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(72) Inventor: **VAROTTI, Mario**  
**25078, VESTONE (IT)**

(74) Representative: **Jorio, Paolo, Dr. Ing. et al**  
**Studio Torta S.r.l.,**  
**Via Viotti, 9**  
**10121 Torino (IT)**

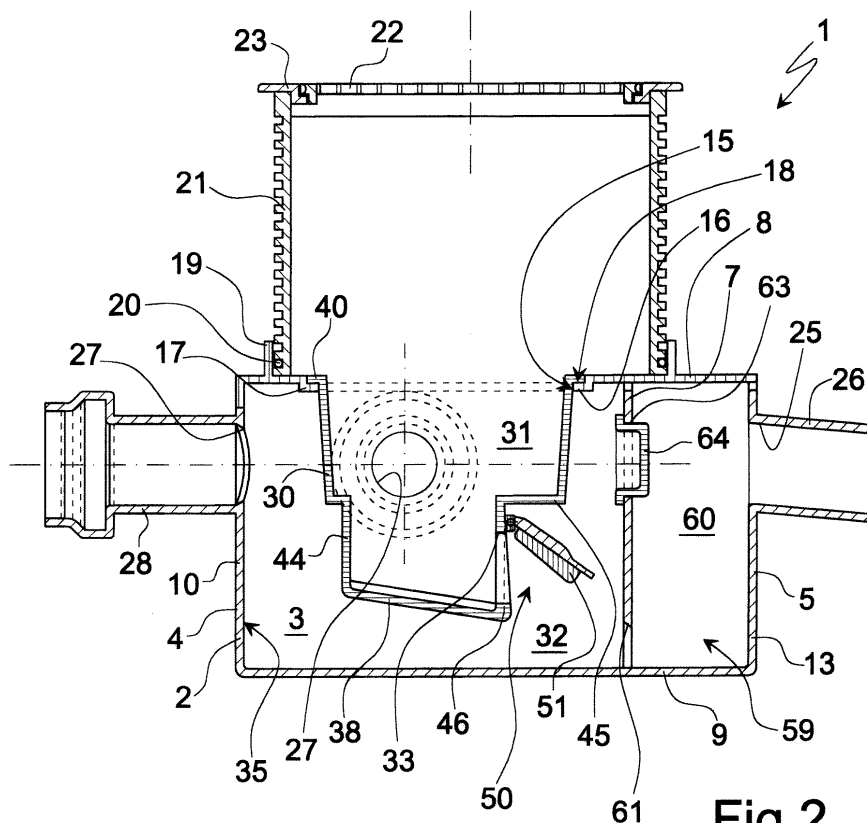
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(71) Applicant: **VALSIR S.p.A.**  
**25078 Vestone (BS) (IT)**

### (54) Drain water sump

(57) A drain water sump (1) has a vessel (2) having an inner chamber (3) having at least one access opening (15) and at least one drain hole (25); a tank (30) is housed inside the chamber (3) and divides the chamber into a first compartment (31) defined inside the tank, and

into a second compartment (32) in the form of a substantially annular channel (35) and radially outer with respect to the first compartment (31); and the first and second compartment (31, 32) communicate via an out-flow opening (33) associated with a non-return valve (50).



**Fig.2**

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## Description

**[0001]** The present invention relates to a drain water sump.

**[0002]** Generally speaking, a sanitary fixture drain water sump comprises a vessel, usually made of plastic material, installed in the floor, and having an inner chamber with a top access opening covered with a grid; and in a lateral wall of the vessel are formed one or more service holes, through which the drain water from respective sanitary fixtures is collected, and a drain hole, through which the water collected in the sump is fed to a drain pipe.

**[0003]** Known sumps have various drawbacks. In particular, they do not always provide for effectively disposing of large amounts of drain water, so that the sump may collect more water than it can dispose of, with the result that the water accumulates inside the sump and leaks out through the top grid into wherever the sump is installed.

**[0004]** Moreover, drain water often being foamy, large amounts of foam tend to accumulate in the sump, even if the water is disposed of properly through the drain hole, and known sumps do not always succeed in preventing foam from accumulating in the inner chamber and seeping out through the grid. In other words, known sumps do not always provide for effectively preventing backflow phenomena.

**[0005]** It is therefore an object of the present invention to provide a drain water sump designed to eliminate the aforementioned drawbacks of the known art.

