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(54) Captive plug

(57) A waste outlet fitting 10 for use in a basin or bath is described. The fitting includes a brass housing 12 for sealingly mounting the fitting 10 within a waste outlet, the housing defining a throughbore. A brass plug 14 is captively received within the housing 12 and a brass actuator 16 is attached to the plug 14, for use in moving the plug 14 from the closed configuration to an open configuration. The outer surface 18 of the housing 12 includes a threaded portion 20 on which are mounted attachment elements 22 for securing the waste outlet fitting 10 to the basin or bath.

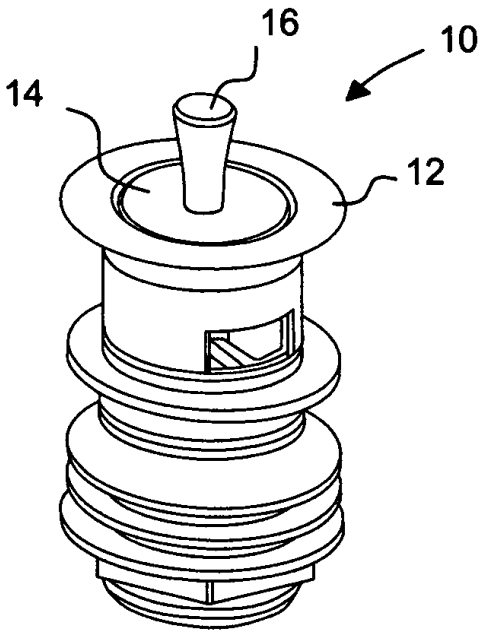

Fig 1.

EP 1 696 080 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to waste outlet fittings, particularly for a bath or a basin.

BACKGROUND OF THE INVENTION

[0002] The conventional plug on a chain for closing a basin outlet has a number of drawbacks, not least of which is that the plug can, by accident or design, become detached from the chain, or the chain become detached from the basin. A further drawback of the plug and chain arrangement is that people with restricted dexterity or strength can have difficulty pressing the plug into, or releasing the plug from, the basin or bath outlet.

[0003] Captive plugs, such as described in US Patent No 4,457,030, the disclosure of which is incorporated herein by reference, overcome a number of these disadvantages, as the plugs are far more difficult to remove from the basin.

[0004] A captive plug has a plug element retained in a housing. The plug element is movable between a closed position and an open position by pressing on one side of the plug, causing the plug to rotate within the housing about a horizontal transverse axis. However, captive plugs have associated drawbacks: for instance, after the plug is moved to the open position, liquid flowing through the outlet can cause the plug to rotate back towards the closed position. Additionally, when pressing on the edge of the plug to rotate the plug to the open position, a user's finger can enter and even become stuck in the basin outlet.

[0005] Those with restricted dexterity can also find known captive plugs difficult to manipulate.

[0006] It is an object of at least one embodiment of the present invention to provide an improved waste outlet fitting which overcomes at least one problem associated with the prior art.

SUMMARY OF THE INVENTION

[0007] According to a first aspect of the present invention there is provided a waste outlet fitting for a basin or bath or the like, the waste outlet fitting comprising:

a housing for sealingly mounting within a waste outlet, the housing defining a throughbore;
a plug captively received by the housing, the plug being rotatable between a closed position wherein the throughbore is closed and an open position wherein the throughbore is at least partially open; and
an actuation member extending from the plug for use in rotating the plug between the closed and open positions.

[0008] In a preferred embodiment, the provision of the actuation member makes opening and closing the waste outlet easier and safer, and the weight of the actuation member assists in preventing an open plug from rotating to the closed position under the action of the liquid being discharged from the basin or bath.

[0009] Preferably, the plug is in the form of a circular disc. At least a portion of the circumferential edge of the disc may, in the closed position, engage a seat defined by the housing to form a seal. Using a disc which forms an edge seal with a surface of the housing creates a seal around the entire periphery of the plug.

