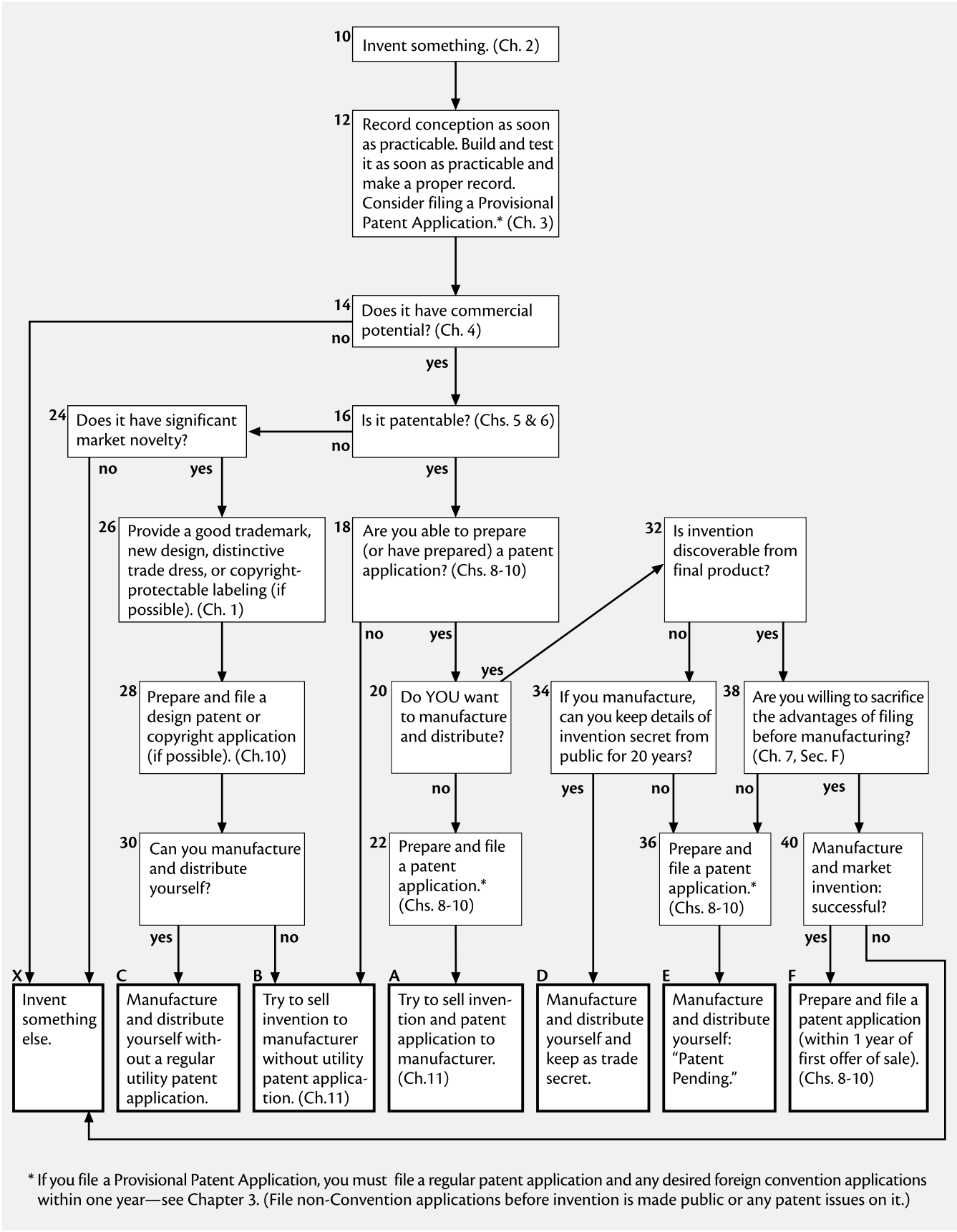
While you may be disappointed at having spent time and effort recording your invention, investigating its commercial potential, building and testing it, or searching it, your time and effort were definitely not wasted. You haven't failed in any way—unless you failed to learn a lesson from your experience. Edison had 3,000 failures, yet he regarded these as positive experiences since he learned 3,000 things he didn't know before. Armed with what you learned, you'll have a better chance at success and will encounter smoother sailing with your next invention.

"Our greatest glory is not in never falling, but in getting up every time we do."

—Confucius

B. Try to Sell Invention to Manufacturer Without "Regular" Patent Application (Chart Route 10-12-14-16-18-B)

This route is especially useful if you've filed PPA on the invention (Box 12), but can also be used if you've built and tested the invention and properly recorded your building and testing activities. After filing a PPA or building and testing



* If you file a Provisional Patent Application, you must file a regular patent application and any desired foreign convention applications within one year—see Chapter 3. (File non-Convention applications before invention is made public or any patent issues on it.)

Fig. 7A—Invention Decision Chart

and recording your efforts (Box 12), see if the invention has commercial potential (Chapter 4—Box 14) and if it's patentable (Chapters 5 and 6—Box 16). If so, whether or not you're able to prepare—or have prepared—a regular patent application, try to sell your invention to a manufacturer (Box B) in the hope that the manufacturer will have the application prepared for you, either on the basis of your PPA or without the PPA. If you take this route, you should be sure either that your PPA is properly prepared (see Chapters 3 and 8) or that you've properly documented conception, building, and testing (Chapter 3). I recommend this route only if you can't prepare or can't afford to have prepared a regular patent application because:

- if you've only built and tested the invention without properly recording your activities, you run a risk of an unscrupulous manufacturer stealing your invention by filing a patent application on your invention before you do so, and
- if you've filed a PPA, you'll have all of the disadvantages of the PPA. (See Chapter 3, Section H, for a discussion of the advantages and disadvantages of filing a PPA.)

C. File an Application and Sell It to or License a Manufacturer If You See Commercial Potential and Patentability (Chart Route 14-16-18-20-22-A)

Filing a patent application and selling rights to the invention is the usual route for most inventors. This is because inventors seldom have the capability to establish their own manufacturing and distribution facilities. If (a) your invention has good commercial potential (Box 14), (b) your decision on patentability is favorable (Box 16), (c) you're able to prepare a patent application (Box 18) (or have one prepared for you), and (d) you don't wish to manufacture and distribute your product or process yourself (Box 20), your next step is to prepare a patent application (Box 22). After you prepare the patent application, you should then try to sell your invention (and accompanying patent application) to the manufacturer, as stated in Box A. Note that if you file a PPA (Box 12), you must file your "regular" patent application, and also any desired foreign convention applications (see Chapter 12) within one year. You should file any desired non-Convention applications before your invention is made public or before any patent issues on it.

Why file a patent application before offering the invention to a manufacturer? A good question, which has four good answers. Let's look at each one individually.

1. Offensive Rights for Your Invention

By preparing and filing a patent application, you've defined your invention and its ramifications in very precise terms, made formal drawings of it, and formally established your claim to it in the PTO. Thus anyone who later sees the invention and wants to steal or adopt it would have to engage in elaborate and (usually) illegal forgeries and other activities. And, the would-be thief will have filed after you, a serious disadvantage. Thus once you file the application, most attorneys agree that you may publish details of your invention freely and show it to anyone you think may have an interest in it (unless you've chosen to maintain your invention as a trade secret while your patent application is pending—see Section F, below).

2. Respect for Your Invention

A manufacturer to whom you show the invention, seeing that you have thought enough of your invention to take the trouble to prepare and file a patent application on it, will treat it, and you, with far more respect and give it much more serious consideration than if you offer an unfiled invention. In other words, if you approach a manufacturer without a patent application, they may not think you're a serious player.

3. You Have Rights Even If You Sign a Manufacturer's Waiver

As you'll see in Chapter 11, most manufacturers to whom you offer an invention will not deal with you unless you first waive (give up) certain potential claims that might arise from the transaction (such as being able to charge the manufacturer with stealing your idea in the event this occurs). Simply put, signing a waiver if you haven't already filed a patent application will put you at the complete mercy of the company to whom you show your invention. Fortunately, however, such waivers do not involve your giving up your rights under the patent laws. Thus, having a patent application on file, in this context, affords you powerful rights against underhanded dealing by the manufacturer (assuming the patent subsequently issues). One inventor, Stephen Key, has said that a patent application levels the playing field, giving an inventor the power to play ball with corporate America.

4. You'll Be Offering More So You'll Get More

Most manufacturers want a proprietary or privileged position—that is, a position that entitles them to a

commercial advantage in the marketplace that competitors can't readily copy and obtain. A patent provides a very highly privileged position: a 17- to 18-year (approximately) monopoly. Thus if you have a patent application that already covers your invention, manufacturers may be far more likely to buy your invention (with its covering patent application) than if you offered them a "naked" invention on which they have to take the time and trouble to file a patent application for you themselves.