**[0006]** In particular, it is an object of the invention to provide a sump which is fully effective in any operating condition, and which, more specifically, provides for disposing of large amounts of water, while at the same time being cheap and easy to produce.

**[0007]** Another particular object of the invention is to provide a sump which, while disposing of large amounts of water, also prevents foam seepage and any other undesired backflow phenomena.

**[0008]** According to the present invention, there is provided a drain water sump as claimed in the accompanying Claim 1.

**[0009]** The sump according to the invention is thus cheap and easy to produce, while at the same time disposing of much larger amounts of water than sumps of similar size and in the same operating conditions.

**[0010]** Even when dealing with large amounts of water, the sump according to the invention also provides for effectively preventing foam seepage and any other undesired backflow phenomena.

**[0011]** A preferred, non-limiting embodiment of the invention will be described purely by way of example with reference to the accompanying drawings, in which:

Figure 1 shows an exploded view in perspective of a drain water sump in accordance with the invention;

Figure 2 shows a section of the Figure 1 sump assembled;

Figure 3 shows a larger-scale view in perspective of a component part of the Figure 1 sump;

Figures 4 and 5 show a larger-scale view in perspective and a larger-scale side view respectively of a further component part of the Figure 1 sump.

**[0012]** Number 1 in Figures 1 and 2 indicates as a whole a domestic sump for collecting drain water from sanitary fixtures.

**[0013]** Sump 1 comprises a vessel 2, preferably made of plastic material and box-shaped, and having an inner chamber 3. Vessel 2 comprises a generically cylindrical portion 4 and a substantially prismatic portion 5, which are contiguous and communicate internally to define chamber 3; and, inside chamber 3, portions 4 and 5 are bounded by a partition 7. More specifically, vessel 2 comprises a substantially flat top wall 8 and a substantially flat bottom wall 9 parallel to each other; and a lateral wall 10 extending perpendicularly between top wall 8 and bottom wall 9. Lateral wall 10 comprises a curved, substantially semicircular portion 11; and a C-shaped portion 12 in turn comprising a rear wall 13, and two lateral sides 14 connected to portion 11. And partition 7 is defined by a flat wall parallel to rear wall 13 and perpendicular to top wall 8 and bottom wall 9.

**[0014]** Top wall 8 has an opening 15 for access to chamber 3; and opening 15 is bounded by a circular peripheral edge 16 having a radially inner flange 17 recessed slightly with respect to top wall 8 to define an annular shoulder 18.

**[0015]** Top wall 8 has a cylindrical collar 19 surrounding opening 15, and in which an extension sleeve 21 is inserted with the interposition of a sealing ring 20; and sleeve 21 is closed at the top by a grid 22 supported by a flange 23.

**[0016]** Through lateral wall 10, close to top wall 8, are formed a drain hole 25 associated with a sleeve 26; and a number of service holes 27 spaced circumferentially along lateral wall 10 and associated with respective sleeves 28 projecting radially from lateral wall 10. Drain hole 25 is connected, in use, to a drain pipe, while service holes 27 are connected to respective sanitary fixtures, and the unused service holes 27 are closed by plugs 29.

**[0017]** A tank 30 is inserted inside chamber 3 to divide chamber 3 into a first and second compartment 31, 32 communicating through an outflow opening 33. More specifically, tank 30 is inserted radially inside vessel 2 to define a substantially annular channel 35 between tank 30 and vessel 2, so that compartment 31 is defined inside tank 30, and compartment 32 is radially outwards with respect to compartment 31 and is substantially defined by channel 35.

**[0018]** With reference also to Figure 3, tank 30 comprises a substantially cylindrical cup-shaped body 36 having a bottom end 37 closed by a bottom wall 38, and

an open top end 39; end 39 has a substantially annular, radially outer seating edge 40 which rests on shoulder 18; and seating edge 40 is substantially flush with the outer surface of top wall 8.

**[0019]** Tank 30 comprises a top portion 41 having seating edge 40 and bounded by a flared lateral wall 42; and a bottom portion 43 having bottom wall 38 and bounded by a substantially cylindrical lateral wall 44. Bottom wall 38 is oblique with respect to lateral wall 44; and bottom portion 43 is smaller in diameter than top portion 41, and is connected to the top portion by an annular flange 45.

**[0020]** Tank 30 is inserted through opening 15, and projects vertically inside chamber 3; and bottom wall 38 is positioned facing and a predetermined distance from bottom wall 9 of vessel 2, and slopes with respect to bottom wall 9.

