Europäisches Patentamt
European Patent Office
Office européen des brevets

EN

EUROPEAN QUALIFYING EXAMINATION 2016

Paper A(E/M)

Electricity / Mechanics

This paper comprises:

* Client's Letter 2016/A(E/M)/EN/1-6
* Client's Drawings 2016/A(E/M)/EN/7-11

Client's Letter

Dear Ms Antoilette,

[001] Our company has specialised in the production of siphons for over one hundred years. Recently, we have developed a new range of products which we hope will be a great success on the market.

[002] Siphons have been used for centuries to guide waste water from sinks or toilet bowls to sewage ducts. A conventional siphon 100 is represented in Fig. 1A in perspective view and in Fig. 1B in cross-sectional view. In Fig. 1B, the siphon 100 connects the plughole 70 of a sink 80 to a sewage duct 90 in a wall 60.

[003] The siphon 100 is composed of three tube sections:

- a U-shaped tube, called a "U-bend" 160, having an inlet opening 120 and an outlet opening 130, and housing a reservoir 140, which extends to an overflow level 150;
- an inlet tube 180, which connects at one end to the inlet opening 120 and at the other end to the sink 80;
- an outlet tube 190, which connects at one end to the outlet opening 130 and at the other end to the sewage duct 90.

[004] Liquid can flow from the sink 80 into the reservoir 140 and fill the reservoir up to the overflow level 150. From the filled-up reservoir 140, liquid flows to the sewage duct 90. The liquid in the reservoir 140 and the walls of the siphon 100 block bad odours from the sewage duct 90.

[005] This conventional siphon 100 has become unpopular with customers who prefer designer equipment with clean and straight contours in their bathrooms and kitchens. In a first, obvious attempt to meet these customer demands, our R&D department proposed a housing 110 enclosing the U-bend 160, as shown in Fig. 1C in perspective view. We were, however, not satisfied with this straightforward solution and never put it on the market. Like the siphon 100 of Fig. 1B, the siphon 100' of Fig. 1C is very bulky, because its dimensions are determined by the U-bend 160. In particular, the U-bend 160 determines a minimum distance "d" between the plughole 70 and the wall 60, and thus limits the possible arrangements of the sink 80.

[006] R&D then came up with a brilliant idea. Because the housing 110 encloses the U-bend 160, it also encloses the reservoir 140 and any liquid therein. Therefore, the U-bend within the housing can be replaced by a simple wall, which blocks bad odours by preventing gas from flowing from the outlet opening to the inlet opening, if the reservoir is filled with liquid up to the overflow level.

[007] Some of our new siphons incorporating such a simple wall are represented in Figs. 2A to 5A in perspective view and Figs. 2B to 5B in cross-sectional view. Other new siphons, which are based on those of Figs. 2A to 5A and 2B to 5B, are shown in Figs. 2C to 5C in cross-sectional view.

[008] The siphon 200 of Figs. 2A and 2B comprises a housing 210. The housing 210 has an inlet opening 220, which is arranged in the top of the housing, and an outlet opening 230, which is arranged in the housing side wall 211 and determines an overflow level 250. The housing 210 encloses a reservoir 240, which extends to the overflow level 250, and a wall 260. Together with liquid in the reservoir 240, the wall 260 blocks bad odours from the sewage duct 90, as can be seen from Fig. 2B.

[009] Furthermore, the siphon 200 comprises an inlet tube 280 and an outlet tube 290. The inlet tube 280 is connected at one end to the inlet opening 220 and at the other end to a sink 80. The outlet tube 290 is connected at one end to the outlet opening 230 and at the other end to the sewage duct 90. The inlet and outlet openings 220, 230 could also be directly connected to the sink 80 and the sewage duct 90 or located differently, as long as liquid can flow from the inlet opening to the outlet opening via the reservoir 240.

[010] The siphon 300 of Figs. 3A and 3B comprises a housing 310. The housing 310 has an outlet opening 330, which is arranged in the housing side wall 311 and determines an overflow level 350, and an inlet opening 320, which is arranged in the housing side wall between the overflow level and the top of the housing. An inlet tube 380 is connected at one end to the inlet opening 320 and at the other end to a sink 80. An outlet tube 390 is connected at one end to the outlet opening 330 and at the other end to the sewage duct 90.

