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

(11) EP 1 674 620 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.06.2006 Bulletin 2006/26

(51) Int Cl.:
E03C 1/22 *(2006.01)*

(21) Application number: **05027933.0**

(22) Date of filing: **20.12.2005**

(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: **23.12.2004 IT VI20040305**

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(54) Liquid drain and waste device, for use in tubs and plumbing fixtures

(57) A liquid drain and waste device, for use in tubs and plumbing fixtures, comprises a trap body (2) having at least one inlet (3) and at least one outlet (4) for the liquid to be drained, a liquid conveying member (5) to be fitted to a passage (P) of the tub or plumbing fixture, to convey the liquid to be drained through the passage (P), means for connection of the trap body (2) to the liquid conveying member (5). Particularly, the connection means comprise snap fit means (7) for removably connecting the trap body (2) to the liquid conveying member (5) for quicker mounting and cleaning.

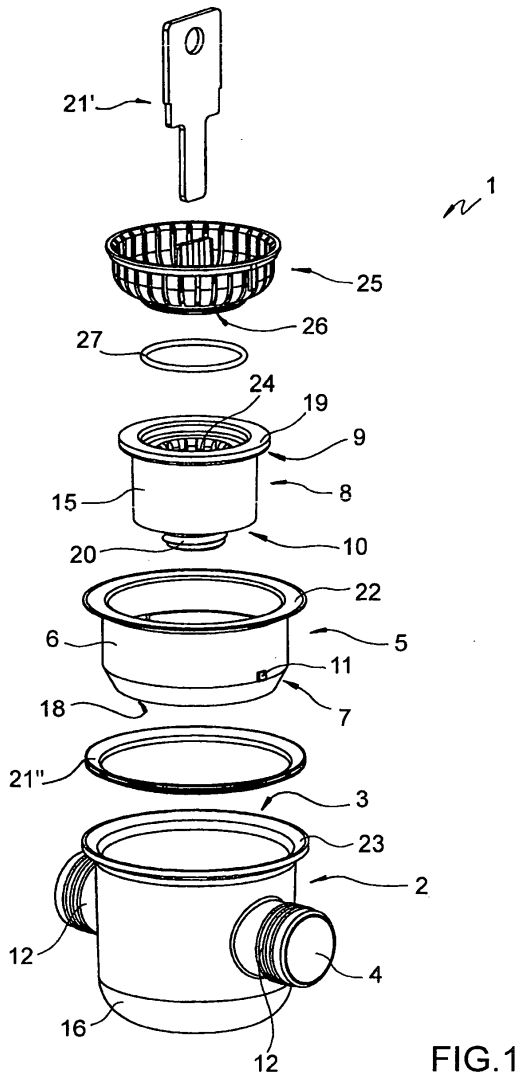

FIG.1

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Description

Field of the invention

[0001] This invention generally finds application in the field of plumbing and particularly relates to a liquid drain and waste device as defined in the preamble of claim 1, for use in tubs and plumbing fixtures.

Background of the invention

[0002] Many waste devices are known in the art, for conveying the water collected at the bottom of various plumbing fixtures, such as tubs, sinks, washbasins, to a sewer line.

[0003] Particularly, FR-A-2791372 discloses a waste device having a trap body designed to be connected to the peripheral edge of a drain opening formed on a bottom wall of a plumbing fixture. The trap body has an internal spiral chamber which defines a siphon, and a top edge which is designed to be compressed against the peripheral edge of the drain opening, with a seal interposed therebetween. The waste device further comprises a pair of screws for exerting a compressive action between the trap body and the peripheral edge of the opening and for supporting the whole waste device.

[0004] An apparent drawback of this arrangement lies in that the trap body is difficult to clean. This is due to its being monolithic, and having a spiral conformation which hinders the removal of any matter deposited therein during use.

