(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 657 370 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.05.2006 Bulletin 2006/20

(51) Int Cl.:
E03D 13/00 *(2006.01)*

(21) Application number: **05256967.0**

(22) Date of filing: **11.11.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **15.11.2004 AU 2004906532**

(71) Applicant: **CAROMA INDUSTRIES LIMITED**
Brisbane,
Queensland 4000 (AU)

(72) Inventor: **Cummings, Stephen John**
Newport 2106
New South Wales (AU)

(74) Representative: **Godwin, Edgar James**
Marks & Clerk
90 Long Acre
London WC2E 9RA (GB)

(54) A removable cartridge assembly for a waterless urinal

(57) A removable cartridge assembly (16) for a waterless urinal (10). The cartridge assembly (16) comprises a cup (42) and a cap (46). The cup (42) is adapted to receive a scent block (44) therein. The cap (46) is adapted to releasably engage the cup (44). When the cap (46) is engaged with the cup (42), the scent block (44) is retained in the cup (42) and, when the cap (46) is disengaged from the cup (42), the scent block (44) is removable from within the cup (42), and thus from the cartridge assembly (16).

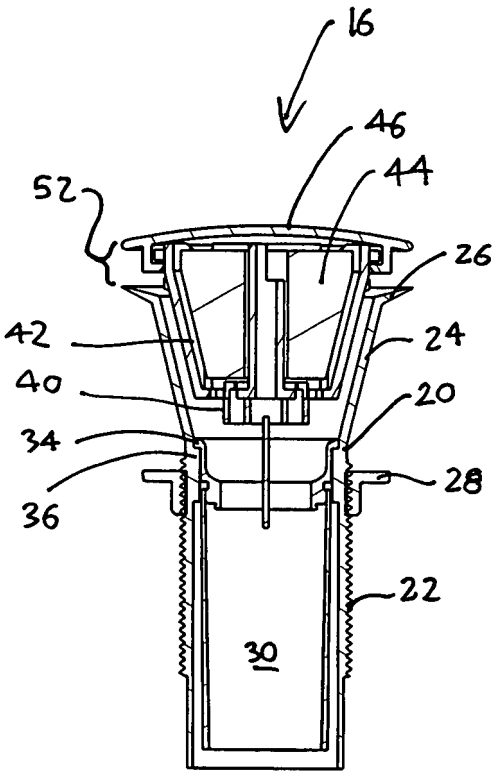

FIG. 6

EP 1 657 370 A2

Description

Field of the Invention

[0001] The present invention relates to a removable cartridge assembly for a waterless urinal.

Background of the Invention

[0002] Waterless urinals that utilise a one-way valve are known. The valve automatically opens in the presence of urine, to allow the urine to flow therethrough to sewerage, and then automatically closes to prevent the passage of any sewerage odour to the room where the waterless urinal is installed. It is also known to mount the valves in a removable cartridge assembly that can be fitted to a purpose built urinal or retro-fitted to an existing flushing urinal, after the flushing water supply to the latter is disabled. It is also known for the cartridge to contain a scent or deodorant block to reduce the negative impact of any odours that may become associated with the cartridge due to having urine pass therethrough.

[0003] A known cartridge assembly has a domed cap which protrudes into the interior of the urinal bowl, which is not aesthetically pleasing.

[0004] A known cartridge assembly also has a scent block contained within a plastic casing that can be releasably connected to the cartridge assembly. This results in unnecessary expense and material wastage as the plastic casing is also discarded when the scent block has been depleted.

[0005] It is an object of the present invention to substantially overcome or at least ameliorate one or more of the prior art deficiencies.

Summary of the Invention

[0006] Accordingly, in a first aspect, the present invention provides a removable cartridge assembly for a waterless urinal, the cartridge assembly comprising:

a cup adapted to receive a scent block therein; and
a cap adapted to releasably engage the cup,
wherein, when the cap is engaged with the cup, the scent block is retained in the cup and, when the cap is disengaged from the cup, the scent block is removable from within the cup, and thus from the cartridge assembly.

[0007] The cup preferably has at least one tab adapted to releasably engage at least one corresponding opening in the cap.

[0008] The cartridge preferably includes a body adapted for sealing connection to an opening in the waterless urinal. The body preferably has an external thread on one end for engaging a retaining nut. The other end of the body preferably has a distally diverging taper adapted to receive the cup therein.

[0009] The interior of the body preferably has a shoulder adapted to engage with corresponding recess formed in a flexible one way valve. The cup is preferably releasably connected to, and supported within the taper by, the valve.

