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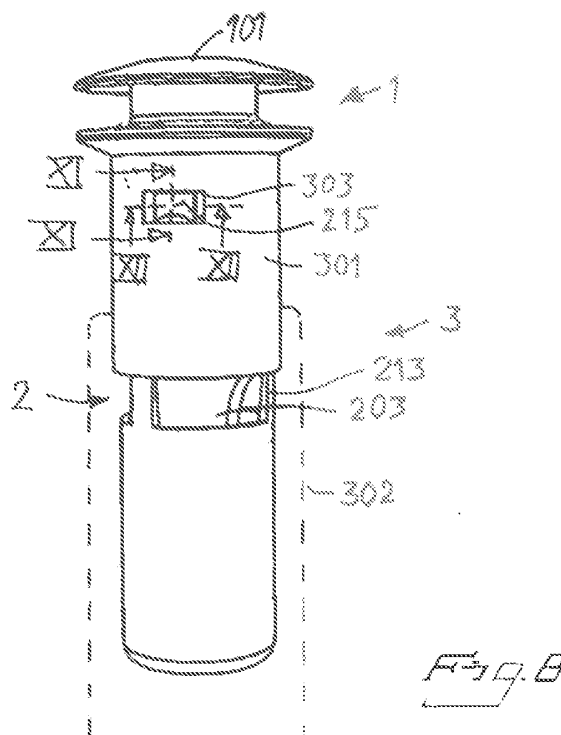
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(54) **A device at a wash-basin with a sink trap and a wash-basin valve of the pop-up type**

(57) The invention concerns a device at a wash-basin and comprises a water trap (2) and a basin valve (1). The valve is of the pop-up type. This means that the valve plate (101) is displaced from the closed to the open position and vice versa by a compressive force of the hand on its upper side.

According to the invention, the water trap has an outer dimension that allows its passage through the valve opening. The valve plate (101) is turnable and, in a first turning position, liftable from the wash-basin. The valve plate (101) is coupled to the water trap (2) by a connecting device that connects the water trap (2) with the valve plate (101) so that the water trap (2) follows the valve plate (101) when it is lifted up from the wash-basin. The water trap (2) has lock members (215) for detachable axial fixation of the water trap (2).



Description

Field of the Invention

[0001] The present invention relates to a device at a wash-basin, which device comprises a water trap and a basin valve, which basin valve is of the pop-up type, involving that the basin valve has a valve opening and a valve plate that is arranged to be able to assume an upper open position and a lower closed position when the valve plate closes the valve opening, the valve plate being arranged to be displaceable from the open to the closed position and vice versa by applying a compressive force on the upper side of the valve plate, which compressive force is of a size such that it easily is produced by manual power.

[0002] In the present application, the terms upper, lower, upward, downward, etc., are used. These relates to the device when it is fitted to a wash-basin and with a vertically directed drainage.

[0003] Further, the terms radial, axial and circumferential direction are related to the axial direction that is defined by the vertical drainage of the wash-basin.

Background of the Invention

[0004] So-called pop-up valves have recently become more and more common for the manoeuvring of a basin valve between its closed and open position. The manoeuvring of such a valve is generally experienced as more comfortable by users than other manoeuvring alternatives. In addition, the design becomes simpler compared to when the manoeuvring is carried out by a lever that is arranged on the wash-basin and that actuates the valve via a linkage.

[0005] For the pop-up mechanism for closing and opening of the valve, several alternative designs are known. A pair of examples of such mechanisms is disclosed in US 4144599 and US 6219861.

[0006] A disadvantage of conventional pop-up valves is that they are fitted to the wash-basin so that the releasing of the valve body requires operation on the underside of the wash-basin where its abutment is arranged, which makes, e.g., repair or other requisite service complicated.

[0007] Under the wash-basin, there is usually a water trap between the valve opening and the drainpipe. For the cleaning of the water trap, operation under the wash-basin is required for cleaning the same. For facilitating the cleaning of the water trap, by W09612071 there is previously known a water trap that is arranged to be able to be pulled up through the opening of the basin valve, which facilitates the cleaning.

[0008] The object of the present invention is to obviate the disadvantages associated with conventional pop-up valves and simultaneously allow the simplified dismounting of a water trap as is disclosed in W09612071 mentioned above.

Description of the Invention

[0009] The object set forth is achieved by the present invention by the fact that a device of the kind mentioned by way of introduction has the special features that the water trap has an outer dimension that allows its passage through the valve opening, that the valve plate is coupled to the water trap by a connecting device that connects the water trap with the valve plate so that the water trap follows the valve plate when the valve plate is lifted up from the wash-basin, and that the water trap has lock members for detachable axial fixation of the water trap.

[0010] Thanks to the valve plate of the pop-up valve being connected to the water trap instead of being fitted by means of an abutment on the wash-basin according to prior art, dismounting of the valve plate is facilitated. The fact that the water trap with which the valve plate is connected is extractable up through the valve opening together with the valve plate also contributes to this. Thereby, also the advantages exhibited by the water trap disclosed in the above-mentioned W09612071 are utilized, i.e., facilitated dismounting upon, e.g., cleaning. By the fact that the axial fixation of the water trap is detachable, this function is made possible without the manoeuvring function of the pop-up valve being affected in other respects. The axial fixation is needed for providing an abutment for the pop-up mechanism.

[0011] Accordingly, the invented device constitutes an overall solution that combines a convenient valve manoeuvring with a simple dismounting of the valve as well as the water trap for cleaning and service.

[0012] According to a preferred embodiment, the water trap comprises a pipe part and a cup part provided with a bottom, into which cup part the pipe part is partly projecting.