[0005] DE-A-10249857 discloses a waste device having a cup-shaped trap body with a lower pipe for connection to the sewer line. Two opposed cylinders are housed within the cup-shaped body, and define a siphon and an elongate rod having an X-section, to adjust the distance between the two cylinders and the siphon size.

[0006] An apparent drawback of this solution is that the cup-shaped body has to be supported by external means, because no means are provided to connect the top edge of the cup-shaped body to the plumbing fixture.

[0007] DE-A-19651405 discloses a waste device having a trap body with a side pipe for connection to the sewer line. A feed line is further provided to convey the drain water from the plumbing fixture into the trap body while supporting the latter. The feed line is removably connected to the trap body by a threaded coupling, to allow cleaning thereof. A pair of siphon-defining cylinders is housed in the trap body.

[0008] A drawback of this solution lies in that the trap body can be only disassembled and internally cleaned by unscrewing the feed line, and thereby removing the only support for the trap body, which can fall. Cleaning has to be performed by supporting the trap body by one hand, and unscrewing the feed line by the other hand, and this makes maintenance more difficult and complex.

[0009] It is further known that certain waste devices similar to those described hereinbefore have an inspection plug on the bottom of the liquid trap body, for quick inspection and easy cleaning of the internal siphon. This solution has the drawback that the sealing effect of the plug decreases with time, thereby causing undesired liquid leakage.

Summary of the Invention

[0010] A primary object of this invention is to obviate the above drawbacks, by providing a waste device that can be easily assembled and disassembled and allows quick maintenance.

[0011] A further object is to provide a cost-effective waste device.

[0012] A particular object of the invention is to provide a device that has a siphon to prevent any odor return unpleasant odors, and can be also simply and effectively cleaned internally.

[0013] Yet another particular object is to provide a device that maintains its features unaltered with time, with no leakage or dripping.

[0014] These objects, as well as other objects that will be apparent hereafter are fulfilled, according to claim 1, by a liquid drain and waste device, for use in tubs and plumbing fixtures, which comprises a trap body having at least one inlet and at least one outlet for the liquid to be drained, a liquid conveying member to be fitted to a passage of the tub or plumbing fixture, to convey the liquid to be drained through the passage, means for connection of the trap body to the liquid conveying member, characterized in that the connection means comprise snap fit means for removably connecting the trap body to the liquid conveying member for quicker mounting and cleaning.

[0015] This particular configuration allows easy connection of the trap body, while preventing it from falling during maintenance and cleaning.

Brief description of the drawings

[0016] Further characteristics and advantages of the invention will be more apparent from the detailed description of a few preferred, non-exclusive embodiments of a drain device according to the invention, which are described as non-limiting examples with the help of the annexed drawings, in which:

FIG. 1 is an exploded perspective view of an embodiment of a device according to the invention;

FIG. 2 is a broken away side view of the device of FIG. 1.

Detailed description of a preferred embodiment

[0017] Particularly referring to the above figures, a liquid drain and waste device according to the invention is described, which is generally designated by numeral 1.

[0018] The device 1 is for use in tubs, plumbing fixtures

and other similar containers. Particularly, the device 1 is designed to be connected to the peripheral edge B of a passage P formed on a bottom wall F of the tub or plumbing fixture.

[0019] The device 1 comprises a trap body 2 having at least one inlet 3 and at least one outlet 4 for the liquid to be drained. A liquid conveying member 5 is further provided, which can be fitted to the peripheral edge B of the passage P for the drained liquid to be conveyed therethrough, and means for connecting the trap body 2 to the liquid conveying member 5. More in detail, the liquid conveying member 5 may have at least one substantially cylindrical portion 6 which defines a substantially vertical longitudinal axis L.

[0020] A peculiar feature of the invention is that the connection means comprise snap fit means 7 for removably connecting the trap body 2 to the liquid conveying member 5 for quicker mounting and cleaning. Furthermore, the connection means may also comprise a removable connection member 8, having an upper portion 9 adapted to be fitted to the liquid conveying member 5 and a lower portion 10 adapted to be connected to the trap body 2. Thanks to this conformation, the trap body 2 may be connected to the liquid conveying member 5 and supported thereby in two manners, i.e. both by the snap fit means 7 and by the connection member 8.