[0010] The cap is preferably located spaced apart from the body by a gap through which urine can enter the body.

[0011] The cap is preferably adapted for removal from the cup, from within the urinal, whilst the cartridge assembly is installed in the urinal.

[0012] In a second aspect, the present invention provides a waterless urinal comprising:

a urinal bowl having an interior surface with an outlet opening therein;
a removable cartridge assembly adapted to mount within the opening, the cartridge assembly having a substantially flat cap,
wherein the cartridge assembly is mounted with the cap substantially parallel to, and slightly proud of, the bowl surface adjacent to the outlet opening.

[0013] The cap is preferably positioned above the adjacent bowl surface by a gap, most preferably approximately a 9 mm gap.

[0014] The cap is preferably slightly convex into the interior of the urinal bowl.

[0015] The removable cartridge assembly preferably has a scent block holder therein and the cap is preferably releasably connected to the scent block holder.

[0016] In a third aspect, the present invention provides a waterless urinal cartridge assembly removal and installation tool, the cartridge assembly comprising: a scent block; a scent block cup; a cap; and one-way valve, the tool comprising: a first end adapted for selective engagement with one or more of the cup, scent block or cap, and the second end adapted for selective engagement with the one-way valve.

[0017] Preferably, the first end comprises a set of manually expandable, spring retractable jaws and the second end comprises a manually slidable, valve engagement and ejection device.

Brief description of the drawings

[0018] Preferred examples of the invention will now be described, by way of examples only, with reference to the accompanying drawings, in which:

Fig. 1 is a cross-sectional side view of a waterless urinal according to a first embodiment of the invention, having a removable cartridge assembly, according to a first embodiment of the invention, therein;
Fig. 2 is a side view of the cartridge assembly shown in Fig. 1;
Fig. 3 is a front view of the cartridge assembly shown in Fig. 1;

Fig. 4 is a top view of the of the cartridge assembly shown in Fig. 1;
Fig. 5 is a bottom view of the cartridge assembly shown in Fig. 1;
Fig. 6 is a cross-sectional view of the cartridge assembly shown in Fig. 1 along the line 6-6;
Fig. 7 is a cross-sectional view of the cartridge assembly shown in Fig. 1 along the line 7-7;
Fig. 8 is a side view of a removable cartridge assembly according to a second embodiment of the invention;
Fig. 9 is a cross-sectional side view of the cartridge assembly shown in Fig. 8 along the line 9-9;
Fig. 10 is a top view of the cartridge assembly shown in Fig. 8;
Fig. 11 is a bottom view of the cartridge assembly shown in Fig. 8.
Fig. 12 is a side view of a removable cartridge assembly according to a third embodiment of the invention;
Fig. 13 is a cross-sectional side view of the cartridge assembly shown in Fig. 12 along the line 13-13;
Fig. 14 is a top view of the cartridge assembly shown in Fig. 12;
Fig. 15 is a bottom view of the cartridge assembly shown in Fig. 12;
Fig. 16 is a front view of an embodiment of a cartridge assembly removal and installation tool according to the invention;
Fig. 17 is a side view of the tool shown in Fig. 16;
Fig. 18 is a cross-sectional side view of the tool shown in Fig. 16 along the line 18-18;
Fig. 19 is a top view of the tool shown in Fig. 16; and
Fig. 20 is a bottom view of the tool shown in Fig. 16.

Detailed description of the preferred embodiment

[0019] Referring firstly to Fig. 1, there is shown a first embodiment of a waterless urinal 10 according to the invention. The urinal 10 has an interior bowl surface 12 with an outlet opening 14. Fig. 1 also shows a first embodiment of a removable cartridge assembly 16 according to the invention. The cartridge assembly 16 is mounted within the opening 14 and connected to mains sewerage by pipes 18.

[0020] The cartridge assembly 16 is best shown in Figs. 2 to 7 and has a generally cylindrical plastic body 20. The body 20 has external threads 22 on one end and a distally diverging taper 24 on the other end. The taper 24 terminates in a flange 26 which is adapted, upon installation, to seal against the outlet opening 14 in the urinal's interior surface 12. The cartridge assembly 16 is inserted through the outlet opening 14 from the urinal's interior and is retained by tightening a nut 28 along the thread 22 until it engages with the lower edge 14a of the outlet opening 14.

[0021] A rubber one-way valve 30 is positioned within the body 20 by an external flange 34 thereon locating against an internal shoulder 36 on the interior of the body 20. The valve 30 is of the type previously described and has flexible walls 38 (see Fig. 7) which expand and separate to allow urine to pass downwardly therethrough and then automatically close to the position shown in Fig. 7 to prevent odour from passing upwardly therethrough.