TIP

An Exception. Although, as stated, it's usually best to file your patent application as soon as possible, it may be to your advantage to delay and keep the invention secret or take your chances approaching manufacturers "naked" if your invention is so innovative that it's not likely to be commercialized for many years. Gordon Gould, the inventor of the laser, did this unintentionally when he delayed in filing his patent application because he mistakenly believed he needed a working model to file. His mistake worked to his great advantage, however, since his delay postponed his monopoly period so that it coincided with the laser's commercial period, thereby turning what would have been a worthless patent into pure gold.

Common Misconception: You shouldn't patent your invention, since someone will see your patent, copy your invention, and make it more cheaply.

Facts: Copiers rarely use patents as a basis for their activities. Usually they copy successful products in the marketplace by reverse engineering. They'll be less likely to do this if it is patented, and a patent will enable you to stop their production or importation, or get royalties from them.

Filing before marketing is so important that I've made it part of the Inventor's Commandment 9 at the beginning of this chapter.

D. If You Have Commercial Potential Without Patentability, License or Sell Your Invention to a Manufacturer Without Filing (Chart Route 16-24-26-28-30-B)

If your invention isn't patentable (that is—the decision in Box 16 is negative), don't give up; there's still hope. Many fortunes have been made on products that weren't patentable. For instance, the Apple computer made its designer-promoters, Jobs and Wozniak, multimillionaires, yet lacked any significant inventive concepts and never was awarded a major patent. Ditto for Henry Ford's automobile and George Eastman's Kodak camera.

Thus you should now decide, on the basis of your commercial potential and patentability evaluations, whether your invention nevertheless possesses "significant market novelty" (Box 24). If so, it may in fact be quite profitable if introduced to the market. Put differently, if your patentability search produces close prior art, but not a dead ringer, this indicates that probably no one has tried your specific, particular idea before, although someone has come close enough to preclude you from getting a patent. However, if you feel, looking back on your commercial-potential and patentability evaluations, that it doesn't have significant market novelty—that is, there's little chance of commercial success—then there isn't much hope and you'll have to try again (Box X).

Assuming that your invention does have significant market novelty (Box 24) but does not qualify for a utility patent, there are several ways that you can use to obtain proprietary rights on your invention and make it more attractive to potential manufacturers. Let's take a closer look at these.

1. Record Conception Properly

While recording conception won't provide you with any rights against independent creators, or "reverse engineers," it will establish (a) you as the inventor, and (b) the date of your invention, so you'll be able to prove that you invented it and when you did so. This will be of great help in stopping any invention thieves who copy it illegally before it's out. (Chapter 3, Section C.)

2. Provide a Clever Trademark

One good way to make your invention more attractive is to provide a clever trademark for it (Box 26). As stated in Chapter 1, Section O, a trademark is a brand name for a product. An excellent type of brand name is one that suggests the function of the product in a very clever way. A clever trademark can be a very powerful marketing tool—that is, a tool that will greatly enhance the value and salability of your invention and give you added proprietary rights to sell to a manufacturer. Examples of clever, suggestive trademarks are *Ivory* for a soap and *Hushpuppy* for shoes. Also consider *Sunkist* citrus fruit, *Shasta* soft drinks, *Roach Motel* roach traps, *Heavyhands* exercise weights, *Sun Tea* beverage containers, and *Walkman* portable tape players.

If you think the mark is valuable and that you (or a company that will license the product) will be able to offer a product with the mark within several years, then you can file an Intent-to-Use trademark application with the PTO to register the mark. See Chapter 1, Section O, for more on trademarks.

3. Provide a Unique Patentable Design

If the invention that fails to qualify for a utility patent is a tangible product, the second trick to obtaining proprietary rights is to create a distinctive design (Box 26). Then, perhaps, a design patent can be obtained. By distinctive design, I mean a shape or layout that is unique and different from anything you've seen so far. The design, in this case, doesn't mean the function or internal structure of the product, but only its outward, nonfunctional, ornamental, aesthetic shape or layout that makes it distinct visually.

For example, the D-shaped *Heavyhands* weights and Dizzy Gillespie's trumpet with its upwardly bent bell section are excellent examples of valuable design inventions. If you've invented a computer, a new case shape can be a design invention. For a bicycle, a new frame shape design would be a design invention. From abacuses to zithers, from airplanes to zippers, almost every humanly made object under the sun can be redesigned or reshaped in a new way so that it can be covered by a design patent.

However, remember from Chapter 1 that for a design patent to be applicable, the new features must be for aesthetic or ornamental purposes and should not have any significant functional purpose—otherwise the PTO will reject it as nonornamental—that is, only a utility patent will be appropriate. Also, the design must be inseparable from the object and not merely surface ornamentation. In the latter case, copyright is the proper form of coverage. (See Chapter 1, Section P.) For example, the label design on a jar of juice cannot be protected by a design patent, but a new shape for the jar would qualify for one. If you do come up with a distinctive design, you should, of course, record it in the same manner as you recorded your invention. (See Chapter 3.) And as with your invention, you should build a prototype or model as soon as practicable. You should also prepare and file a design-patent application (Box 28) on the ornamental appearance (not workings) of your invention.

As stated in Chapter 6, unless you live near the PTO or a Patent and Trademark Depository Library, it doesn't pay to search a new design beyond the most cursory look in product catalogs. This is because the cost of the search will greatly exceed the cost and effort to prepare and file a design-patent application. As you'll see in Chapter 10, a design-patent application consists simply of a drawing and a few forms that you fill out; it's very easy and economical to prepare.

4. Provide Distinctive "Trade Dress"

If you can't come up with a new design (or even if you can), you can still enhance the proprietary value of your invention by providing it with a distinctive "trade dress," such as a special, uniform color (as Kodak does with its yellow film packages), a special "certificate of authenticity" (if appropriate) as some manufacturers do with their replicas of antique objects, and/or a unique advertising slogan. This type of enhanced uniqueness is not different or special enough to qualify for a utility patent, design patent, copyright, or trademark. However, you can acquire offensive rights, at least before it is made public, under trade secret law. (See Chapter 1, Section Q.) And the law of unfair competition may provide some rights once it is commercially unveiled (Chapter 1, Section R). Be sure to record the trade dress properly (see Chapter 3) before showing it to anyone, and be sure to use it (or have it used) consistently and as much as possible after marketing.

5. Provide Copyrightable Labeling

Look closely at some of the packaged products that you see in your home or on display in a store for a copyright notice, for example, "© 1980 S.C. Johnson & Son, Inc." This copyright is intended to cover either the wording on the label or container, the artwork thereon, or both. While relatively easy to design around (that is—come up with a close but noninfringing alternative), unique labeling with a copyright notice nevertheless provides a measure of offensive rights that is well worth the small effort it takes to invoke. Many market researchers have shown that an attractive label can make all the difference in the success of a product. Accordingly, it can pay, if you're marketing a packaged product, to spend some effort, either on your own or in hiring a designer, to come up with an attractive, unique label, affix a copyright notice, and apply for copyright registration. (See Chapter 1, Section P.)

6. Consider Trade Secret

Keep your invention secret, at least until you file. If you do offer it to any manufacturers, you should apprise them that it can be kept as a trade secret permanently, if it is trade-secretable. More on this in Section F, below.

7. Submit Your Idea to Quirky.com

In lieu of submitting your unpatentable but commercially valuable brainchild to conventional manufacturers, one manufacturer, Quirky.com, seeks niche products to evaluate and manufacture even though the product may not be different enough to be patentable. As reported in *Parade* for 2010 Oct 24, Quirky, founded by Ben Kaufman, receives ideas from the public, submits them to its members (called "Quirks"), and designs and manufactures the product if (a) the Quirks provide a favorable opinion and (b) Quirky gets enough premanufacturing orders to cover production costs. Quirky isn't concerned with patents and relies on fast production and marketing to head off potential copiers. They charge submitters $10 to submit an idea (to make sure submitters are serious) and they pay royalties on the sales as the product is manufactured and sold.

E. Make and Sell Your Invention Yourself Without a Utility Patent Application (Chart Route 16-30-C)

Here we assume again that you have an unpatentable invention. If you can make and distribute it yourself (Box 30), it's better to do so (Box C) than to try to sell it to a manufacturer outright. Even if you have a trademark (even a good one), a design patent application, distinctive trade dress, and/or a unique label, the absence of a utility patent application means a manufacturer does not get a really good privileged position, and so will generally not be as inclined to buy your invention. However, if you decide to manufacture the invention yourself, and you reach the market first, you'll have a significant marketing advantage despite the lack of a utility patent. Also, since you're the manufacturer, you'll make a much larger profit per item than if you received royalties from a manufacturer.

If you're not going to, or won't be able to, bring your invention to the market right away and you want to prevent anyone else from patenting it, consider making a "defensive publication" of it to create prior art on it. See Chapter 14, Section G, for how to make a defensive publication.