[0021] Particularly, the snap fit means 7 may include at least one projection 11 extending radially outwards from the cylindrical portion 6 of the liquid conveying member 5. The snap fit means 7 may preferably include a pair of radial projections 11 formed on the cylindrical portion 6 in diametrically opposed positions. In this configuration, each radial projection 11 is designed to engage in the trap body 2 to support it.

[0022] As is shown in the annexed drawings, the trap body 2 may have at least one transverse drain line 12, having an edge 13 for connection with the trap body 2, and designed to convey the liquid to the outlet 4. The connecting edge 13 may define an abutment surface 14 for a corresponding radial projection 11, so that the trap body 2 is connected to the liquid conveying member 5 and supported by mutual contact between the connecting edge 13 of the trap body 2 and each abutment surface 14 integral with the liquid conveying member 5.

[0023] The trap body 2 may preferably comprise two transverse drain pipes 12 which define respective abutment surfaces 14 for the radial projections 11.

[0024] As shown in FIG. 2, the connection member 8 may include a cylindrical wall 15 which defines a siphon 17 with a bottom wall 16 of the trap body 2.

[0025] Furthermore, the liquid conveying member 5 may have a specially shaped bottom edge 18, designed to be coupled to a complementary top edge 19 formed on the connection member 8. The bottom edge 18 and the top edge 19 may be mutually coupled in such a manner as to vertically support the connection member 8, which is in turn designed to support the trap body 2 with its lower portion 10.

[0026] The bottom edge 18 of the liquid conveying member 5 and the top edge 19 of the connection member 8 may be so shaped as to allow relative rotation thereof, and allow vertical upward extraction of the connection member 8.

[0027] The lower portion 10 of the connection member 8 may have a threaded end 20 which is adapted to be tightened into a threaded receptacle 21 integral with the lower wall 16 of the trap body 2 to connect the latter with the liquid conveying member 5. Thus, the snap fit means 7 will allow easy and quick connection of the trap body 2 to the liquid conveying member 5, whereas the connection member 8 will increase the strength and stability of the connection thanks to its threaded end 20.

[0028] Furthermore, the liquid conveying member 5 and the trap body 2 may have respective circumferential projections 22, 23, adapted to interact with the peripheral edge B of the passage P of the tub or plumbing fixture. The circumferential projections 22, 23 may interact with the peripheral edge B of the passage P from opposite sides in such a manner as to stably secure the device 1 as the connection member 8 is tightened into the threaded receptacle 21.

[0029] In use, the device 1 is installed by downwardly introducing the liquid conveying member 5 into the passage P and upwardly drawing the trap body 2 toward the liquid conveying member 5 until connection therewith by the snap fit means 7. At a later time, the connection member 8 may be downwardly introduced and tightened into the threaded receptacle 21 for a more stable connection. As the connection member 8 is tightened, the circumferential projections 22, 23 of the conveyor member 5 and the trap body 2 are compressed against the peripheral edge B to secure the device 1 to the tub or plumbing fixture, thereby preventing any liquid leakage and dripping.

[0030] The connection member 8 may be tightened using a suitable tool, such as the key 21' as shown in FIG. 1. Furthermore, a suitable seal 21" may be laid on the peripheral edge B of the passage P, to be compressed by the circumferential projections 22, 23.

[0031] As shown in FIG. 2, the connection member 8 may include an internal cylindrical of frustoconical filter 24, which is coaxial to and integral with the cylindrical wall 15 of the connection member 8, to retain any solid matters suspended in the liquid flowing from the liquid conveying member 5 into the trap body 2.

