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(54) **Closure assembly and apparatus including the same**

(57) The invention relates to the provision of an item such as a sink, bath or shower tray which has a drain hole for liquid and which drain hole may be selectively sealed to allow a body of liquid to be collected in a cavity of the item. The drain hole leads to a drainpipe and the current invention provides a closure assembly which has a sealing member which can be moved between an open drainage position and closed sealing position. The member is provided downstream of the drain hole and typically within the drainpipe, within which the same is moveable between the two positions.

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Description

[0001] The invention to which this application relates is an assembly for use in the selective closing and opening of a drain hole provided within a sink, bath, shower tray or bidet or similar form of article and hereinafter referred to in a non-limiting manner as a sink.

[0002] Conventionally, sinks are provided to allow the use of liquid held within a cavity formed in the same for washing purposes and, once the washing activity has ceased, to allow the removal of the liquid from the sink via at least one drain hole provided in the basin of the same. In order to achieve this, the drain hole is provided with a plug which can be selectively positioned in the drain hole in a tight seal therewith in order to prevent liquid passing into the drain hole from the sink, or removed from the drain hole to open the drain hole and allow liquid to leave the sink and flow into the drain. While plugs are still used, they are generally regarded as being unsightly and therefore at least one alternative system is used extensively.

[0003] This alternative system utilises a plate like member which can be moved between a first, closed position in which the same seals against the periphery of or adjacent to the top face of the drain hole, and a second, open position in which the plate like member is raised from the drain hole to define a gap between the plate and drain hole and through which gap the liquid in the sink can pass into the drain hole to drain the liquid from the sink. The plate member can be provided with an external finish, such as for example, stainless steel or chrome, which is more pleasing to the eye than a normal plug. Furthermore, the movement of the plate can be achieved remotely from the plate location such that the user does not have to place their hands into what maybe a dirty liquid to move the cover from the closed to open position.

[0004] The movement of the plate is achieved via a mechanical actuation assembly which typically comprises two interconnected rods mounted within the drain hole on the underside of the plate. At a distal end of the rods there is provided, typically at a location adjacent to the taps provided on the sink, a portion which is exposed to be actuated by the user or may be linked to a rotational member which can be actuated by the user. This means that the user can actuate the cover without having to place their hands into the body of water held in the sink.

[0005] Although this assembly is found to be more attractive than a conventional plug, there are still problems. The first is that the particular shape and appearance of the plate which can be used, are relatively limited. Furthermore, the appearance of the assembly, when the plate is raised from the drain hole into the open position, is not particular appealing as the drain hole itself can be viewed. A further problem is that the plate and elongate member extending on the underside therefrom for connection with the mechanical actuation assembly, is typically a loose component and is subject to theft. If the same has been stolen, there is no way of closing the drain hole which means that the sink is unusable in terms of collecting a body of liquid. This is in contrast to conventional plugs which are typically located on the sink via a chain.

[0006] The aim of the present invention is to provide a closure assembly for selectively closing and opening a drain hole, and to provide the assembly in a form which allows greater options to be available in terms of the appearance of the drain hole and closure assembly and also to provide the closure assembly in a manner in which the same can not be easily removed.

[0007] In a first aspect of the invention there is provided apparatus having a cavity for the collection of a body of liquid therein, said cavity including at least one drain hole leading to a drain pipe, and a closure assembly, said closure assembly including a member movable between a closed position in which the body of liquid can be collected and an open position in which liquid is allowed to drain through the drain pipe and wherein said member is located downstream from the drain hole.

[0008] In one embodiment the said member is located in the drainpipe connected to the drain hole.

[0009] In one embodiment the item has a cavity and is provided as part of a sink, bath or shower tray assembly, to which reference is hereon made in a non limiting manner.

[0010] Typically, the member is provided as part of a closure assembly which includes actuating means to act on the member to move the same between the open and closed positions. In one embodiment, the actuating means comprises one or more rods, which have a free end which can be actuated, directly by a user, or via an actuating member, with said actuation possible at an external location on the sink remote from the member.

[0011] Typically, the said actuation location is such that the same can be used without the user having to bring their hand into contact with any liquid held in the cavity.