[011] The housing 310 encloses a reservoir 340, which extends to the overflow level 350, and a tubular wall 360. One end of the tubular wall 360 surrounds the inlet opening 320. The tubular wall 360 and the inlet tube 380 are integrally formed in order to facilitate manufacture of the siphon 300.

[012] If the reservoir 340 is filled with liquid up to the overflow level 350, the tubular wall 360 is exposed on one side, namely its inner side, to gas entering the housing 310 from the inlet opening 320, whereas it is exposed on the other side, namely its outer side, to gas entering the housing from the outlet opening 330. This prevents gas from flowing from the outlet opening 330 to the inlet opening 320. Due to this favourable arrangement of the walls 260 and 360, the housings 210 and 310 of Figs. 2 and 3 can be made more compact than the housing 110 of Fig. 1C.

[013] The siphons 400, 500 of Figs. 4 and 5 differ from those of Figs. 2 and 3 in that they comprise a reservoir side wall 441, 541 in addition to a housing side wall 411, 511. The reservoir side wall 441, 541 determines an overflow level 450, 550 up to which the reservoir 440, 540 extends. An outlet opening 430, 530 is arranged in the bottom of the housing 410 as shown in Figs. 4A and 4B, or in the housing side wall 511 between the bottom of the housing 510 and the overflow level 550, as shown in Figs. 5A and 5B. Compared to the siphons 200, 300 of Figs. 2 and 3, the siphons 400, 500 have a reduced height. Consequently, the accessible space under the sink 80 is increased, which is particularly convenient for persons sitting in a wheelchair. On the other hand, siphons without a separate reservoir side wall can have a relatively small depth, which allows for a reduced minimum distance "d", as can be seen in Fig. 2B.

[014] Furthermore, the top of the housing 410, 510 and the inlet opening 420, 520 arranged therein are configured to connect directly to the sink 80 without the need of an additional inlet tube.

[015] The siphons 200', 300', 400', 500' of Figs. 2C to 5C are based on those of Figs. 2A to 5A and 2B to 5B and additionally comprise a valve 270, 370, 470, 570. The valve 270, 370, 470, 570 has a float 271, 371, 471, 571, which is located in the reservoir 240, 340, 440, 540 and serves as a valve body. If the reservoir 240, 340, 440, 540 is filled with liquid, the float 271, 371, 471, 571 is biased by buoyancy against a valve seat 272, 372, 472, 572 into a closed position, in which it blocks the inlet opening 220, 320, 420, 520 (see Figs. 2C and 4C). The weight of liquid on top of the float 271, 371, 471, 571, which is represented as an arrow in Figs. 3C and 5C, can overcome the buoyancy and move the float into an open position. When the float 271, 371, 471, 571 is in the open position, the liquid on top of the float flows into the reservoir 240, 340, 440, 540, after which the float is moved back by buoyancy into the closed position.

[016] In the closed position represented in Figs. 2C and 4C, the float 271, 371, 471, 571 prevents gas evaporating from the liquid in the reservoir 240, 340, 440, 540 from reaching the inlet opening 220, 320, 420, 520 and entering a bathroom. The siphons 200', 300', 400', 500' are therefore of particular use for waterless urinals. Waterless urinals are located in regions without a public water supply, e.g. in toilets along motorways in uninhabited areas. Since such urinals cannot be flushed, the liquid in the reservoir is not regularly replaced by fresh water and may give rise to bad odours.

[017] In order to guide the float 271, 371, 471, 571 as it moves between the open and closed positions, the valve 270, 370, 470, 570 may comprise a guide 260, 373, 441, 541. In Fig. 2C, the wall 260 serves as guide. In Figs. 4C and 5C, the separate reservoir side wall 441, 541 serves as guide.

[018] In the siphon 200' of Fig. 2C, in which the inlet tube 280 extends through the inlet opening 220 into the housing 210, the valve seat 272 is located at the end of the inlet tube.

[019] In the siphons 300', 400', 500' of Figs. 3C to 5C, which comprise a tubular wall 360, 460, 560, one end of which surrounds the inlet opening 320, 420, 520, the valve seat 372, 472, 572 is located at the other end of the tubular wall. In this case, the tubular wall 360, 460, 560 should only extend to the overflow level 350, 450, 550 in order to avoid the presence of liquid on top of the float 371, 471, 571 in the closed position.