[0032] A grate 25 is further provided, which is removably connected to the liquid conveying member 5 to retain any solid matters suspended in the liquid upstream from the liquid conveying member 5. The grate 25 may be slideably connected to the liquid conveying member 5 in such a manner as to selectively impede liquid flow. Particularly, the grate may include a central plug 26, with a circumferential seal 27 attached thereto, for impeding liquid flow when the grate 25 is pressed downwards.

[0033] Furthermore, thanks to the above particular conformation, periodic maintenance and cleaning is

much easier. To this purpose, it is sufficient to remove the grate 25 by a simple upward sliding motion, and to unscrew and remove the connection member 8 to have full access to the trap body 2. This will be still connected to the peripheral edge B of the passage P, even when the connection member 8 is removed, thanks to the action of the snap fit means 7.

[0034] The foregoing proves that the device of the invention fulfils the intended objects and particularly affords easy installation and further maintenance and cleaning.

[0035] The device of this invention is susceptible of a number of changes and variants, within the inventive concept disclosed in the appended claims. All the details thereof may be replaced by other technically equivalent parts, and the materials may vary depending on different needs, without departure from the scope of the invention.

[0036] While the device has been described with particular reference to the accompanying figures, the numerals referred to in the disclosure and claims are only used for the sake of a better intelligibility of the invention and shall not be intended to limit the claimed scope in any manner.

Claims

1. A liquid drain and waste device, for use in tubs and plumbing fixtures, comprising a trap body (2) having at least one inlet (3) and at least one outlet (4) for the liquid to be drained, a liquid conveying member (5) to be fitted to a passage (P) of the tub or plumbing fixture, for conveying the liquid to be drained through the passage (P), means for connection of said trap body (2) to said liquid conveying member (5), **characterized in that** said connection means comprise snap fit means (7) for removably connecting said trap body (2) to said liquid conveying member (5) for quicker mounting and cleaning.

2. Device as claimed in claim 1, **characterized in that** said liquid conveying member (5) has at least one substantially cylindrical portion (6) which defines a substantially vertical longitudinal axis (L).

3. Device as claimed in claim 2, **characterized in that** said snap fit means (7) include at least one projection (11) extending radially outwardly from said cylindrical portion (6), which is adapted to engage in said trap body (2) to support it.

4. Device as claimed in claim 3, **characterized in that** said trap body (2) has at least one transverse drain line (12), for conveying the liquid to said at least one outlet (4).

5. Device as claimed in claim 4, **characterized in that** said at least one drain line (12) has an edge (13) for connection to said trap body (2), which defines an abutment surface (14) for said at least one radial projection (11).

6. Device as claimed in claim 5, **characterized in that** said snap fit means (7) have two diametrically opposed radial projections (11) on said cylindrical portion (6), said trap body (2) comprising two corresponding transverse drain lines (12) which define respective abutment surfaces (14) for said radial projections (11).

7. Device as claimed in claim 1, **characterized in that** said connection means comprise a removable connection member (8), having an upper portion (9) adapted to be fitted to said liquid conveying member (5) and a lower portion (10) adapted to be connected to said trap body (2).

8. Device as claimed in claim 7, **characterized in that** said connection member (8) includes a cylindrical wall (15) which defines a siphon (17) with a bottom wall (16) of said trap body (2).

9. Device as claimed in claim 7, **characterized in that** said liquid conveying member (5) has a specially shaped bottom edge (18), designed to be coupled to a complementary top edge (19) of said connection member (8) for vertically supporting the latter.

10. Device as claimed in claim 9, **characterized in that** said bottom edge (18) of the liquid conveying member (5) and said top edge (19) of the connection member (8) are so shaped as to allow relative rotation thereof, and allow vertical upward extraction of said connection member (8).

11. Device as claimed in claim 10, **characterized in that** said connection member (8) has a threaded lower end (20) which is adapted to be tightened into a threaded receptacle (21) integral with the lower wall (16) of said trap body (2) to connect the latter with said liquid conveying member (5).

