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(54) **Cover assembly for an inspection opening, in particular a wall inspection opening, of a lavatory**

(57) A cover assembly (1) for an inspection opening, in particular a wall inspection opening, of a lavatory, having a frame (2) which fits to an opening in a wall; a plate (3) fixable removably to the frame; and a lock member (20) for securing the plate to the frame or releasing the plate from the frame; the lock member (20) has a head (22) which rests against an edge (7) of the plate (3), and the lock member is inserted inside a seat (23) so as to

rotate between a lock position, in which the lock member is interposed between the edge (7) of the plate and a stop member (40) on the frame (2) to prevent movement of the plate with respect to the frame in a predetermined direction (D), and a release position, in which the lock member (20) is slidable axially inside the seat (23) to permit movement of the plate with respect to the frame in the aforementioned predetermined direction.

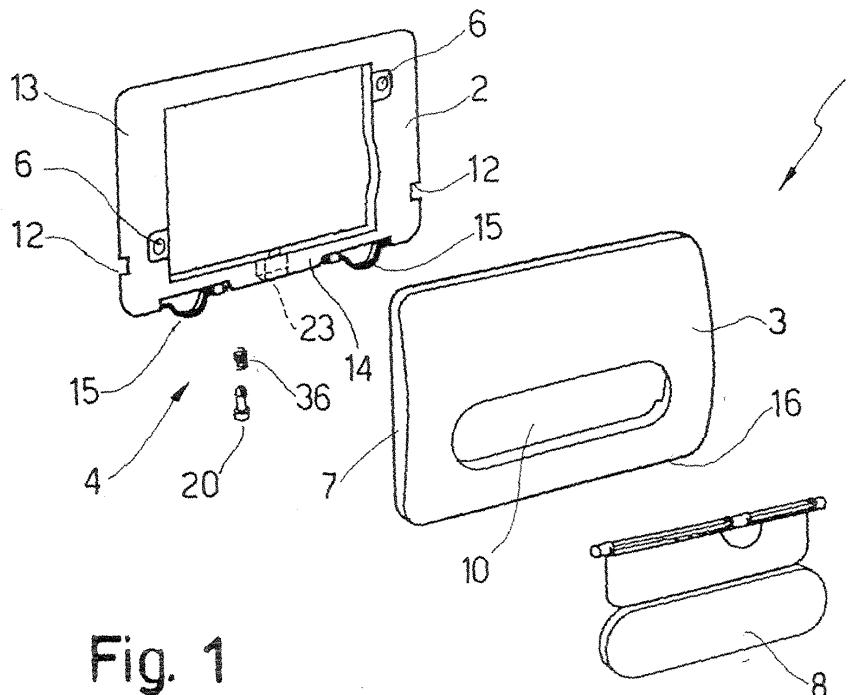


Fig. 1

Description

[0001] The present invention relates to a cover assembly for an inspection opening, in particular a wall inspection opening, of a lavatory.

[0002] Lavatory flush tanks are known which are recessed or built into a wall; the flush control devices are wall-mounted with the actuating members extending through an inspection opening formed in the wall; and the inspection opening is closed by a cover assembly which generally comprises a frame fixed to the wall, a plate fixed removably to the frame and fitted with control buttons, and a lock member which can be activated to secure or release the plate to or from the frame.

[0003] Known cover assemblies, such as the one described in EP-A-0866183, have various drawbacks, and, in particular, are relatively complex to produce and assemble, and/or awkward to use.

[0004] It is therefore an object of the present invention to provide a cover assembly for a lavatory inspection opening, designed to eliminate the drawbacks of known solutions, and which, in particular, is extremely easy to produce, assemble and use, while at the same time being fully efficient and reliable.

[0005] According to the present invention, there is provided a cover assembly for an inspection opening, in particular a wall inspection opening, of a lavatory, as claimed in the accompanying Claim 1.

[0006] The cover assembly according to the invention is extremely straightforward and therefore cheap to produce and easy to assemble, while at the same time being fully efficient and reliable.

[0007] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic exploded view in perspective of a cover assembly for an inspection opening of a lavatory in accordance with the invention;

Figure 2 shows a rear view, with parts removed for clarity, of the Figure 1 cover assembly as assembled;

Figures 3 and 4 show two sections, in respective perpendicular planes, of a detail of the Figure 1 cover assembly.

