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(54) **SIPHON WHICH CAN BE SHORTENED**

(57) The invention relates to a siphon comprising:
- a housing with a bottom, an upper wall arranged at a distance from the bottom and a wall extending between the bottom and upper wall along the periphery thereof, wherein an inflow opening is arranged in the upper wall and wherein the housing further comprises an outlet opening;
- a siphon funnel comprising a tubular part, wherein one end of the tubular part is widened in radial direction and wherein the siphon funnel is arranged sealingly on the upper wall, with the widened part in the inflow opening, and wherein the tubular part extends toward the bottom,
- a separating wall arranged around and on the tubular part of the siphon funnel, wherein a throughflow channel is formed between the separating wall and the tubular part and wherein at least one opening is provided in the separating wall close to the widened part of the siphon funnel in order to provide a liquid connection between the throughflow channel and the space enclosed by the housing; and
- a closing cover arranged in closing and removable manner on the separating wall close to the bottom of the housing, wherein an opening is provided between the other end of the tubular part and the cover in order to provide a liquid connection between the tubular part and the throughflow channel.

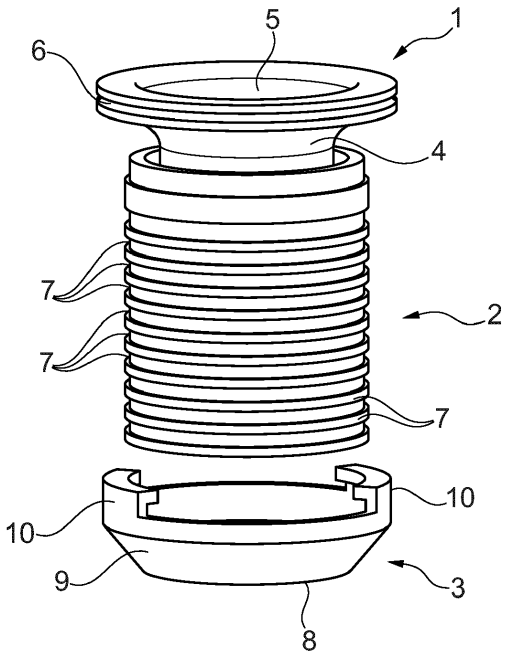


Fig. 1

EP 3 235 962 A1

Description

[0001] The in- a housing with a bottom, an upper wall arranged at a distance from the bottom and a wall extending between the bottom and upper wall along the periphery thereof, wherein an inflow opening is arranged in the upper wall and wherein the housing further comprises an outlet opening;vention relates to a siphon comprising:

- a siphon funnel comprising a tubular part, wherein one end of the tubular part is widened in radial direction and wherein the siphon funnel is arranged sealingly on the upper wall, with the widened part in the inflow opening, and wherein the tubular part extends toward the bottom.

[0002] Such a siphon is generally known and is for instance used as siphon for an elongate shower drain or a bath. The siphon funnel can here be removed from the housing in order to enable easier cleaning of the siphon.
[0003] A water seal is formed in a siphon so that odour nuisance from the sewer is prevented. The higher the water seal, the better it can withstand an underpressure in the sewer, and the water seal can be prevented from being suctioned out by the underpressure.
[0004] The available height for the siphon, and thereby the water seal, depends however on the situation. When the siphon is for instance used in a wooden floor, there is usually an abundance of space, while in a concrete floor the space is limited by all the rebar arranged in the floor.
[0005] Known siphons cannot however be adjusted to the available height in simple manner. This is because a separating wall is arranged around the siphon funnel, which wall runs upward from the bottom of the housing. Therefore, if the length of the siphon funnel were to be shortened, the height of the separating wall, and thereby also the height of the siphon, will remain the same in such an embodiment.
[0006] It is therefore an object of the invention to reduce or even obviate the above stated drawbacks.
[0007] This object is achieved according to the invention with a siphon according to the preamble, which is characterized by:

- a separating wall arranged around and on the tubular part of the siphon funnel, wherein a throughflow channel is formed between the separating wall and the tubular part and wherein at least one opening is provided in the separating wall close to the widened part of the siphon funnel in order to provide a liquid connection between the throughflow channel and the space enclosed by the housing; and
- a closing cover arranged in closing and removable manner on the separating wall close to the bottom of the housing, wherein an opening is provided between the other end of the tubular part and the cover in order to provide a liquid connection between the tubular part and the throughflow channel.