12. Device as claimed in claim 8, **characterized in that** said connection member (8) includes an internal cylindrical of frustoconical filter (24), which is coaxial to and integral with said cylindrical wall (15), to retain any solid matters suspended in the liquid flowing from said liquid conveying member (5) into said trap body (2).

13. Device as claimed in one or more of the preceding claims, **characterized in that** it comprises a grate (25), which is removably connected to said liquid conveying member (5) to retain any solid matters suspended in the liquid upstream from the liquid conveying member (5).

14. Device as claimed in claim 13, **characterized in that** said grate (25) is slideably connected to said liquid conveying member (5) to selectively impede liquid flow.

15. Device as claimed in one or more of the preceding claims, **characterized in that** said liquid conveying member (5) and said trap body (2) have respective circumferential projections (22, 23), adapted to interact with a peripheral edge (B) of the passage (P) of the tub or plumbing fixture.

16. Device as claimed in claim 15, **characterized in that** said circumferential projections (22, 23) interact with the peripheral edge (B) from opposite sides in such a manner as to secure said trap body (2) as the connection member (8) is tightened into said threaded receptacle (21).

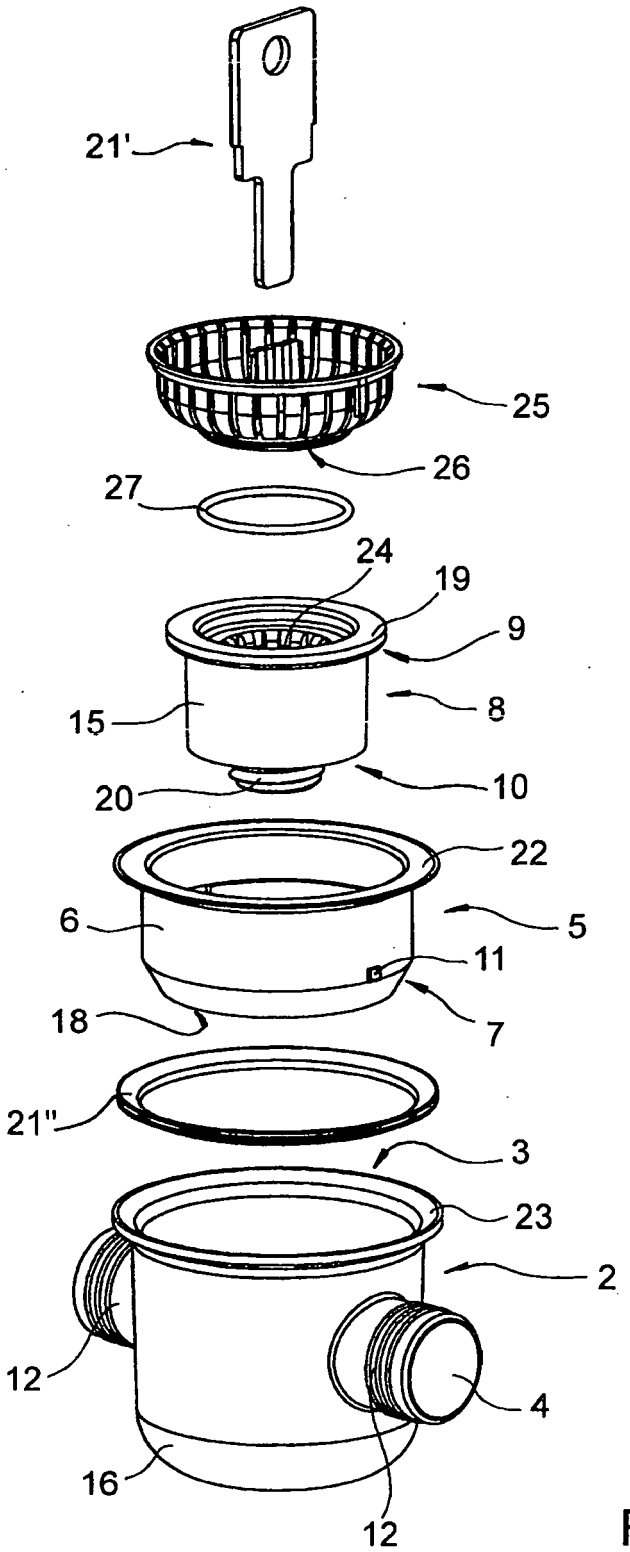

FIG.1

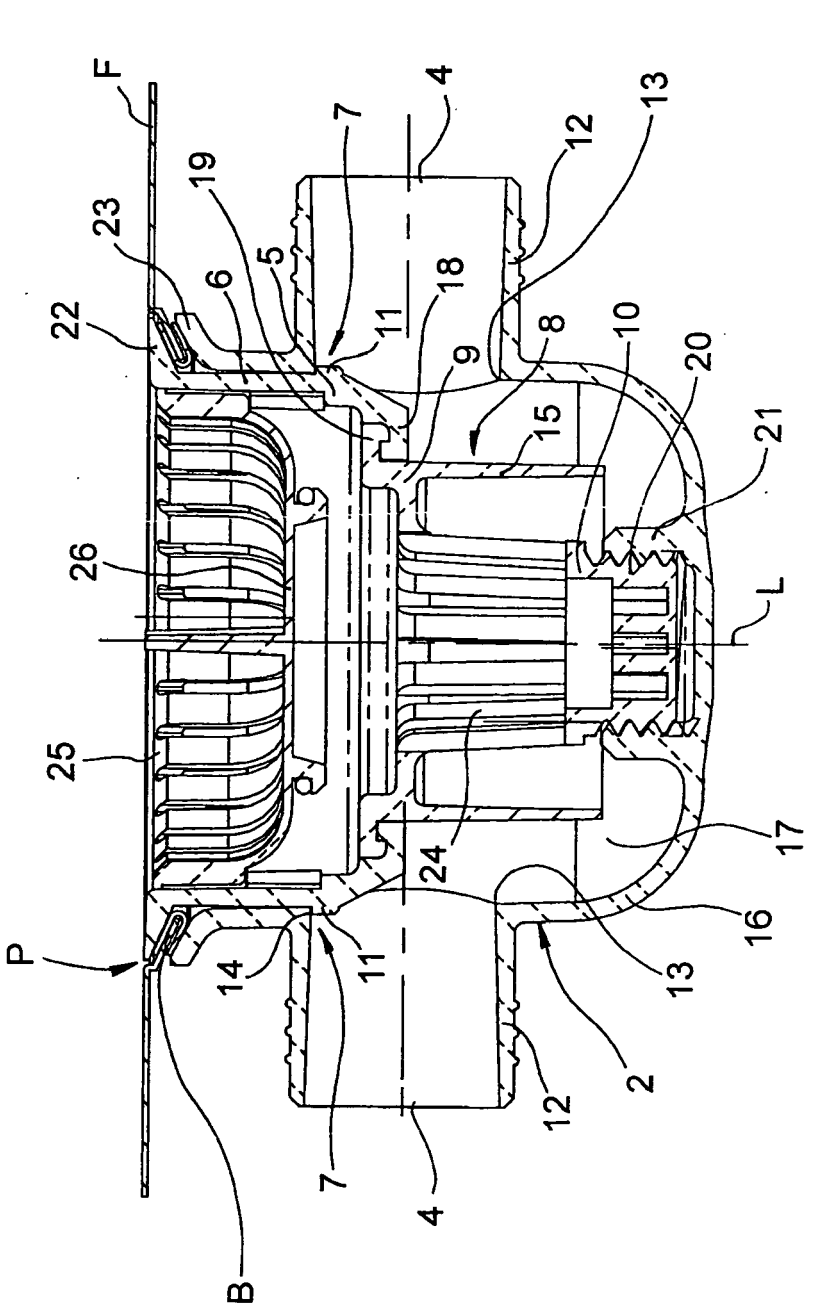
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FIG.2