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(54) A cistern assembly for a toilet bowl

(57) A cistern assembly for a toilet bowl includes a support frame (10) for embedding in a cavity (11) in a wall (12) and defining a frontally open space, and a cistern (13) which can be inserted in the frame (10) or extracted therefrom through the said frontal space. The cistern (13) includes a rear or inner portion (13a) for engagement in the space in the frame (10) and an outer or front portion (13b) of a size and shape such as to project outwardly, once installed, beyond the frame (10) and beyond the vertical plane of the wall (12).

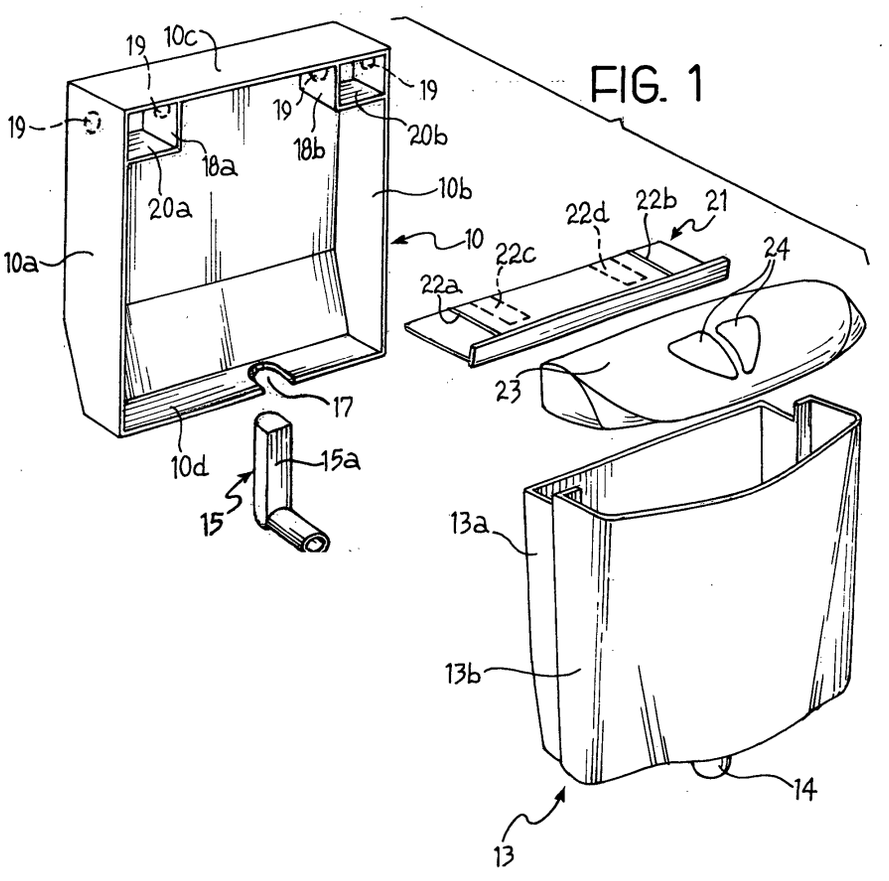

FIG. 1

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Description

[0001] The present invention relates to a cistern assembly for a toilet bowl, in particular to a cistern assembly for partially embedding in a bathroom wall.

[0002] Heretofore, two basic types of cistern for toilet bowls have been known in the art: cisterns which are embedded in bathroom walls and so-called surface-mounted cisterns, mounted on the surface of a wall.

[0003] It is known that conventional embedded cisterns involve various disadvantages, including problems in installing the cistern and gaining access to it once installed, mainly owing to the small size of the hole left in the wall, which is normally closed by an outer plate which can be removed for accessing the inside of the cistern whenever maintenance is required.

[0004] Surface-mounted cisterns, while being simpler to install and easier to access for maintenance, have the disadvantage of impinging considerably on the space in the bathroom. Besides taking up space, if a surface-mounted cistern is fitted at a later date than the toilet bowl, it can have the added disadvantage of disrupting the vertical axis of the toilet bowl, unless this is moved forwards.

[0005] One prior art cistern assembly, having the characteristics defined in the preamble to Claim 1, is described in Brazilian Patent Application BR-9804484-2A.

[0006] The object of the present invention is to provide an improved cistern assembly which overcomes the disadvantages of the prior art discussed above and combines the advantages of embedded cisterns with those of surface-mounted ones.

[0007] This and other objects and advantages, which will become clearer later, are achieved according to the invention by providing a cistern assembly having the characteristics claimed in the appended Claims.

