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(54) Quick-mounting water discharge group for sanitary facilities and sanitary facility using such group

(57) A quick-mounting water discharge group (10) for sanitary facilities (50) comprising a lower closure ring (40), a first and second element (12, 13) in which the first element (12) is mushroom-shaped, can be applied in a hole (14) of the sanitary facility (50) and comprises a head portion (15), which can be coupled with the internal wall of the sanitary facility (50) and shaped in use to substantially cover the hole (14), and a hollow tubular portion (16) which can be coupled in use with the hole (14) which extends from the head portion (15); the second element (13) being a box-shaped element and comprising a first upper opening (17) and at least a second water discharge opening (18); the lower closure ring (40) being constrainable in an internal portion (42) to a lower portion of the hollow tubular portion (16) and snap-couplable in an external portion (41) with the first upper opening (17) to create a water passage from the first element (12) to the second element (13) when the group (10) is mounted in the hole (14) of the sanitary facility (50).

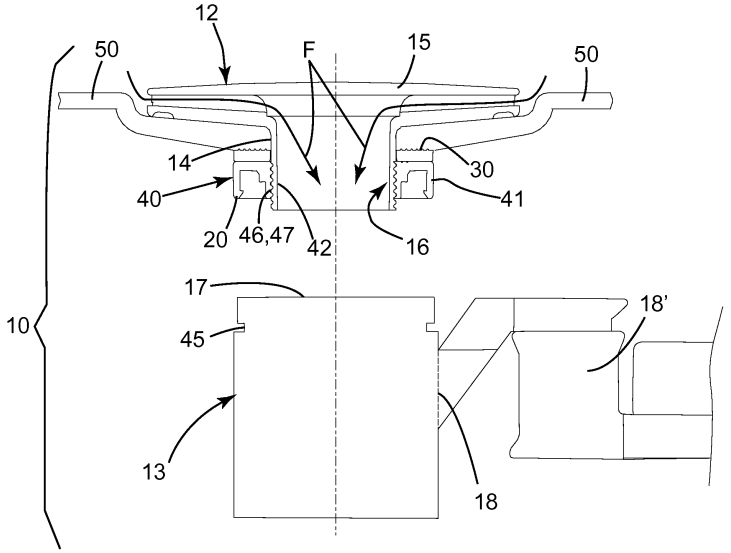


Fig. 2

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Description

[0001] The present invention concerns a quick-mounting water discharge group for sanitary facilities. Currently known discharge groups, and in particular for bath tubs, comprise one or more elements which are to be mounted in a hole of the sanitary facility on one hand while on the other to be connected to the discharge pipes.

[0002] Disadvantageously it occurs that the laying operations of the tub and mounting of the relating discharge group are neither quick nor easy operations.

[0003] As a matter of fact with the currently know groups the assembly phase requires supply of adhesive substances to bind the same group to the tub and thus entailing a lot of waiting time after laying operations before such binding material dries.

[0004] It is the object of the present invention to provide a device capable of overcoming the prior art drawbacks mentioned above in an extremely simple, economical and particularly feasible manner.

[0005] Another object of the present invention is to provide a quick-rapid water discharge group for sanitary facilities which do not require, during the assembly step, use of adhesive substances such as silicon.

[0006] Further object of the present invention is to provide a quick-mounting water discharge group for sanitary facilities easy to make at a low cost.

[0007] These objects according to the present invention can be attained by making a quick-mounting water discharge group for sanitary facilities as described in claim 1.

[0008] Further characteristics of the invention are described by the subsequent claims.

[0009] The characteristics and advantages of the quick-mounting water discharge group for sanitary facilities according to the present invention shall be more evident from the following description given as exemplifying and non-limiting with reference to the attached schematic drawings, in which:

- Figure 1 is a raised schematic view of a sanitary facility, in particular of a bath tub, provided with a quick-mounting water discharge group according to the present invention;
- Figure 2 is a section partially exploded view of the quick-mounting water discharge group of figure 1;
- Figure 3a is a section schematic view of a preferred embodiment of a quick-mounting water discharge group according to the present invention comprising a discharge closure set in closed position;
- Figure 3b is a partial top view of the actuation means of the discharge closure set of the sanitary facilities of figure 3a in closed position;
- Figure 4a is a section schematic view of the quick-mounting water discharge group of figure 3a in which the discharge closure set is in opened position;
- Figure 4b is a partial top view of the actuation means of the discharge closure set of the sanitary facilities of figure 4a in opened position;
- Figure 5 is a section schematic view of a sanitary facility, in particular a bath tub, provided with a water discharge group of the type of figure 3a.
- Figure 6 is a section view of a sanitary facility provided with another water discharge group according to the present invention connected to a filling limiting device;
- Figure 7a shows a top view of an element of the filling limiting device of figure 6;
- Figure 7b is a section view of the element of figure 7a;
- Figure 8a is a schematic representation of the sanitary facility of figure 6 during filling once the filling level has been reached and at the beginning of excess water discharging;
- Figure 8b is a schematic representation of the sanitary facility of figure 6 during filling and steady-state excess water discharging;
- Figure 8c is a schematic representation of the sanitary facility of figure 6 at a state of filling equilibrium; and
- Figure 9 is a schematic representation of the sanitary facility of figure 6 during emptying.

[0010] With reference to the figures, a quick-mounting water discharge group for sanitary facilities 50 according to the present invention is indicated as 10.

[0011] The term sanitary facilities means elements such as sinks, wash-tubs, bidets or, preferably bath tubs, as shown for example in figure 1 and 5.

[0012] In particular the quick-mounting water discharge group 10 for sanitary facilities 50 mentioned above comprises a first element 12, connectable, through a lower closure ring 40, in a non-removable manner with a hole 14 made in an eventual sanitary facility 50 and a second element 13 connectable without any of the adhesive substance to the closure ring 40 mentioned above during the assembling step of the group 10 itself.

[0013] According to a preferred embodiment the first element 12 is mushroom-shaped and, as mentioned beforehand, it can be applied in a hole 14 advantageously made in a lower portion of the sanitary facility 50 for the passage of water from the sanitary 50 itself towards the outside.

[0014] As shown in figure 2 such first element 12 comprises a head portion 15 which, in use, is connectable to the internal wall of the sanitary facility 50 and shaped in a manner such that it covers substantially the related abovementioned hole 14 and to extend beyond it for a short section on the internal wall of the sanitary facility 50 mentioned above.