[0008] Number 1 in Figures 1 and 2 indicates as a whole a cover assembly for an inspection opening of a lavatory, in particular a wall inspection opening for a flush tank flush valve control device.

[0009] Cover assembly 1 comprises a frame 2; a plate 3 fixable removably to frame 2; and a reversible fastening device 4 for fixing plate 3 removably to frame 2.

[0010] Frame 2 is fixable in known manner, e.g. by means of screws (not shown) inserted inside holes 6, to a wall in which the inspection opening to be closed is formed (e.g. the front wall of the cavity in which the flush

tank is housed).

[0011] Plate 3 has a peripheral edge 7 perpendicular to plate 3, and is fitted with a pushbutton 8 hinged in known manner to an inner surface 9 of plate 3 and housed inside a window 10 formed through plate 3. In use, pushbutton 8 cooperates with known actuating members (not shown) to activate the flush valve.

[0012] Fastening device 4 comprises a number of teeth projecting from edge 7 of plate 3, and which engage respective lock seats 12 formed in a peripheral border 13 of frame 2. More specifically, teeth 11 are inserted inside respective lock seats 12 in a predetermined direction D and, in particular, in a downward movement; and a bottom portion 14 of border 13 has flexible members 15 which cooperate with a bottom portion 16 of edge 7 to permit engagement of respective lock seats 12 by teeth 11.

[0013] Fastening device 4 also comprises a lock member 20, which can be activated to secure plate 3 to frame 2 or release plate 3 from frame 2.

[0014] With reference also to Figures 3 and 4, lock member 20 extends along an axis A parallel to direction D, is substantially T-shaped, and comprises a cylindrical stem 21 from which a substantially prismatic end head 22 projects transversely.

[0015] Lock member 20 is inserted, so as to rotate about axis A, inside an open-bottomed seat 23 formed in portion 14; and seat 23 has a substantially prismatic, rectangular-section chamber 24 having, at opposite axial ends, an inlet 25 bounded by a substantially rectangular front edge 26, and an end wall 27 in which is formed a through hole 28 housing stem 21 in sliding manner.

[0016] The end 29 of stem 21 opposite head 22 has transverse retaining tabs 30 which, cooperating with a collar 31 bounding hole 28, prevent withdrawal of lock member 20 from seat 23. To insert stem 21 inside hole 28, stem 21 has a longitudinal slit 32 allowing the two portions of stem 21 separated by slit 32 to flex towards each other; and stem 21 has two diametrically opposite, longitudinal ribs 34 extending from end 29 to a predetermined distance from head 22, and which are inserted inside hole 28. Stem 21 is of such a length that, when tabs 30 contact collar 31, head 22 is outside chamber 24, beyond front edge 26.

[0017] A portion 35 of stem 21, extending between head 22 and ribs 34, is fitted with an elastic member 36, in particular a helical spring, located between head 22 and end wall 27, and of an outside diameter larger than hole 28.

[0018] On the opposite side to stem 21, head 22 has a tool seat 37, e.g. a hexagonal dead hole, into which a tool, e.g. an Allen wrench, is insertable. And portion 16 of edge 7 of plate 3 has an access hole 38 aligned with tool seat 37 along axis A of stem 21, and into which the tool for manoeuvring lock member 20 is insertable.

[0019] Lock member 20 is movable between a lock position, in which lock member 20 secures plate 3 to

frame 2, and a release position, in which lock member 20 permits movement of plate 3 with respect to frame 2 in direction D, so as to release teeth 11 from respective lock seats 12 and so remove plate 3 from frame 2.

[0020] Head 22 is shaped so as to be insertable inside seat 23 (more specifically, inside chamber 24) when lock member 20 is in the release position, and to be located outside seat 23 and interposed between front edge 26 of seat 23 and edge 7 of plate 3, when lock member 20 is in the lock position.

[0021] In the lock position, shown by the continuous line in Figures 3 and 4, lock member 20 is interposed between edge 7 of plate 3 and a stop member 40 carried by frame 2 to prevent movement of plate 3 with respect to frame 2 in direction D.

[0022] In the example shown, stop member 40 is defined by front edge 26 of seat 23; and opposite, respectively bottom and top, surfaces 41, 42 of head 22 rest against edge 7 of plate 3 and front edge 26 (i.e. stop member 40) respectively.