[020] Please draft a set of claims and an introductory part of the description for a European patent application which protects our invention. To minimise our costs we ask you to use the attached drawings for the patent application and to avoid any claims fee and any fees for further patent applications.

Yours sincerely,
Flush Gordon
Siphony Ltd.

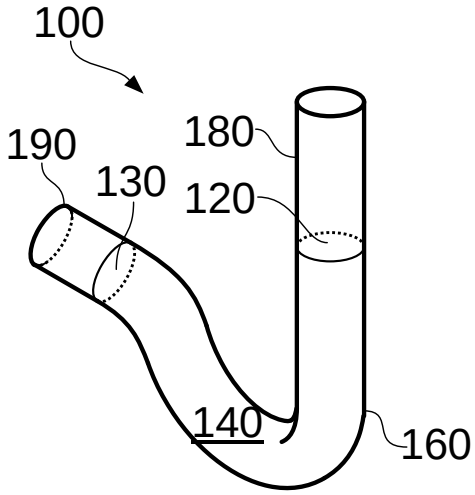

FIG. 1A

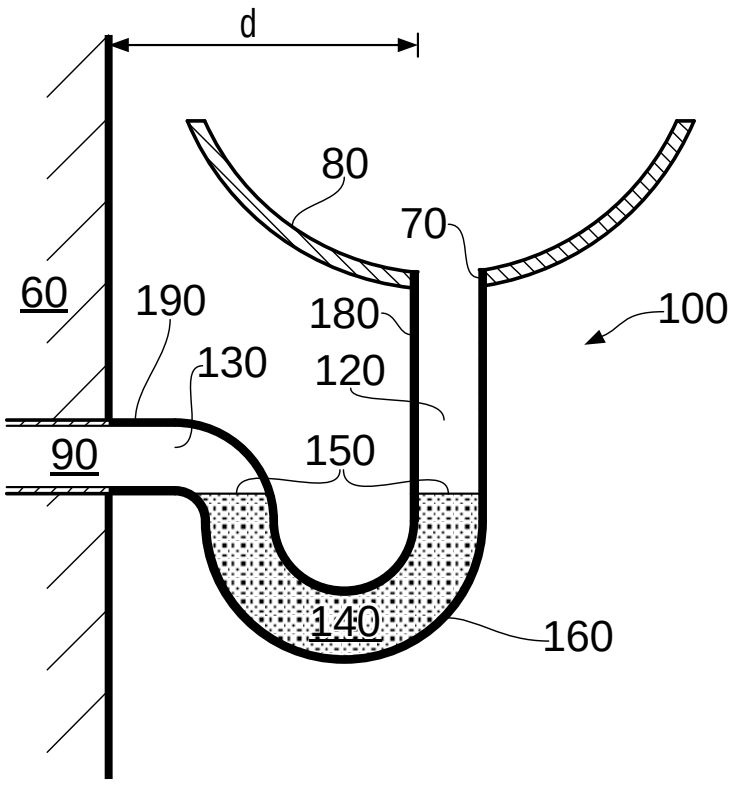