[0022] The top of the valve 30 has four locating arms 40 which are adapted to snap engage with a plastic cup 42. The cup 42 is adapted to receive a scent or deodorising block 44 therein. A shallowly curved, plastic cap 46 is releasably connected to the cup 42 by tabs 48 on the cup 42 which engage with corresponding openings 50 in the cap 46. The cap 46 can be removed from the cup 42 by pressing the tabs 48 inwardly away from the openings 50. The operation of the tabs 48 make the cartridge assembly 16 resistant to unauthorised disassembly (e.g. by vandals), as will be described in more detail below, making it suitable for public applications.

[0023] The cap 46 is positioned so as to leave about a 9 mm high gap 52 between the bottom of the cap 46 and the top of the flange 26. In use, urine flows along the bowl surface 12 into the gap 52, through the cartridge assembly 16 and through the valve 32 to mains sewerage via the pipes 18. The gap 52 also allows pleasant odours from the scent block 44 to pass into the room in which the urinal 10 is installed.

[0024] The cartridge and urinal described above have several advantages. Firstly, the cartridge is very easy to install and use. It is also very easy to install, remove, or replace the scent block 44, and without requiring disassembly of the cartridge 16 from the urinal 10. Secondly, the mounting of the slightly convexly curved (almost flat) cap 46 only slightly protruding from the adjacent interior surface 12 of the urinal 10 provides an aesthetically pleasing, unobtrusive visual appearance to the cartridge assembly 14 and the urinal 10, as the cap appears to follow the contours of the bowl interior. This is particularly apparent when viewed from almost directly above, which is the point of view of most users of the urinal 10.

[0025] Figs. 16 to 20 show an embodiment of a cartridge assembly removal and installation of a tool 60 according to the installation. The tool 60 has a handle 61, a first end 62, adapted for selective engagement with the cap 56, and a second end 64, adapted for selective engagement with the scent block 44.

[0026] The first end 62 of the tool 60 has a fixed jaw 66 and a moveable jaw 68. The movable jaw 68 is connected to button 70 and, as best shown in Fig. 18, depression of the button 70 towards the tool body 61, as indicated by arrow 72, causes the movable jaw 68 to move away from the tool body 61, as indicated by arrow 74, to increase the distance between the jaws 66 and 68. The tool 60 also includes a spring 76 which biases the jaws towards the (minimum opening) position shown in Figs. 16 to 20 in the absence of pressure on the button 70.

[0027] In use, a user depresses the button 70 to widen the gap between the jaws 66, 68. This allows the jaws 66, 68 to be passed over the top of the cap 46 and into

the gap 42. When pressure on the button 70 is released, the jaws 66, 68 move inwardly and contact the tabs 48 and move the tabs 48 inwardly and away from engagement in the openings 50, which frees the cap 46 from engagement with the cup 42. The cap 46 is also gripped by the jaws 66, 68 and can then be lifted free of the cartridge assembly 16.

[0028] A similar procedure to that described above can also be used to grip and remove the cup 42 from the cartridge assembly 16.

[0029] A reverse of the above procedures can be used to reinstall a fresh cup 42 and scent block 44 and also reinstall the cap 46.

[0030] The second end 64 of the tool 60 includes an end formation 76 which is adapted to engage with the interior of the flange 34 associated with the one-way valve 30. The end formation 76 also includes a gripping part 78, which may be slid in the direction of double-headed arrow 80, relative to an internal formation 82.

[0031] In use, the gripping part 78 is slid away from the first end 62. The end formation 76 is then pressed into engagement with the one-way valve 30. Withdrawing the tool 60 away from the cartridge assembly 16 results in the removal of the valve 30 from the cartridge assembly 16. The gripping part 78 is then slid back towards the first end 62 which causes the internal formation 82 to abut the valve 30 and force it out of engagement with the end formation 76, for disposal.

[0032] A reverse of this procedure can be used to install a replacement one-way valve 30 into the cartridge assembly 16.

[0033] It should be noted that the tool 60 allows the cap 56, cup 42, scent block 44 and one-way valve 30 to be removed and/or replaced in the cartridge assembly 16 without requiring human contact with these, or any other, components of the cartridge assembly 16. This is advantageous from a hygiene perspective.