[0013] The cup part and the pipe part projecting into the same provide in a simple and efficient way the water trap function. Together with a surrounding outer pipe, there is formed a flow path from the cup part, over its edge and downward between its outside and the outer pipe.

[0014] According to an additional preferred embodiment, the device comprises a tubular casing having an upper end attached to the wash-basin and connected to the valve opening and a lower end for the connection to a drainpipe, the water trap being arranged in said casing.

[0015] By the water trap co-operating in such a way with a surrounding tubular casing, the pulling-up of the water trap itself and a correct reinstallation of the same are facilitated. Simultaneously, line communication between the valve opening and the drainpipe is maintained.

[0016] According to an additional preferred embodiment, the lock member of the water trap is connected with the casing by a detachable joint.

[0017] In such a way, an axial fixation of the water trap is guaranteed in a simple way at the same time as the detachability makes it easy to lift up the water trap when needed.

[0018] According to an additional preferred embodiment, the detachable joint comprises openings in the casing and lock lugs on the pipe part, which lock lugs are arranged to be snapped into and out of the openings.

[0019] Thereby, the detachable joint is provided in an easy and easily manoeuvrable way.

[0020] According to an additional preferred embodiment, the pipe part has upwardly directed tongues, from which a respective lock lug projects radially, each lock lug having a cam profile, e.g., an arc-shaped profile, in the circumferential direction.

[0021] By the mounting on tongues, a spring action is obtained in a simple way that facilitates the coupling together of the joint. The arc profile of the lock lugs allows the same to be easily pressed out from the openings upon turning of the pipe part thanks to the cam action that arises between the arc profile and the side edge of the respective opening. The cam profile may alternatively be provided by chamfers out toward the peripheral side edges of the lock lug.

[0022] According to an additional preferred embodiment, the pipe part has upwardly directed tongues, from which a respective lock lug projects radially, each lock lug having a cam profile, e.g., an arc-shaped profile, at the top in the axial direction.

[0023] By this alternative embodiment, the water trap can be pulled up, the cam action of the arc profile or an oblique bevelling pressing out the lock lugs toward the upper edge of the respective opening. The spring force of the tongues guarantees that the lock lugs are in a lock position at small axial forces, such as such those that occur upon manoeuvring of the pop-up valve. A stronger, but still moderate upwardly directed axial force releases the lock lugs.

[0024] According to an additional preferred embodiment, the connecting device between the valve plate and the water trap is detachably arranged.

[0025] Thereby, it is enabled that the valve plate can be separated easily from the water trap, which allows removal of only the valve plate.

[0026] According to an additional preferred embodiment, the connecting device comprises a bayonet fitting.

[0027] A bayonet fitting affords a simple and reliable solution of how the valve plate can be separated from the water trap, where a simple rotary motion of the valve plate provides the two connection positions for pulling up only the valve plate and together with the water trap, respectively.

[0028] The valve plate may alternatively be screwed in with its connecting part in the water trap.

[0029] According to an additional preferred embodiment, the pipe part and the cup part are interconnected by a detachable coupling device, the surrounding casing being arranged to hold the coupling device attachingly when the water trap is in place in the surrounding casing.

[0030] By the coupling device, it is ensured that both parts come along upon lifting. Thanks to it being detachable, separation of the parts from each other is enabled

when the water trap is dismantled, which facilitates efficient cleaning.

[0031] According to an additional preferred embodiment, the pipe part has an upper section and a lower section, which lower section has a smaller outer diameter than the upper section, the upper section having at least one depression on its outside and the cup part, at an upper part thereof, being provided with at least one radially inwardly directed projection adapted to project into the depression for the formation of said coupling device.

[0032] Thereby, the detachable coupling device is provided in an easy and expedient way where the surrounding tubular casing abuts against the upper part of the cup part for holding the projection inserted in the depression.

[0033] According to an additional preferred embodiment, in the tubular casing, a wall is arranged under the water trap.

[0034] When the water trap is dismantled, there is an entirely free passage from the valve opening down through the drainpipe. This entails a risk that objects that are dropped, e.g., a wedding ring, may disappear down through the drainage. By the arrangement of the wall according to this embodiment, it is enabled to capture these objects.

[0035] According to an additional embodiment, a secondary water trap device is arranged under the water trap, said wall constituting part of the secondary water trap device.

[0036] When a wash-basin having a simple water trap has not been used for a longer time, there is a risk that it dries out, which causes spread of bad smell. By the secondary water trap device, this risk is reduced. The secondary water trap device does not need to be liftable since it is exposed to soiling to a very small extent. In addition, the secondary water trap captures objects that fall down, thereby fulfilling the function of the wall mentioned in the embodiment mentioned just above.

[0037] The above-mentioned preferred embodiments of the invention are defined in the claims depending on claim 1. It should be emphasized that additional preferred embodiments naturally may consist of all feasible combinations of the above-mentioned preferred embodiments.

[0038] The invention is explained in more detail by the subsequent description of exemplary embodiments of the same, reference being made to the appended figures.

Brief Description of the Drawings

[0039]

Fig. 1 is a longitudinal section through a first exemplary embodiment of a device according to the invention.

Fig. 2 is a section along the line II-II in Fig. 1.

Fig. 3 is a section through a part of the device in Fig. 1.

Fig. 4 is a section through a detail of the device in Fig. 1.

Fig. 5 is a longitudinal section through a second exemplary embodiment of the invention.

Figs. 6-8 are perspective views of third exemplary embodiments of the invention.

Fig. 9 is a longitudinal section through a fourth exemplary embodiment of the invention.

Fig. 10 is a longitudinal section through a fifth exemplary embodiment of the invention.

Figs. 11 and 12 are sections along the lines XI-XI and XII-XII, respectively, in Fig. 8.