[0023] In the release position, as shown by the dash line in Figures 3 and 4, lock member 20 is slidable axially inside seat 23 along axis A, and therefore parallel to direction D, to allow plate 3 to slide in direction D with respect to frame 2. As lock member 20 slides inside seat 23, elastic member 36 comes into contact with end wall 27, and further slide of lock member 20 is effected in opposition to elastic member 36.

[0024] Lock member 20 is set to the lock position or release position by rotating head 22 ninety degrees using the tool inserted inside tool seat 37 through access hole 38.

[0025] Rotation of head 22 is limited by blocks 43, e.g. carried by front edge 26 of seat 23 and so located as to limit rotation of head 22 to two perpendicular positions.

[0026] Cover assembly 1 is installed as follows.

[0027] Frame 2 is fixed to the wall, about the inspection opening, in known manner, e.g. by means of screws inserted inside holes 6.

[0028] Plate 3 is then fitted upwards in direction D to frame 2 by forcing flexible members 15; since lock member 20 is in the release position, edge 7 of plate 3 cooperates with and pushes head 22 (which is initially outside chamber 24) into seat 23 in opposition to elastic member 36; the sliding movement of lock member 20 inside seat 23 allows plate 3 to move with respect to frame 2; plate 3 moves in direction D in opposition to flexible members 15 until teeth 11 engage respective lock seats 12; and elastic member 36 expels head 22 from chamber 24, beyond front edge 26.

[0029] Once plate 3 engages frame 2, the tool is inserted inside tool seat 37 through access hole 38, and lock member 20 is rotated 90°. Any further rotation of head 22 is prevented by blocks 43. Head 22 is now interposed between edge 7 of plate 3 and front edge 26 of seat 23, and prevents any movement of plate 3 with respect to frame 2. When edge 7 is pushed upwards,

head 22, interposed between bottom portion 16 of edge 7 and stop member 40, prevents plate 3 from moving upwards in direction D with respect to frame 2, thus preventing release of teeth 11 from lock seats 12 to remove plate 3.

[0030] To remove plate 3, lock member 20 is set to the release position using the tool (by rotating the lock member 90° in the opposite direction to before). When bottom portion 16 of edge 7 is then pushed upwards in direction D, edge 7 cooperates with and pushes head 22 to push lock member 20 inside seat 23, thus releasing teeth 11 from lock seats 12 to remove plate 3 from frame 2.

[0031] Clearly, changes may be made to the cover assembly as described and illustrated herein without, however, departing from the protective scope defined by the accompanying Claims.

20 Claims

1. A cover assembly (1) for an inspection opening, in particular a wall inspection opening, of a lavatory, comprising a frame (2) which fits to an opening in a wall; a plate (3) fixable removably to the frame; and a lock member (20) for securing the plate to the frame or releasing the plate from the frame; the cover assembly being **characterized in that** the lock member (20) comprises a head (22) which rests against an edge (7) of the plate (3); and **in that** the lock member is inserted inside a seat (23), so as to rotate between a lock position, in which the lock member is interposed between said edge (7) of the plate and a stop member (40) on the frame (2) to prevent movement of the plate with respect to the frame in a predetermined direction (D), and a release position, in which the lock member (20) is slidable axially inside the seat (23) to permit movement of the plate with respect to the frame in said direction.
2. A cover assembly as claimed in Claim 1, **characterized in that** the lock member (20), in the release position, is slidable axially, inside the seat (23), parallel to said direction (D).
3. A cover assembly as claimed in Claim 1 or 2, **characterized in that** opposite surfaces (41, 42) of said head (22) rest against said edge (7) of the plate (3) and against said stop member (40) respectively.
4. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** the stop member (40) is defined by a front edge (26) of the seat (23).
5. A cover assembly as claimed in Claim 4, **characterized in that** said head (22) is so shaped as to be insertable inside the seat (23) when the lock mem-

ber (20) is in the release position, and to be located outside the seat (23) and interposed between said front edge (26) and the edge (7) of the plate (3) when the lock member (20) is in the lock position.