[0010] Preferably, the plug edge defines a convex surface, and the housing defines a complementary concave seat. Providing complementary curved surfaces on the edge of the plug and the housing maximises the sealing area between the plug and the seat to improve the performance of the waste outlet fitting.

[0011] The plug may be moved from the closed position towards the open position by applying a lateral force to the actuation member sufficient to rotate the plug about an axis transverse to the longitudinal axis of the throughbore.

[0012] The actuation member is most preferably located towards the centre of the plug. In one embodiment, the actuation member is aligned with the longitudinal axis of the throughbore. Locating the actuation member towards the centre of the plug, particularly along the longitudinal axis of the throughbore, means the plug may be moved by pushing the actuation member in any direction transverse to the longitudinal axis of the throughbore, rather than pulling or pushing on the actuation member in a direction parallel to the throughbore axis. This method of operation has the advantage that the actuation member does not need to be gripped, or moved with any degree of precision, with the result that it can be easily manipulated by, for example, a person with restricted hand mobility, a person wearing protective gloves, or using a tool or implement. Furthermore, the possibility of a user's fingers entering the waste whilst the plug is being opened or closed is greatly reduced.

[0013] The actuation member may be connected to the plug by means of a threaded engagement. The actuation member may include a threaded male portion, which is engageable with a female threaded portion on the plug. Alternatively, the plug may include a threaded boss, which is engageable with a threaded receiving portion on the actuation member.

[0014] In a further alternative, the actuation member may be welded to the plug or formed integrally with the plug. It will be understood any suitable method of attaching the actuation member to the plug may be employed.

[0015] In one arrangement, the actuation member is secured to the plug by means of a separate screw.

[0016] The plug may define an aperture through the centre of the plug to permit the insertion and removal of securing means, typically a screw-bolt, for securing the waste outlet fitting to the waste outlet of the bath or basin.

[0017] Many waste outlet fittings are provided with a grid or spider, located within the throughbore, which acts as a coarse filter to prevent large objects entering the waste pipe work. The screw-bolt may pass through a central aperture in the grid or spider to engage a portion of the waste outlet or another portion of the waste outlet fitting to secure the waste outlet fitting to the bath or basin or the like.

[0018] Preferably, the actuation member is of a relatively dense and inert material, such as brass, stainless steel or heavy duty polymeric materials. A dense material such as brass will raise the combined centre of gravity of the plug and actuation member to assist in retaining the plug and actuation member in the open position as a liquid flows through the outlet.

[0019] The inert material may be chrome plated. For materials such as brass, a chrome plate finish can be more aesthetically pleasing.

[0020] Preferably, the plug and housing are of a relatively dense and inert material, such as brass, stainless steel or heavy duty polymeric materials

[0021] Preferably, the plug is snap-fitted or pressed into the housing.

[0022] The housing may include an overflow outlet.

[0023] By virtue of the present invention, a waste outlet fitting is provided which combines ease of use and reliability of performance.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The present invention will now be described by way of example only with reference to the accompanying Figures in which:

Figure 1 is a perspective view of a waste outlet in a closed configuration according to a first embodiment of the present invention;
Figure 2 is a side view of the waste outlet fitting of Figure 1;
Figure 3 is a cross-sectional view of the waste outlet fitting of Figure 1;
Figure 4 is a cross-sectional view of the waste outlet fitting of Figure 1 in an open configuration;
Figure 5 is a perspective view of a waste outlet fitting according to a second embodiment of the present invention in a closed configuration;
Figure 6 is a side view of the waste outlet fitting of Figure 5;
Figure 7 is a cross-sectional view of the waste outlet fitting of Figure 5;
Figure 8 is a cross-sectional view of the waste outlet fitting of Figure 5 in an open configuration.

[0025] Figure 9 is cross-sectional exploded view of a waste outlet fitting according to a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0026] Reference is first made to Figure 1, a perspective view of a basin waste outlet fitting, generally indicated by reference numeral 10, in a closed configuration, and to Figure 2, a side view of the waste outlet fitting 10.