[0012] Providing the member at a location intermediate the drain hole opening and the opposing end of the drain pipe, allows the effective opening and closing of the drain hole to allow liquid to be collected in the cavity and to be drained therefrom.

[0013] Furthermore, as the member is located and retained within the drain pipe, the same is not easily accessible from the sink cavity and therefore the opportunity for the member to be stolen and render the sink unusable, is significantly reduced in comparison to conventional closures.

[0014] Preferably, on the sink side of the drain hole and typically substantially over said drain hole, there is provided a cover said cover positioned with respect to the drain hole opening to define one or more apertures through which liquid can pass so as to allow the same to enter the drain hole. It should be appreciated that liquid can enter the drain hole regardless of whether the member is in the open or closed position. However, if the member is in the closed position, the liquid will only be able to enter the drain pipe until it reaches the position of the

member in its sealing position, at which point no further movement of the liquid is possible along the drain pipe until the member is moved to the open position.

[0015] Preferably the majority of the mechanism is located below the item in an enclosure. In one embodiment the enclosure is provided as an integral part of the item and can also be used to conceal other components of the sink.

[0016] In one embodiment, to minimise the size of the enclosure a horizontally sealing waste trap is utilised.

[0017] In one embodiment, the cover is formed as a sheet material body and the aperture or apertures which are provided, are formed between a periphery of the cover and the drain hole opening and/or surface of the sink adjacent to the drain hole opening.

[0018] Thus, to a user viewing the sink from a normal position of use, the drain hole opening is not readily apparent and in plan view, the apertures between the cover and cavity are not visible.

[0019] In one embodiment, the shape of at least the external surface of the cover, is contoured to match the shape of the sink surface adjacent thereto.

[0020] In one embodiment, the material used to form the cover or at least form the external surface of the cover, has a selected appearance which, although required to be resistant to damage from the liquid, can be selected from a wide range of possible materials and therefore can be selected to provide a range of particularly distinctive visual appearances which would not be possible using conventional closure means. This can be achieved as the cover is not required to perform a movement function.

[0021] Typically, the cover is held in a fixed position with regard to the sink, regardless of whether liquid is being held in the sink or being drained therefrom.

[0022] In a further aspect of the invention there is provided a closure assembly for an item in the form of a sink, bath, shower tray or bidet, said item having at least one drain hole formed therein and a drain pipe extending from said drain hole to allow liquid to drain from the item when the closure assembly is in an open position, wherein said closure assembly comprises a member which can be moved between an open, drainage, position and a closed, sealing, position, actuation means to allow the member to be moved between said positions and a cover, said cover provided in a fixed relationship with regard to the item to define at least one aperture through which liquid leaves the item and enters the drain pipe.

[0023] Typically the member is operated by the actuation means which extend to an external location on or adjacent to the item, at which location the user can operate the actuation means and hence selectively move the member. Typically, the member is located within the drain pipe at a spaced distance from said cover which is typically located at the drain hole opening into the drain pipe.

[0024] Thus, when the item is being used to collect liquid therein to form a body of water, a portion of the liquid will be held in the drain pipe between said drain hole opening and the location of the member in the closed sealing position.

[0025] For the avoidance of doubt, it should be appreciated that reference to the use of the item in relation to a sink, should be interpreted as use in a kitchen sink, bathroom sink, bidet, bath, shower tray, or the like and indeed any item where there is a need to selectively collect liquid to form a body of water and also then selectively allow the release of the same to be drained away.

[0026] In a further aspect of the invention there is provided apparatus for the control of the flow of liquid through a drain hole from a sink, shower tray, bidet or bath leading to a drain pipe, said apparatus including a closure assembly, said closure assembly including a member movable between a closed position in which the liquid is prevented from draining and an open position in which liquid can drain and wherein said member is located downstream from the opening into the drain hole in both closed and open positions.

[0027] Specific embodiments of the invention are now described with reference to the accompanying drawings wherein;

Figure 1 illustrates a sink in accordance with one embodiment of the invention.

Figure 2 illustrates a sectional elevation of the sink of figure 1, along line A-A; and

Figures 3a and b illustrate a further view of the assembly in accordance with the assembly in accordance with the invention in open and closed positions.