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6. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** the lock member (20) is substantially T-shaped, and comprises a stem (21) from which said head (22) projects transversely.
7. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** said seat (23) is formed in the frame (2).
8. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** the lock member (20) is loaded by an elastic member (36) to expel the head (22) from the seat (23).
9. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** said edge (7), against which the head (22) of the lock member (20) rests, is a bottom edge of the plate (3), and has an access hole (38) permitting access to the head (22) and through which a tool, such as an Allen wrench, is insertable to manoeuvre the lock member (20).
10. A cover assembly as claimed in one of the foregoing Claims, **characterized in that** the lock member (20) comprises transverse retaining tabs (30) for preventing withdrawal of the lock member (20) from the seat (23).
11. A cover assembly as claimed in one of the foregoing Claims, **characterized by** comprising teeth (11) projecting from the plate (3) to engage respective lock seats (12) formed in the frame (2); and flexible members (15) carried by the frame (2) and cooperating with said edge (7) of the plate (3) to permit engagement of the respective lock seats (12) by the teeth (11).

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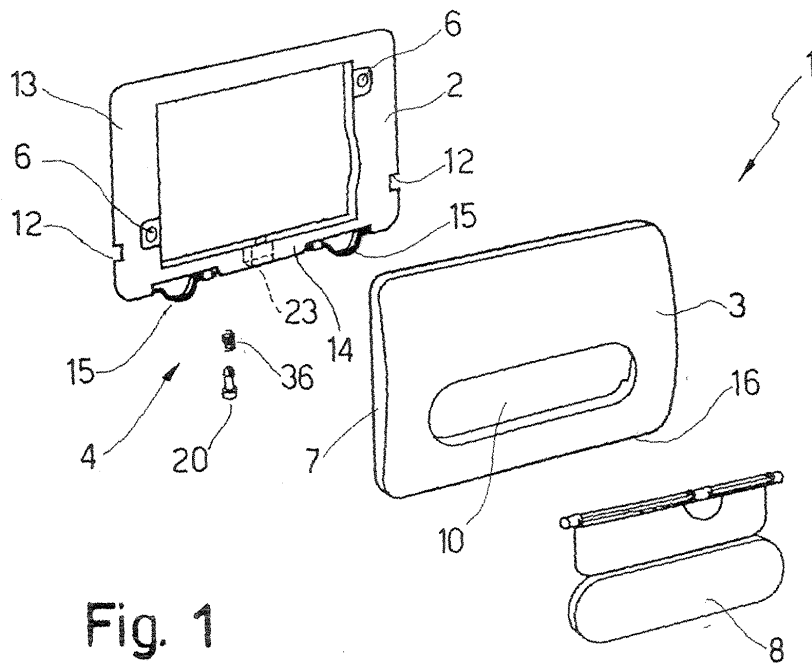