F. Manufacture and Distribute Your Invention Yourself, Keeping It as a Trade Secret (Chart Route 20-32-34-D)

Even though your invention may be commercially valuable and patentable, it isn't always in your best interest to patent it. The alternative, when possible, is to keep an invention a trade secret and manufacture and sell the invention yourself, for example, by direct mail marketing, broadcast or periodical advertising, possibly eventually working your way up to conventional distributors and retailers. As explained in Chapter 1, Section Q, a trade secret has numerous advantages and disadvantages. An invention can be maintained as a trade secret right up until the time a patent application is published or a patent actually issues, but after that the trade secret is lost. If you file a Nonpublication Request (NPR) at the time of filing, and you don't file for a patent outside the U.S., your application will never be published if it doesn't issue. In that case your invention will remain a trade secret as long as you continue to treat it as one and as long as the invention is not publicly disclosed by others, provided it can't be discovered from the final product (see next paragraph). Your application will not issue if you can't convince the PTO to grant you a patent, or you abandon it—for example, you don't respond to an Office Action or you don't pay the issue fee.

You'll be relieved to learn that it's very easy to keep and protect your invention as a trade secret. You simply identify what the trade secret or secrets are, write them up (use a notebook or invention disclosure as explained in Chapter 3), sign and date the write-up, and get it signed by two witnesses. You should not consider (and you can't protect) every bit of information as a trade secret. You can only protect secret information that has commercial value because it is not known by others. Write up this important information—the crown jewels. After you write it up, take normal precautions to keep the information secret. Keep your documentation safe, don't let anyone see it (or the actual manufacture of the product) unless they have a "need to know" (for example, an employee) and have signed a nondisclosure (keep-confidential) agreement. Also, keep the trade secret information out of any service or instruction manual that goes with the product. You don't need to file any governmental forms or applications to create trade secret rights.

Remember that you can't maintain trade secret rights on an invention unless it can't be discovered from the final product—even if sophisticated reverse engineering is used. One good example of an invention that was kept as a trade secret is the formula used in the Toni home permanent wave kit. Its inventor, Richard Harris, manufactured and sold the unpatented invention through his own company for many years, making large profits, and thereafter sold his business for $20 million when he decided to retire.

Although not specifically covered on the chart, there is another possibility in the trade secret category. That is, you may sell your invention to a manufacturer who may choose

to keep it as a trade secret, provided you've filed an NPR at the time of filing. This may occur with either unpatentable or patentable inventions (Chart routes 16-24-26-28-30-B or 16-18-20-22-A), but you don't have to worry about this alternative since it's the manufacturer's choice, not yours. If you've filed an NPR, the manufacturer can simply allow the patent application to go abandoned so it won't be published, thereby maintaining the trade secret. While you may lose the ego boost of a possible patent, your bulging wallet should provide adequate alternative compensation.

CAUTION

One disadvantage of keeping a "hardware" (as opposed to a process) invention as a trade secret is that someone else can validly patent the hardware if they invent it independently and can then sue you for patent infringement, even if you've been using the trade secret commercially for 20 years! However, under a new "prior user's rights" statute (35 USC 273), if someone has a method patent, but you've used the method commercially for over a year before the method patent application was filed, you have a complete defense to any action for patent infringement on the method.

TIP

You shouldn't refer to your abandoned patent application in any other application that will issue as a patent, since anyone can gain access to an abandoned application that's referred to in a patent.

G. File Patent Application and Manufacture and Distribute Your Invention Yourself (Trade-Secretable Invention) (Chart Route 20-32-34-36-E)

Suppose your invention is not discoverable from your final product (Box 32) so that you can keep it secret for a while, but not for the life of a patent (Box 34). Or, suppose, after evaluating the advantages and disadvantages of a trade secret under the criteria above, you don't wish to choose the trade-secret route, preferring instead to patent your invention. You should then prepare and file a patent application (Box 36) (see Chapters 8 to 10) and then manufacture and distribute the invention yourself with the notice "patent pending" affixed to the invention (Box E).

You may think that preparing and filing a patent application is a lot of hassle (it is), but if you have a patentable invention and a commercially viable product and you don't pay for a patent application now (by hiring an attorney or doing it yourself), you will pay for it later. If you have a successful product on the market, competitors will copy it. If you "go naked" by putting it out with no patent rights, you won't be able to stop the copiers and you'll lose far more market share than what the cost of a patent would have been.

CAUTION

Keep It Secret. While the patent application is pending, you should—provided you've filed an NPR—not publish any details of your invention. That way, if the patent application is finally rejected, you can allow it to go abandoned and still maintain your trade secret. Remember, by law, the PTO must keep your patent application secret until it's published (your application will be published 18 months after filing unless an NPR was filed), or until it issues (if it was not published). In practice, the PTO is very strict in this regard. Until pending patent applications are published or they issue, outsiders have no access to them, and PTO personnel must keep patent applications in strict confidence. If you've filed a patent application without an NPR and decide to maintain your invention as a trade secret, you can still prevent the normal 18-month publication of the application by abandoning the application before it's published.

TIP

Effect of "Patent Pending" Notice. The patent-pending notice on your product does not confer any legal rights, but it is used by most manufacturers who have a patent application on file in order to deter potential competitors from copying their inventions. The notice effectively warns competitors that the manufacturer may get a patent on the product, so that if they do invest the money and effort in tooling to copy the invention, they could be enjoined from further manufacturing, with a consequent waste of their investment. However, make sure you don't use a patent-pending notice with a product that is not actually covered by a pending application: To do so is a criminal offense.

H. File Patent Application and Manufacture and Distribute Invention Yourself (Non-Trade-Secretable Invention) (Chart Route 20-32-38-36-E)

This will be the route followed by most inventors who wish to manufacture their own invention. Assume that the

essence of your invention, like most, is discoverable from the final product (Box 32), and assume that it's cheaper to file a patent application than to manufacture and sell products embodying the invention yourself (Box 38). Alternatively, assume that you don't want to sacrifice the advantages of filing before manufacturing. In either case, you should prepare and file a patent application (Box 36) and then manufacture and distribute the invention yourself with the patent-pending notice (Box E).

I. Test Market Before Filing (Chart Route 20-32-38-40-F)

Although I know you'd like to manufacture and test market your invention before filing a patent application on it, I generally don't recommend marketing before filing for patentable inventions because of the following:

1. You have less than one year to do the test marketing because of the "one-year rule" (Chapter 5, Section E).
2. You may get discouraged unjustifiably if you try to market your invention and you aren't successful; that is—you probably will be too discouraged to file a patent application and therefore you'll lose all rights on the invention forever.
3. You'll lose your foreign rights, since most foreign countries or jurisdictions, including the European Patent Office (see Chapter 12), have an absolute novelty requirement, which means that if the invention was public anywhere (with some exceptions) before its first filing date, such publication will prevent the issuance of a valid patent.
4. There is a possibility of theft, since anyone who sees it can (assuming it's not trade secretable) copy it and file a fraudulent patent application on it.
5. There are business disadvantages when:
   - the product has a short or seasonal selling period or limited market life
   - test marketing would disclose an easily copyable product to competitors
   - the cost of test marketing would be so high as to outweigh the risk of regular marketing
   - the product is merely a response to competition, or
   - market conditions in the field are changing so fast that the results of a market test would soon be obsolete. (*Wall St. Journal*, 1984 Aug. 27, p. 12.)

So, assuming your invention is discoverable from the final product (Box 32), ask yourself whether it's easier and cheaper to manufacture and test market it than to file a patent application. If it is, and if you're also willing to sacrifice the above five advantages of filing before manufacturing (Box 38), and the above business disadvantages don't apply, you can manufacture and market your invention (Box 40) before filing. While you're test marketing, you can put a warning notice (no legal effect, but possibly a deterrent one) on your product, such as "Patent Rights Reserved," as Federal Express did on its envelopes.

If you discover, within about nine months of the date you first introduce your product, that it is a successful invention and likely to have good commercial success, begin immediately to prepare your patent application (Box F), so that you'll be able to get it on file within one year of the date you first offered it for sale or used it to make a commercial product.

If your manufacturing and market tests (Box 40) are not successful, you should generally drop the invention and concentrate on something else (Box X), although you still have the right to get a patent on your invention. Thus, if the market test is unsuccessful, but you feel that you don't want to give the invention up forever, by all means follow the line, and prepare and file the patent application (regular or PPA) within one year of the first offer of sale (Box F). If you do manufacture and market your invention, and then later file a patent application on it, be sure to retain all of your records and paperwork regarding the conception, building, testing, and manufacturing of your invention; these can be vital if you ever get into an interference. (See Chapter 13, Section K.)

Now that we've covered all possible routes on the chart, I hope you've found one that will meet your needs. If your choice is to file a patent application, move on to Chapters 8 to 10; if you want to try to market your invention first, skip over to Chapter 11. Chapter 10 also covers design patents.

TIP

Don't give up your day job. While patents can sometimes be very profitable for their inventors, unfortunately great success stories are few and far between. Thus I strongly advise you not to depend on your invention or any patent to pull you out of poverty or change your life style, because few do. Keep your present vocation unless and until you attain success. If your invention does succeed, that's a great win and you should enjoy the success to the fullest. However, in case it does not, you can still continue as before and learn from the experience.