[0027] The waste outlet fitting 10 includes a brass housing 12 for sealingly mounting within a waste outlet (not shown). A brass plug 14 is captively received within the housing 12 and a brass actuator 16 is attached to the plug 14, for use in moving the plug 14 from the closed configuration, shown in Figure 1, to an open configuration.

[0028] The outer surface 18 of the housing 12 includes a threaded portion 20 on which are mounted conventional attachment elements 22 for securing the waste outlet fitting 10 to a basin (not shown). These attachment elements 22 are widely used and known to the person of skill in the art.

[0029] Referring now also to Figure 3, a cross-sectional view of the waste outlet fitting 10, the plug 14 is a circular disc having a radiussed concave edge 24. The plug 12 is captively received by the housing 12 and the housing includes a seat 26, which defines a complementary radiussed concave surface 28. In the closed configuration, the gap between the plug edge 24 and the seat 26 is sufficiently small to form an effective water seal.

[0030] The actuator 16 is secured within a recess 30 in the plug 14 by a threaded connection 32.

[0031] The housing 12 defines a throughbore 34 having a longitudinal axis 36. The actuator 16 is located in the centre of the plug 14 and, in the closed position, is substantially aligned with the axis 36.

[0032] To rotate the plug 14 from the closed position shown in Figures 1 to 3 to the open position shown in Figure 4, a cross-sectional view of the waste outlet 10 in an open configuration, a force is applied transverse to the longitudinal axis 36 causing the plug 14 to rotate about an axis perpendicular to the longitudinal axis 36.

[0033] Figures 5 to 8 show an alternative waste outlet fitting 40 according to a second embodiment of the present invention. The waste outlet fitting 40 is for fitting to a bath (not shown) and the features and operation of the waste outlet fitting 40 are similar to those already discussed in connection with Figures 1-4.

[0034] Referring now to Figure 9, there is shown a cross-sectional view of a waste outlet fitting 50 according to a third embodiment of the present invention.

[0035] In this embodiment, the waste outlet fitting 50 has an upper housing 51 and a lower housing 52. The waste outlet fitting 50 is secured to a bath 60 by sandwiching the bath outlet 53 between the upper and lower housings 51, 52. The lower housing 52 has a lip 55, which supports a seal flange 57.

[0036] The upper and lower housings 51, 52 are secured together by means of a screw-bolt 54.

[0037] The head of the screw-bolt 54 engages a spider 58 formed integrally with the upper housing 51, the shaft of the screw-bolt 54 passing through an aperture 56 in the spider 58 and engaging with an internally-threaded second aperture 62 defined by the lower housing 52.

[0038] To permit the waste outlet fitting 50 to be supplied in an assembled configuration, the plug 68 is provided with an aperture 70 through which the screw-bolt 54, and the head and shaft of a screwdriver, may pass. The actuator 66 is releasably secured to the plug 68 by an internal thread 72 which engages an external thread 74 on a boss 76. The boss 76 extends from an upper surface 78 of the plug 68.

[0039] The external surface 80 of the lower housing 52 is smooth and is adapted to be received within associated pipework or the entrance to a trap (not shown).

[0040] To fit the waste outlet fitting 50 to the bath 52, the bath outlet 53 is sandwiched between the upper and lower housings 51, 52, the actuator 66 is unscrewed from the plug 68, permitting the bolt 54 to be passed through the first aperture 56 and screwed into the second aperture 62.

[0041] Various modifications and improvements may be made to the embodiments hereinbefore described without departing from the scope of the invention. For example, although the actuator is shown centrally located on the plug, an off-centre location could be used. In this case, the actuator could be in the form of a ring or hook which a user could pull to close or open the plug. Furthermore, the edge of the plug could be provided with a rubber 0-ring which assists in forming a seal in the closed configuration.

[0042] The illustrated embodiments feature relatively short actuators, however in other embodiments a relatively long actuator could be provided, to allow the plug to be opened and closed without the user having to place a hand in the liquid in the basin or bath.