[0028] Referring firstly to Figure 1, there is illustrated a sink in accordance with the invention, in the form of a bathroom sink. The sink 2, includes a cavity 4 in which water can be poured from one or more tap assemblies 6 which are mounted at the rim 8 of the cavity at the rear as shown. At the base 10 of the basin cavity, there is provided a cover 12 which can be of any shape, appearance as desired. It will therefore be seen that from the normal viewpoint of a user of the sink in direction 14, all that is apparent to them is the cover 12. There is no movable assembly or removable part provided within the cavity which is contrary to the conventional sink wherein there is either a plug or a plate which can be raised or lowered between an open and closed position to allow the drainage or collecting of liquid in the sink.

[0029] On the underside of the sink or basin, there is provided an enclosure 16, said enclosure acting as the masking means for the closure assembly provided for the sink.

[0030] Referring now to Figure 2, there is illustrated the sink and drainage assembly in accordance with the invention, with a cross section having been taken through line A - A of Figure 1. The drainage assembly comprises a drain hole 17 which leads into a drainpipe 18 and waste

trap 20 which, in this case, depend vertically downwardly and then horizontally to allow the same to be provided within the enclosure 16 on the underside of the sink

[0031] Within the vertical portion 18 of the drain, there is provided the closure assembly for the sink which is shown in more detail in Figures 3a and b. The closure assembly comprises a member 22, which comprises a plate-like portion 24 and a downwardly depending rod 26. The base or free end 28 of the rod 26, is contactable with an actuation means 30, which comprises, in this embodiment, first and second interconnected rods 32, 34. One end of the actuation means contacts with the free end 28 of the member 26 and the other end is connected to a lever 36 which is provided externally for user actuation and hence allows the user to move the closure assembly between open and closed positions.

[0032] The member 22 is provided to be raised and lowered so as to move the same between a lowered sealing position shown in Figure 3a and a raised drainage position shown in Figure 3b. In the lowered, sealing position, the member portion 24 seals against a peripheral lip 38 of the drainpipe and in a drainage position, the member portion 24 is raised from the peripheral lip 38 so as to form a gap 40 between the same. Thus, in use, in the closed, sealing position, water which is poured into the sink cavity 4, will enter into the portion 42 of the drainpipe through a gap 44 which is formed between the cover 12 and the external face 46 of the sink cavity 4, adjacent the drain hole opening 17. The liquid will then therefore flow through this gap and into the top portion 42 of the drainpipe until it meets the member portion 24 in its sealing position which prevents the liquid from passing any further down the drainpipe. The continued flow of liquid into the cavity, therefore causes the top portion of the drainpipe to fill up and, in due course, the basin cavity to fill up.

[0033] When it is required to drain the liquid from the basin cavity 4, the actuation means 30 is operated from lever 36 externally of the basin to cause the rods 32, 34 of the actuation means to move the member 22 from the sealed position to the open drainage position shown in Figure 3b, with the movement being as indicated by the arrow 48. In this position, the gap 40 which is formed between the member 22 and the peripheral lip 38 of the drainpipe, allows the flow of liquid therethrough and to continue along the remainder of the drainpipe and to the drainage system as indicated by the arrows 50.

[0034] It should therefore be appreciated that despite the movement of the member between the drainage and sealing positions, and also the change in condition of the sink which allows the collection or drainage of liquid in the basin cavity, that no visual change is apparent to the user of the sink as the cover 12 remains in its fixed position and therefore the appearance of the sink remains the same regardless of the drainage or sealed condition. This provides a visually more appealing sink to a user and furthermore, as the closure assembly is effectively trapped within the drainpipe, the ability for the theft of the member 22 is greatly reduced. Furthermore, access can still be gained to the closure assembly via the drainpipe to replace any parts or make any necessary repairs.

[0035] A further advantage of the present invention is that as the cover is the only portion which is viewable, the materials used for the remainder of the closure assembly which is held within the drainpipe, and which is not externally viewable, can be chosen with regard to functional and/or cost requirements rather than having to take into account any visual appearance implications.

Claims

1. Apparatus having a cavity for the collection of a body of liquid therein, said cavity including at least one drain hole leading to a drain pipe, and a closure assembly, said closure assembly including a member movable between a closed position in which the body of liquid can be collected and an open position in which liquid is allowed to drain through the drain pipe and wherein said member is located downstream from the drain hole.