FIG. 1B

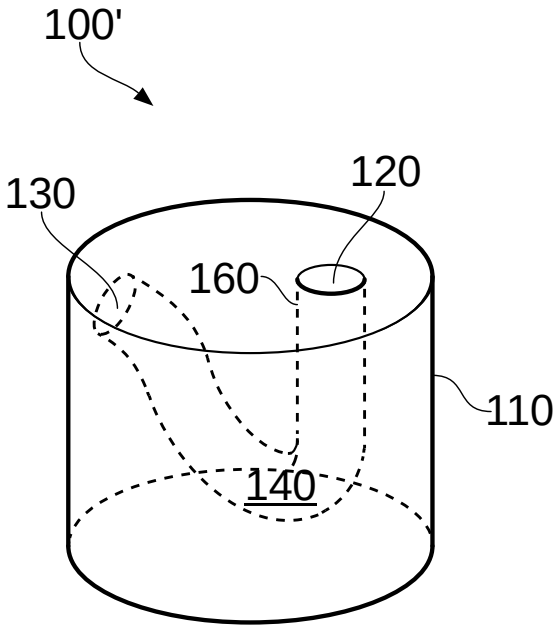

FIG. 1C

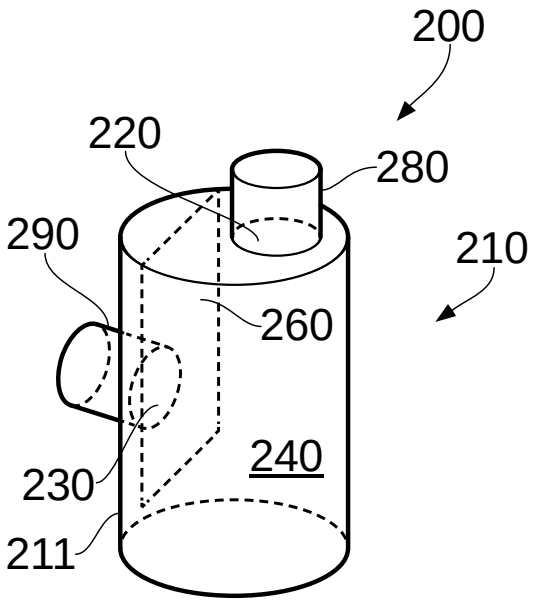

FIG. 2A

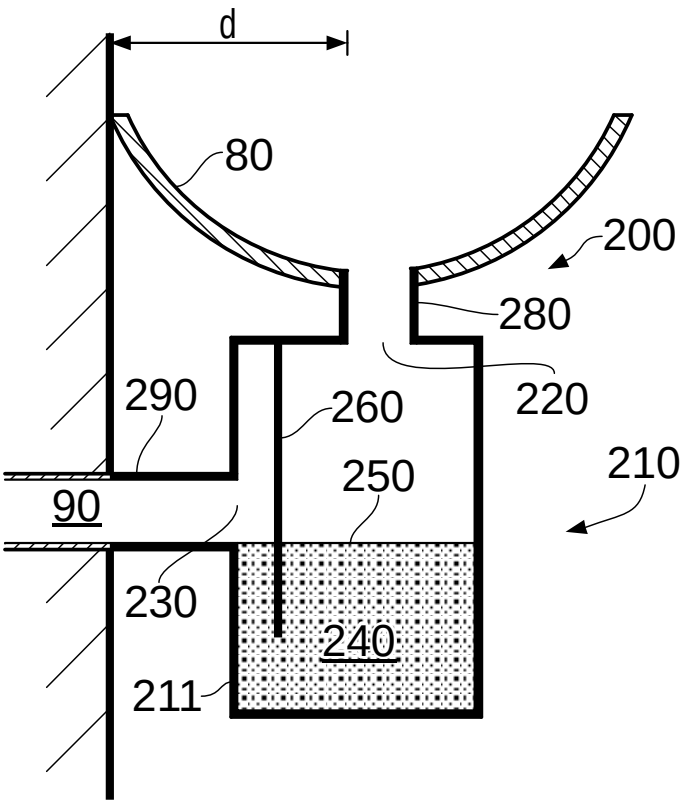

FIG. 2B

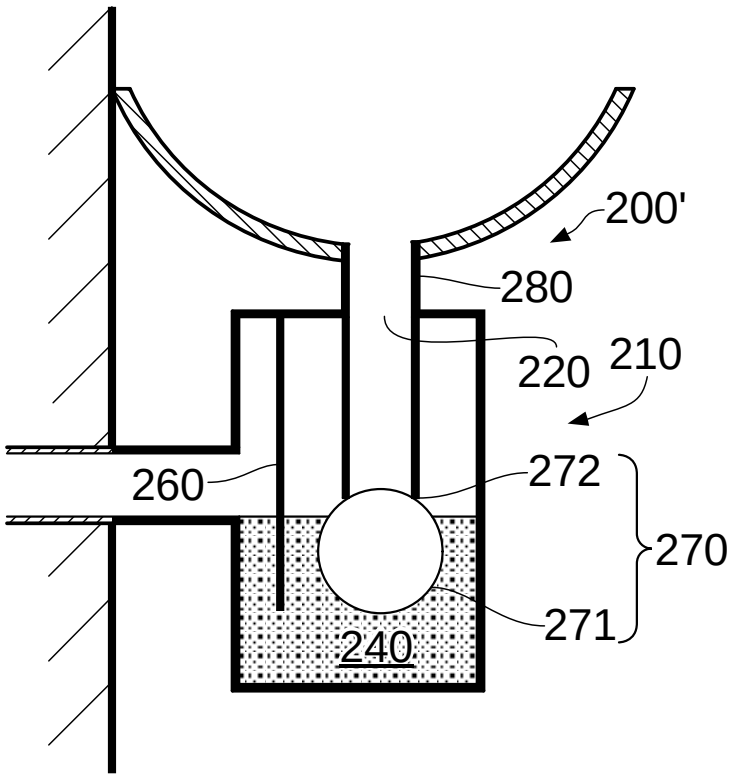

FIG. 2C