Description of Exemplary Embodiments

[0040] Fig. 1 is a longitudinal section through a first exemplary embodiment of a device according to the invention. The device comprises a valve 1, a water trap 2 and a surrounding tubular casing 3, which components are arranged in the outlet of a wash-basin 4.

[0041] The valve has a valve plate 101 that is sealingly applied to a ring-shaped valve seat 102, the valve opening surrounded by the valve seat 102 being closed. The figure shows the valve in the open position, wherein water can flow out between the valve plate 101 and the valve seat 102, through the valve opening and via the water trap 2 down to the drainpipe 6 connected with the tubular casing 4.

[0042] The valve is a so-called pop-up valve, i.e., closure of the valve is made by applying a slight compressive force on the valve plate 101 by the hand so that it will abut against the valve seat 102. Opening of the valve is made by likewise quickly pressing downward on the valve plate 101, which thereafter springs up by means of a pop-up mechanism 103 not shown.

[0043] The pop-up mechanism may be made in accordance with the principal structure disclosed in anyone of US 4144599 or 6219861 initially mentioned or by utilizing some other conventional such mechanism.

[0044] A connecting device 104 connects the valve plate and the pop-up mechanism thereof with the water trap 2.

[0045] The water trap 2 consists of a pipe part 201 and a cup part 204. The pipe part 201 has an upper section 202 and a lower section 203, where the lower section 203 has a smaller outer diameter than the upper one 202.

[0046] The water trap is surrounded by a tubular casing 3, which has an upper part 301 of a smaller outer diameter than its lower part 302. The lower part 302 of the casing has a greater inner diameter than the outer diameter of the lower section 203 of the pipe part 201 for the formation of a flow path between them. The upper part 301 of the casing is sealingly fitted in a hole in the bottom of the wash-basin and is connected to the valve seat 102. The upper and lower parts of the casing are suitably separate parts.

[0047] The water trap is detachably attached to the upper part 301 of the casing in a way that fixes the water trap axially in the casing so that the function of the pop-up valve is guaranteed. The detachability makes that the

water trap can be pulled up out of the casing. Examples of this attachment are described in more detail in connection with Figs. 6-8.

[0048] The inner diameter of the upper part 301 of the casing 3 is somewhat greater than the outer diameter of the upper section 202 of the pipe part 201 of the water trap, and a sealing ring is arranged between them. The cup part 204 of the water trap consists of a bottom 206 and an upwardly directed cylindrical wall 205 connected therewith. The cylindrical wall 205 has a smaller outer diameter than the inner diameter of the upper part 301 of the casing 3. Accordingly, the relative dimensions of the components allow the water trap to be pulled out upward through the upper part 301 of the casing 3. The connection device 104 is connected to the upper section 202 of the pipe part 201 of the water trap by means of a bayonet fitting having a radially projecting pin 105.

[0049] The valve plate 101 can be lifted up from the wash-basin by means of the bayonet fitting. In a certain turning position of the pin 105, the upper section 202 is connected in such a way that it comes along up when the valve plate 101 is lifted up. This is accomplished by the fact that the upper tube section 202 above the pin 105 has an inwardly directed flange portion 208 (see Fig. 2) that extends at a certain angle in the circumferential direction, e.g., 90°. By turning the valve plate 101 to a position where the pin 105 of the bayonet fitting is right opposite the flange portion 208 in the circumferential direction, the requisite axial locking action between the pin and the flange portion 208 is provided.

[0050] Further, the cup part 204 is connected with the pipe part 201 in a suitable way so that also the cup part comes along up. The entire water trap 2 is thereby liftable by means of the valve plate 101.

[0051] Fig. 2 is a section along the line II-II in Fig. 1 through the connection device 104 and the upper section 202, and shows the connection upon the lifting of the water trap. The pin 105 is accordingly in a turning position where it is situated under the flange portion 208. Turning of the pin a quarter of a turn from the position shown disengages the locking and the valve can be removed without the water trap coming along.

[0052] Fig. 3 is a section through a part of a device according to the invention, according to a second exemplary embodiment and illustrates an alternative for how the cup part 204 and the pipe part are attached to each other. The upper part of the device with the connection to the pop-up valve is omitted in this figure for the sake of clarity.

[0053] At its upper section 202, the pipe part 201 has two ring-shaped grooves 209, 211 on the outside. In the upper one of said grooves 209, a sealing ring 210 is arranged and abuts sealingly against the inside of the upper part 301 of the tubular casing 3. The lower groove 211 is for the joining with the cup part 204 of the water trap. At the top, the cylindrical wall 205 of the cup part is provided with a number of upwardly directed tongues 213, each of which having a radially inwardly directed projec-

tion 212. The inwardly directed projections 212 project into the depression 211 that is formed by the groove 211 so that a joint is established between the cup part 204 and the pipe part 201. When the water trap 2 is in place in the casing 3, the projections 212 are held in place in the groove 211 by the upper part 301 of the casing 3.

[0054] When the water trap has been pulled up from the wash-basin, it is easy to release this joint by the tongues 213 being flexible. Thereby, cleaning of the water trap is facilitated.

[0055] Fig. 3 shows also how the upper part 301 of the casing 3 can be connected with its lower part 302 where the lower part 302 having an upper circular edge is screwed onto an external thread of the upper part 301.

[0056] Fig. 4 is a section through the cup part 204 in Fig. 3, from which it is seen how the tongues 213 having projections 212 are arranged.

[0057] In the exemplary embodiment illustrated in Fig. 5, the device is provided with a detachable joint between the upper part 301 of the tubular casing 3 and the pipe part 201 of the water trap. The upper part 301 of the casing has three openings 303, which can be connected to an overflow of the wash-basin. Further, there are lock lugs 215 formed as outwardly directed projections on tongues 214, which constitute an extension of the upper tube section 202 upward. The lock lugs 215 have an arc-shaped profile in the circumferential direction, e.g., circular arc-shaped.