2. Apparatus according to claim 1 wherein the apparatus is provided as part of a sink, bath or shower tray assembly.

3. Apparatus according to claim 1 wherein the closure assembly includes actuating means to act on the member to move the same between the open and closed positions.

4. Apparatus according to claim 3 wherein the actuating means comprises one or more rods, with a free end which can be actuated at a location remote from the said member.

5. Apparatus according to claim 4 wherein the actuation location allows the user to operate the same without having to bring their hand into contact with any liquid held in the cavity.

6. Apparatus according to claim 1 wherein the member is located intermediate the drain hole opening and the opposing end of a drain pipe section connected thereto.

7. Apparatus according to claim 6 wherein the member is located within the drainpipe.

8. Apparatus according to claim 1 wherein within the cavity there is located a cover positioned over the drainhole with one or more apertures between the cover and cavity walls through which liquid can pass so as to allow the same to enter the drain hole.

9. Apparatus according to claim 1 wherein liquid can

enter the drain hole regardless of whether the member is in the open or closed position.

10. Apparatus according to claim 1 wherein at least part of the closure assembly is located below the member in an enclosure.

11. Apparatus according to claim 10 wherein a horizontally sealing waste trap is located within the enclosure.

12. Apparatus according to claim 8 wherein the shape of at least the external surface of the cover, substantially matches the shape of the cavity wall adjacent thereto.

13. Apparatus according to claim 8 wherein the cover is provided in a fixed position with regard to the cavity.

14. A closure assembly for an item in the form of a sink, bath, shower tray or bidet, said item having at least one drain hole formed therein and a drain pipe extending from said drain hole to allow liquid to drain from the item when the closure assembly is in an open position, wherein said closure assembly comprises a member which can be moved between an open, drainage, position and a closed, sealing, position, actuation means to allow the member to be moved between said positions and a cover, said cover provided in a fixed relationship with regard to the item to define at least one aperture through which liquid leaves the item and enters the drain pipe.

15. An assembly according to claim 14 wherein the member is operated by the actuation means which extend to an external location on or adjacent to the item, at which location the user can operate the actuation means and hence selectively move the member.

16. An assembly according to claim 14 wherein the member is located within the drain pipe at a spaced distance from said cover which is located above the drain hole opening.

17. An assembly according to claim 16 wherein when the item is being used to collect liquid therein, a portion of the liquid will be held in the drain pipe between said drain hole opening and the location of the member when in the closed sealing position.

18. An assembly according to claim 14 wherein the member has plate like sealing portion and a rod extending therefrom.

19. Apparatus for the control of the flow of liquid through a drain hole from a sink, shower tray, bidet or bath leading to a drain pipe, said apparatus including a closure assembly, said closure assembly including a member movable between a closed position in which the liquid is prevented from draining and an open position in which liquid can drain and wherein said member is located downstream from the opening into the drain hole in both closed and open positions.