[0008] In the invention the siphon funnel, on which the separating wall is also arranged, can be easily shortened, for instance using a saw. The closing cover can then be placed against the underside of the siphon funnel, whereby the siphon funnel, the separating wall and closing cover form a closed channel running downward from the inflow opening to a position close to the bottom of the housing, then running upward again through the throughflow channel between the tubular part and the separating wall, and finally debouching via an opening on the upper side close to the widened part into the space enclosed by the housing.
[0009] An additional advantage is that the siphon funnel with separating wall and the closing cover can be made from different materials. The siphon funnel can for instance be made of ABS, which is a material which can be easily sawn and processed. This will reduce the chance of burrs after sawing, and it will be possible to easily remove possible burrs. In addition, the closing cover can for instance be made of PP, which is a more flexible material and is thereby more suitable for clamping around the separating wall.
[0010] In addition, the siphon according to the invention has the advantage that the siphon funnel is arranged sealingly on the upper wall, with the widened part in the inflow opening. Since the separating wall and the closing cover are likewise arranged on the siphon funnel, no support of the siphon funnel is needed on the underside. The siphon according to the invention is therefore also suitable for embodiments wherein the outlet pipe is arranged on the underside of the housing and the bottom of the housing provides no direct support.
[0011] In an embodiment of the siphon according to the invention the separating wall is arranged concentrically to the tubular part.
[0012] Arranging the separating wall concentrically forms a channel which runs radially outward from the inflow opening and thus causes minimal obstruction to the throughflow of water. It is nevertheless also possible not to arrange the separating wall concentrically relative to the tubular part.
[0013] The separating wall is thus preferably cylindrical.
[0014] In a preferred embodiment of the siphon according to the invention the closing cover has a bottom and an upright wall along the peripheral edge of the bottom.
[0015] The upright wall of the closing cover can easily grip around the separating wall and thus provide for a good seal on the underside of the separating wall and the tubular part while a space remains in the closing cover, along which space the water can flow from the tubular part, via the closing cover and into the throughflow channel between the tubular part and the separating wall.
[0016] In a highly preferred embodiment of the siphon according to the invention a number of parallel grooves

are arranged on the outer surface of the separating wall for receiving a sealing ring.

[0017] The grooves can be used for arranging a sealing ring, such as an 0-ring, whereby the closing cover can be properly sealed onto the separating wall.

[0018] In addition, the parallel grooves which lie in planes at right angles to the longitudinal direction of the tubular part can be used as sawing aid for sawing off the tubular part of the siphon funnel at right angles.

[0019] In a further preferred embodiment of the siphon according to the invention at least two fingers are arranged on the free edge of the upright wall of the closing cover, which fingers engage on one of the parallel grooves.

[0020] Since several parallel grooves are in a preferred embodiment arranged as sawing aid and for arranging a sealing ring, there will also be remaining grooves between the groove with a sealing ring and the upper side of the siphon funnel, on which grooves the fingers can engage and can fasten the closing cover by means of a snap connection.

[0021] After shortening the siphon funnel to the desired length the closing cover can hereby be reliably sealed at all times by means of the sealing ring, and be reliably attached by means of the fingers, which engage in one of the remaining grooves. It is optionally also possible for the fingers to engage on the same groove as that in which the sealing ring is accommodated.

[0022] In another embodiment of the siphon according to the invention the closing cover is integrated with the bottom of the housing. It is important here that the height from the upper surface with the inflow opening to the bottom of the housing can likewise be adjusted. This is for instance possible by providing different housings with different dimensions, wherein a housing with the desired height appropriate for the siphon funnel shortened as desired is selected. It is more preferable that one single housing can be easily adjusted in height to the length of the siphon funnel.

[0023] A sealing ring such as an 0-ring is preferably arranged between the widened part and the inflow opening. It is hereby possible to remove the siphon funnel from the housing repeatedly, for instance for cleaning.

[0024] It is also recommended that a sealing ring is arranged between the closing cover and the separating wall. A reliable seal is hereby obtained, while the closing cover can be removed from the separating wall.

[0025] In yet another preferred embodiment of the siphon according to the invention the wall extending between the bottom and upper wall comprises at least two telescopically arranged wall parts.

[0026] Using the telescopic wall parts the distance between the bottom and the upper surface of the housing can be easily adjusted so that the overall height of the siphon can be minimized.

[0027] In yet another preferred embodiment of the siphon according to the invention a first telescopic wall part is provided on the outer surface with a number of parallel grooves for receiving a sealing ring and wherein the other wall part grips around the first telescopic wall part.