[0043] In other embodiments an actuation member could be provided to extend from a lower face of the plug, allowing the plug to be rotated by a rod, lever or cable arrangement extending below the basin or bath.

[0044] In the embodiment shown in Figure 9, the external surface of the lower housing could be threaded to form a threaded connection with associated pipework or the entrance to a trap.

[0045] Those of skill in the art will also recognise that the above described embodiments of the invention provide a waste outlet fitting which combines ease of use with reliability of performance.

Claims

1. A waste outlet fitting for a basin or bath or the like, the waste outlet fitting comprising:

   a housing for sealingly mounting within a waste outlet, the housing defining a throughbore;
   a plug captively received by the housing, the plug being rotatable between a closed position wherein the throughbore is closed and an open position wherein the throughbore is at least partially open; and
   an actuation member extending from the plug for use in rotating the plug between the closed and open positions.

2. The waste outlet fitting of claim 1 wherein, the plug is in the form of a circular disc.

3. The waste outlet fitting of claim 2 wherein, at least a portion of the circumferential edge of the disc in the closed position, engages a seat defined by the housing to form a seal.

4. The waste outlet fitting of claim 3 wherein, the plug edge defines a convex surface, and the housing defines a complementary concave seat.

5. The waste outlet fitting of any preceding claim wherein, the plug is moved from the closed position towards the open

position by applying a lateral force to the actuation member sufficient to rotate the plug about an axis transverse to the longitudinal axis of the throughbore.

6. The waste outlet fitting of any preceding claim wherein, the actuation member is most preferably located towards the centre of the plug.

7. The waste outlet fitting of claim 6 wherein, the actuation member is aligned with the longitudinal axis of the throughbore.

8. The waste outlet fitting of any preceding claim wherein, the actuation member is connected to the plug by means of a threaded engagement.

9. The waste outlet fitting of claim 8 wherein, the actuation member includes a threaded male portion, which is engageable with a female threaded portion on the plug.

10. The waste outlet fitting of claim 8 wherein, the plug includes a threaded boss which is engageable with a threaded receiving portion on the actuation member.

11. The waste outlet fitting of any of claims 1 to 7 wherein, the actuation member is welded to the plug or formed integrally with the plug.

12. The waste outlet fitting of any of claims 1 to 7 wherein, the actuation member is secured to the plug by means of a separate screw.

13. The waste outlet fitting of any preceding claim wherein, the plug defines an aperture through the centre of the plug to permit the insertion and removal of securing means for securing the waste outlet fitting to the waste outlet of the bath or basin.

14. The waste outlet fitting of claim 13 wherein, the screw-bolt passes through a central aperture in a grid or spider to engage a portion of the waste outlet or another portion of the waste outlet fitting, to secure the waste outlet fitting to the bath or basin or the like.

15. The waste outlet fitting of any preceding claim wherein, the actuation member is of a relatively dense and inert material.

16. The waste outlet fitting of claim 15, wherein the inert material is chrome plated.

17. The waste outlet fitting of any preceding claim wherein, the plug and housing are of a relatively dense and inert material.

18. The waste outlet fitting of any preceding claim wherein, the plug is snap-fitted or pressed into the housing.

19. The waste outlet fitting of any preceding claim wherein, the housing includes an overflow outlet.

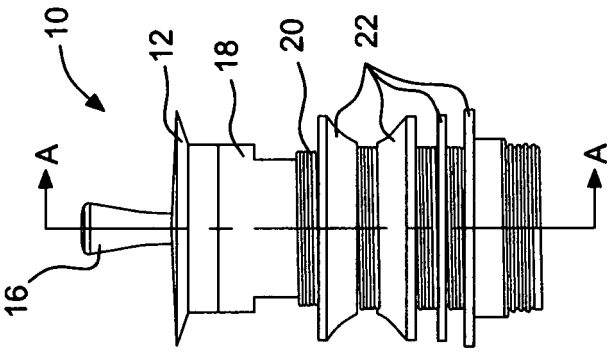

Fig 2.