[0015] The first element 12, alongside the head portion 15 described above, also comprises a hollow tubular portion 16 connectable with the hole 14 which extends from the head portion 15 for a straight section. Advantageously such hollow tubular portion 16 has dimensions such that it extends beyond the lower wall of the sanitary facility 50 through the hole 14.

[0016] As indicated by arrow F in figure 2 the head portion 15, when mounted, does not make the hole 14 watertight but allows passage of water from the sanitary facility 50 into the tubular portion 16.

[0017] In order to maintain the first element 12 constrained in such position, the group 10 comprises, as mentioned beforehand, a lower closure ring 40, preferably provided with a sealing gasket 30, which is mounted laterally externally on a lower portion of the tubular portion 16 in a manner such that it abuts against the lower external wall of the sanitary facility 50 when the group 10 is mounted and installed.

[0018] Such lower closure ring 40, and in particular one of its internal portion 42, can be screwed onto a lower portion of the tubular portion 16 projecting below the sanitary facility 50, when mounted.

[0019] In such case related threaded surfaces 46, 47 are provided for both on the lower external portion of the tubular portion 16 and on the internal surface of the lower closure ring 40.

[0020] In addition, portions 15 and 16 of the mushroom-shaped element 12 can be integrally made, as previously described, or they can be two separate elements such as a conical body 16, equipped with a lower threaded end 46, and an upper covering cap 15.

[0021] As mentioned at the beginning of the description, the quick-mounting water discharge group 10 for sanitary facilities 50 additionally comprises a second element 13 connectable of the lower closure ring 40 in a manner such that it is positioned, when mounted, below the sanitary facility 50.

[0022] In particular, such second element 13 is a box-shaped element and it comprises a first upper opening 17 and at least a second upper water discharge opening 18 in which, during assembly of the group 10, the first upper opening 17 is connectable stably to the lower closure ring 40.

[0023] In such manner, when the ring 40 is mounted on the first element 11 as described previously, the lower portion of the tubular portion 16 is directed towards the internal of the second element 13 itself into which the water present in the sanitary facility 50 during use is conveyed.

[0024] Preferably, as shown in figure 2, the first upper opening 17 and the related portion of contact of the lower closure ring 40 can be snap-coupled due to the presence, on the ring 40, of an annular projection 41 equipped with a tooth-shaped end 20 capable of interlocking with the related annular seat 45 made on the external surface of the opening 17.

[0025] Once the toothed end 20 is coupled with the related seat 45, safe passage of water from the first element 12 into the second element 13 occurs and, if the discharge opening 18 is accessible, passage of water occurs from inside the sanitary facility 50 into the discharge pipe 18'.

[0026] Since the abovementioned coupling, toothed end 20 - seat 45, is of snap coupling type and since in particular the lower closure ring 40 and the first element 12 can be bonded to the related sanitary facility 50 during the manufacture of the sanitary facility 50 in an extremely easy manner, assembly during implementation step of the group 10 results to be quite easy and quick in that it only consists in pressing the second element 13 against the ring 40 to snap-couple.

[0027] Furthermore, during the assembly step, that is only the abovementioned snap-coupling step, the invention does not require advantageously the presence of any adhesive substance, for example silicon, thus reducing to zero the waiting time for laying operations of the sanitary facility 50 upon the first use of the same.

[0028] In addition, the quick-mounting water discharge group 10 can comprise, in a preferred embodiment, also an improved discharge closure set 100 adapted to make the discharge pipe 18' selectively accessible with the water eventually contained inside the sanitary facility 50.

[0029] An example of such discharge closure set 100 is shown in figures 3a-4b and comprises a plug 111 free to move between a first open position, raised, and a second closed position, lowered.

[0030] In particular, such plug 111 cooperates with a discharge mouth 112 made upstream of the discharge opening 18 in a seat within the second element 13.

[0031] As shown in figure 3a, when in closed position the plug cooperates with the mouth 112 closing it completely and blocking any water penetrating into the group 10 from the sanitary facility 50 upstream of the mouth 112 itself and consequently upstream of the discharge opening 18.

[0032] As shown in figures 3a and 4a the second element 13 in fact internally contains two selectively communicating compartments in which the first is always connected through the first element 12 to the eventual sanitary facility 50, and in particular with the water contained therein, and the second compartment is always connected with the discharge pipe 18' through the opening 18.

[0033] Advantageously, the portion of the plug 111 which cooperates with the mouth 112 is complementary to it and it is provided with a gasket 114 adapted to maintain the closure watertight, thus preventing the water present in the sanitary facility 50 from discharging into the discharge pipe 18'.

[0034] Moreover, the discharge closure set 100 is provided with opening/closing means 115 which cooperate with the plug 111 in order to move it to one of the two open or closed positions.

[0035] The opening/closing means comprise a moveable element 118 moving between a first coupling position with said plug 111 and a second uncoupled position.

[0036] According to the preferred embodiment, when the moveable element 118 is at the first coupling position, such moveable element 118 and the plug 111 are magnetically coupled.

[0037] Preferably, the moveable element 118 is a first permanent magnet and the plug 111 comprises a second permanent magnet 119 of the same polarity which thus

generates a repulsion effect against the moveable element 118.

[0038] In addition, guide and stop means 120 are provided, such as upper and lower abutments, for which cooperate with the plug 111, in order to define and delimit the distance which can be covered by the same.

[0039] Such guide and stop means 120 cooperate with the lower portion of the plug 111 in order to make a stop for the opening movement of the plug 111.

[0040] The moveable element 118 of the opening/closing means 115 is preferably connected to actuation means 116 outside the sanitary facility 50 and arranged such that it can be activated by a user.

[0041] The external actuation means 116 operate on the moveable element 118 to control its movement through suitable motion transmission means 117, such as for example a rigid rod connected to a lever 121 constrained to rotate around a pin 122.

[0042] Advantageously, the moveable element 118 is positioned outside the discharge pipe 18' and therefore, the motion transmission means 117 do not have to come into contact with water.

[0043] When the external actuation means 116 are guided to closed position, the moveable element 118 is brought by the motion transmission means 117 to a distal position with respect to the plug 111 so that there is substantially no coupling between the permanent magnet 119 provided for on the plug and the moveable element 118 itself.