[0028] Providing the first telescopic wall part with grooves enables this wall part to be easily shortened using a knife or a saw, thereby increasing the adjustment range of the telescopic housing.

[0029] These and other features of the invention are further elucidated with reference to the accompanying figures.

Figure 1 shows a first embodiment of a part of the siphon according to the invention in perspective view.

Figure 2 shows the part according to figure 1, shortened and assembled.

Figure 3 shows the part according to figures 1 and 2 arranged in a first embodiment of a siphon according to the invention.

Figure 4 shows the part according to figures 1 and 2 arranged in a second embodiment of a siphon according to the invention.

Figure 5 shows a perspective view of the part which can be shortened of a third embodiment according to the invention.

Figure 6 shows a cross-sectional view of the part of figure 5.

Figure 7 shows a cross-sectional view of the measuring of the height of a siphon.

Figure 8 shows a side view of the marking of a siphon to be shortened.

[0030] Figure 1 shows a siphon funnel 1 with a separating wall 2 and a closing cover 3 arranged therearound. The siphon funnel has a tubular part 4 having a radially widened end 5 on the upper side. A peripheral groove 6 in which a sealing ring such as an 0-ring can be arranged is provided along the peripheral edge of widened end 5.

[0031] The outer surface of separating wall 2 is provided with a large number of parallel grooves 7. A sealing ring can be arranged in these grooves 7, and these grooves 7 can additionally be used as sawing aid to shorten tubular part 4 and the separating wall to the desired length and at right angles in one operation (see also figure 2).

[0032] Closing cover 3 has a bottom 8 and an upright peripheral wall 9. Arranged on the free upper edge of this peripheral wall 9 are two fingers 10 which can engage in one of the parallel grooves 7 in order to attach closing cover 3 to separating wall 2.

[0033] Figure 2 shows the part according to figure 1 in assembled state. Before assembly, tubular part 4 and separating wall 2 have been shortened by means of for instance sawing. This has created a waste part 11. Waste part 11 clearly shows that separating wall 2 is connected to tubular part 4 of siphon funnel 1 by means of three ribs 12, and that it thus forms one whole.

[0034] In a special embodiment of the invention tubular part 4 can also be arranged asymmetrically in separating

wall 2, wherein tubular part 4 lies against separating wall 2. This renders ribs 12, which could possibly obstruct the throughflow of water and dirt, particularly hairs, unnecessary.

[0035] After shortening, closing cover 3 is pressed against the underside of separating wall 2 so that fingers 10 engage on one of the grooves 7.

[0036] Figure 3 shows a cross-section of a siphon 20. This siphon 20 has a housing with a bottom 21, an upper wall 22 and a two-part peripheral wall 23, 24. The two parts of peripheral wall 23, 24 slide telescopically in each other and are sealed onto each other by means of a sealing ring 25. The first peripheral wall part 23 is provided on the upper side with a number of grooves 26 in which sealing ring 25 is accommodated and which moreover enable easy shortening of peripheral wall part 23. The second peripheral wall part 24 is then placed thereon and sealing ring 25 provides for the mutual sealing between the two peripheral wall parts 23, 24.

[0037] Provided in upper wall 22 of housing 20 is an inflow opening bounded by a depending flange 27. The part shown in figure 2 is placed in this inflow opening, wherein widened end 5 of tubular part 4 seals onto depending flange 27 via the sealing ring 28 arranged in groove 6.

[0038] The length of separating wall 2 and tubular part 4 is chosen such that bottom 8 of the closing cover lies substantially against bottom 21 of the housing.

[0039] In this siphon 20 water W will flow via widened part 5 into tubular part 4 to a position close to the underside of siphon 20. Tubular part 4 lies at a distance from bottom 8 of closing cover 3, thereby forming a connection to channel 29 which is formed between tubular part 4 and separating wall 2.

[0040] Water W flows back upward via this channel 29 to a position close to widened part 5, where it can flow via a peripheral opening 30 into housing 21, 22, 23, 24, and from there to an outlet conduit 31.

[0041] Figure 4 shows a second embodiment 40 of the siphon according to the invention. Siphon 40 has a housing with a bottom 41, 42, a two-part upright wall 43 and an upper wall 44. Provided in upper wall 44 is an inflow opening with depending flange 45, onto which the widened part 5 of tubular part 4 seals via a sealing ring 46.

[0042] The two-part upright wall 43 enables the height of the housing to be adjusted. The height of the siphon can then be adjusted thereto.