**[0021]** Lateral wall 44 of bottom portion 43 has a flat portion 46, through which is formed outflow opening 33, which is substantially circular and bounded by a peripheral edge 47; and a fluidtight seat 48 is defined inside outflow opening 33.

**[0022]** Outflow opening 33 is associated with a non-return valve 50 allowing fluid flow in one direction only, outwards of tank 30, i.e. from compartment 31 to compartment 32.

**[0023]** With reference also to Figures 4 and 5, valve 50 comprises a rocking shutter 51 cooperating with fluidtight seat 48; shutter 51 comprises a flap 52 hinged at the top to two supports 53 on the outside of tank 30, and which is only movable outwards of tank 30; and flap 52 has two pins 54 fitted to and rotating freely on supports 53, and clicked inside respective seats 55 formed in supports 53.

**[0024]** Flap 52 comprises a plug portion 56 insertable inside outflow opening 33; and a radially outer portion 57 which rests against peripheral edge 47 of outflow opening 33.

**[0025]** Sump 1 also comprises a siphon 59 (Figure 2) connecting compartment 32 to drain hole 25.

**[0026]** More specifically, partition 7 defines inside chamber 3 a third compartment 60 adjacent to compartment 32 and communicating with compartment 32 through an auxiliary hole 61 formed through partition 7, close to bottom wall 9 of vessel 2; and drain hole 25 and auxiliary hole 61 are located at different heights to define siphon 59.

**[0027]** Partition 7 also has an inspection hole 63 which is located close to top wall 8 of vessel 2, is substantially aligned with drain hole 25, and is closed by a removable plug 64.

**[0028]** In actual use, the drain water from the various sanitary fixtures connected to service holes 27 is collected inside compartment 32, and flows inside annular channel 35 and siphon 59 to drain hole 25. Annular channel 35 is sized to impart substantially laminar flow to the water flowing through, and backflow of water and/or foam from compartment 32 to compartment 31 is prevented by non-return valve 50, which also keeps insects and small animals out of compartment 31.

vented by non-return valve 50, which also keeps insects and small animals out of compartment 31.

## 5 Claims

1. A drain water sump (1) comprising a vessel (2) having an inner chamber (3) having at least one access opening (15) and at least one drain hole (25), and **characterized by** comprising a tank (30) inserted inside said chamber (3) to divide the chamber into a first and a second compartment (31, 32) communicating through an outflow opening (33).
2. A sump as claimed in Claim 1, **characterized in that** the first compartment (31) is defined inside the tank (30), and the second compartment (32) is radially outer with respect to the first compartment (31).
3. A sump as claimed in Claim 1 or 2, **characterized in that** the tank (30) is inserted radially inside the vessel (2) to define a substantially annular channel (35) between the tank (30) and the vessel (2).
4. A sump as claimed in one of the foregoing Claims, **characterized in that** the access opening (15) is formed in a top wall (8) of the vessel (2), and the tank (30) is inserted through the access opening (15) and projects vertically inside the chamber (3).
5. A sump as claimed in Claim 4, **characterized in that** the tank (30) comprises a substantially annular seating edge (40) which rests on a shoulder (18) formed on the top wall (8) of the vessel (2) and defining the access opening (15).
6. A sump as claimed in any one of the foregoing Claims, **characterized in that** the outflow opening (33) is associated with a non-return valve (50) permitting fluid flow in one direction only, outwards of the tank (30).
7. A sump as claimed in Claim 6, **characterized in that** the non-return valve (50) comprises a rocking shutter (51) cooperating with a fluidtight seat (48) formed in the outflow opening (33).
8. A sump as claimed in Claim 7, **characterized in that** the outflow opening (33) is formed through a lateral wall (44) of the tank (30), and the shutter (51) comprises a flap (52) hinged at the top to the outside of the tank (30) and movable outwards of the tank (30).
9. A sump as claimed in Claim 8, **characterized in that** the shutter (51) comprises a plug portion (56) insertable inside the outflow opening (33); and a ra-

dially outer portion (57) which rests on a peripheral edge (47) of the outflow opening (33).