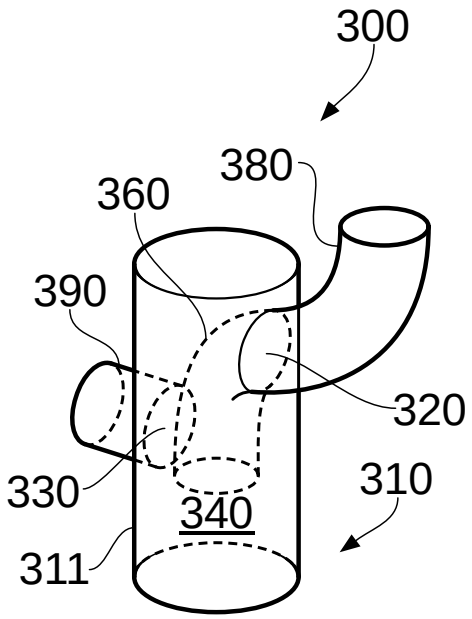

FIG. 3A

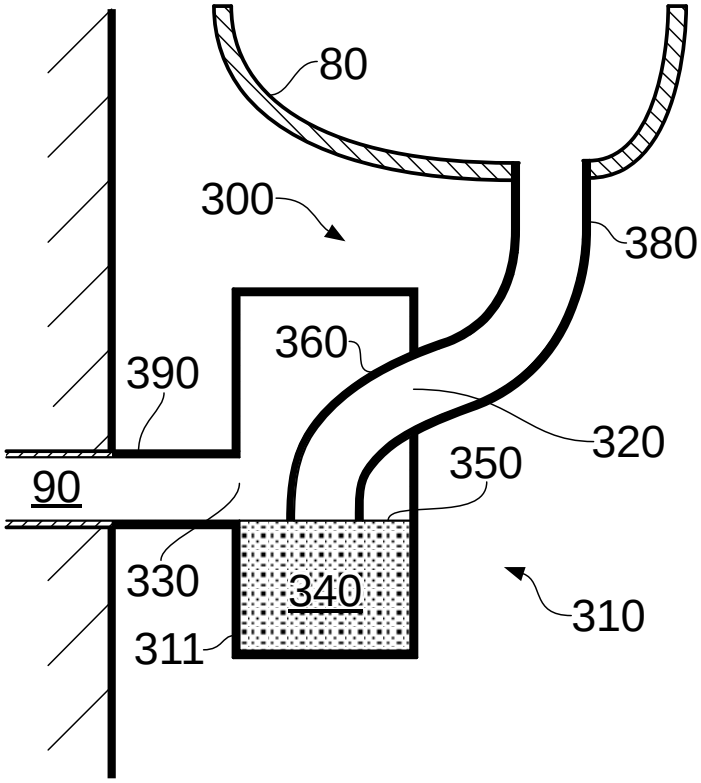

FIG. 3B

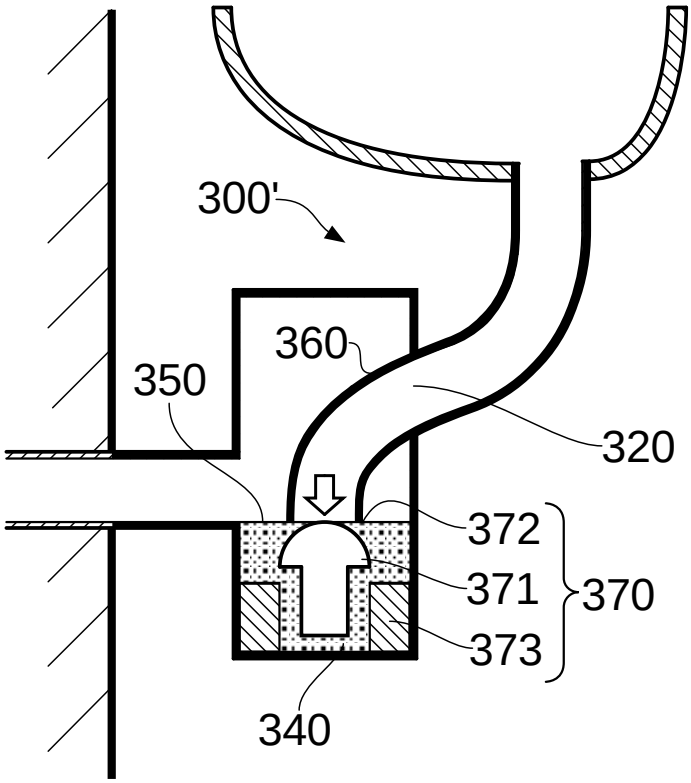

FIG. 3C

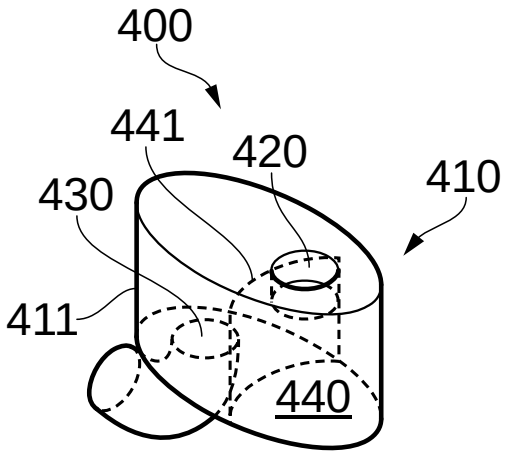

FIG. 4A

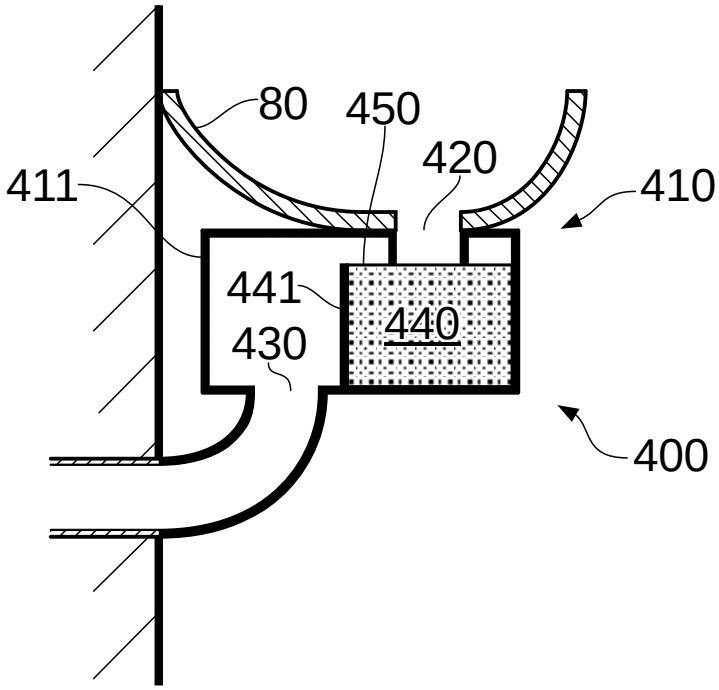