[0058] In this example, the connection between the valve plate 101 and the water trap 2 is such that the water trap 2 can be turned by the turning of the valve plate. When the water trap 2 is turned in this way, the lock lugs will, due to their arc-shape, be pressed inward while overcoming the spring force of the tongues 214 so that they disengage from the openings 303. In this position, the valve plate 101 together with the entire water trap 2 can be lifted up out of the casing and be removed from the wash-basin.

[0059] Alternatively, the lock lugs may have an arc-shaped or chamfered profile in the axial direction.

[0060] Figs. 11 and 12 illustrate lock lugs 215 arranged to enable them to be pulled upward and turned, respectively, in order to be released from the opening 303.

[0061] When the water trap is to be remounted, it is pushed down into the casing 3 until the lock lugs 215 are level with the openings 303, which, possibly after a certain turning, snap into these by virtue of the spring action of the tongues 214. When the lock lugs are in place in the openings, axial movement of the water trap 2 is arrested.

[0062] Fig. 6 illustrates the device in Fig. 5 in an exploded view. The water trap 2 is partly pulled up out of the upper part 301 of the tubular casing, and the valve plate 101, with the pop-up mechanism thereof, is pulled up out of the water trap 2. The cup part 204 of the water trap is partly projecting down into the casing 3, and the pipe part has the lower section 203 thereof partly projecting down into the cup part. On its upper section 202,

the groove 211 can be seen in which the cup part 204 is attached in the mounted state by the projections 212 of the tongues 213. Further up, the sealing ring 210 is visible.

[0063] From the upper section 202 of the pipe part, the tongues 214 having lock lugs 215 by which the water trap is fixed in the casing 301 in the mounted state extend upwardly, the lock lugs projecting into the openings 303 of the casing 301.

[0064] Fig. 7 illustrates the device in Fig. 6 in a stage where the water trap is on its way to be pushed into the casing 3. In Fig. 8, the water trap is in its place in the casing, the lock lugs 215 being situated in the openings 303. The water trap 2 having the pipe part 203 thereof inwardly projecting into the cup part 205 is visible underneath the upper part of the casing. In Figs. 5-7, only the upper part 301 of the casing 3 is shown. As indicated by dashed lines in Fig. 7, the casing also has a lower part 302 having a somewhat greater diameter than the upper part 301 thereof and that surrounds the cup part 204 of the water trap 2 in a similar way as illustrated in Figs. 1 and 2.

[0065] Fig. 9 is a section through a part of a device according to yet an exemplary embodiment of the invention. Here, the device is provided with a secondary water trap device 5.

[0066] The secondary water trap device 5 is formed of a downwardly directed cylindrical wall 501 attached to the underside of the cup part of the superjacent water trap 2 and of a pipe unit 502 arranged inside the cylindrical wall 501. At the top, the pipe unit 502 is provided with an oblique wall 503. The flow path of the water through the double water trap assembly is indicated by the arrows.

[0067] When the upper water trap 2 is lifted up in the way described above, the downwardly directed cylindrical wall 501 also comes along up. The oblique wall 503 prevents loose objects that fall through the outlet of the wash-basin from disappearing down into the drainpipe 6.

[0068] Also in the embodiment of the invention when there is no secondary water trap device, a wall corresponding to the wall 503 may be arranged with the purpose of preventing dropped objects from falling down into the drainpipe 6.

[0069] Fig. 10 illustrates a second exemplary embodiment having double water traps. In this embodiment, the subjacent water trap device 5 is formed of a cup-shaped part turned upside down having a top wall 505, from which a downwardly directed cylindrical wall 504 projects downward. In the cylindrical wall 504, a number of openings 506 are recessed for the throughput of water. In this exemplary embodiment, the entire lower water trap device 5 is left behind when the upper water trap 2 is lifted up.

[0070] The water trap is suitably made of PVC plastic that is suitable for the handling of cold or hot water and provides a dimensionally stable construction.

Claims

1. Device at a wash-basin (4), which device comprises a water trap (2) and a basin valve (1), which basin valve is of the pop-up type, involving that the basin valve has a valve opening and a valve plate (101) that is arranged to be able to assume an upper open position and a lower closed position when the valve plate (101) closes the valve opening, the valve plate (101) being arranged to be displaceable from the open to the closed position and vice versa by applying a compressive force on the upper side of the valve plate (101), which compressive force is of a size such that it easily is produced by manual power, **characterized in that** the water trap (2) has an outer dimension that allows its passage through the valve opening, that the valve plate (101) is coupled to the water trap (2) by a connecting device (104) that connects the water trap (2) with the valve plate (101) so that the water trap (2) follows the valve plate (101) when the valve plate (101) is lifted up from the wash-basin (4), and **in that** the water trap has lock members (215) for detachable axial fixation of the water trap. 5
2. Device according to claim 1, **characterized in that** the water trap (2) comprises a pipe part (201) and a cup part (204) provided with a bottom (206), into which cup part the pipe part (201) is partly inwardly projecting. 10
3. Device according to claim 2, **characterized in that** the device comprises a tubular casing (3) having an upper end attached to the wash-basin (4) and connected to the valve opening and a lower end arranged for the connection to a drainpipe (6), and that the water trap (2) is arranged in said tubular casing (3). 15
4. Device according to claim 3, **characterized in that** the lock member of the water trap is connected with the casing by a detachable joint (215, 303). 20
5. Device according to claim 4, **characterized in that** the detachable joint (215, 303) comprises openings (303) in the casing (3) and lock lugs (215) on the pipe part, which lock lugs are arranged to be snapped into and out of said openings (303). 25
6. Device according to claim 5, **characterized in that** the pipe part (201) has upwardly directed tongues (214), from which a respective lock lug (215) projects radially, and that each lock lug (215) has a cam profile, e.g., an arc-shaped profile, in the circumferential direction. 30
7. Device according to claim 5, **characterized in that** the pipe part (201) has upwardly directed tongues (214), from which a respective lock lug (215) projects radially, and that each lock lug (215) has a cam profile, e.g., an arc-shaped profile, at the top in the axial direction. 35
8. Device according to anyone of claims 1-7, **characterized in that** the connecting device (104) is detachably arranged. 40
9. Device according to claim 8, **characterized in that** the connecting device (104) comprises a bayonet fitting (105, 208). 45
10. Device according to claim 2, **characterized in that** the pipe part (201) and the cup part (204) are interconnected by a detachable coupling device, and that the tubular casing (3) is arranged to hold the coupling device (211, 212) attached when the water trap is in place in the surrounding pipe. 50
11. Device according to claim 10, **characterized in that** the pipe part has an upper section (202) and a lower section (203), which lower section has a smaller outer diameter than the upper section (202), that the upper section (202) has at least one depression (211) on its outside, and that the cup part (204), at an upper part thereof, is provided with at least one radially inwardly directed projection (212) adapted to project into the depression (211) for the formation of said coupling device (211, 212). 55
12. Device according to any one of claims 3-11, **characterized in that** in the casing, a wall (503, 505) is arranged under the water trap (2).
13. Device according to claim 12, **characterized in that** a secondary water trap device (5) is arranged under the water trap (2), said wall (503, 505) constituting part of the secondary water trap device (5).