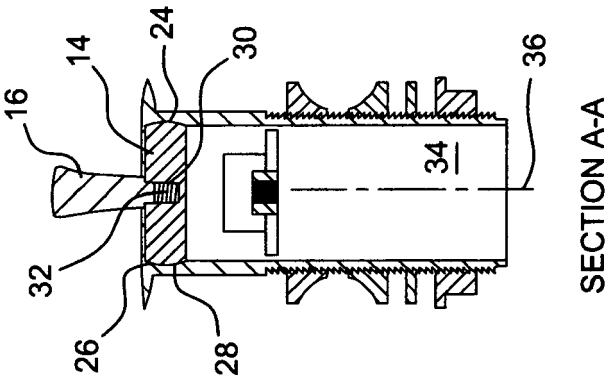

Fig 3.

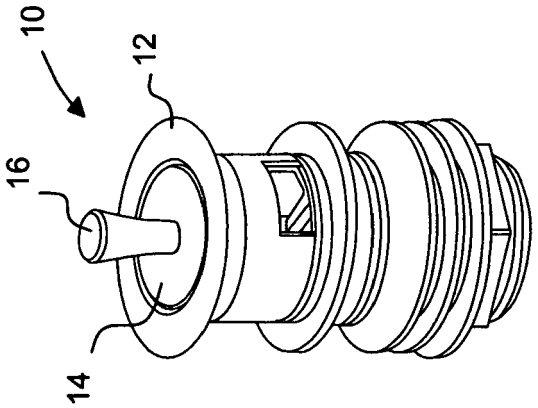

Fig 1.

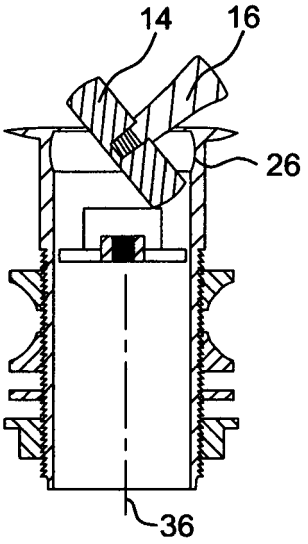

Fig 4.

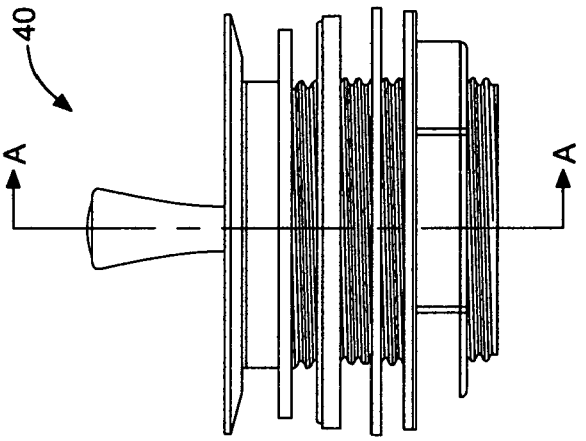

Fig 7.

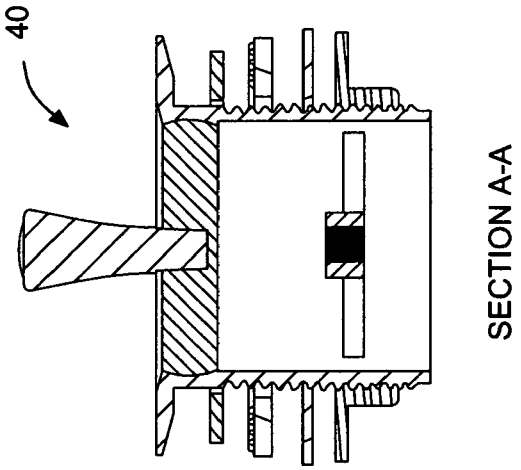

Fig 6.