[0043] The closing cover, which closes the underside of separating wall 2 and thus forms a U-shaped channel of tubular part 4 and throughflow channel 47, is formed in the bottom 41, 42 of the housing. Recessed part 42 fulfils here the same function as the closing cover 3 shown in figures 1 and 2. A sealing ring 48 is arranged in a groove of separating wall 2 so that separating wall 2 can close around recessed bottom part 42.

[0044] Figure 5 shows a perspective view of the part 50 which can be shortened of a third embodiment according to the invention. This part 50 which can be shortened has a siphon funnel with a tubular part 51 having a radially widened end 52 on the upper side. A cylindrical separating wall 53 (see also figure 6) is arranged around tubular part 51.

[0045] Just as the part shown in figures 1 and 2, cylindrical separating wall 53 is provided with parallel peripheral grooves 54 in which an 0-ring 55 is arranged. A closing cover 56, which is arranged around the underside of cylindrical separating wall 53, can be sealed with this 0-ring 55.

[0046] Further provided is a clamp 57 which runs along the underside of closing cover 56 and protrudes with both free outer ends 58 into parallel grooves 54 and thus locks closing cover 56 on cylindrical separating wall 53. Clamp 57 is preferably made of a resilient material, such as a suitable plastic, so that clamp 57 can be snapped around closing cover 56 in simple manner.

[0047] Figure 7 shows a measuring instrument 70 with which the desired length of a siphon 80 (see figure 8) can be determined. Measuring instrument 70 is elongate and has a number of ridges 71 at one end. By placing measuring instrument 70 with the other end 72 on bottom 73 of a siphon housing 74 it is then possible to determine which ridge R lies flush with upper surface 75 of the siphon housing.

[0048] In figure 8 measuring instrument 70 is placed with ridges 71 in grooves 81 of separating wall 82. This separating wall is arranged around a tubular part 83 with widened upper part 84. A projection 76 lies here in a peripheral groove 85 in widened upper part 84. End 72 of measuring instrument 70 hereby protrudes above widened end 84 over a distance h. The thickness of an as yet to be arranged closing cover as shown in the previous figures is hereby taken into consideration.

[0049] Finally, the groove 81 at which siphon 80 has to be sawn so that siphon 80 including a closing cover (not shown) can be placed in siphon housing 74 in fitting manner can be determined on the basis of the height R on measuring instrument 70 determined in figure 7.

Claims

1. Siphon comprising:

- a housing with a bottom, an upper wall arranged at a distance from the bottom and a wall extending between the bottom and upper wall along the periphery thereof, wherein an inflow opening is arranged in the upper wall and wherein the housing further comprises an outlet opening;
- a siphon funnel comprising a tubular part, wherein one end of the tubular part is widened in radial direction and wherein the siphon funnel is arranged sealingly on the upper wall, with the widened part in the inflow opening, and wherein the tubular part extends toward the bottom,

characterized by

- a separating wall arranged around and on the tubular part of the siphon funnel, wherein a throughflow channel is formed between the separating wall and the tubular part and wherein at least one opening is provided in the separating wall close to the widened part of the siphon funnel in order to provide a liquid connection between the throughflow channel and the space enclosed by the housing; and
- a closing cover arranged in closing and removable manner on the separating wall close to the bottom of the housing, wherein an opening is provided between the other end of the tubular part and the cover in order to provide a liquid connection between the tubular part and the throughflow channel.

2. Siphon as claimed in claim 1, wherein the separating wall is arranged concentrically to the tubular part.

3. Siphon as claimed in claim 1 or 2, wherein the separating wall is cylindrical.

4. Siphon as claimed in any of the foregoing claims, wherein the closing cover has a bottom and an upright wall along the peripheral edge of the bottom.

5. Siphon as claimed in any of the foregoing claims, wherein a number of parallel grooves are arranged on the outer surface of the separating wall for receiving a sealing ring.

6. Siphon as claimed in claims 4 and 5, wherein at least two fingers are arranged on the free edge of the upright wall of the closing cover, which fingers engage on one of the parallel grooves.

7. Siphon as claimed in any of the foregoing claims, wherein the closing cover is integrated with the bottom of the housing.

8. Siphon as claimed in any of the foregoing claims, wherein a sealing ring such as an 0-ring is arranged between the widened part and the inflow opening.

9. Siphon as claimed in any of the foregoing claims, wherein a sealing ring is arranged between the closing cover and the separating wall.

10. Siphon as claimed in any of the foregoing claims, wherein the wall extending between the bottom and upper wall comprises at least two telescopically arranged wall parts.