Patent Application Software Now Available

To facilitate and partially automate the preparation of a patent application, a computer program *PatentEase* is now available. This program will take you step-by-step through the entire process of preparing a patent application. The program contains copious examples of every part of a patent application. Further, it automates many tasks associated with the preparation of an application. The *PatentEase* program runs under the Windows™ operating system and is available from Nolo.

J. Summary

After you make your patentability decision and evaluate the commercial potential of your invention, you have a number of possible routes to take. If you feel that your invention lacks commercial potential, drop it and move on to something else. If you feel that it has commercial potential, but you can't prepare a regular patent application, file a PPA or try to sell it without filing a PPA or an RPA. If your invention is patentable, file first and then try to sell it to a manufacturer. (You should file first to secure your rights, especially if you sign a manufacturer's waiver form.)

If your invention isn't patentable, you may be able to file a design patent application, secure trademark rights, copyright, or trade dress rights before offering it to a manufacturer. You can make and sell the invention yourself with or without a patent application, and you can keep it a trade secret after putting it on the market if it's the type of invention that can't be reverse engineered. Although test marketing before filing can provide helpful information, it also involves risk of theft and loss of foreign patenting rights.

CHAPTER 8

How to Draft the Specification and Initial Drawings

Inventor's Commandment 10

In recent years, the Patent Court began limiting the scope of some patents by relying upon "limiting statements" that the patentees made in their specifications and remarks to the PTO. For that reason, your patent application should not contain any statements that the courts could possibly use against you to limit the claims of your invention—that is, do not indicate any field of the invention, do not mention any problems with the prior art that are not already known, or that your invention doesn't solve, do not indicate that any embodiment is preferred, do not include any specific advantage unless at least one embodiment has this advantage, indicate that "one or more aspects" have the advantages, do not include any objects, make the summary and abstract as broad and nonspecific as possible, do not refer to "the invention" but only to "this embodiment," do not state that any part is essential, and include as many embodiments as possible.

Inventor's Commandment 11

The specification and drawings of your patent application must contain a description of your invention in full, clear, concise, and exact terms so that anyone having ordinary skill in the field will be readily able to make and use it. While a statute requires you to disclose the best mode for carrying out the invention, you should disclose all possible modes (embodiments) without indicating any preference, unless the PTO requires you to do so.

Inventor's Commandment 12

In your patent application, you should "sell" your invention to the examiner or anyone else who may read the application. State all the disadvantages of the prior art factually and the advantages of one or more embodiments (not the invention per se) in a nonlimiting way.

This and the next two chapters are the heart of this book: They cover the writing and transmittal of your patent application to the Patent and Trademark Office (PTO). This chapter provides an overview of the patent application drafting process and contains specific instructions on drafting a specification and preliminary drawings. Chapter 9 explains how to draft patent claims (sentence fragments that delineate the precise scope of the patent being sought). Chapter 10 explains how to "final" the application as well as the precise steps involved in transmitting it to the PTO. In addition, Chapter 10 covers design patent applications.

Because these subjects can be difficult to understand in the abstract, I use concrete examples throughout. And, at the end of this chapter, you'll find the specification (including the abstract) and formal drawings of a sample patent application. Similarly, at the end of Chapter 9, you'll find the patent claims of this same application. In Chapter 10, I have provided a completed set of formal papers for a mailed application and full instructions for online filing.

New Patent Revision Pending

As this edition goes to press (winter 2010) a complete revision of the patent statutes is pending. Other revision bills have been introduced in previous Congresses but were derailed because of protests by independent inventors, Nobel laureates, friends of the patent system, concerned legislators, labor unions, "green" advocates, and the drug companies, who prefer strong patents. The current bill adds a new wrinkle in that it would provide a three-tier examination system (quick examination for a high fee, regular examination for a moderate fee, and deferral of examination until a fee is paid). Complete information about the current bill and the arguments against its provisions can be found on the Professional Inventors' Alliance site (www.PIAUSA.org).

While the proposed bill has some provisions that would help independent inventors, it also has some provisions I consider harmful. I urge you to visit the above site and call or write your congressperson and senators and urge them to oppose the harmful parts of this bill. The PIA site, above, will post updated information. You can also find current information on these issues at Nolo's website at www.nolo.com/patentityourself and at my update site, www.PatentItYourselfUpdates.Blogspot.com.

Have you filed a Provisional Patent Application (PPA)? As a result of legislation enacted in 1999, you may now convert the PPA to a regular patent application (RPA) even if the PPA did not include any claims. (35 USC § 111.) I don't recommend converting the PPA to an RPA, because your patent will expire 20 years from the earlier date of your PPA (rather than the later date of your RPA).

If you filed a PPA and are ready to file your RPA, I recommend that you file a separate RPA to start the 20-year term from the date of your RPA. To file a separate RPA, follow the instructions in this chapter for preparing an RPA from scratch. You should claim the benefit of the PPA in the RPA. If the one-year anniversary of your PPA falls on a weekend or holiday, you can still get the benefit of the PPA by filing the RPA on the next business day. Remember that your PPA will not be read by any PTO personnel unless you need to rely on its date to predate a reference cited against your claims or in case you're unfortunate enough to get into an interference (a situation in which two pending patent applications by different applicants claim the same invention).

A. Lay Inventors *Can* Do It!

It's a common myth that a lay inventor won't be able to prepare a patent application, or prepare it properly. Having worked with many lay inventors I dispute this vigorously. I have found that lay inventors can and have done very good jobs, often better than patent attorneys, by following this book. To prepare a proper patent application, you should be mainly concerned with four basic, essential considerations:

1. The specification (description and operation of your invention and drawings) should be detailed enough so that there will be no doubt that one skilled in the art will be able to make and use the invention after reading it.
2. You should not state anything in the application that a court could use to limit your invention—see Inventor's Commandment 10 at the beginning of this chapter.
3. The main claims should be as broad as the prior art permits. (More about this in Chapter 9.)
4. You should "sell" your invention by stressing all of its advantages in a nonlimiting way.

If you satisfy these four criteria, you'll be home free. All the other matters are of lesser import and can be fixed if necessary. I'll show you how to satisfy these main criteria in this and the next chapters. Now let's get started by looking at what's contained in a patent application.

B. What's Contained in a Patent Application

A regular patent application that is filed by mail or hand delivery to the PTO must contain several more items than one that is filed over the Internet via the PTO's EFS-Web (Electronic Filing System) and consists of the following parts, which are all sent together to the PTO after assembly in the below order: The items that are omitted when filing by EFS-Web are indicated by the ‡ symbol.

1. A self-addressed receipt postcard (see Chapter 10, Section E5)‡
2. A check or, if paying by credit card, a completed Form PTO-2038 for the filing fee (see Appendix 4, Fee Schedule)‡
3. A Transmittal Letter and a Fee Transmittal (Forms 10-2 or PTO/SB/05 and 10-3 or PTO/SB/17)‡
4. A Non-Publication Request (NPR) (Form 10-7 or PTO/SB/35). Send this if you don't want the application to be published 18 months after filing (if it's still pending then), you want to avoid the publication fee, or if you want to keep your invention secret if it doesn't issue. ‡
5. A drawing or drawings of the invention—either formal or informal (see Chapter 10, Sections A-D)
6. A specification containing the following sections:
   a. Title of the Invention (no more than 500 characters)
   b. Cross-Reference to Related Applications.† This is used to refer to and claim priority of any PPA or prior related applications that you've filed.
   c. Federally Sponsored Research.† This is used to indicate that the invention was made under a government contract and that the government has rights in it.
   d. Sequence Listing or Program.† This is used to indicate if the application contains a biotech sequence listing or computer program as an appendix or on CD-ROM.
   e. (1) Background—Prior Art. This section should state any known problems that the invention definitely solves and discuss and criticize the relevant prior art (previous patents and other relevant developments in the same technological areas). (A Field of Invention was previously required but is no longer needed and should not be used because it can be used to bring in prior art that might not otherwise be relevant.)

‡ This part is not needed if filing by Internet (EFS-Web).

† If this section is not applicable, it can be omitted or the phrase "not applicable" should follow the heading.

(2) Advantages. Here list the advantages of your invention (optional).

f. The Summary should briefly describe the invention as claimed.
g. Drawings†—Figures. This is a brief listing of the Drawing figures and may include the subsection below, Reference Numerals.
h. Reference Numerals (optional but desirable). These are the Drawing numbers that designate the respective parts of your invention, such as 10 motor, 12 shaft, etc.
i. Detailed Description—First Embodiment—Figs. 1-X. This is a narrative description of the structure of the invention's main embodiment. If the invention contains a program listing which is not extensive (over about ten pages), include it here or in the drawings. If it is longer, put it on a CD-ROM. Detailed Description also includes the three subsections below, Operation—First Embodiment, Description—Additional Embodiment, and Operation—Additional Embodiment.
j. Operation—First Embodiment. This portion of the Detailed Description explains how the main embodiment of the invention works or operates.
k. Description—Additional Embodiment—Figs. Y-Z. This portion of the Detailed Description describes the structure of an alternative embodiment, if you have one.
l. Operation—Additional Embodiment. This portion of the Detailed Description describes the operation of the alternative embodiment. (Repeat for all additional embodiments.)
m. Conclusion, Ramifications, and Scope. This part again summarizes the invention's advantages, the alternative physical forms or uses it can take, and a broadening paragraph to remind any judge that it shouldn't be limited to the particular form(s) shown.