[0044] In such configuration, illustrated in figure 3a and 3b substantially no force is exerted on the plug 111 which consequently falls due to gravity, guided by the guide and stop means 120, until the plug is positioned on the discharge mouth 112 of the second element 13.

[0045] When in closed position, the plug 111 is at least partially inserted in the discharge mouth 112 and completely closes it in a substantially watertight manner.

[0046] The discharge mouth section 112 of the second element 13 is preferably frustoconically shaped, with the larger base turned upwards, like the section of the plug portion complementary to the same. In such a manner, on one hand, greater interference and thus sealing between the plug 111 and such mouth 112 is ensured, while on the other hand the mouth 112 acts as a stop for the closing movement of the plug 111.

[0047] However, when the external actuation means 116 are guided to open, the moveable element 118 is moved by the motion transmission means 117 to a position overlapping with the plug 111, as shown in figures 4a and 4b.

[0048] In such position, the permanent magnet 119 of the plug 111 and the permanent magnet of the moveable element 118 magnetically repel each other, since they have been deliberately chosen of the same polarity.

[0049] Thus, there is a magnetic force acting on the plug 111 which pushes it upwards.

[0050] Subsequently, the plug 111 rises, guided by the guide and stop means 120, until it interferes with the same, thus leaving the mouth 112 of the second element 13 at least partially open. Hence the water can flow into the discharge pipe 18' through the opening 18 of the second element 13.

[0051] Figure 5 shows a bath tub 50 provided with the group 10 and discharge closure set 100 of sanitary facilities as they have been just described.

[0052] Advantageously, the group 10 can also comprise at least a third 33 and fourth 34 opening, arranged substantially on the opposite side with respect to the second opening 18, which connect the group 10 to a filling limiting device for sanitary facilities 210.

[0053] A preferred embodiment of such filling limiting device 210 connected to the group 10 both mounted on a sanitary facility 50 is shown schematically in figure 6.

[0054] Such filling limiting device 210 comprises a first pipe 211 connectable at its first end 212 to the third opening 33 of the second element 13 upstream of the mouth 112 and connected at a second end 213 to a second pipe 214 for water drainage. The first pipe 211 is shaped in a manner such that its second end 213 is positioned at a higher elevation with respect to its first end 212. The second pipe 214 comprises a first end 215 connected to the second end 213 of the first pipe 211 and a second end 216 positioned at lower elevation than the first end 212 of the first pipe 211 and connected to the fourth opening 34 downstream of the mouth 112.

[0055] At the connection between the second end 213 of the first pipe 211 and the first end 215 of the second pipe 214, a vent pipe 217 towards the environment is provided for. At the open end 218 of such vent pipe 217, a vent control valve 219 is arranged and provided with a membrane 220 which allows exit and/or entry of air into the filling limiting device 210.

[0056] According to a preferred embodiment of the invention, the membrane has at least one coupling seat 222 with the open end 218 of the vent pipe 217 and is made of elastically deformable material in order to selectively make a sealed coupling with such end. In addition, the membrane is provided with a centrally-arranged, preferably cross-shaped cut 221; such membrane also advantageously is of negligible weight. Advantageously, the vent control valve 219 faces a wall of the sanitary facility 50 at the external actuation means 116 of the closure set 110 previously described. In such a manner, such valve 219 is concealed from sight and protected against clogging due to accumulation of dirt or any other sediment material.

[0057] When the external actuation means 116 are moved to closed position the plug 111 is inserted at least partially into the discharge mouth 12 and closes it in a substantially watertight manner.

[0058] In such configuration the filling tank 51 collects water up to a first maximum filling level delimitated by the elevation at which the first and the second pipe 211, 214 of the filling limiting device 210 join, as illustrated in figure 8a.

[0059] The water 52 also reaches such level in the first

pipe 211 of the filling limiting device 210. Once such level has been reached, the excess water tends to flow, pushed by the weight of the water 52 present in the filling tank 51, from the first pipe 211 of the filling limiting device 210 to the second pipe 214 of the same thus flowing towards the discharge 113 connected downstream of the second pipe 214.

[0060] In such circumstances, if water continues to be inserted in the filling tank 51 at a greater flow rate than the flow rate with which the water flows from the second pipe 214, the water level in the filling tank 51 and in the first and second pipes 211, 214 tends to rise. This leads to higher pressure inside the first and the second pipe 211, 214 which slightly lifts the membrane 220, in such a manner permitting the excess air to exit through the vent control valve 219.

[0061] When the filling tank 51 reaches the second filling level illustrated in figure 8b, the pipes 211, 214 are completely emptied of air. This triggers the communicating vessels effect and the filling tank 51 tends to empty up at the maximum flow rate.

[0062] If, in such conditions, further addition of water ceases, emptying of the filling tank 51 continues until a predetermined third filling height, illustrated in figure 8c, is reached, in which a depression occurs in the pipes 211, 214 such that it activates the membrane 220 opening its cross-shaped cut.

[0063] Thus, there is a slight entry of air which compensates the depression of air which had occurred in the pipes 211, 214 and disables the communicating vessels effect.

[0064] However, when the external actuation means 116 are moved to open position the plug 111 lifts, thus leaving the mouth 112 of the discharge 113 at least partially open. Hence water can flow directly into the discharge 18' without being forced to pass through the first pipe 211.

[0065] In an analogous manner such filling limiting device 210 can be employed even for sinks, wash-tubs, bidets or other similar facilities.

[0066] Hence, it is easy to understand how the device object of this finding operates.

[0067] The quick-mounting water discharge group 10 for sanitary facilities 50 according to the present invention comprises a first and second element 12, 13 alongside a lower closure ring 40.

[0068] The first element 12 is mushroom-shaped and it can be mounted in a non-removable manner in the sanitary facility 50 in a hole 14 made in a lower portion of the same sanitary facility 50 itself.

[0069] The lower closure ring 40 can be connected on the lower part to the first element 12 to maintain it in the abovementioned insertion position of the hole 14 of the sanitary facility 50.

[0070] The second element 13 is a box-shaped element and it comprises a first upper opening 17 and at least a second water discharge opening 18, in which the first upper opening 17 can be snap-coupled with the lower closure ring 40 to create a water passage from the first element 12 to the second element 13 which in turn is selectively in communication with the discharge pipe 18'.