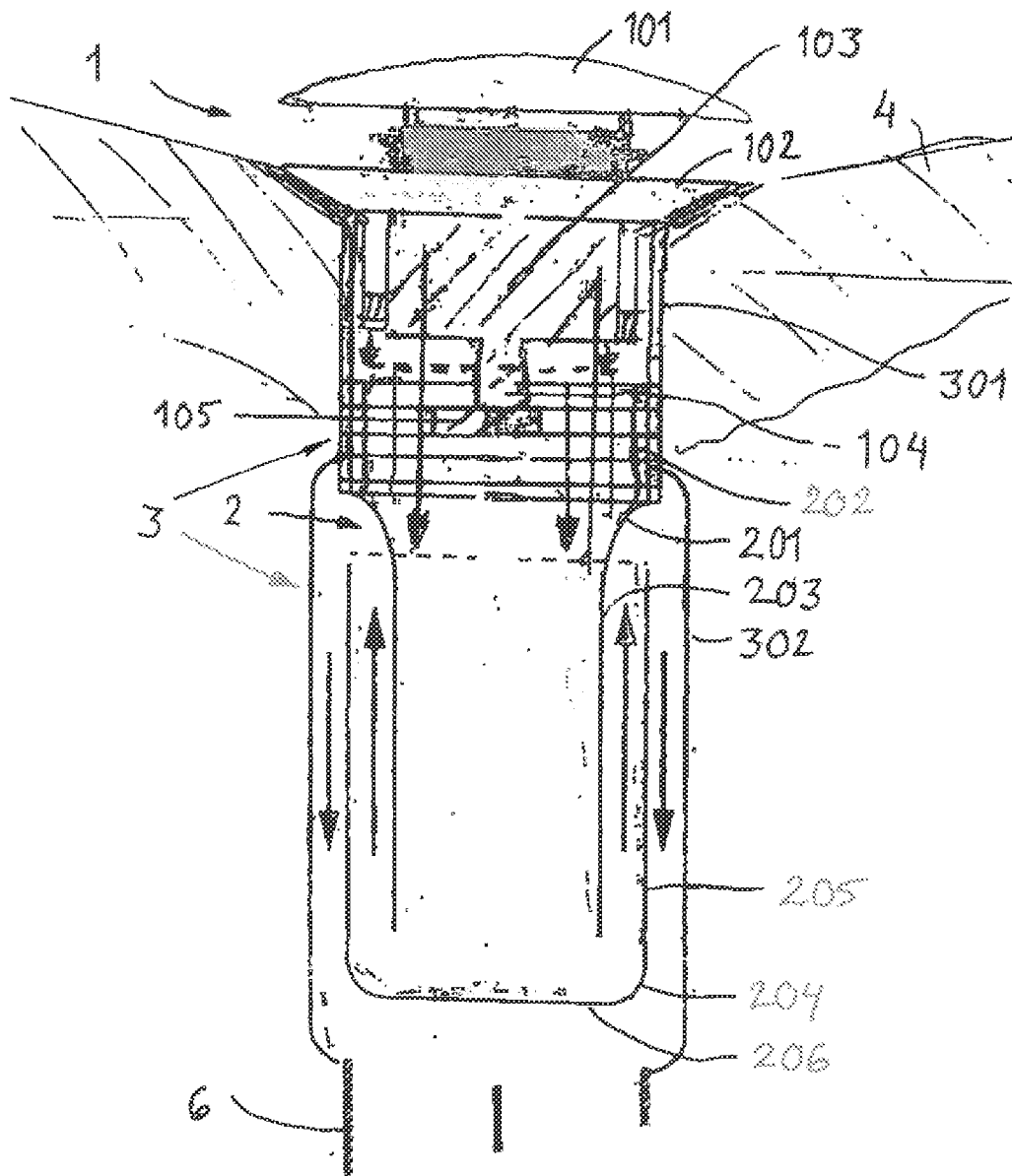
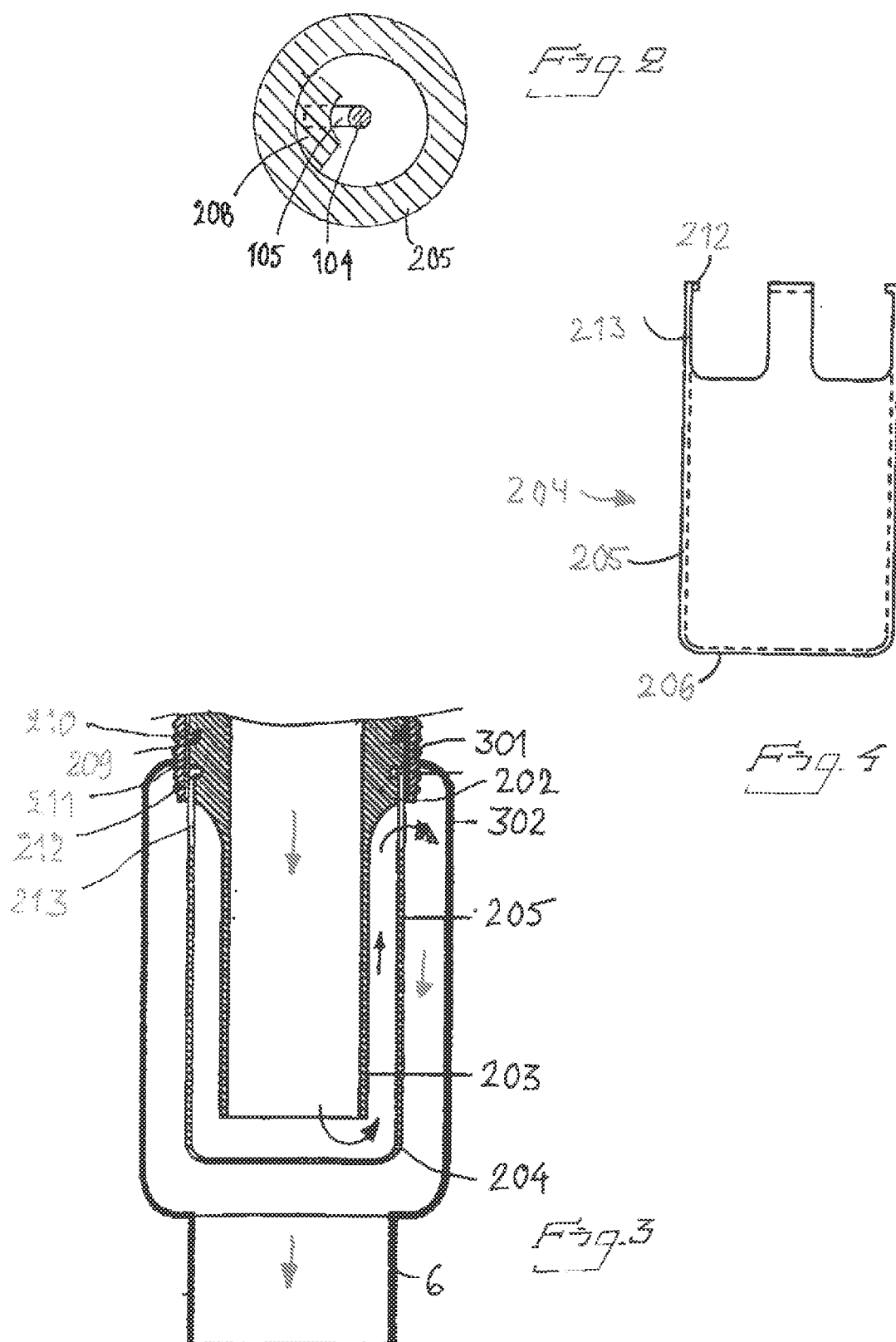