20. Apparatus according to claim 19 wherein the member is located in the drainpipe.

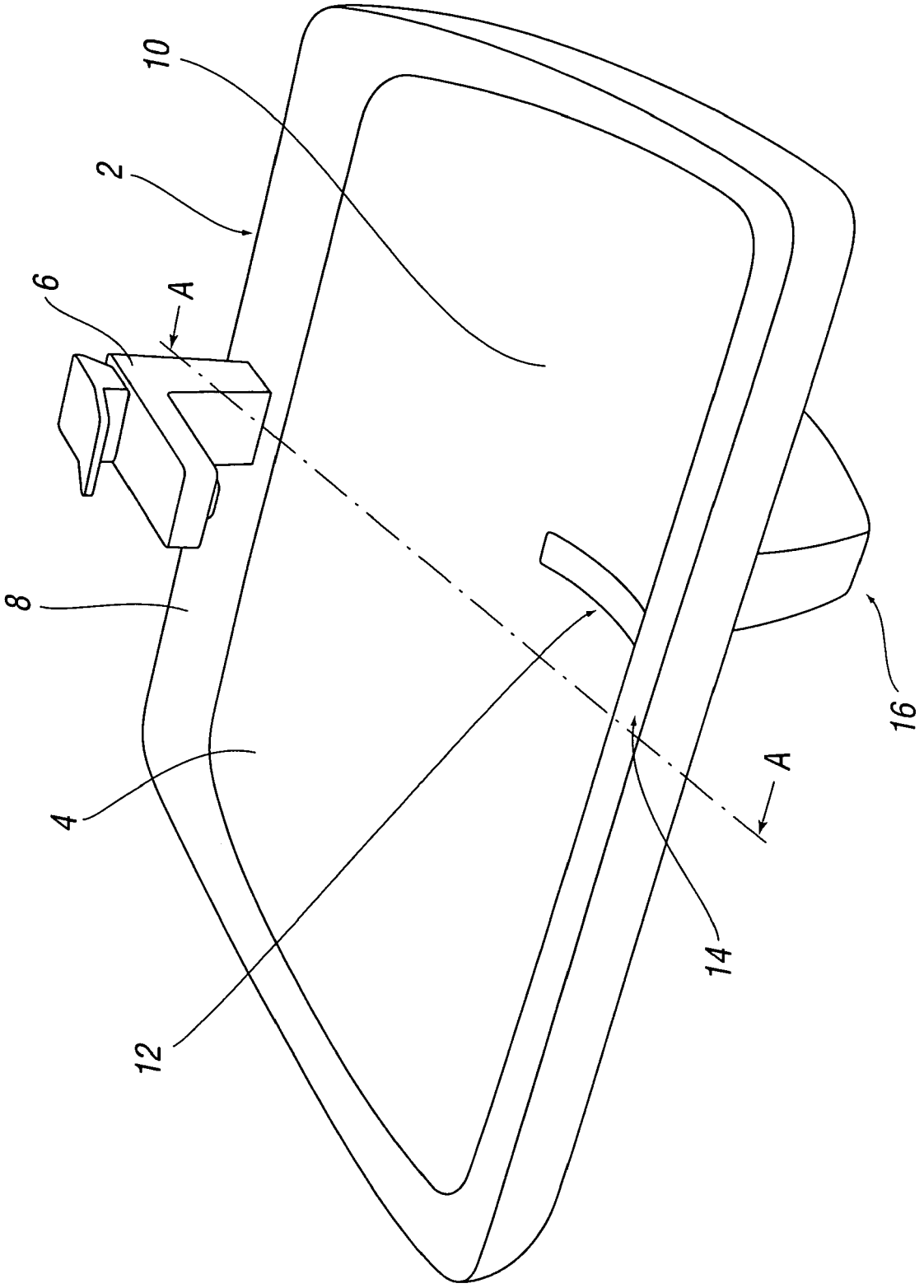

FIG. 1

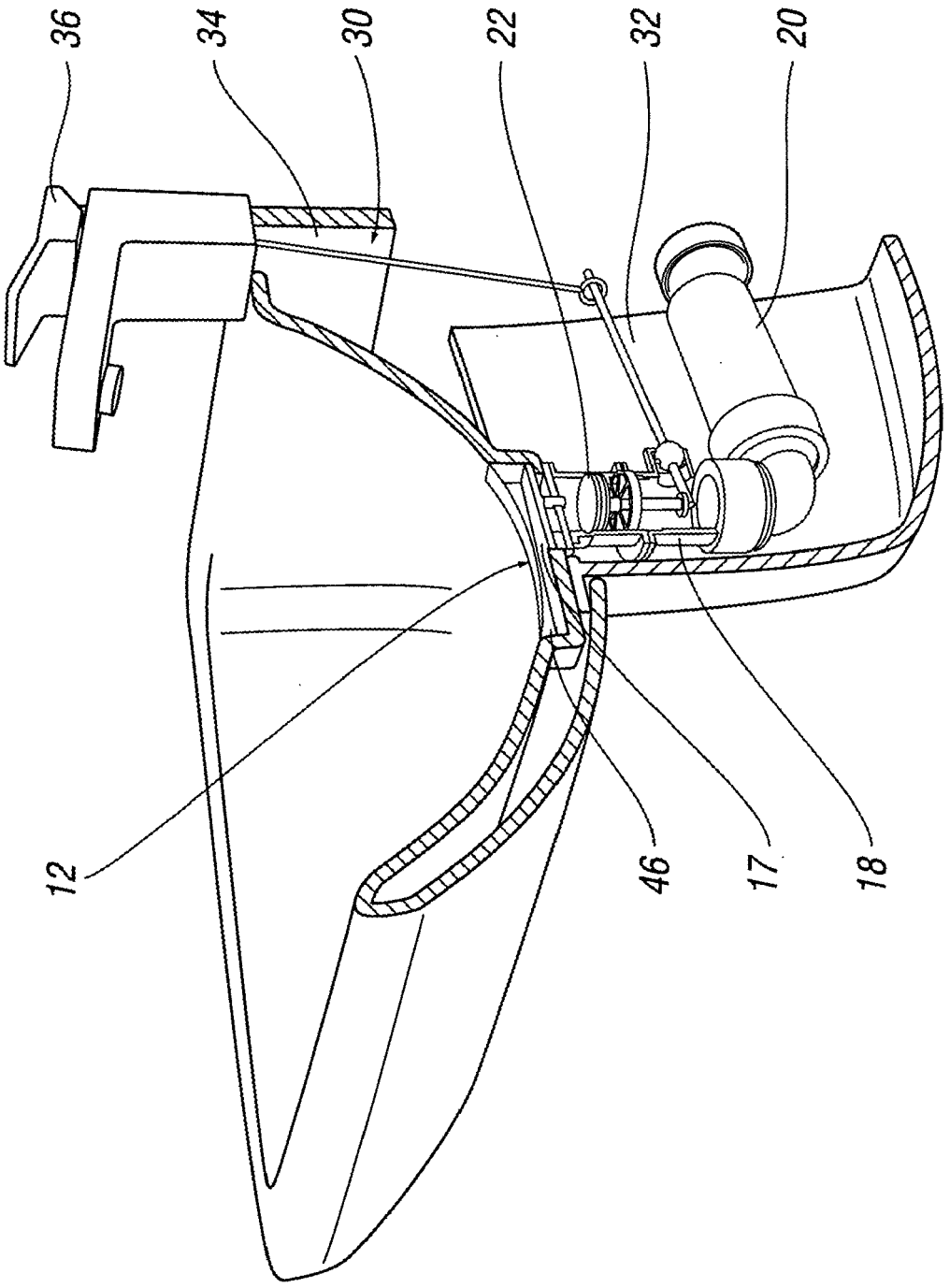

FIG. 2