11. Siphon as claimed in claim 10, wherein a first telescopic wall part is provided on the outer surface with a number of parallel grooves for receiving a sealing ring and wherein the other wall part grips around the first telescopic wall part.

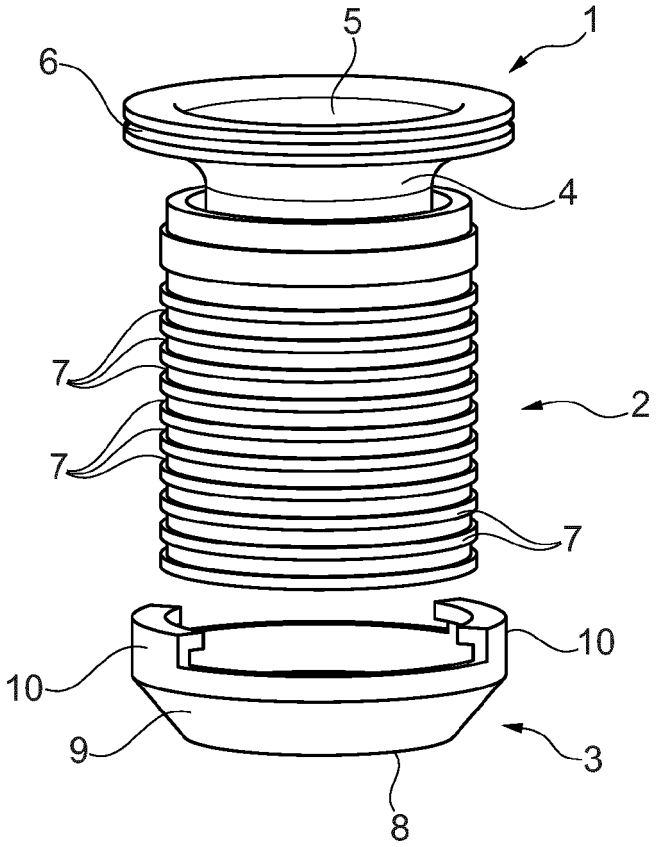


Fig. 1

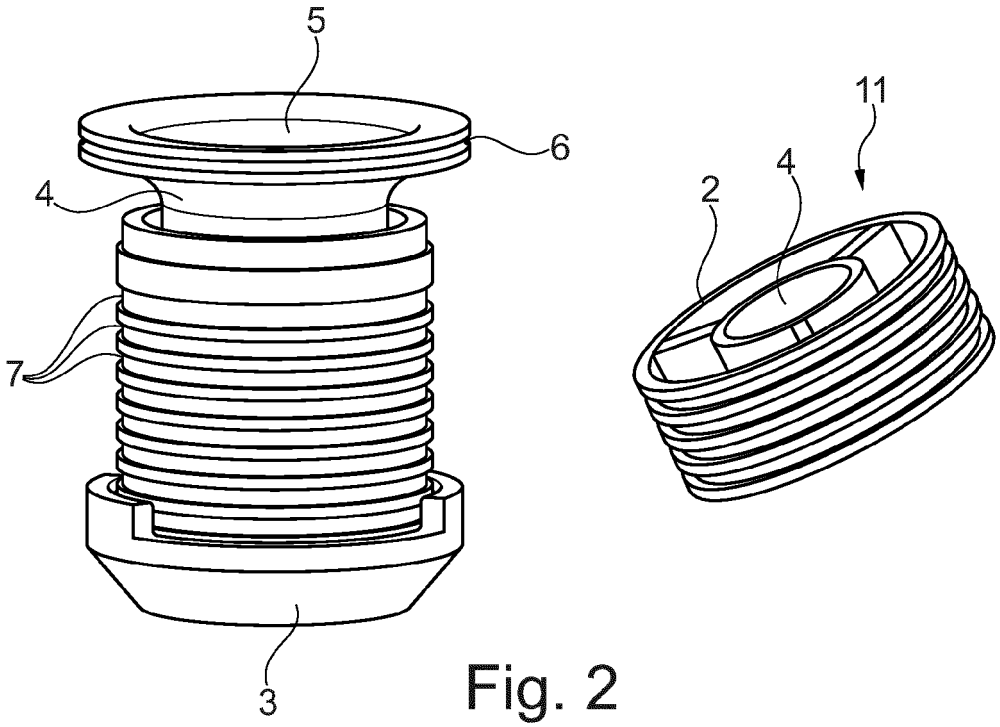


Fig. 2

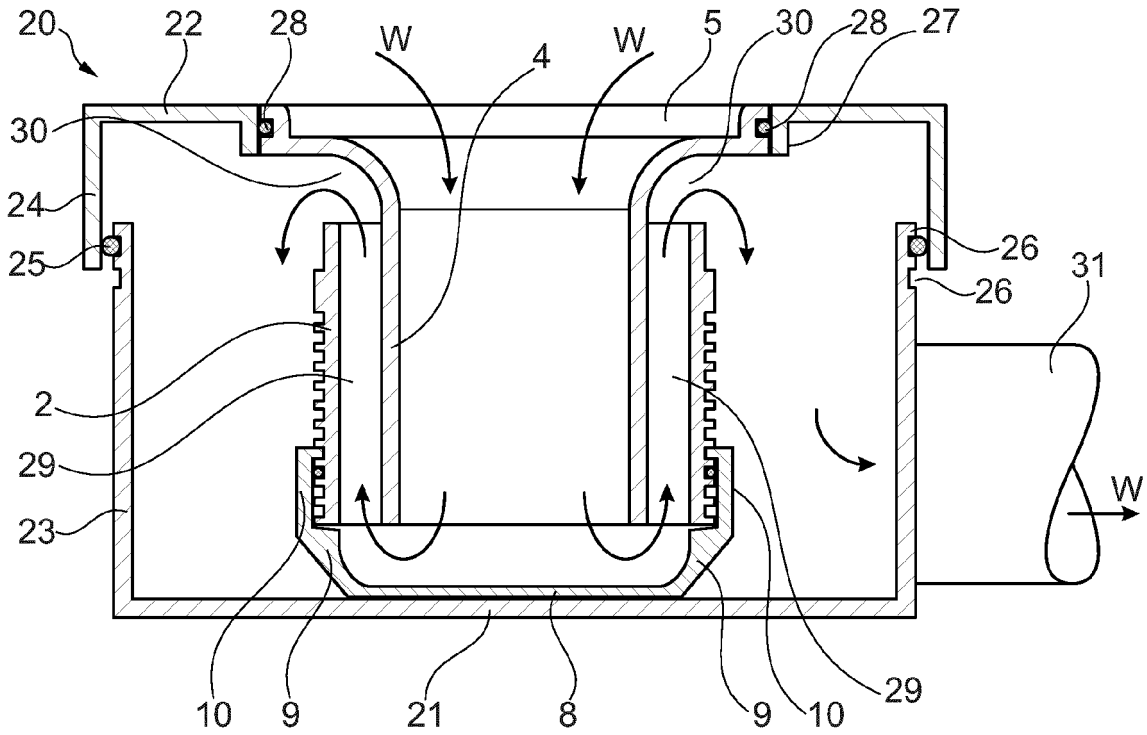

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Fig. 3

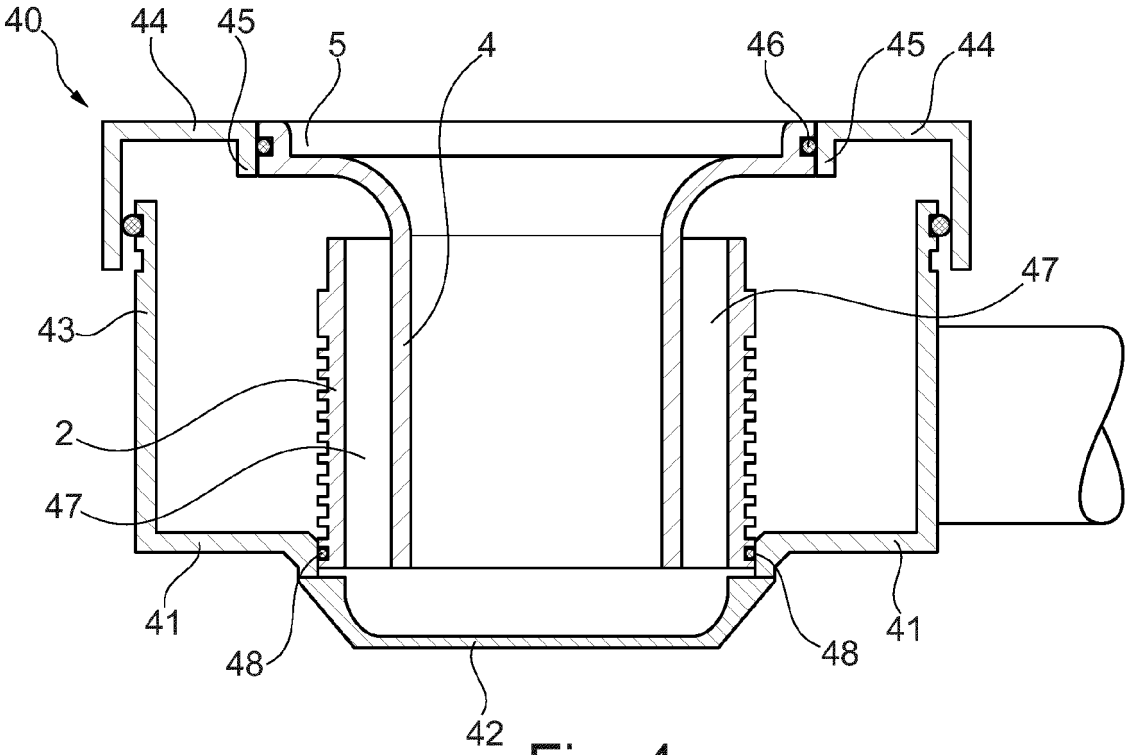