Fig. 1



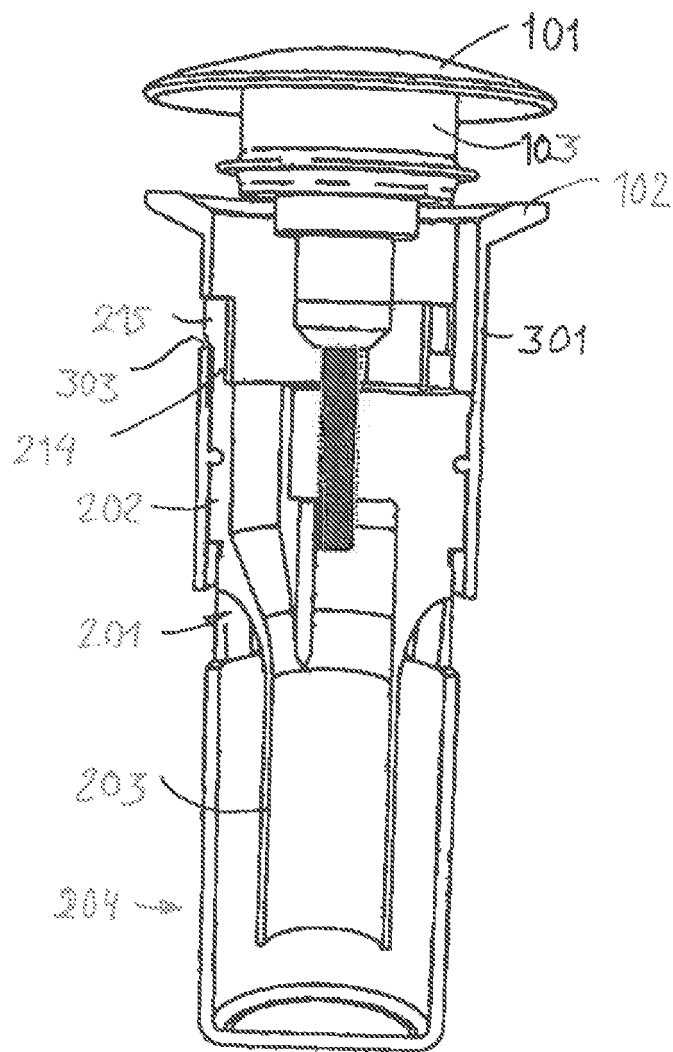


Fig. 5

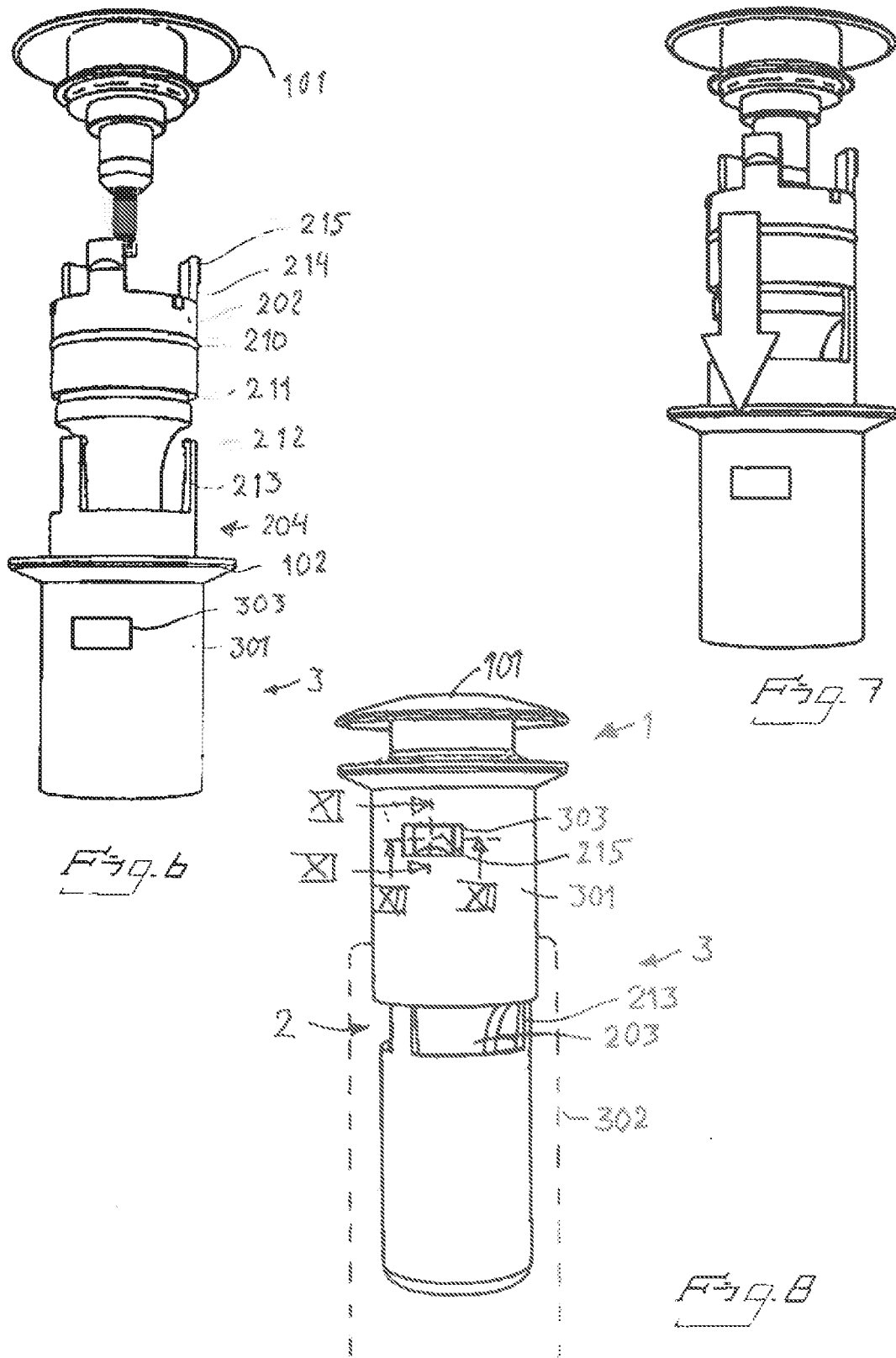




Fig. 12