[0071] In such manner it is advantageously possible to limit the mounting step to only a snap-coupling between the second element 13 and the ring 40 providing that the first element 12 with the related ring 40 be mounted on the sanitary facility 50 before laying the sanitary facility itself.

[0072] Furthermore, since the connection between the second element 13 and the ring 40 is of snap-coupling type, no application of glue or silicon is required during the mounting step.

[0073] In addition, the group 10 can advantageously comprise a control set of the opening 110 and a filling limiting device 210 as described previously in a manner to make an improved sanitary facility.

[0074] Thus, it has been seen that a quick-mounting water discharge group for sanitary facilities according to the present invention achieves the previously described objects.

[0075] The quick-mounting water discharge group for sanitary facilities thus conceived according to the present invention is susceptible to various modifications and variants, all within the scope of the same inventive concept; moreover, all details can be replaced by other technically equivalent elements. In practice, any type and size of material can be used depending on the technical requirements.

Claims

1. A quick-mounting water discharge group (10) for sanitary facilities (50) comprising a lower closure ring (40) and a first and second element (12, 13), in which said first element (12) is mushroom-shaped, can be coupled with a hole (14) of said sanitary facility (50) and comprises a head portion (15), which can be coupled with the internal wall of said sanitary facility (50) and shaped to substantially cover said hole (14), and a hollow tubular portion (16) which can be coupled with said hole (14) which extends from said head portion (15), said second element (13) being a box-shaped element and comprising a first upper opening (17) and at least a second opening for water discharge (18), said lower closure ring (40) being constrainable along an internal portion (42) in a lower portion of said hollow tubular portion (16) and snap-couplable in an external portion (41) with said upper portion (17) to create the water passage from said first element (12) to said second element (13) when said group (10) is mounted in said hole (14) of said sanitary facility (50).

2. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 1 **characterised in that** said snap-coupling is

achieved through a tooth-shaped end (20) of said external portion (41) of said ring and a related annular seat (45) made in an upper portion of said first opening (17).

3. Quick-mounting water discharge group (10) for sanitary facilities (50) according to any one of the preceding claims **characterised in that** it is provided with a discharge closure set (100) which can be activated by a user.

4. Quick-mounting water discharge group (10) for sanitary facilities (50) according to the preceding claim **characterised in that** said discharge closure set (100) comprises a plug (111) free to move between a first open position and a second closed position, and opening/closing means (115) adapted to cooperate with said plug (111) in order to move it to one of the said two open or closed positions, said opening/closing means (115) comprising at least one element (118) moveable between a first coupling position with said plug (111) and a second uncoupled position **characterised in that** in said first coupling position, said moveable element (118) and said plug (111) are magnetically coupled.

5. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 4 **characterised in that** said plug (111) comprises at least one first permanent magnet (119) and said moveable element (118) comprises at least a second permanent magnet, said first and second permanent magnets having the same polarity.

6. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 4 or 5 **characterised in that** it comprises guide and stop means (120) for the definition and limitation of the travel of said plug (111).

7. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 4 or 5 or 6 **characterised in that** said guide and stop means (120) cooperate in abutment with a lower portion of said plug (111).

8. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 4 or 5 or 6 or 7 **characterised in that** said opening/closing means (115) comprise actuation means (116), accessible from outside, connected to said moveable element (118) through motion transmission means (117).

9. Quick-mounting water discharge group (10) for sanitary facilities (50) according to claim 8 **characterised in that** said motion transmission means (117) comprise a rod connected downstream to a lever (121) constrained to rotate around a pin (122), said lever (121) transmitting a translational motion to said moveable element (118).

10. Quick-mounting water discharge group (10) for sanitary facilities (50) according to any one of the preceding claims **characterised in that** it comprises a third and a fourth opening (33, 34).

11. Sanitary facility (50) comprising a tank element (51) provided with a discharge mouth which can be selectively blocked **characterised in that** it comprises a quick-mounting water discharge group (10) according to any one of the preceding claims.

12. Sanitary facility (50) according to the preceding claim when dependent on claim 10 comprising a filling limiting device (210).

13. Sanitary facility (50) according to the preceding claim **characterised in that** said filling limiting device (210) for sanitary facilities (50) comprises a first pipe (211) connectable at its first end (212) to the base of a filling limiting device (51) of said sanitary facility (50) and connected at one of its second ends (213) to a second pipe (214) for water drainage, the first pipe (211) being shaped in a manner such that its second end (213) is positioned at a greater elevation than its first end (212), said second pipe (214) comprising a first end (215) connected to said second end (213) of said first pipe (211) and a second end (216) positioned at a lower elevation than the first end (212) of said first pipe (211), at the connection between said second end (213) of said first pipe (211) and said first end (215) of said second pipe (214), a vent pipe (217) being provided towards the environment, provided at one of its open ends (218) with a vent control valve (219) for the exit and/or entry of air.

14. Sanitary facility (50) according to claim 13 **characterised in that** said vent control valve (219) comprises a membrane (220) provided with a cut (221).

15. Sanitary facility (50) according to claim 14 **characterised in that** said cut (221) of said membrane (220) is cross-shaped and arranged centrally with respect to the same.

16. Sanitary facility (50) according to claim 14 or 15 **characterised in that** said membrane (220) is made of elastically deformable material and comprises a seat (222) for coupling with said open end (218) of said vent pipe.

17. Sanitary facility (50) according to claims 14 or 16 **characterised in that** said membrane (220) is of negligible weight.