7. Claims. These are precise sentence fragments that delineate the exact nature of your invention—see Chapter 9.
8. Sequence Listing.† Include this heading only if a nucleotide or amino acid sequence is part of the invention and you provide it on paper.
9. Abstract. This is a brief summary of the entire specification. It is technically considered part of the specification.
10. A completed Patent Application Declaration (PAD) form (Form 10-1A or PTO/SB/01 [use the simpler PTO/SB/01A if you include an Application Data Sheet—see Item 12]). The PAD is a statement under penalty of perjury that you're the true inventor and that you acknowledge a duty to keep the PTO informed of all material information and prior art related to your invention. (A Small-Entity Declaration is no longer needed.)
11. An Information Disclosure Statement, List of Prior Art Cited by Applicant (Forms 10-5 and 10-6 or PTO/SB08a and 08b), and copies of such prior art, other than U.S. patent references. Technically, these aren't part of the patent application, but because they're supposed to be sent to the PTO with or soon after the application, I've included them here. These inform the PTO of relevant prior art or any circumstances known to you that may potentially affect the novelty or obviousness of your invention.
12. An Application Data Sheet (ADS) (Form PTO/SB/14) to provide the bibliographic data about the application (Inventors' names, addresses, etc.). This document is mandatory if filing by EFS-Web but I strongly recommend that you file one if you are filing by mail to reduce data-entry errors. As stated, you can use a simpler declaration, PTO/SB/01A, if you include an ADS.

Note that a printed patent contains additional data, such as references cited, field of search, and so on. You should *not* include this additional data in your patent application. The PTO will add this data when they print the patent.

A Provisional Patent Application (PPA) must include some, but not all, of the parts just listed for a regular patent application. The parts that must be included for a PPA are:

- items 1–3, and 5 (postcard, payment, transmittal letter or cover sheet (Form 3-5 or PTO/SB/16), fee transmittal, and drawings), and
- items 6a (title), 6g (drawing figures), 6i (description—main embodiment), 6j (operation—main embodiment), and 6k and l (description and operation—alternative embodiments).

Note that the PPA uses a different transmittal letter or cover sheet (Form 3-5 or PTO/SB/16) and has a different fee. (See Appendix 4, Fee Schedule.)

The PTO's Rule 77 (37 CFR 1.77) states that the elements of a patent application should be arranged in the above order with the above headings in capital letters. I thus recommend that you use this format for smoothest sailing of your application through the PTO. However, since the headings are rather broad and don't break your application into enough easily digestible parts—as this book does—I recommend you add the additional headings in the above list, namely the Advantages, Reference Numerals, and Description and Operation of the various embodiments. I also recommend that you add any further headings you

think would be useful, especially if your application is long or technically complex.

C. What Happens When Your Application Is Received by the PTO

Once the PTO receives your application, it will go to an application processing branch, whose clerical personnel will deposit your check or process your credit card payment. They'll scan all of your papers sent by mail or assemble all of your "papers" filed via the Internet, assign a filing date and serial number to your application, put this information onto your postcard if you filed by mail, and return it. If you filed by the Internet, the PTO's server (computer) will provide you with an instant equivalent of the postcard receipt. Then, regardless of how you filed, if everything is not complete—for example, you didn't sign the application or pay the proper fee—they'll send you an objections sheet, indicating what you must do to complete the application, including (usually) a surcharge or fine to punish you for the error of your ways. Once your application is complete they'll send you an official filing receipt and forward your file to the drafting department, where your drawings will be reviewed for formal requirements. A drawing objection slip will be put in your file if your drawings have any formal errors, such as blurred lines. They may send you a notice stating that your application will not be examined until you file replacement drawings; if so, file corrected drawings in the time allotted. Once your drawings are approved, your file will be sent to an appropriate examining division.

Within a few months to a few years, your application will be reviewed by an examiner who will usually send you an "Office Action." (Examiners rarely allow an application upon first review.) The Office Action will do one or more of the following:

- object to one or more informalities of your application (for example, you didn't indicate your citizenship properly)
- object to one or more aspects of your specification and/or drawings
- reject some or all of your claims because of imprecise language, or
- reject some or all of your claims because of lack of patentability over the prior art.

To overcome these objections and/or rejections, you'll have to submit an "Amendment" (Chapter 13) in which you:

- make changes, additions, or deletions in the drawings, specification, or claims, and/or
- convince the examiner that the Office Action was in error.

Your application will be published 18 months from your earliest claimed filing date, unless you filed an NPR at the time of filing. If you filed an NPR, the information in your patent application will become publicly available only if a patent eventually issues. If you file the NPR and later decide to foreign file (see Chapter 12), you must rescind your NPR (use Form 10-7) within 45 days.

If the examiner eventually decides to allow the application (either as originally presented or as amended), you'll be sent a Notice of Allowance which gives you three months to pay an issue fee, a publication fee if applicable, and fix any drawing errors. Your specification and claims, along with certain other information (your name, address, and a list of all prior art cited by the examiner), will then be sent to the U.S. Government Printing Office. There they'll be printed verbatim as your patent. From filing to issuance, the process usually takes somewhere between six months to three years, but sometimes longer.

TIP

Model of Invention. You never have to furnish or demonstrate a working model of your invention. However, in rare cases, if the examiner questions the operability of your invention, such as if you claim a perpetual motion or energy machine, one way for you to prove operability is by demonstrating a working model. Working models are also useful to enable the examiner to understand and appreciate the commercial or intrinsic value of your invention.

D. Do Preliminary Work Before Preparing Your Patent Application

Before you begin the actual writing of your patent application or prepare any of the forms that go along with it, it's wise to make thorough preparations. Having worked on many patent applications, I can tell you that if adequate preparations are made beforehand, the actual writing of the application will go far more smoothly and will rarely take more than several partial days. Here are the basic preparatory steps.

1. Review the Prior Art

Assemble all your prior-art references, including any references gleaned from textbooks, magazines, or journals you've searched or discovered that are relevant to your invention or to the field of your invention. Read each of these references carefully, noting the terms used for the parts or steps that are similar to those of your invention.

Write down the terms of the more unusual parts and, if necessary, look them up in your prior-art patents, textbooks, magazine articles (see Appendix 3, Glossary of Useful Technical Terms), or a visual dictionary (see Appendix 2, Resources: Government Publications, Patent Websites, and Books of Use and Interest). In this way you'll be familiar with the term for every art and its precise meaning. Also, note the way the drawings in these prior-art references are arranged and laid out. Pay particular attention to what parts are done in detail and what parts need be shown only very roughly or generally because they are well known or are not essential to the invention.

If you see any prior-art patent whose specification contains words, descriptions, and/or drawing figures that you can use in your application, feel free to plagiarize! Unless a patent states that it is covered by copyright (rare), patents are not considered to be covered by copyright and it's considered perfectly legal and ethical to copy the text.

2. Review Your Disclosure

In Chapter 3, I strongly advised that you prepare a description (with sketches) of your invention and have this signed and witnessed, either in a laboratory notebook or on a separate piece of paper, called an invention disclosure. Review this now to be sure you have all of the details of your invention drawn or sketched in understandable form and that the description of your invention is complete. If you haven't done this yet, do it now, referring to Chapter 3 when necessary.

3. Ramifications

Write down all of the known ramifications (potentially different uses, materials, sizes, and methods of operation) and embodiments (other forms which the invention can take). That is, record all other materials that will work for each part of your invention, other possible uses your invention can be put to, and other possible modifications of your invention. Think of ways in which its size or shape can be altered, parts (or steps in its manufacture) that can be eliminated, and so on. If your invention is a process or method, other ramifications and embodiments can be different materials that your inventive process modifies, variations of your process, and different environments in which the process can be used.

The more ramifications and embodiments you can think of, the broader your patent claims will be interpreted, and the more you'll be able to block others from obtaining patents either on devices similar to your invention or on improvements to it. Also, you'll have something to fall back on if your main or basic embodiment is "knocked out" by prior art that your search didn't uncover or that surfaced after your search.

For instance, suppose your invention is a delaying device that closes the lid of a potpourri box automatically a few moments after the lid is opened. Another embodiment that could make advantageous use of the delaying device might be in a "roly-poly man" toy to make the man stand up again automatically a few moments after he's tipped over. If you have a process or software-related invention on a process for using a computer to categorize investments, alternative embodiments might be the use of the process to categorize inventory hardware or recipes.