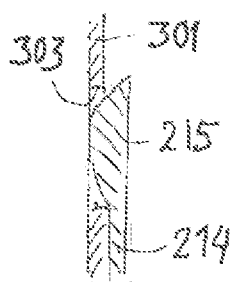


Fig. 11

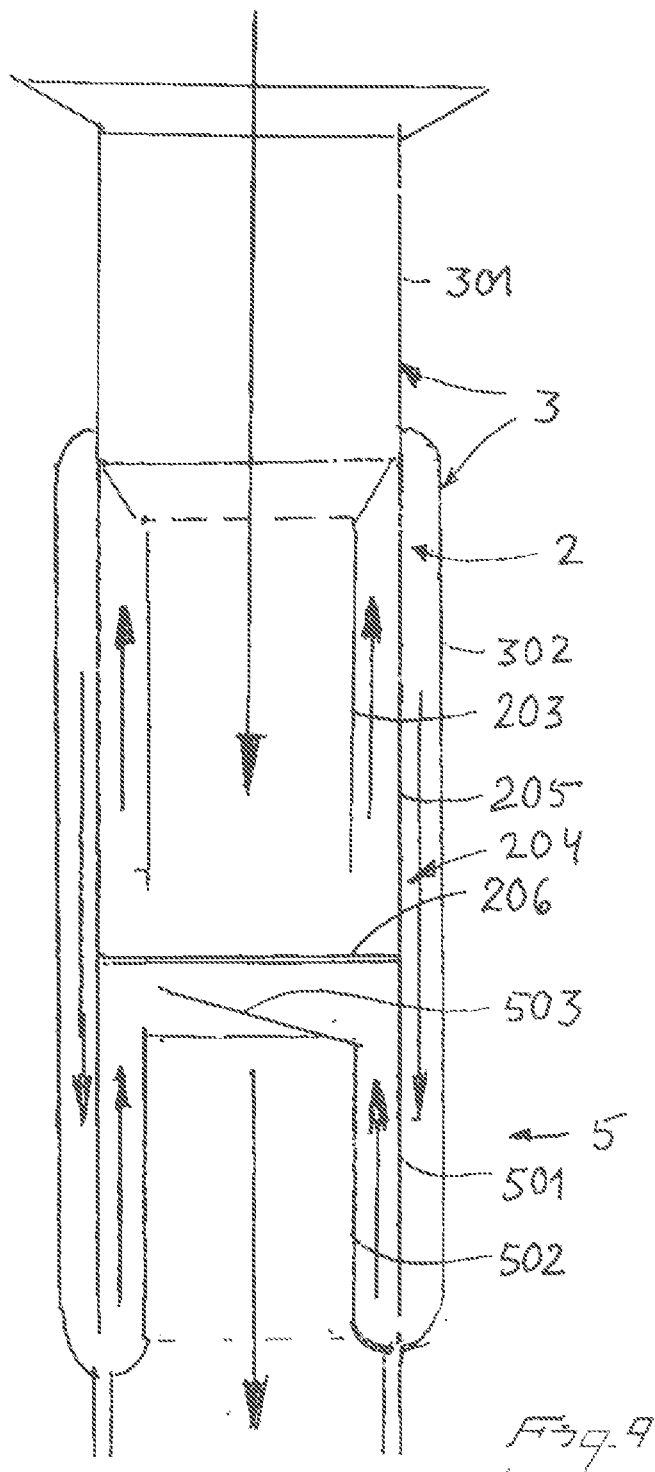
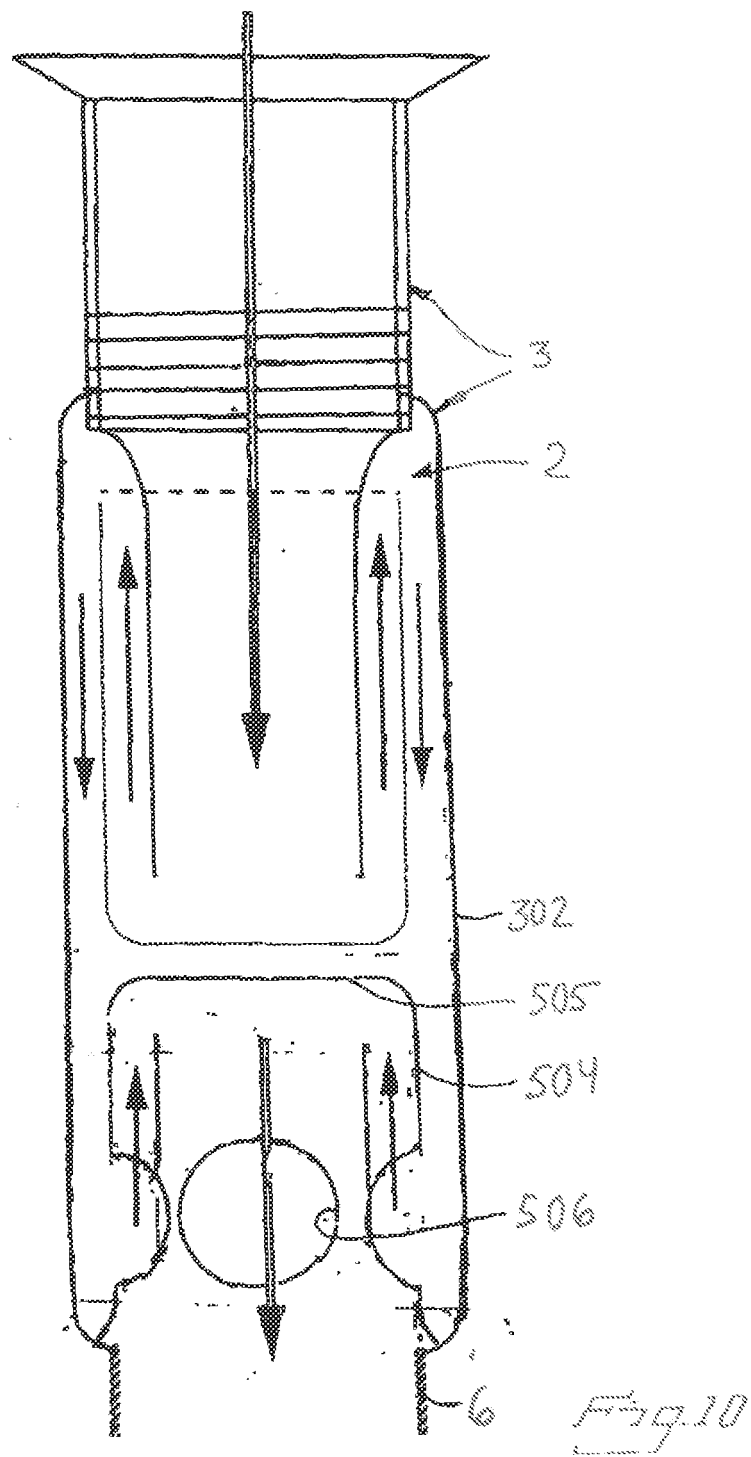


Fig. 9



REFERENCES CITED IN THE DESCRIPTION

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