FIG. 4B

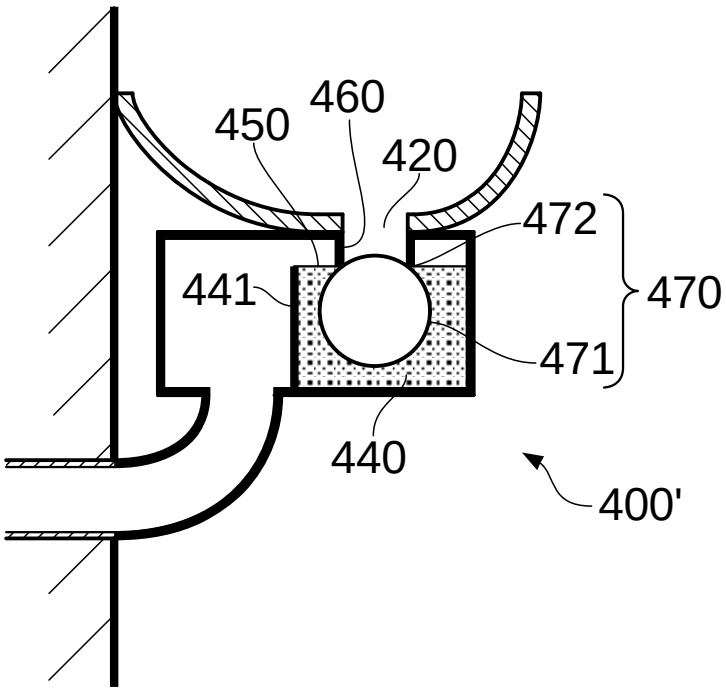

FIG. 4C

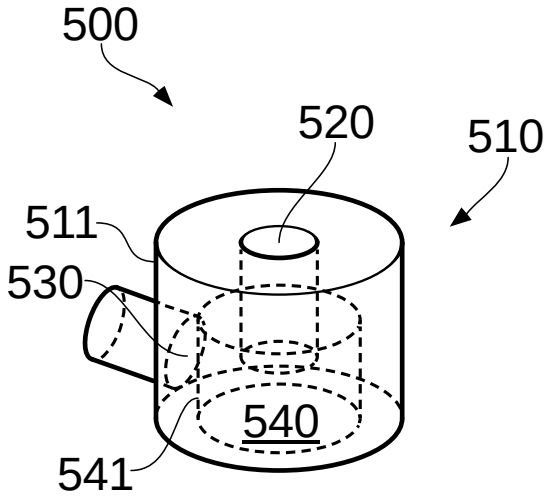

FIG. 5A

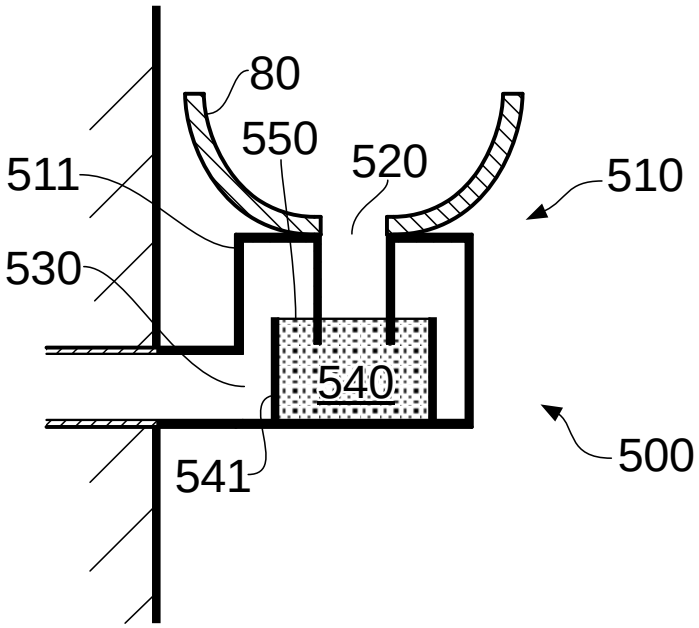

FIG. 5B

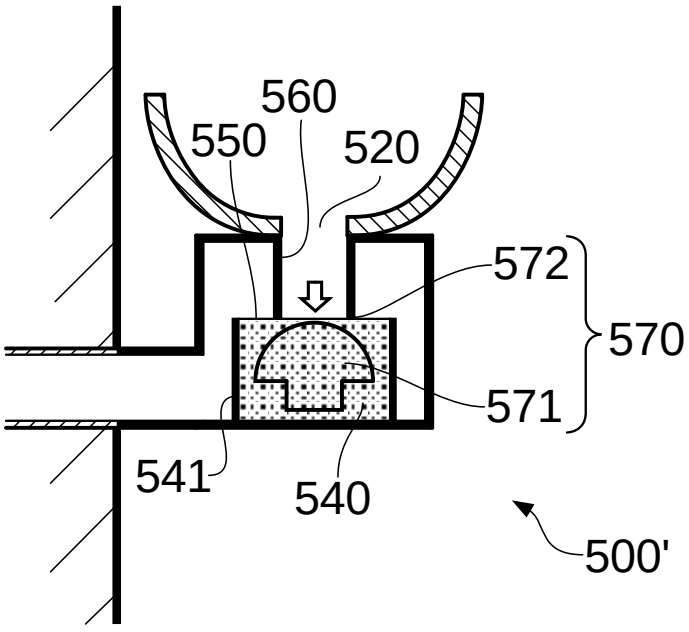

FIG. 5C