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Fig. 4

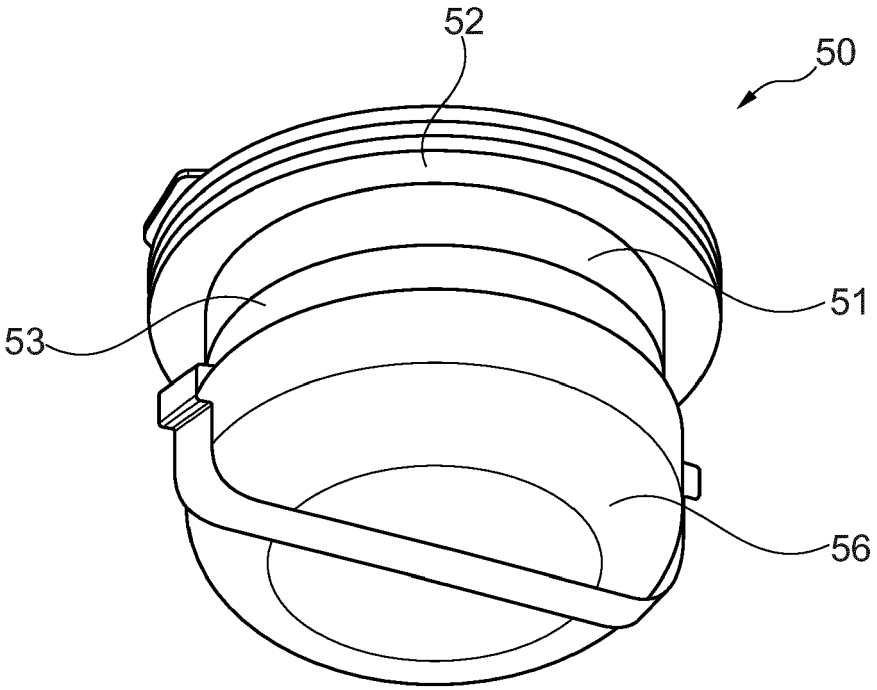


Fig. 5

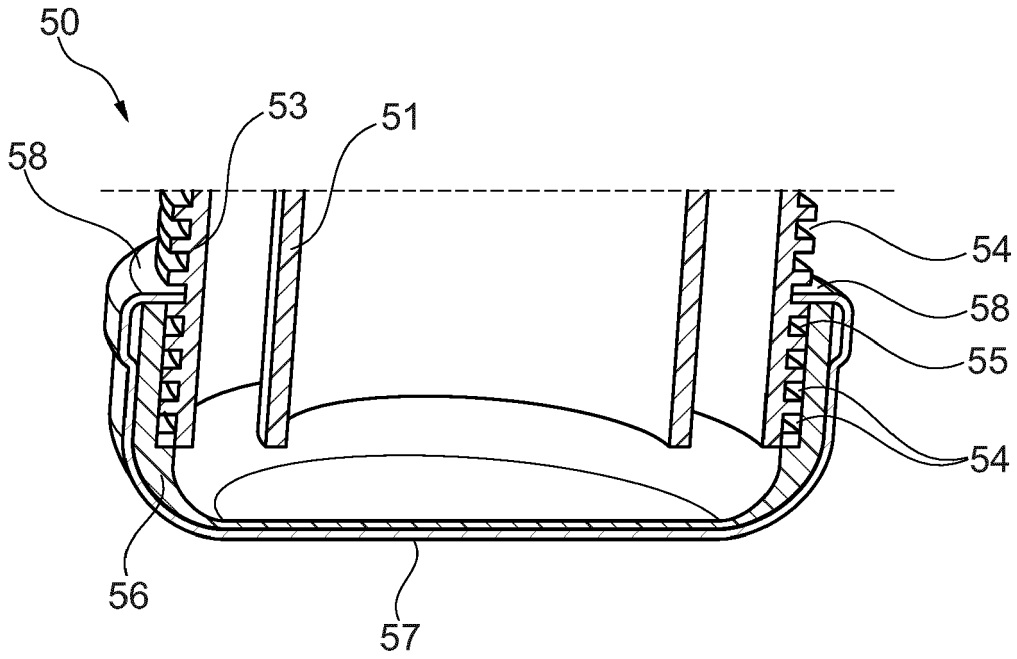


Fig. 6

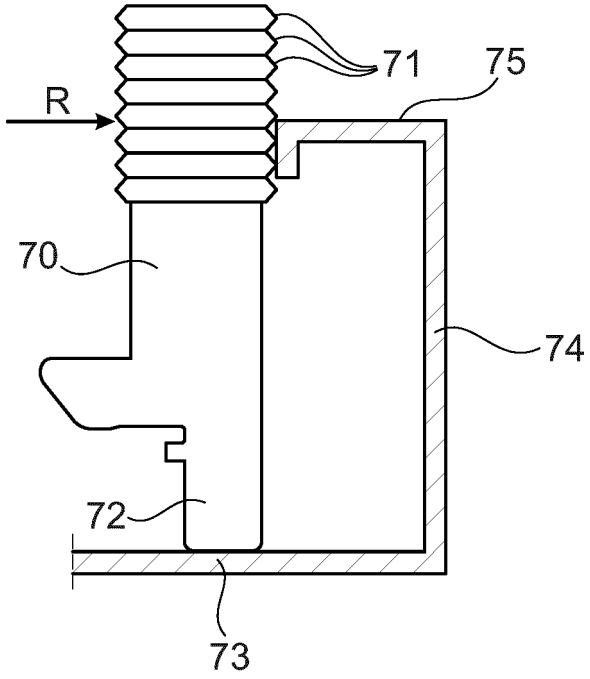


Fig. 7

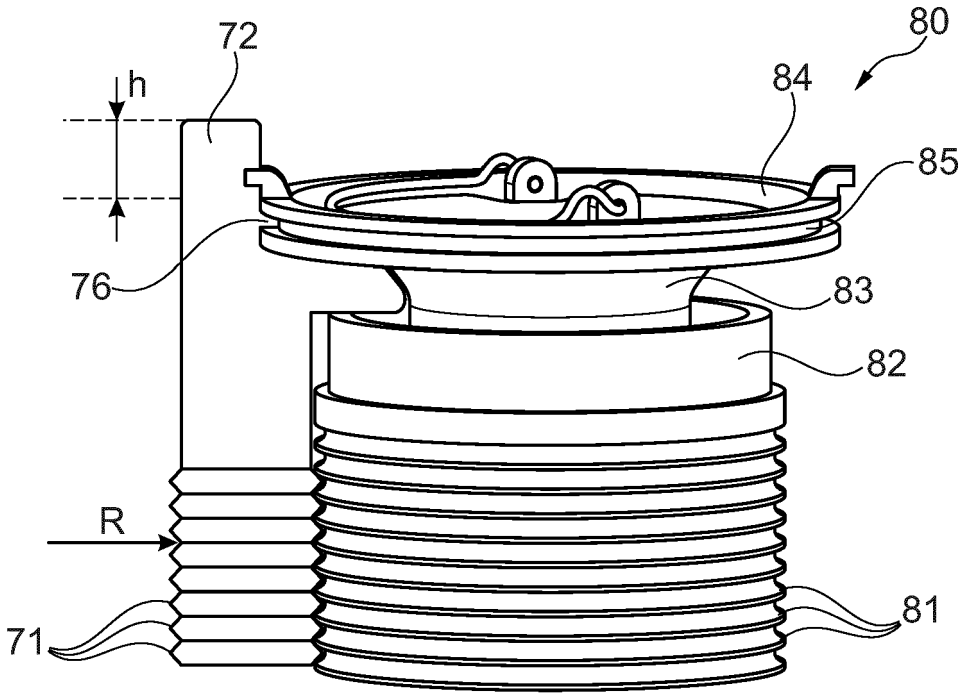


Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 17 16 7074

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 July 2017	Van Bost, Sonia

CATEGORY OF CITED DOCUMENTS

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