[0034] Figs. 8 to 11 show a second embodiment of a removable cartridge assembly 16' according to the invention. The cartridge assembly 16' is similar to that shown in Figs. 1 to 7 and like reference numerals are used to denote like features with the first embodiment. However, the cap 46 of the cartridge assembly 16' is formed from Vitreous China and does not snap engage with the cup 42 like the first embodiment. Instead, the cap 46 merely sits on top of the cup 42 and is retained in the position shown in the drawings by its own mass. As a result, the cartridge assembly 16 is suited for home or other non-public applications.

[0035] Figs. 12 to 15 show a third embodiment of a removable cartridge assembly 16" according to the invention. The cartridge assembly 16" is similar to that shown in Figs. 1 to 7 and like reference numerals are used to denote like features with the first embodiment. The cartridge assembly 16" has a cap 46 which is releasably connected to the cup 42 by the tabs 48 which engage with corresponding openings 50 in the underside of the cap 46. As a result, and similar to the first embodiment of cartridge assembly 16, the cartridge assembly 16" also requires use of the tool 60 for removal of the cap 56 and access to the scent block 44 and is also therefore vandal resistant and thus suited for use in public applications.

[0036] Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

Claims

1. A removable cartridge assembly for a waterless urinal, the cartridge assembly comprising:

   a cup adapted to receive a scent block therein; and
   a cap adapted to releasably engage the cup,
   wherein, when the cap is engaged with the cup, the scent block is retained in the cup and, when the cap is disengaged from the cup, the scent block is removable from within the cup, and thus from the cartridge assembly.

2. The assembly as claimed in claim 1, wherein the cup has at least one tab adapted to releasably engage at least one corresponding opening in the cap.

3. The assembly as claimed in claims 1 or 2, wherein the cartridge includes a body adapted for sealing connection to an opening in the waterless urinal.

4. The assembly as claimed in claim 3, wherein the body has an external thread on one end for engaging a retaining nut.

5. The assembly as claimed in claim 4, wherein the other end of the body has a distally diverging taper adapted to receive the cup therein.

6. The assembly as claimed in claims 3, 4 or 5, wherein the interior of the body has a shoulder adapted to engage with corresponding recess formed in a flexible one way valve.

7. The assembly as claimed in claim 6, wherein the cup is releasably connected to, and supported within the taper by, the valve.

8. The assembly as claimed in any one of the preceding claims, wherein the cap is located spaced apart from the body by a gap through which urine can enter the body.

9. The assembly as claimed in any one of the preceding claims, wherein the cap is adapted for removal from the cup, from within the urinal, whilst the cartridge assembly is installed in the urinal.

10. A waterless urinal comprising:

a urinal bowl having an interior surface with an outlet opening therein; and
a removable cartridge assembly adapted to mount within the opening, the cartridge assembly having a substantially flat cap,
wherein the cartridge assembly is mounted with the cap substantially parallel to, and slightly proud of, the bowl surface adjacent to the outlet opening.

11. The urinal as claimed in claim 10, wherein the cap is positioned above the adjacent bowl surface by a gap.

12. The assembly as claimed in claim 11, wherein the cap is positioned about the adjacent bowl surface by approximately a 9mm gap.

13. The assembly as claimed in any one of claims 10, 11 or 12, wherein the cap is slightly convex into the interior of the urinal bowl.

14. The assembly as claimed in any one of claims 11 to 13, wherein the removable cartridge assembly has a scent block holder therein.

15. The assembly as claimed in claim 14, wherein the cap is releasably connected to the scent block holder.

16. A waterless urinal cartridge assembly removal and installation tool, the cartridge assembly comprising: a scent block; a scent block cup; a cap; and one-way valve, the tool comprising:

a first end adapted for selective engagement with one or more of the cup, scent block or cap, and
the second end adapted for selective engagement with the one-way valve.

17. The tool as claimed in claim 16, wherein the first end comprises two manually expandable, spring retractable jaws.

18. The tools claimed in claim 16 or 17, wherein the second end comprises a manually slidable, valve engagement and ejection device.