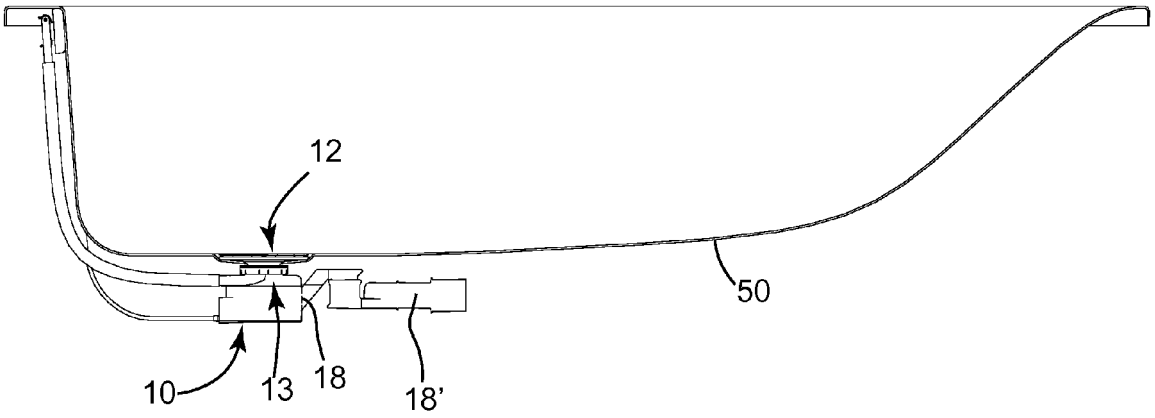


Fig. 1

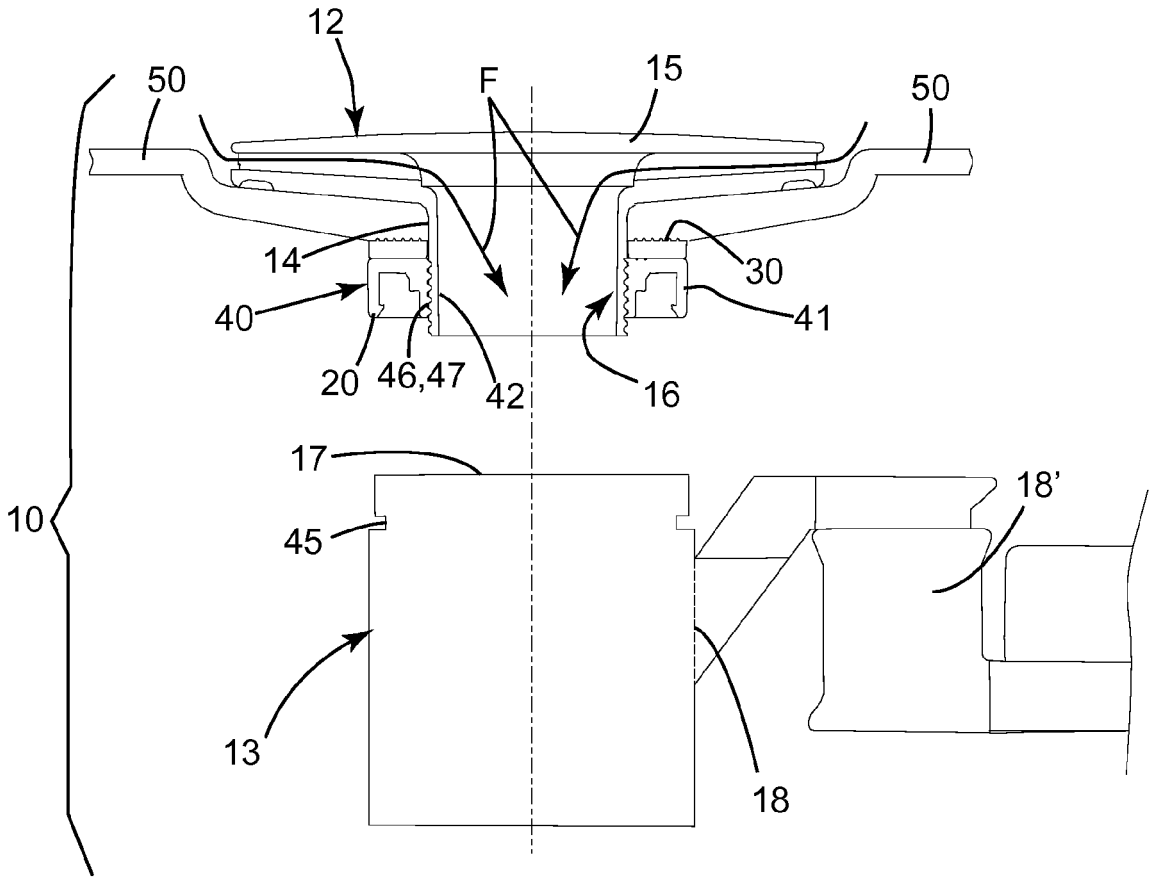


Fig. 2

Fig. 3a

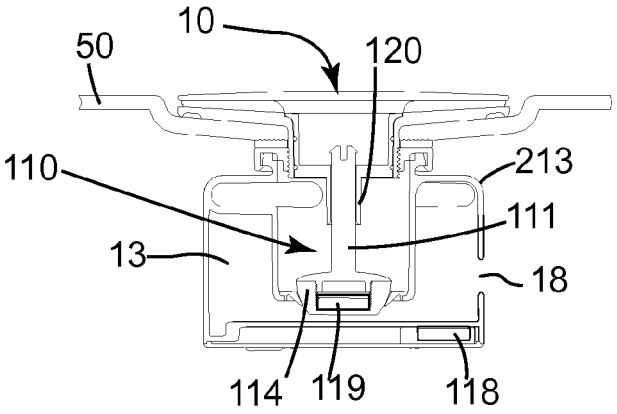


Fig.3b

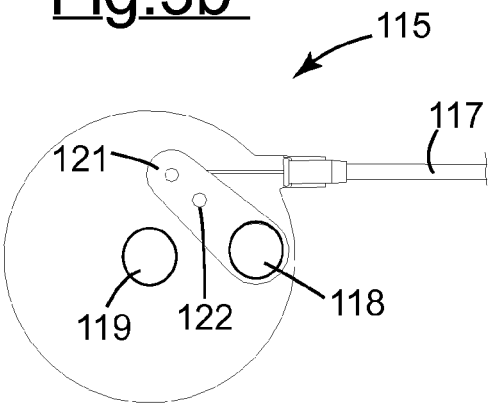


Fig. 4a

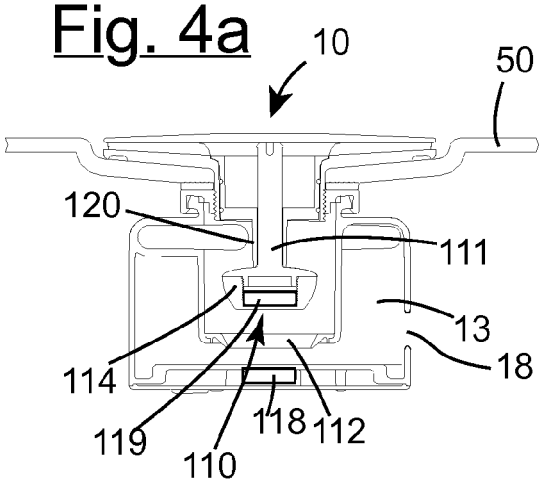


Fig. 4b

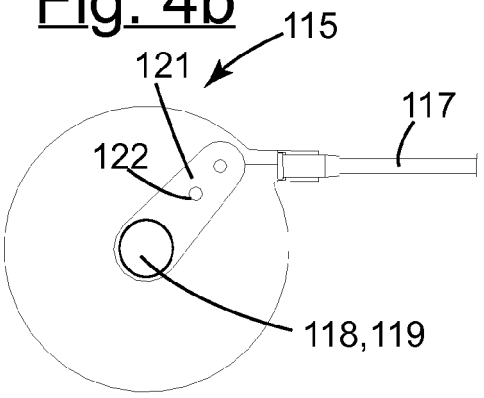