TIP

Several Related Inventions. If you have two or more related inventions, such as a car radio mount and a housing for the same radio, you may show, describe, and claim both in the same application. The examiner may allow both inventions at once and you'll save fees and effort. However, you're allowed only one invention per filing fee, so the examiner may require you to restrict your application to one invention (Chapter 13, Section M). If so, you can easily file a divisional application (Chapter 14, Section D) on the other inventions before the original application issues and still get the benefit of your original application's filing date. However, each divisional application will require its own filing, issue, and maintenance fees (a substantial expense). Also, your original application and any divisionals you file will expire 20 years from the filing date of your original application. Keep this in mind and don't file your divisionals long after your original filing date. The advantage of filing a divisional later is that you postpone the second filing fee a year or two, and you'll avoid paying it altogether if you find the invention hasn't panned out and you decide to drop it. (In any case, don't include several inventions on one application if they're from different inventors or are not related.)

4. Sources of Supply

Suppose your invention contemplates the use of an exotic or uncommon material or component, or involves unusual manufacturing steps. In this case you must obtain the names and addresses of potential suppliers and/or identify textbooks or other references outlining how one should obtain or make such unusual elements or procedures. Describe these unusual dimensions, materials, or components in detail.

For example, with an electrical circuit, you generally don't have to include the technical values or identifications of components. However, if the operation of the circuit is at all unusual, or if any component values are critical, or if it contains a possibly novel feature, write down their names or identifications. With a chemical invention, write down the source or full identification of how to make any unusual or possibly novel components or reactions. With a mechanical invention, if any unusual or possibly novel parts, assembly steps, or materials are required, be sure you provide a full description and reference as to where to obtain or how to perform them.

EXAMPLE 1: Griselda invents a new photofinishing process that requires the use of a special trademarked developer, Hypoxx, made by the Briskin Co. of Merion, Pennsylvania. If Griselda knows the composition of the developer, she must indicate this in the specification, but if not she can simply refer to the developer as Hypoxx developer from the Briskin Co. of Merion, Pennsylvania.

EXAMPLE 2: Tom invents a new plumbing fixture that uses a special valve that also is positioned where two parts pivot with respect to each other. No such "pivoting valve" exists. In order to fulfill the PTO's disclosure requirement, Tom must design the pivoting valve and describe and draw it in his patent application.

The reason why you will need the full details of any special aspects of your invention is simple. Section 112 of the patent laws (35 USC 112) mandates that the specification provide a "full, clear, concise, and exact" description of the invention such that anyone skilled in the art can make and use it without too much effort. In addition, if any feature is possibly novel, you may have to claim it specifically, so you will want to provide adequate terminology in the specification to support your claim language.

5. Advantages/Disadvantages

List all disadvantages of the relevant prior art that your invention overcomes, referring to the checklist in Chapter 4 (Form 4-2) to make sure your listing is complete. Then list all the advantages of your invention over the prior art, and all of your invention's general disadvantages. (Because of the new court decisions (see Inventor's Commandment 10), we have to be careful how we state these, as I'll explain later.)

Now that we have reviewed these vital preliminary steps, let's turn to writing the specification.

E. Flowchart

To get you oriented, I've provided, in Fig. 8A below, a self-explanatory flowchart of the entire application preparation process. Steps A to P, V, and W are covered in Chapter 8, Steps Q to U in Chapter 9, and Steps X to Z in Chapter 10.

F. Write Your Patent Specification to Comply With the Full Disclosure Rules

In writing the specification of a patent application, including a PPA, your goal is to disclose clearly everything you can think of about your invention. In case of doubt as to whether or not to include an item of information, put it in. The statutory provision that mandates the inclusion of all this information in your patent application is Section 112 of the patent laws, paragraph 1, which reads as follows:

> *"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 the invention."*

If you read this statute carefully, you will see that it imposes three requirements on a patent specification: (1) it must provide a written description of the invention, that is, it must tell what it is, (2) it must fully, clearly, concisely, and exactly teach one skilled in the art how to make and use it, and (3) it must set forth the best mode of carrying out the invention. The reason for these requirements is based upon the "exchange theory" of patents. The government grants you a patent (that is, a monopoly on your invention) for a term of 17 to 19 years in exchange for your disclosing to the public the full details of your invention (written description, how to make and use it, and best mode). In this way the public will get the full benefit of your creativity after your patent expires. If you describe the parts of the invention and how it operates, you will satisfy the first two requirements (written description and how to make and use).

However, under current court decisions, it's dangerous to disclose a "best mode" since a court may use this to limit your invention to this mode or embodiment. I have never seen any instance where an examiner or a court criticized an application that disclosed several different embodiments but did not anoint one as the best. So most practitioners now recommend that, to prevent any court from limiting your invention to one mode, you disclose all of the

*This word or words should appear as section heading in all capitals without boldface.

Fig. 8A—Steps in Preparing a Patent Application

embodiments "fully, clearly, concisely, and exactly" without stating which one is "best."

However, you may identify the one you currently favor in a nonlimiting manner, for example, "At present I believe that this embodiment operates most efficiently, but the other embodiments are also satisfactory." If you can't decide which embodiment is the best, it's okay to list each embodiment and tell its relative advantages and disadvantages. For example, in the delay device referred to above, its use to close a box lid after a few minutes might be your first embodiment, and the delayed "roly-poly man" might be an alternative embodiment. In this case you need merely state that the box is your presently preferred practical application of the delay device, but the other embodiment has other substantial applications.

Another reason for disclosing as much as you can about your invention is, as stated, to block others from getting a subsequent improvement patent on your invention. Suppose you invent something and disclose only one embodiment of it, or only one way to do it. If you get a patent that shows only that one embodiment, someone may later see your patent and think of another embodiment or another way to do it that may be better than yours. This person will then be able to file a new patent application on this "improvement invention" and thereby, assuming a patent is issued, obtain a monopoly on the improvement. If this occurs, you won't be able to make, use, or sell the improvement without a license from the person who owns that patent. This is so even though you have a patent on the basic invention.

As mentioned earlier, you must provide enough information in your patent application to enable anyone working in the field of your invention to be able to build and use it, without undue effort. That is, anyone in the field must be able to make a working version of your invention from the information contained in your patent application. However, to comply with this section, you ordinarily don't have to put in dimensions, materials, and values of components, since the skilled artisan is expected to have a working knowledge of these items. However, as described above, dimensions, materials, or components that are critical to the performance of your invention, or that are at all unusual, *must* be included. If in doubt, include this specific information.

Finally, having reviewed many patent applications prepared by laypersons, I find that the most common error in preparing the specification of a patent application is a failure to include enough detail about the invention, or enough ramifications. Thus, if you "sweat the details" like a good professional does, you'll seldom go wrong.

Common Misconception: A patent specification should not include details of the invention since this will limit the invention to such details.

Fact: The scope of the invention is determined mainly by the claims; so including details in the specification will not limit its scope.

"New Matter" May Not Be Added After Filing

What happens if you don't put enough information in about your invention to enable "one skilled in the art" to make and use it without undue effort? Either your entire application can be rejected under Section 112 on the grounds of "incomplete disclosure," or it may be later invalidated if an infringer challenges it when you try to enforce it. Also, if your patent application is rejected because of incomplete disclosure, usually there is nothing you can do since you aren't allowed to add any "new matter" (additional technical information) to a pending application. (See Chapter 13, Inventor's Commandment 26.) In other words, "You must get it right the first time." While many inventors object to and rail against the "no-new-matter rule" ("Why can't I add improvements to my application?"), a moment's thought will convince you that the rule has a good purpose. Without the rule, an applicant could continuously add improvements and modifications, so that the filing date would be meaningless.

NOTE

Software Note. If your invention includes a microprocessor and an application program for it, either in software or in firmware, you should either include a source or object code listing of the program with your patent application, or a detailed flowchart. The flowchart should be detailed enough so that a programmer having no more than ordinary skill would be able to use your chart to write the program and debug it without undue effort or significant creativity—even if the task would take several months.

NOTE

Biotechnology Note. If your invention requires a microorganism or a fusion gene that is not widely available, you must make a deposit of your "special" bug or plasmid in an

approved depository. See MPEP (*Manual of Patent Examining Procedure*), 608.01(p)(c), and Chapter 2400, referred to in Appendix 2. If your application contains a nucleotide or amino acid sequence, you must describe your sequence according to the PTO's sequence rules. See MPEP 2420 et seq. for the rules and availability of a program called "PatentIn" for submitting the sequence in electronic form. Applicants who file a paper application can now file program listings and biotech sequence lists on a CD-ROM (in duplicate for program listings, see Rule 52(e)). When a program has 300 lines or fewer (72 characters per line), you can submit it on drawing sheets or in the specification. (If it has more than 60 lines, put it at the end of the specification.) When it has more than 300 lines, it must be on CD-ROM. If you file via EFS-Web, you can file these items electronically.

NOTE

Formula Note. You can enter formulas in the text the same way you would do if you were writing a college paper or textbook. However, it's best to avoid formulas, Greek letters, and subscripts, if at all possible: The printer may get them wrong, and if your patent ever gets into court, they'll turn off or intimidate a lay judge. Remember, the "KISS" rule (Keep It Simple, Stupid!).