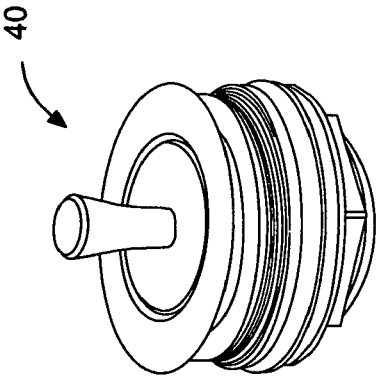

Fig 5.

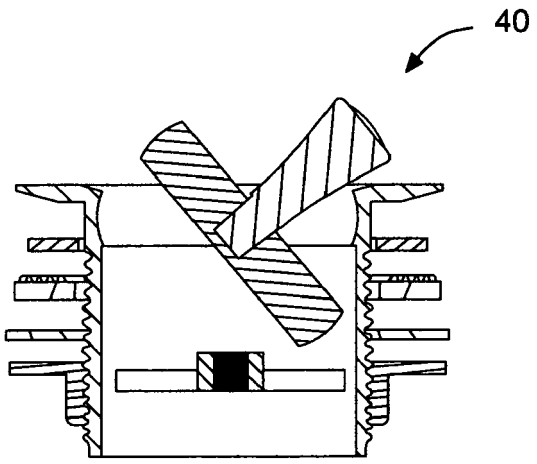

Fig 8.

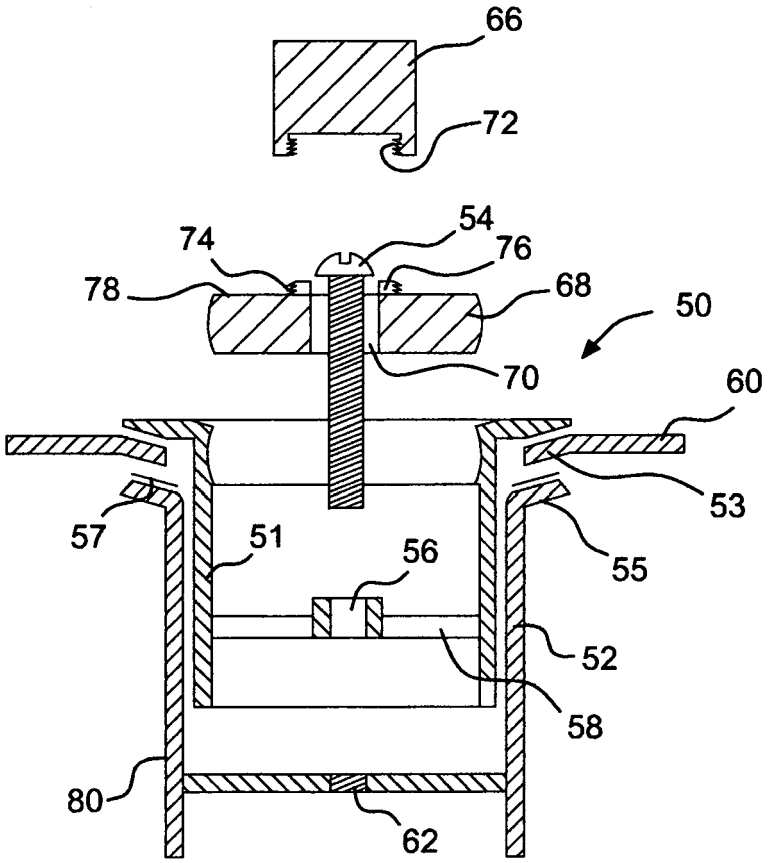

Fig 9.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 25 0849

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	GB 07881 A A.D. 1910 (MOSES JAMES ADAMS) 3 April 1911 (1911-04-03) * figure 2 * -----	1-3,5-7, 11,15-17	
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			TECHNICAL FIELDS SEARCHED (IPC) E03C A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	30 May 2006	Geisenhofer, M

CATEGORY OF CITED DOCUMENTS

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30-05-2006

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