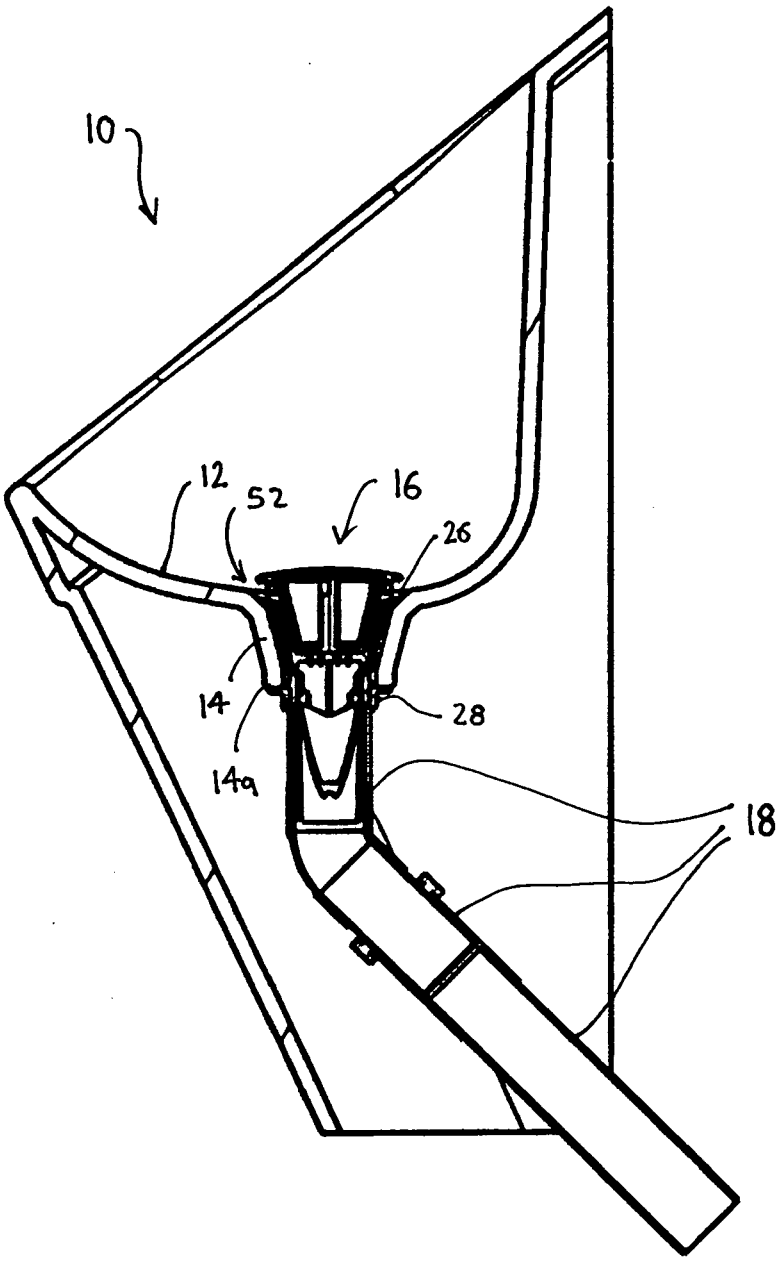

FIG. 1

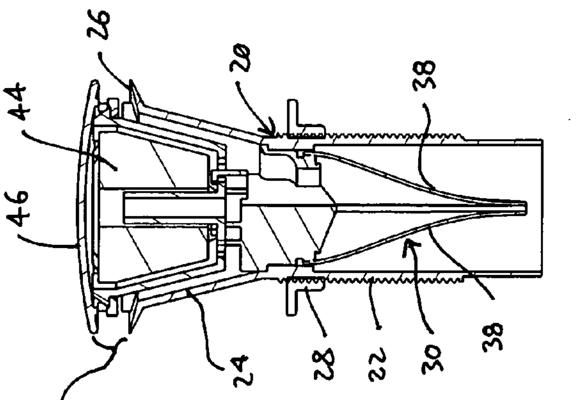
FIG. 7

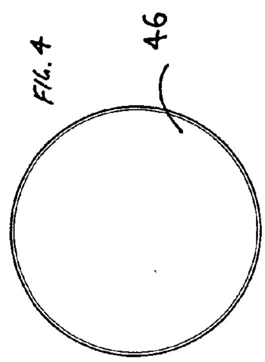
FIG. 4

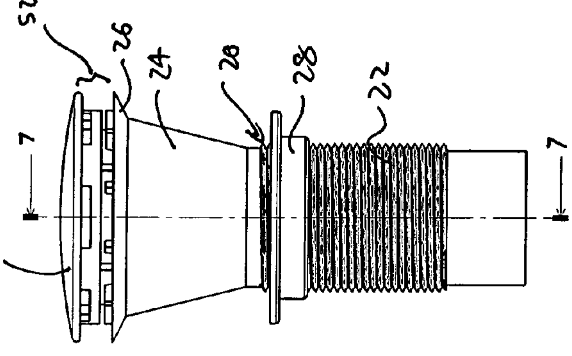
FIG. 3

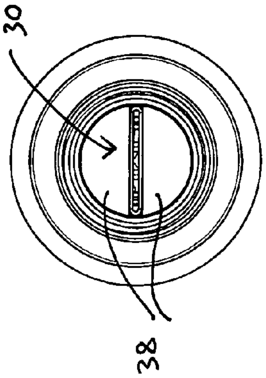