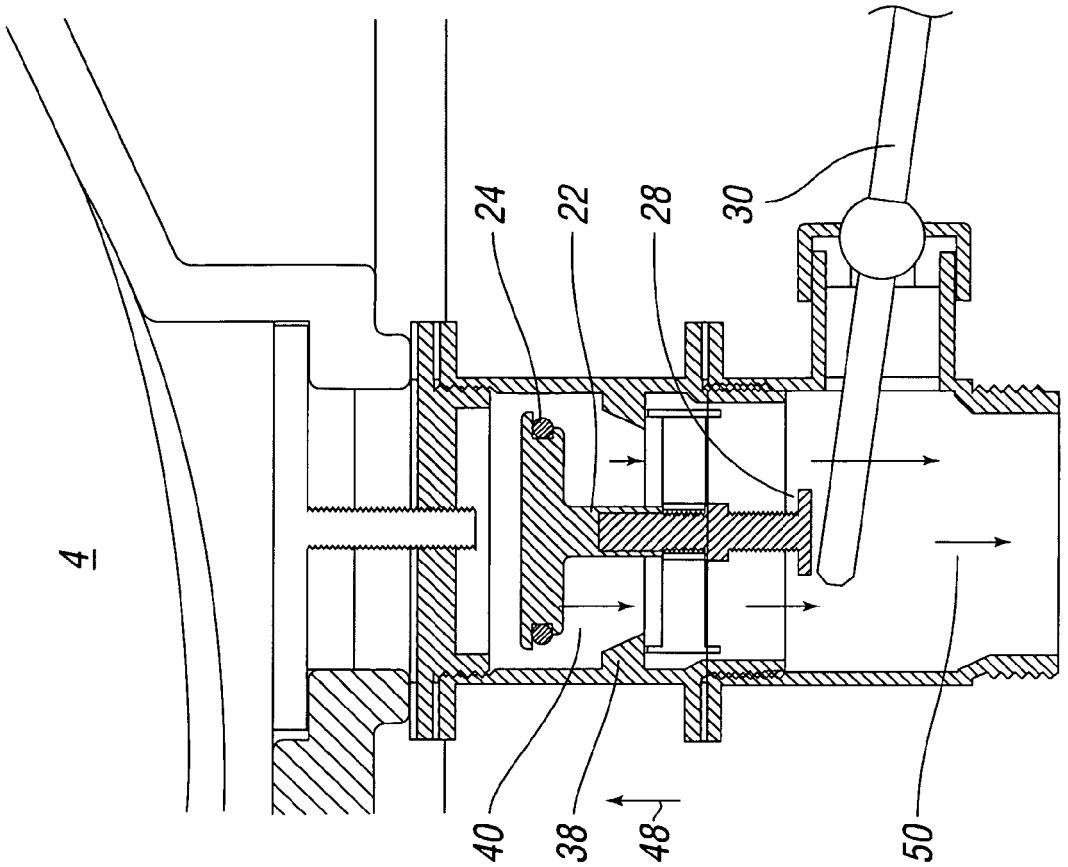

FIG. 3b

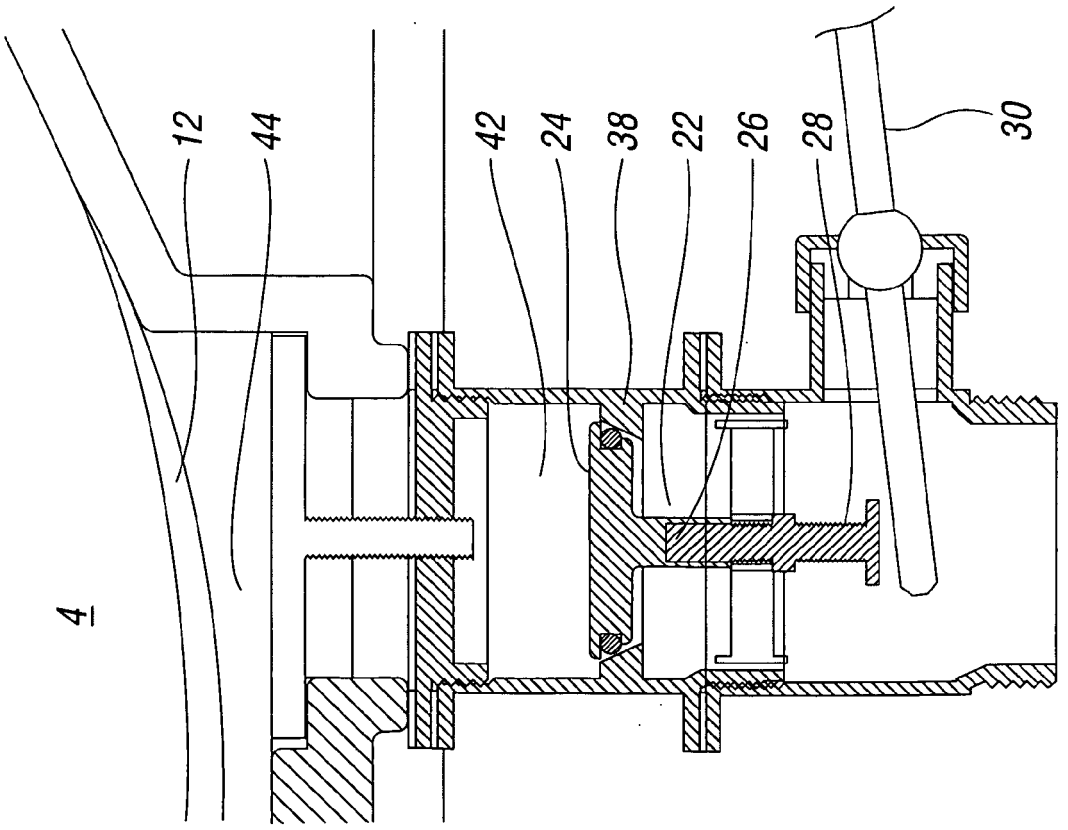

FIG. 3a