NOTE

Trademarked Chemical Note. If your invention uses a trademarked chemical—such as "Ajax developer"—and you don't know its composition, see if any other similar chemicals will work. If so, you can just refer to the chemical by its generic name, with a reference to a suitable manufacturer—for example, "developer, preferably Ajax brand, sold by Ajax Chemical Company, Inverness Park, California." If the trademarked chemical is critical, try your best to find its generic constituents—for example, by contacting the company or doing research. One clever inventor found the composition by calling a Poison Control Center hotline. If you can't find the constituents, you'll have to refer to the chemical by its trademark and manufacturer, but this can limit your invention severely.

G. Software, Computer-Related Inventions, and Business Methods

Many inventors have asked me if I planned to write a separate book on how to patent software. I always answer in the negative. This is because I believe there is no need for such a book: patent applications for software and other computer-related inventions are prepared under the same rules and with the same general considerations as for any other invention.

The same is true for business method and Internet-related patents (see Chapter 5, Section C1c). While all of these inventions are new, iconoclastic to established practice, and difficult to search, they must be described and claimed in the same manner as any "old-fashioned" invention.

The main consideration applicable to these inventions is in meeting the full disclosure requirement. As stated in the preceding section, a patent application must contain a sufficiently detailed description of the invention so that one having ordinary skill in the art to which it pertains, or to which it is most nearly connected, will be able to make and use the invention without undue effort. In practice, the PTO and courts strictly enforce this requirement when software, computer-related inventions, or business method inventions are involved, since the newness of the field makes most people less comfortable with it. So if you're preparing a patent application on a software, computer-related invention, or business method invention, be absolutely sure that no one will ever be able to challenge it for "incomplete disclosure." That is, make absolutely sure it contains a "full, clear, concise, and exact" description of the invention and how to make and use it.

How should you fulfill this requirement in practice with software inventions? Virtually every software invention uses a computer program of some sort, whether it's in a PROM (programmed read-only memory) or a separate program on a disk which is used with a general-purpose computer. To fulfill the complete disclosure requirement, it is essential that you disclose either a listing of the program or a detailed flowchart of the operations and steps involved with the invention that a programmer can use to create a working version.

If you've already written the program, the easiest way to provide the necessary disclosure is to supply the listing as part of the patent application. (See "Computer Programs Note" in Section I, below, for how to do this.) The listing must be submitted in ASCII format per PTO Rule 52(e) (37 CFR 1.52(e)). Therefore, unless you can somehow supply the object code in ASCII, you will have to submit the source code.

You should explain in the specification how to implement the listing and any special instructions that may be necessary to implement the invention without undue experimentation. The explanation should detail how to configure the computer to perform the required function and interrelate with any other elements to

yield the claimed invention. For instance, you should state what programming language the listing is in (for example, "C++"), how to use it to control the computer or microprocessor, what type of computer or microprocessor to use it with (for instance, "a Pentium chip"), and what hardware should be connected to the computer, both on the input and output sides as necessary (for instance, "a MIDI interface" and "a laser printer").

The program should be free of any serious bugs and should not have too many minor bugs (virtually no program is 100% bug free). In other words, no one should be able to say your listing wouldn't function according to its specifications. (The PTO won't test your program, but if you get a patent and later seek to enforce it during license negotiations or in court, your adversary will!)

If you choose to provide only a flowchart, make sure it's complete and detailed enough to enable any reasonably skilled programmer to write a program, using only routine skills. The flowchart will be adequate even if it would take a programmer several months to write the program, so long as only routine skill and not extraordinary effort will be involved. In this connection, I like to think of a flowchart like the plans for a building: If the plans are adequate for an ordinary builder to construct the building, they will be adequate, even if it will take the builder several months, or even a year or more. However, if the plans are rough and sketchy, so that the builder has to hire an architect to complete them, or has to use a lot of imagination to fill in gaps, then they're inadequate. Fig. 8B shows adequately detailed flowcharts (from U.S. Pat. No. 5,170,279, 1992 Dec 8) in two parts: general and specific. The associated explanation in the specification (not provided) discusses each block in detail, lists the equations referred to in the blocks, and explains exactly how to implement the flowchart. Applicants who file a paper application can now file program listings and biotech sequence lists on a CD-ROM (in duplicate for program listings, see Rule 52(e)). When a program has 300 lines or less (72 characters per line), you can submit it on drawing sheets or in the specification. (If it has more than 60 lines, put it at the end of the specification.) When it has more than 300 lines, it *must* be on CD-ROMs.

If you file your application via EFS-Web (as explained in Chapter 10, Section F), you may file computer programs, sequence listings, and large tables as text files with a .txt extension instead of mailing them to the PTO on CDs. The text file must be in ASCII and the specification must have a separate paragraph identifying the text file by name, date of creation, and size in bytes. To see the PTO's Notice for this matter, go to http://www.uspto.gov, then search for "LEGAL FRAMEWORK FOR EFS-WEB," then go to part XIII.

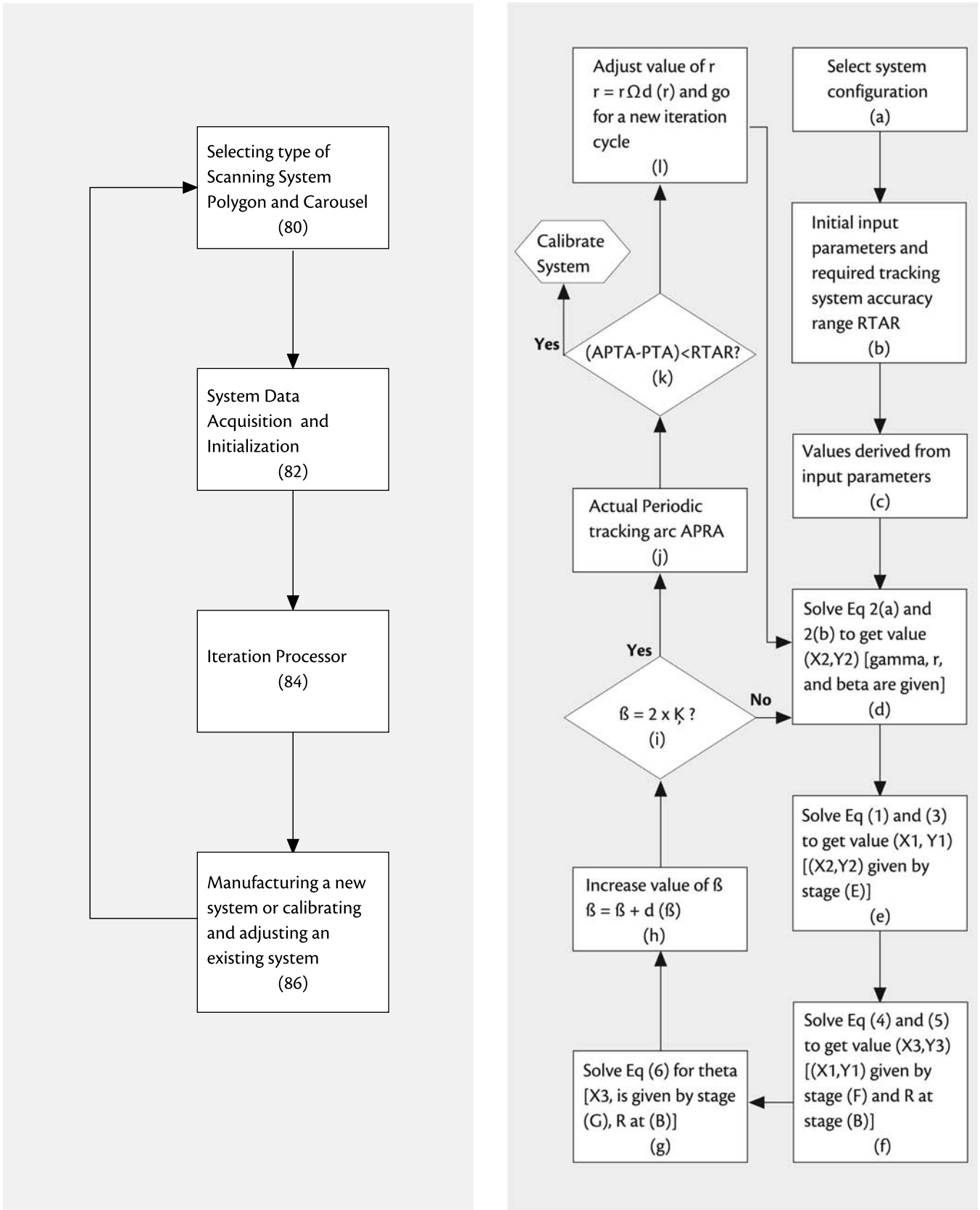
You may be able to deter readers of your patent from copying and using your program listing by including a copyright notice in the patent application. Including such a notice will not deter determined pirates from copying your source code (SC), so it's best not to include source code, if at all possible. You may provide just the object code or a detailed flowchart.