Fig. 5

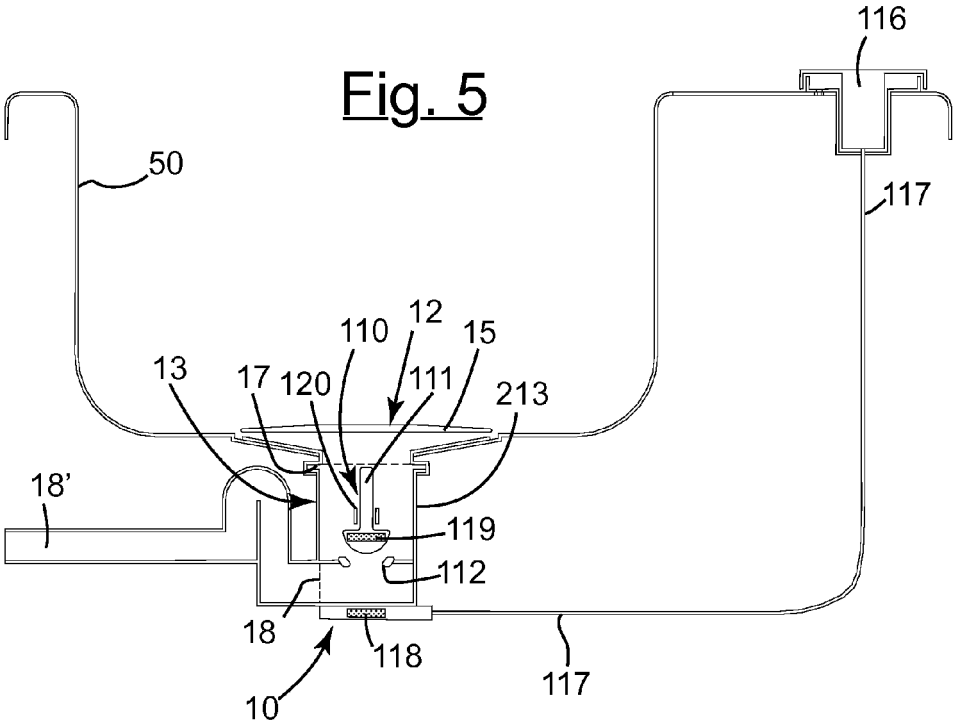


Fig. 6

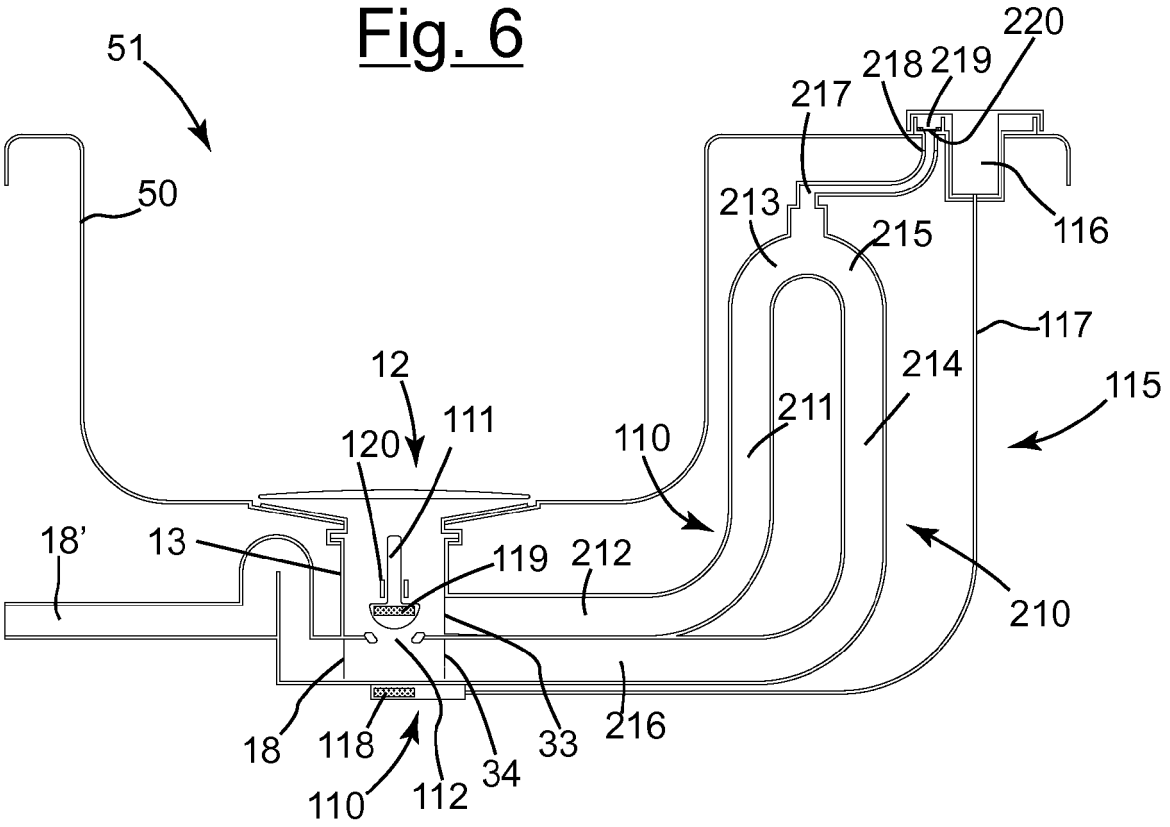


Fig. 7a

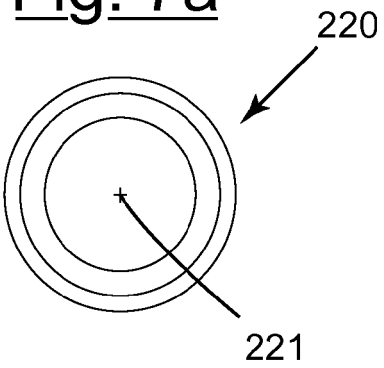


Fig. 7b

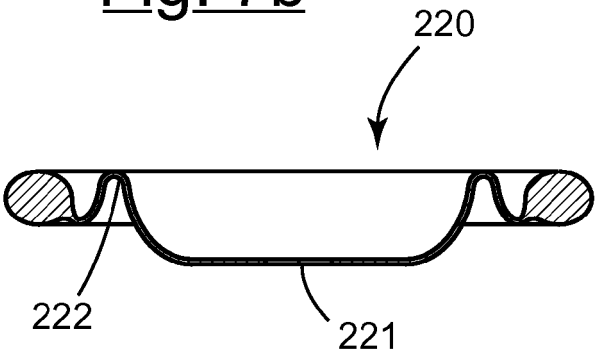


Fig. 8a

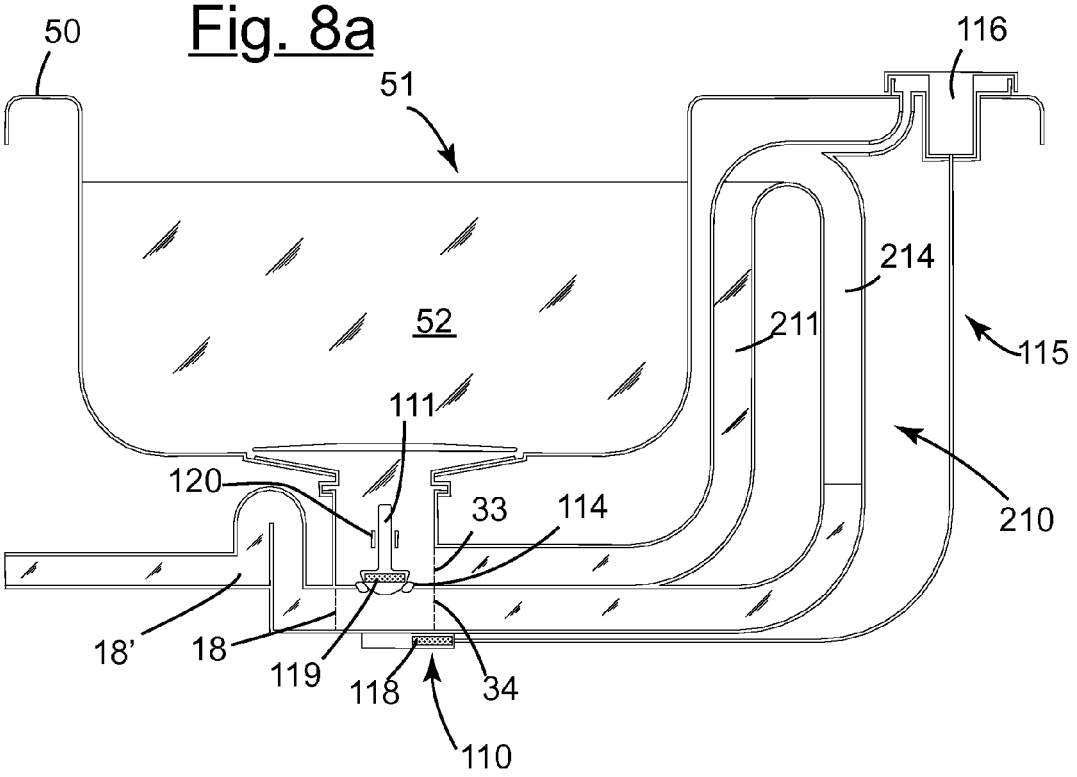

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Fig. 8b