FIG. 5

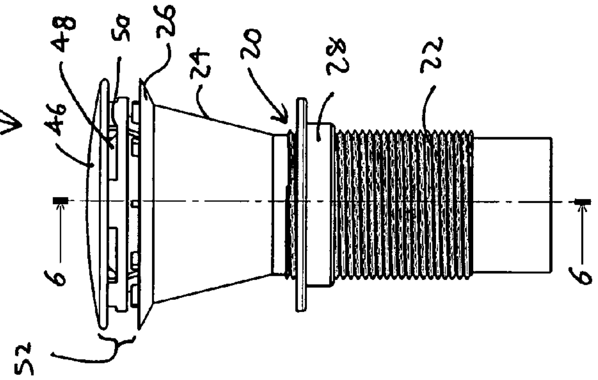
FIG. 2

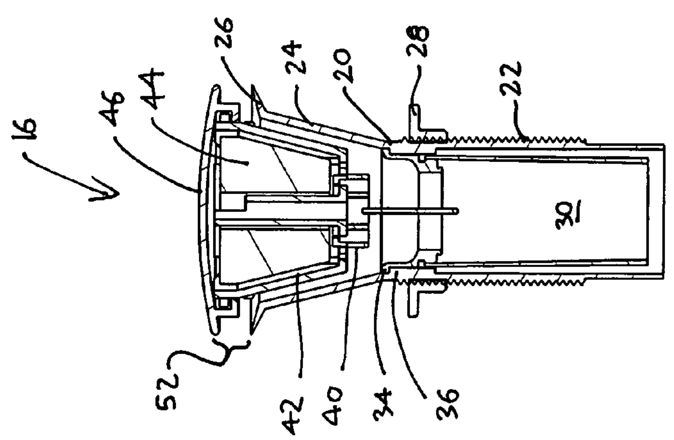
FIG. 6

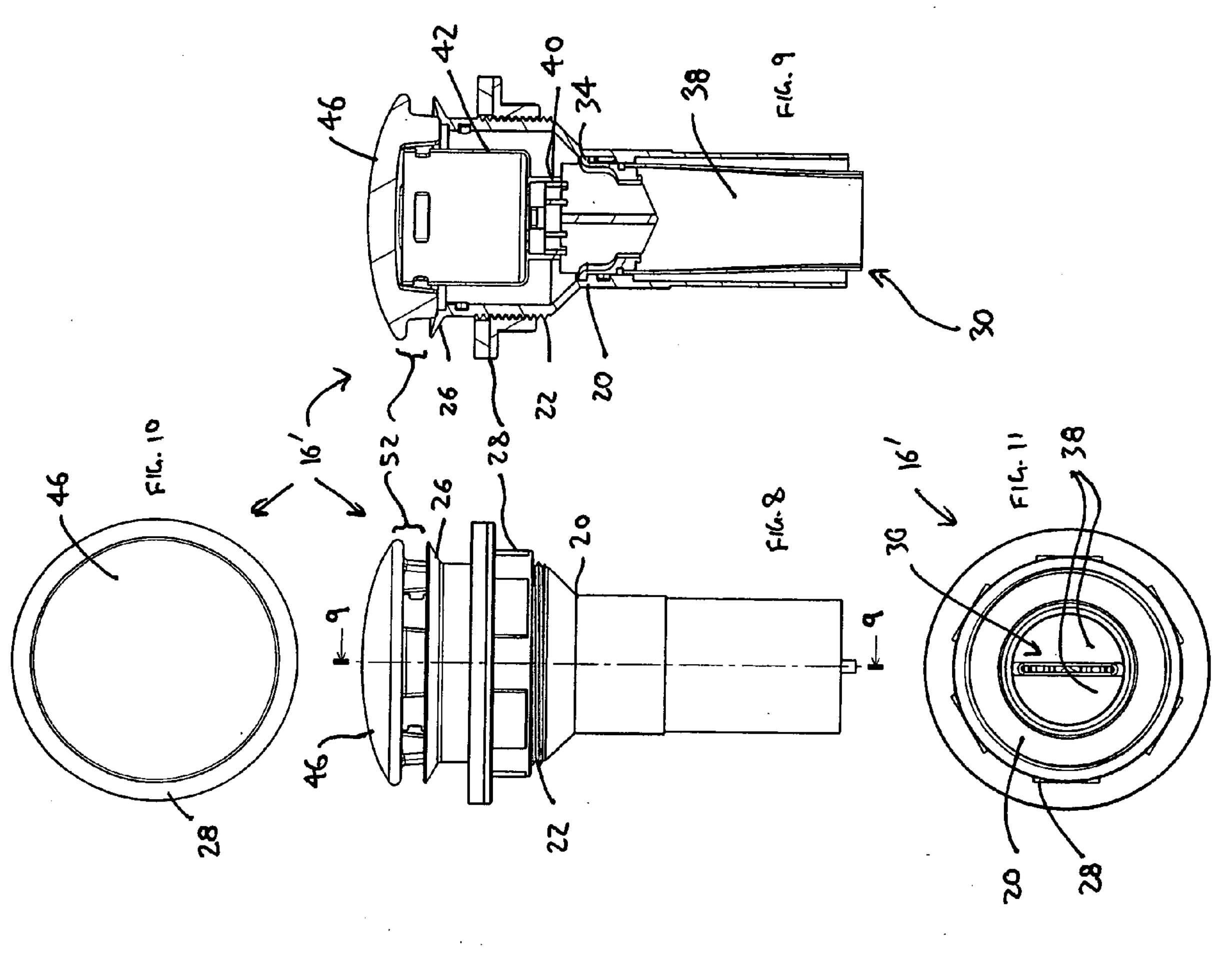
FIG. 8
FIG. 9
FIG. 10
FIG. 11
16'
9
9
46
42
40
34
38
30
26
28
22
20
52
36