All Process Inventions Must Now Be Hardware Based

Due to a recent decision of the Supreme Court, *Bilski v. Kappos*, discussed in Chapter 9, all process claims must now recite a process that either (1) is tied in a substantial way to a particular machine or apparatus, or (2) transforms an article into a different state or thing. The former *State Street* case standard that required the claim to recite a "useful, concrete, and tangible result" is no longer applicable. Most patent attorneys and inventors disagree strongly with the *Bilski* decision, but we have to live with it (unless the Supreme Court reverses). In order to have your claims be hardware-based to comply with *Bilski*, your process must actually be hardware (machine or apparatus) based and you should describe the hardware in that manner in the specification. For example, if you have a financing method that involves monetary manipulations, or an Internet invention that involves transactions, you will have to describe the manipulations or transactions as hardware based—that is, by including a computer to tally and monitor the monetary amounts and transactions in its CPU and memory and possibly the display, and discussing and claiming the invention basically in terms of the computer. As stated in Chapter 5, the Supreme Court left the door open for additional ways to claim processes, to be determined in future cases. Unless you want your application to be a test case, I strongly recommend that you follow the rule of *Bilski* (until and if the rules are broadened).

H. First Prepare Sketches and Name Parts

Before you even begin the actual nuts and bolts preparation of your specification, you should make (or have made for you) penciled sketches of your invention. These will form the basis of the drawings you'll eventually send to the PTO along with your patent application. (See Chapter 10, Section A.) Your sketches will also be the foundation of your



General **Specific**

Fig. 8B—Software Flowcharts

application. In other words, you'll build from these as you write your specification and claims.

The main reason I discuss sketches at this point is that you have to do your sketches prior to drafting the specification, as well as the other parts of the application. You don't have to worry about planning any layout of your figures on the drawing sheets, or the size of the figures—yet. This will be covered in detail in Chapter 10. For now, merely complete a set of sketches showing all of the aspects of your invention without worrying about size or arrangement; these sketch-figures can even be done very large and on separate sheets. Later on they can be reduced and compiled onto the drawing sheets as part of the "finaling" process (Chapter 10).

After you've completed your sketches, write down a name for each part adjacent to such part in each sketch, such as "handlebar," "handgrip," "clamp," "bolt," etc. Write the names of the parts lightly in pencil so that you can change them readily if you think of a better term. Use lead lines to connect each name to its part if the parts are crowded enough to cause confusion. If you have any difficulty naming any part, refer to the Glossary of Useful Terms (Appendix 3), your prior-art patents, or a visual dictionary such as *The Firefly Visual Dictionary* by Corbeil and Archambault (Firefly Books, 2002) or the *Visual Dictionary of Science* (DK Publishing, 1998).

Your drawing should be done in separate, unconnected figures, each one labeled ("Fig. 1," "Fig. 2," etc.) so that all possible different views and embodiments of your invention are shown. If two figures are related, you can refer to them with the same number but with different suffixes or primes, for example, "Fig. 1A," "Fig. 1B," etc., or "Fig. 1," "Fig. 1′," etc. Use as many views as necessary. Look at a relevant prior-art patent to get an idea as to how it's done. The views should generally be perspective or isometric views, rather than front, side, and top, engineering-type views. If you have trouble illustrating a perspective view, take a photo of a model of your invention from the desired angle and draw the photo—perhaps by enlarging and tracing it. Alternatively you can use a "see and draw" copying device of the type employing a half-silvered mirror in a viewing head on a pedestal; these are available in art supply stores and through gadget mail-order houses. Hidden lines should be shown in broken lines, as shown in Fig. 8C. For complicated machines, exploded views are desirable as shown in Fig. 8D. The drawings must be filed as a separate document from your patent application (whether filing in paper or via the Internet). Never include your drawing sheets as part or pages of the written description.

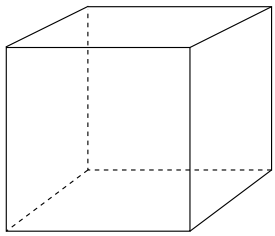


Fig. 8C—Isometric View With Hidden Lines

You can use any reasonable symbols for mechanical, electronic/electrical, and chemical parts; the PTO has no requirements in this area, except that the symbols not be outrageous. I suggest you use conventional symbols, such as those approved by the ANSI (American National Standards Institute), those used in conventional texts, or those used in your prior-art patents. In lieu of graphical symbols, labeled boxes are also acceptable, so long as the part represented by the box is standard or conventional.

If you have an electronic system, a block diagram with each block labeled (for example, "Schmitt Trigger," "flip-flop," "inverter") is fine. If any block represents a non-conventional circuit, however, be sure that you explain clearly what's in the block or provide a reference to a suitable publication. If any block represents a programmed microprocessor or computer, remember that you must provide a listing of the program or a software flowchart to provide a complete disclosure. (See Section F, above.)

If possible, one figure of your drawing should be comprehensive enough to show the basic idea of the invention and to be suitable for inclusion in the *Official Gazette* (OG). If the PTO grants your patent, they will publish one figure, the main claim, and the bibliographic details of your patent in the OG. See Chapter 6, Section K, for more on the OG. The other figures can be fragmentary or partial views; you don't have to show the same details more than once.

Different colors and different shades of gray can be shown with different types of shading lines, but provide a suitable decoding legend in a separate figure. For more information, see Nolo's *How to Make Patent Drawings*, by Jack Lo and David Pressman.

If your invention is related to a prior-art device, you may want to illustrate the prior-art device in the first figure of drawings so that you can explain it and its drawbacks. This Fig. must be labeled "Prior Art."

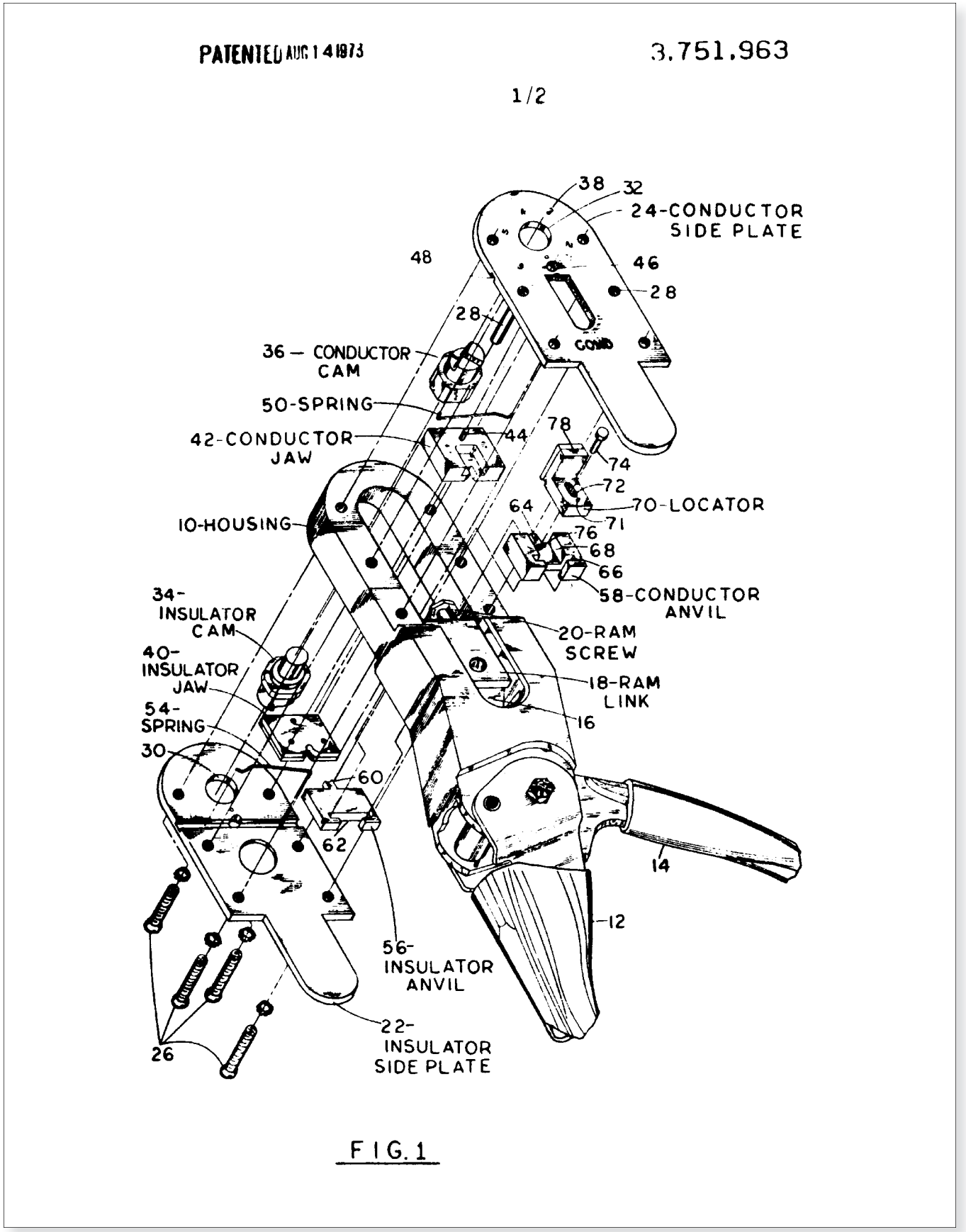


Fig. 8D—Isometric Exploded View