Fig. 1

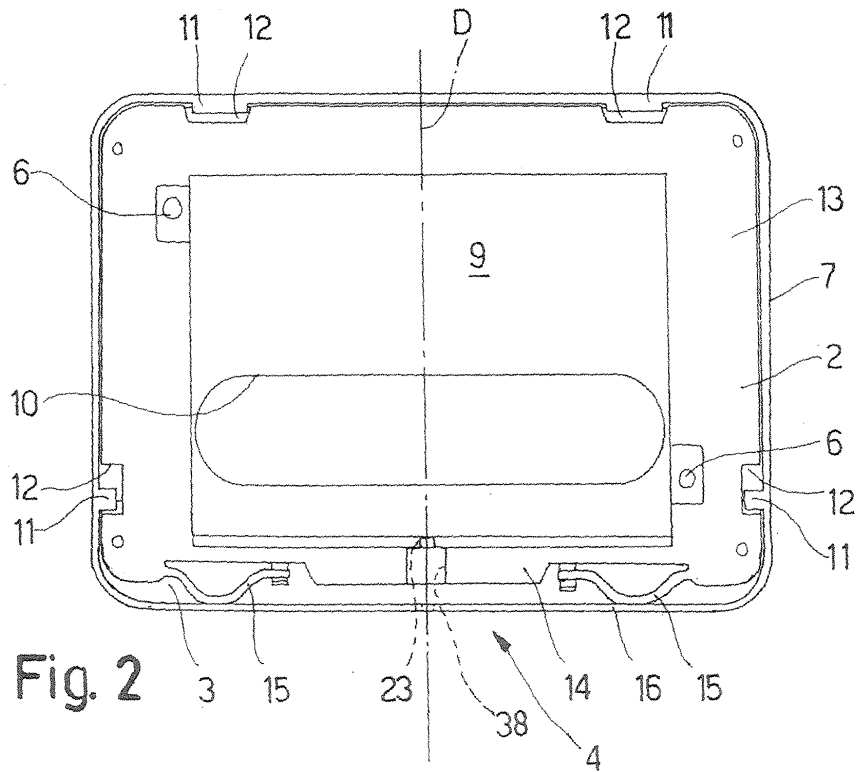


Fig. 2

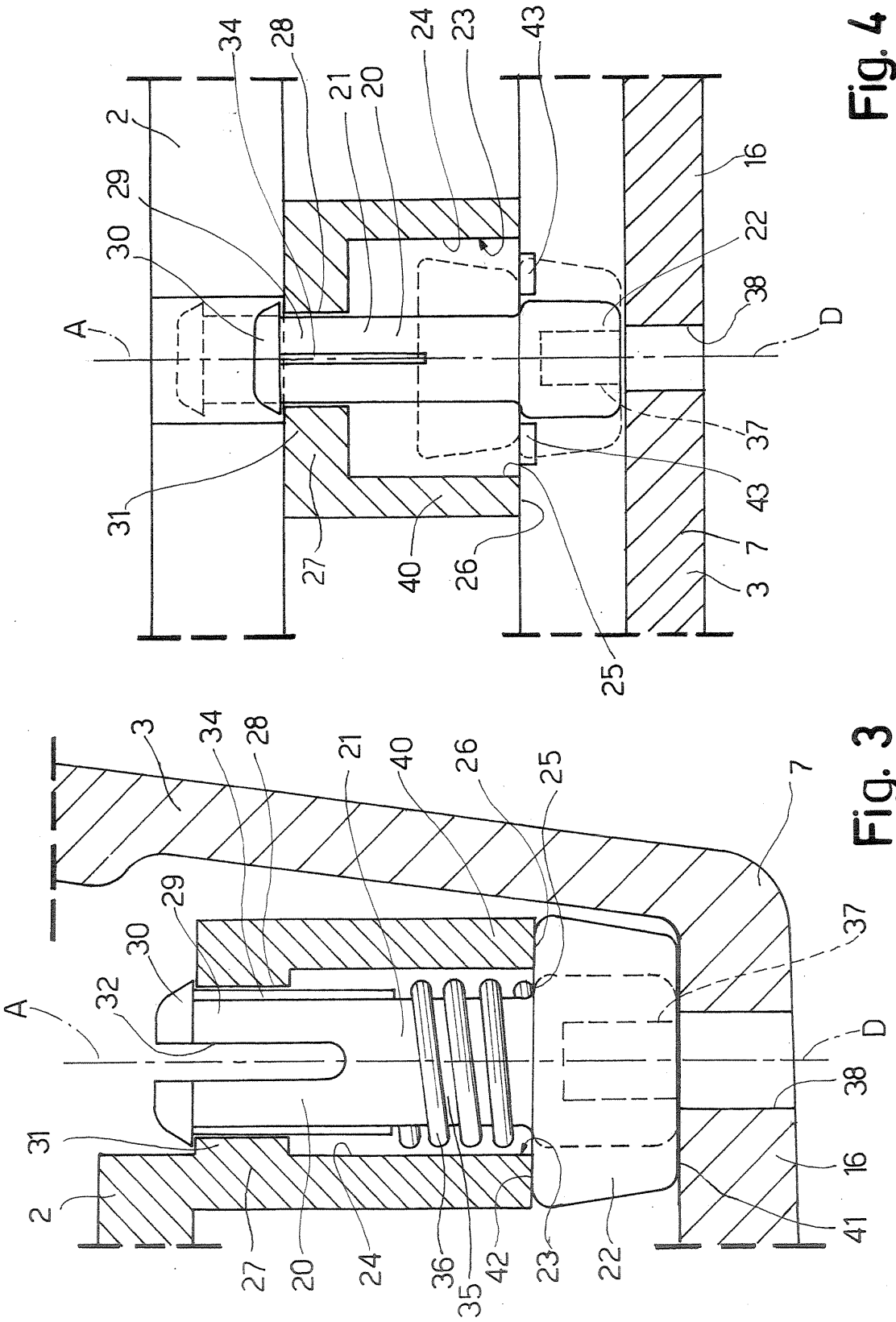


Fig. 4

Fig. 3