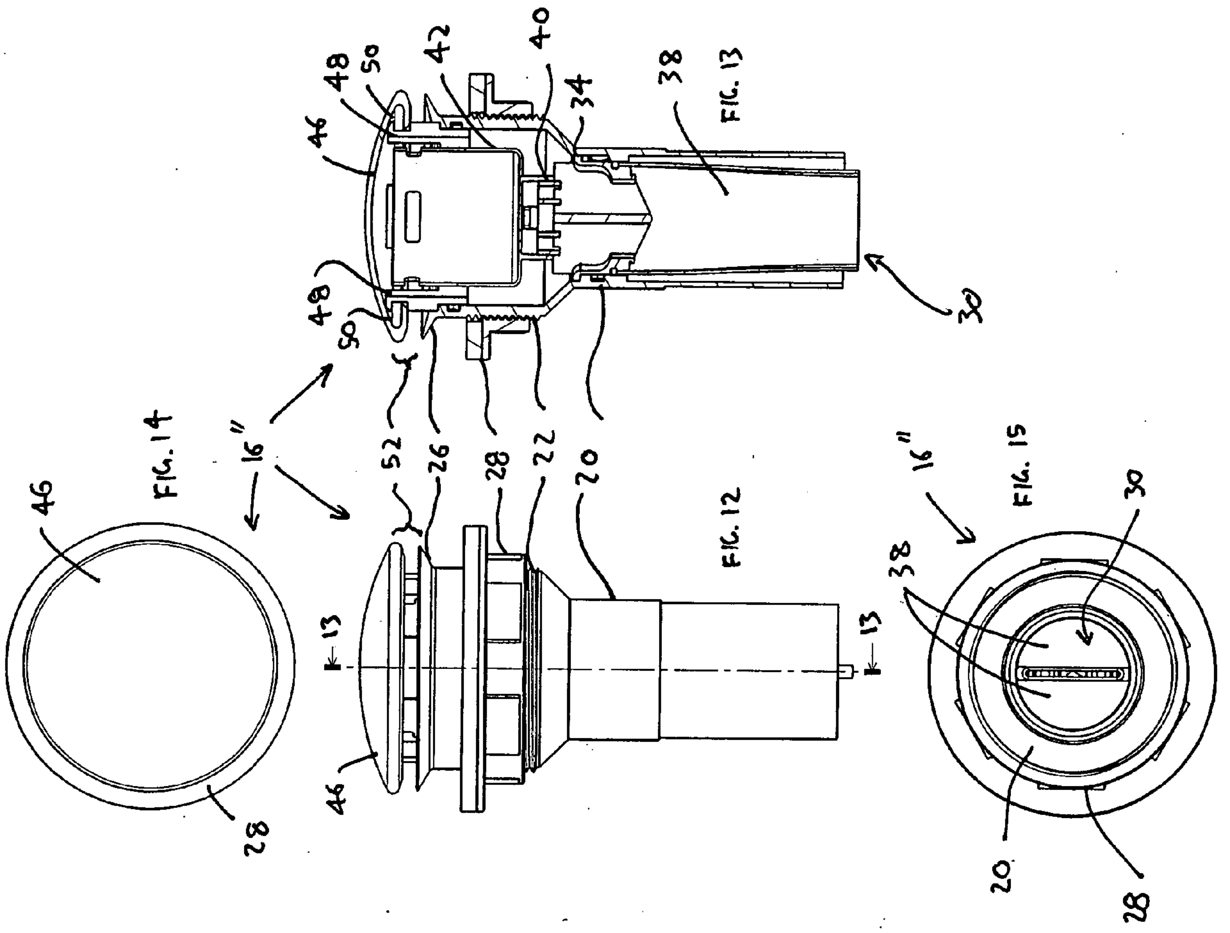
FIG. 12
FIG. 13
FIG. 14
FIG. 15
16''
13
20
22
26
28
30
34
38
40
42
46
48
50
52