10. A sump as claimed in one of the foregoing Claims, **characterized by** comprising siphon means (59) connecting the second compartment (32) to the drain hole (25). 5
11. A sump as claimed in one of the foregoing Claims, **characterized by** comprising a partition (7) inside the chamber (3) to define a third compartment (60) adjacent to the second compartment (32) and communicating with the second compartment (32) via an auxiliary hole (61) formed through the partition (7). 10 15
12. A sump as claimed in the foregoing Claims, **characterized in that** the drain hole (25) and the auxiliary hole (61) are located at different heights to define a siphon (59). 20
13. A sump as claimed in Claim 11 or 12, **characterized in that** the partition (7) comprises an inspection hole (63) closed by a removable plug (64). 25

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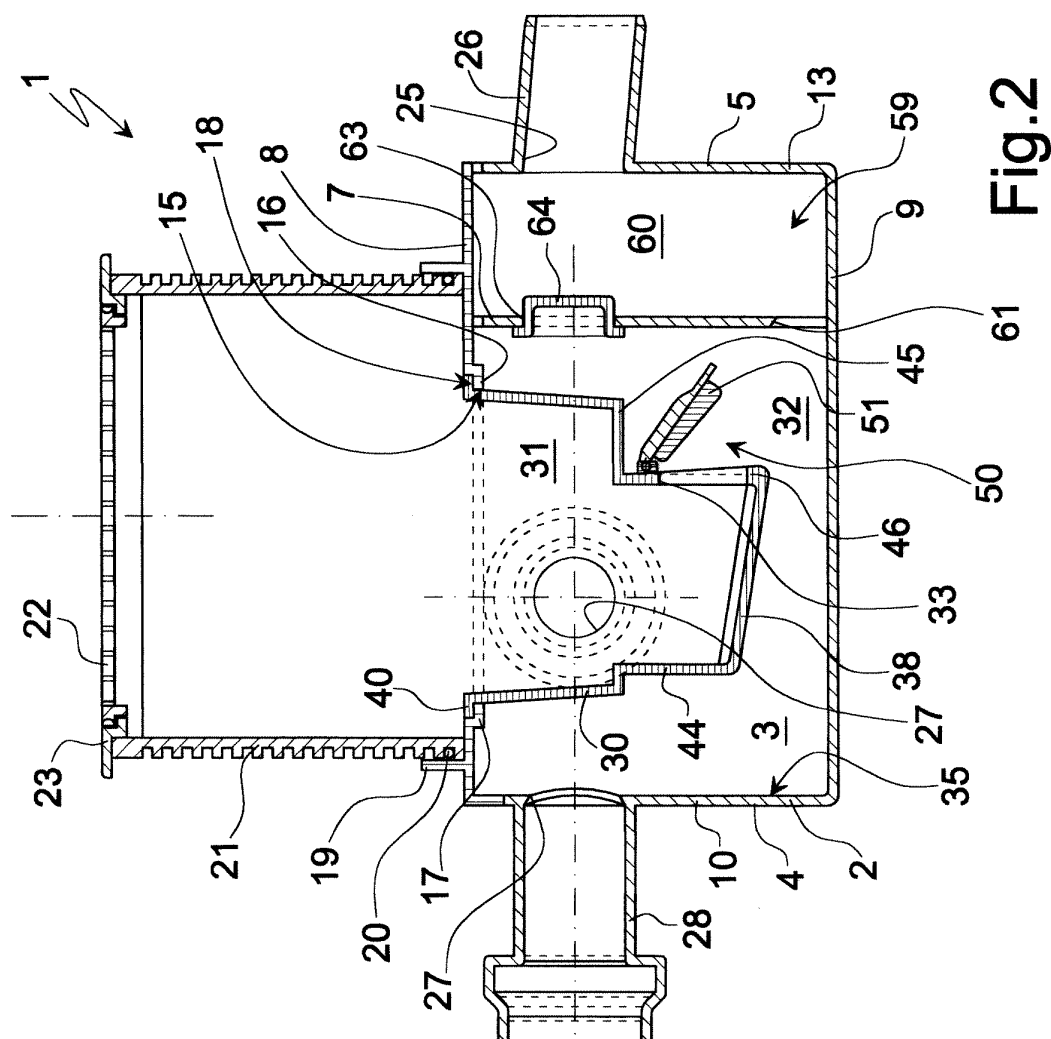
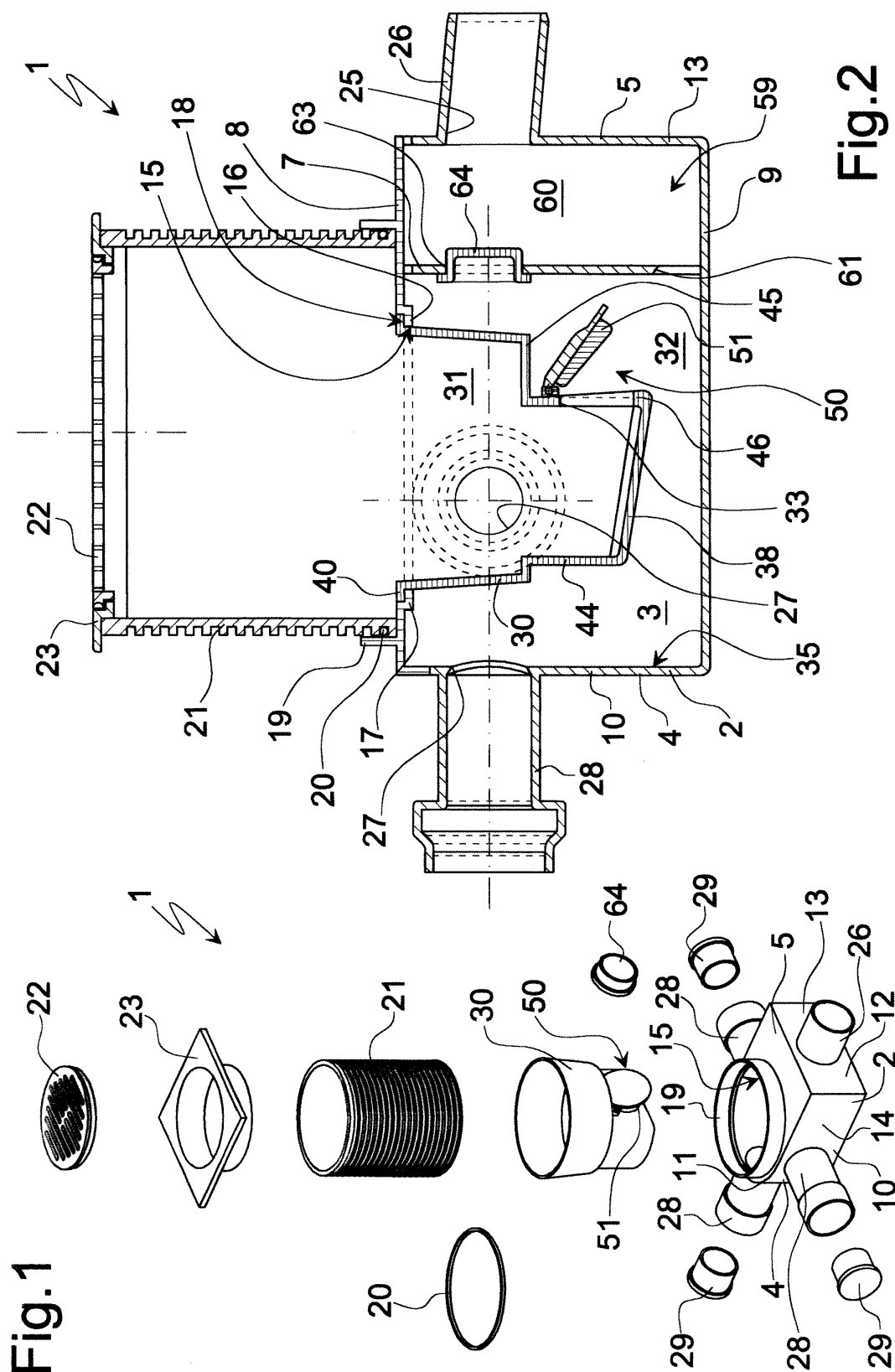
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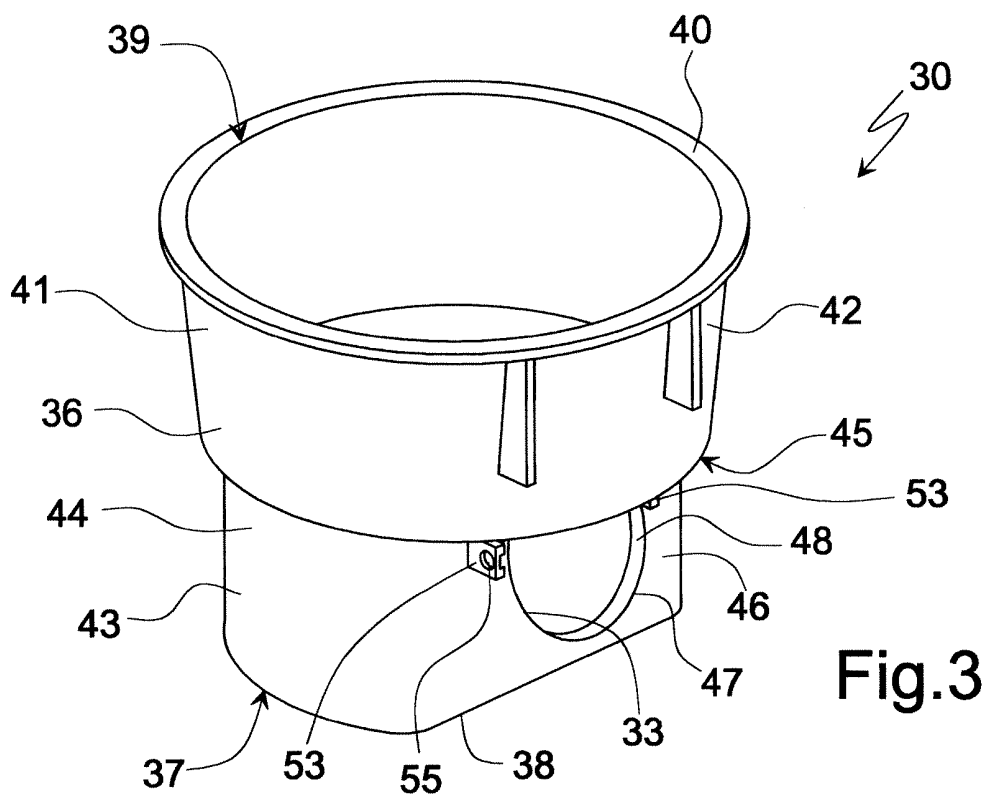
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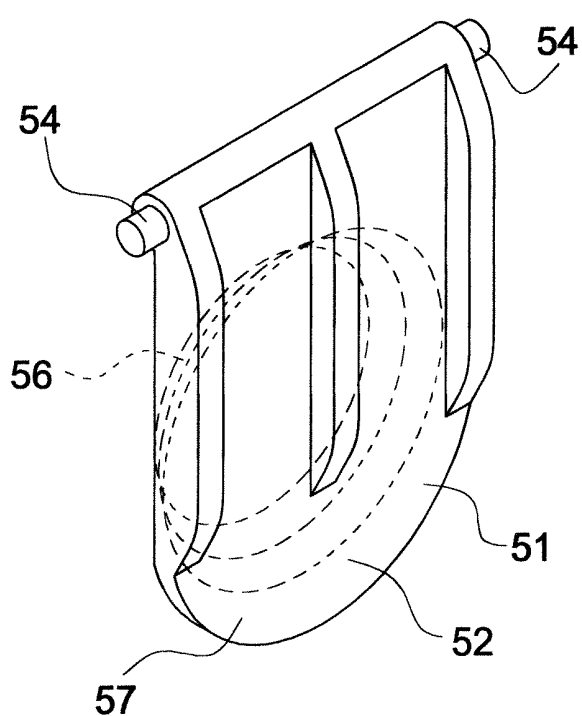
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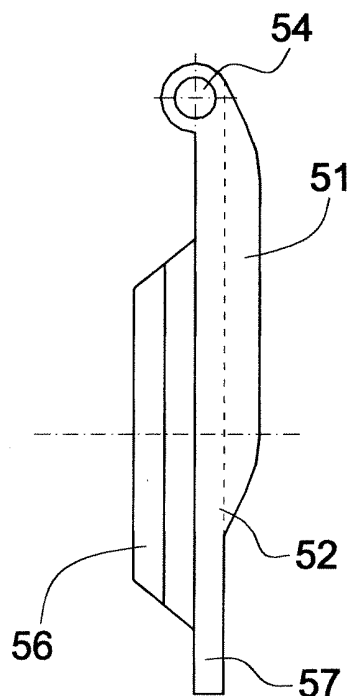




**Fig.3**



**Fig.4**



**Fig.5**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 10 2959

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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Place of search MUNICH		Date of completion of the search 2 September 2004	Examiner Flygare, E
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 04 10 2959

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