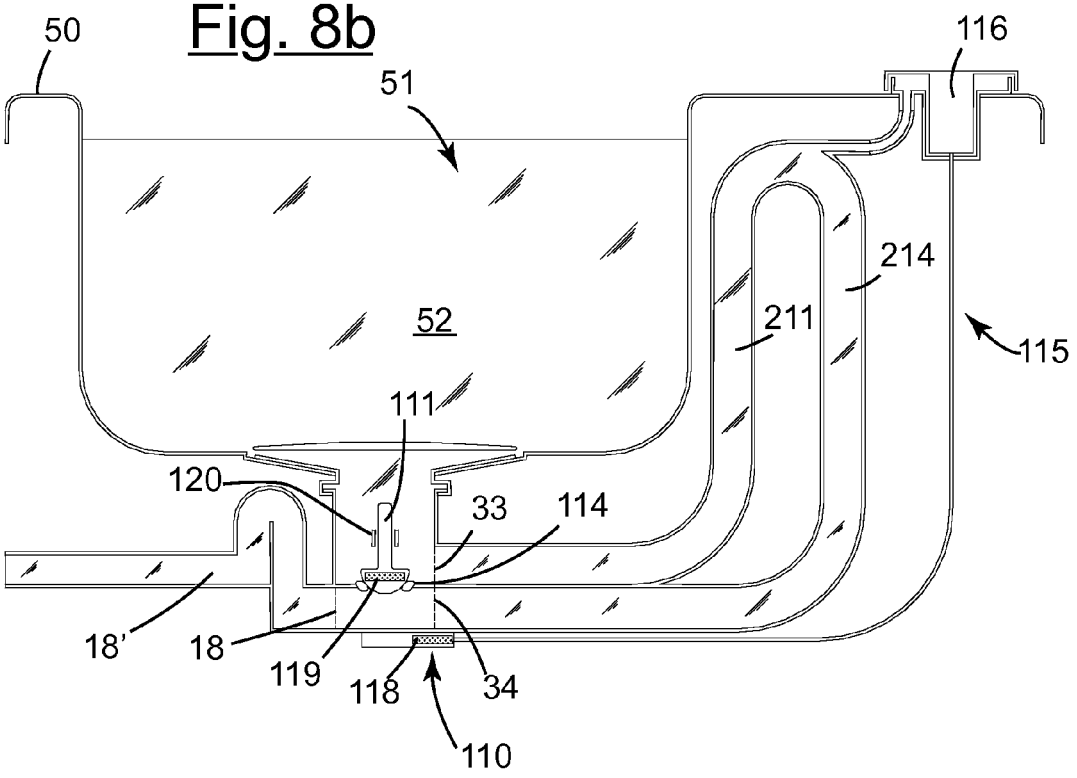

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Fig. 8c

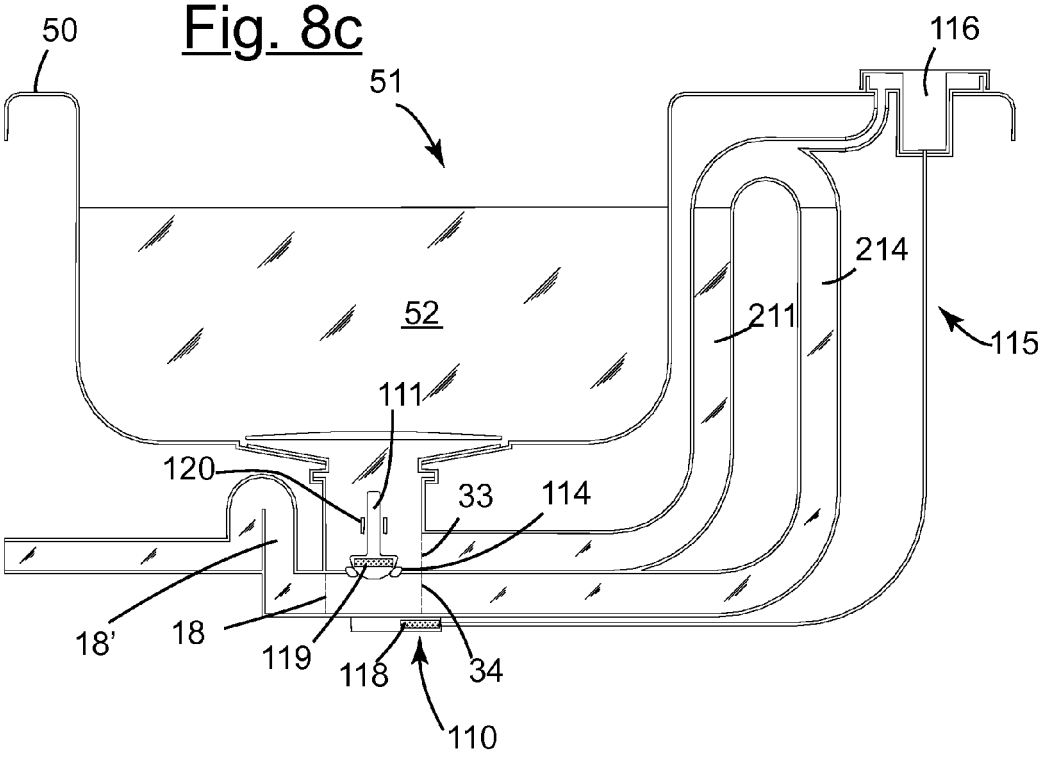
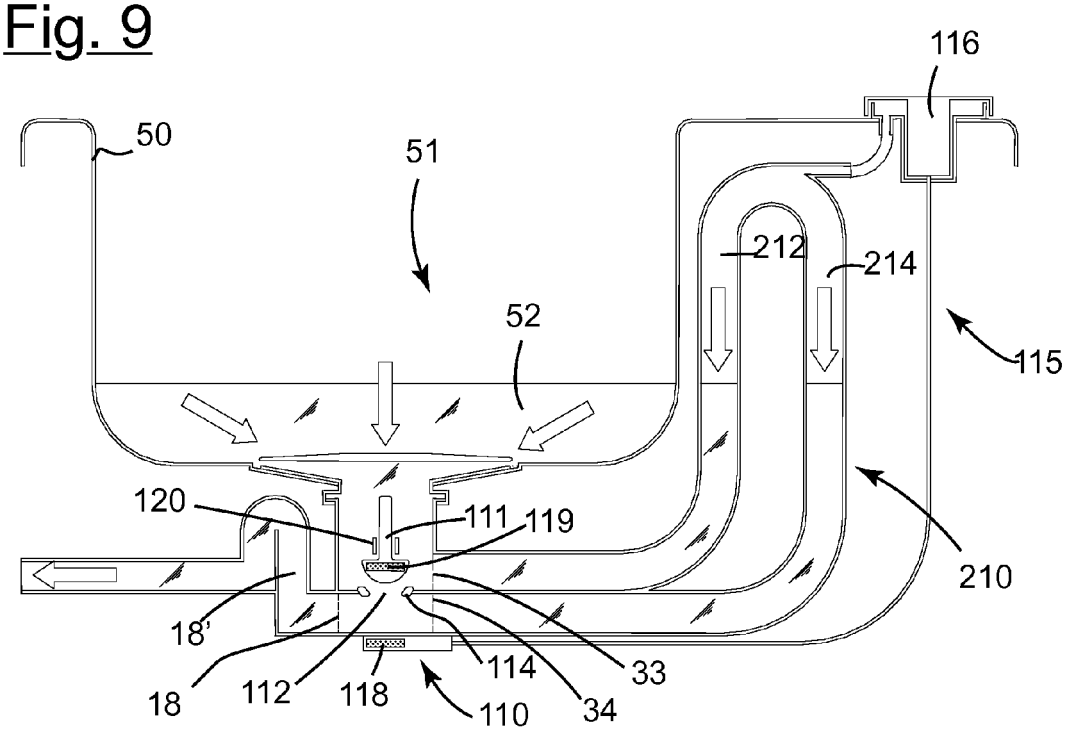

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Fig. 9


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EUROPEAN SEARCH REPORT

Application Number
EP 07 12 3508

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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E03C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 December 2008	Flygare, Esa

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