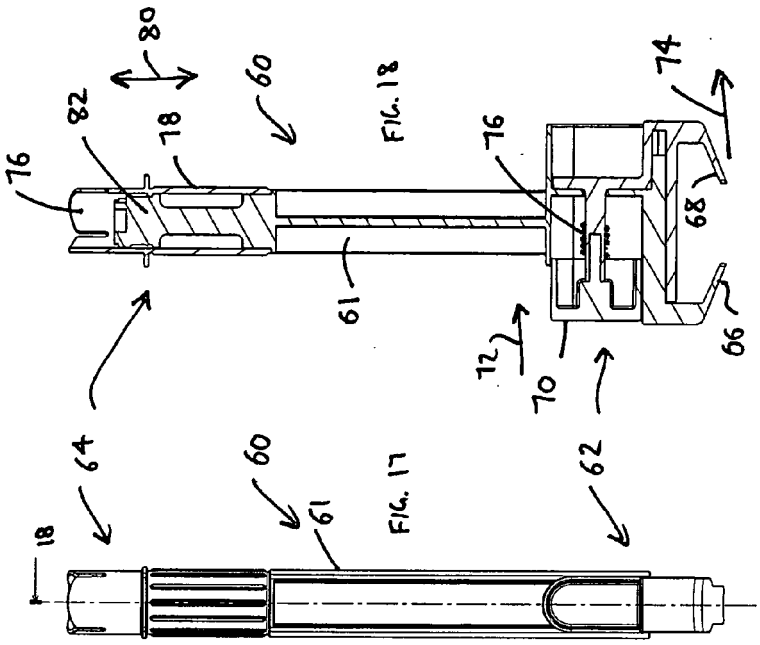

FIG. 18

FIG. 17

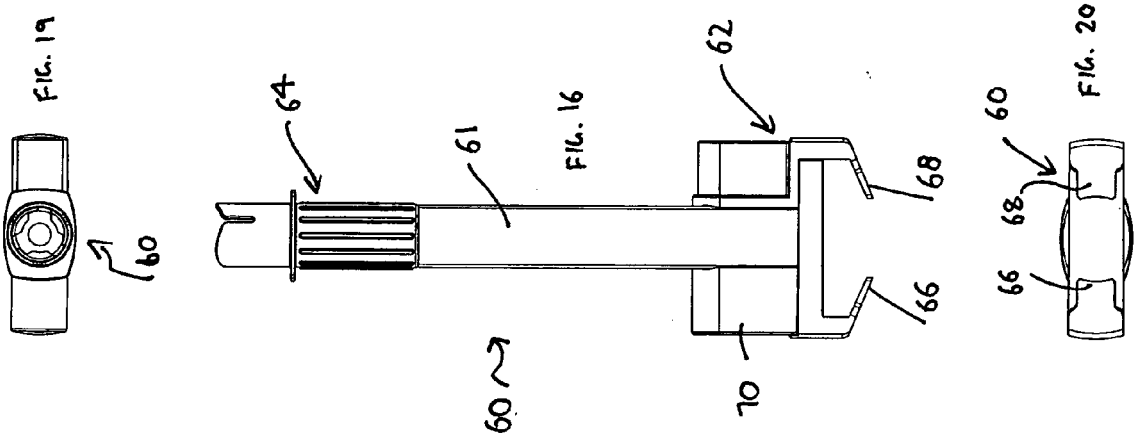

FIG. 19

FIG. 16

FIG. 20