[0008] The characteristics and advantages of the invention will become apparent from the detailed description of several embodiments thereof, with reference to the appended drawings, provided purely by way of non-limitative example, in which:

Figure 1 is an exploded perspective view of a first embodiment of a cistern assembly of the present invention;

Figure 2 is a vertically sectioned schematic view of the cistern assembly of the invention of Figure 1 in its installed condition;

Figure 3 is a top plan view of a detail of Figure 1 on an enlarged scale;

Figure 4 is an exploded perspective view of a second embodiment of a cistern assembly of the invention; and

Figures 5 and 6 are vertically sectioned schematic views, similar to Figure 2, of the cistern assembly of Figure 4 installed in two different ways.

[0009] With reference initially to Figures 1 and 2, a frame suitable to be accommodated and embedded in a cavity 11 formed in a bathroom wall 12 is indicated 10.

[0010] Measured perpendicular to the plane of the wall 12 in which it is to be installed, the frame 10 is not as deep as that of a conventional embedded cistern; as a result, also the depth of the cavity 11 is reduced.

[0011] The frame 10 defines an open space which is open at the front and in which a flushing cistern 13, which is wider overall than its support frame 10, is partially enclosed.

[0012] In the present description, and in the Claims which follow, words or expressions such as "frontal", "frontally" and "depth" are to be understood with reference to direction essentially perpendicular to the vertical surface of the wall 12.

[0013] The cistern 13 comprises a rear or inner portion 13a, which is received in the frame 10, and an outer or front portion 13b which, when the cistern is installed, projects from the surface of the wall 12.

[0014] In the various preferred embodiments illustrated in the drawings, the outer portion 13b of the cistern is slightly larger than the inner portion 13a so as to hide the edges of the frame 10.

[0015] At the bottom, the cistern 13 has a discharge connector 14 for insertion into a pipe 15 leading to the toilet bowl 16 which, in the example of Figure 2, is of a type mounted so as to project from the wall 12. In this application, as shown in greater detail in Figure 3, the vertical branch of the pipe 15 can have a flat front surface 15a which is positioned flush with the wall 12, against the rear surface of the toilet bowl 16.

[0016] The bottom of the frame 10 has an aperture or a recess 17, through which the discharge connector 14 of the toilet bowl passes. A pair of vertically arranged plates 18a, 18b are formed in the upper portion of the frame 10, near the top corners and not far from the vertical side walls 10a, 10b of the frame. Respective apertures or lines of weakness 19 are formed in these vertical walls and in the plates 18a, 18b for facilitating the formation, by breaking out, of apertures which are substantially aligned horizontally for receiving and supporting a pipe and associated control valve (not shown) for the inlet of water for the cistern 13.

[0017] Also near its top corners, the frame forms a pair of horizontal plates 20a, 20b, arranged just below the upper horizontal surface 10c of the frame. The horizontal plates 20a, 20b, which are preferably joined to the vertical plates 18a, 18b respectively, act as support surfaces for an essentially flat cover element 21 which is mounted horizontally on top of the inner portion 13a of the cistern. The dimensions of the cover element 21, the main function of which is to limit evaporation of the water contained in the cistern and to muffle the noise of water being flushed from the cistern, essentially match those of the plan form of the inner portion 13a of the cistern. The cover element 21 also has a pair of laterally spaced slots 22a, 22b for engagement on the vertical plates 18a, 18b of the frame 10. The cover element 21 also

has two additional apertures or recesses 22c, 22d, or lines of weakness for forming them, for the through passage of an inlet pipe supplying water to the cistern 13.

[0018] The cistern 13 has a lid 23 closing the top of the outer portion 13b of the cistern which is advantageously configured to advantage so as to hide the upper horizontal edge of the frame 10. The lid 23 also has push buttons 24 for controlling the means (not shown) for controlling the water discharge.

[0019] Figures 4, 5 and 6 illustrate a variant which differs from the embodiment of Figures 1 to 3 in that the frame 10 is of rectangular shape, with the passage 17 for the discharge connector 14 of the cistern constituted by an aperture formed in the lower horizontal wall 10d of the frame and the pipe 15 being embedded into the wall 12.

[0020] Finally, Figure 6 illustrates a further variant, in which the toilet bowl is of a type set on the floor and the cistern assembly is positioned higher than in the embodiments shown in the preceding drawings.

[0021] The cistern 13 and the frame 10 have respective connection means (not shown for the sake of simplicity), preferably arranged on their facing side walls, for permanently securing the cistern into its vertical operating position in the frame.

[0022] As will be appreciated, the cistern assembly of the present invention takes up very little space in the room in which it is fitted; maintenance operations are simpler since gaining access to the inside of the cistern involves simply removing the lid 23; the cistern itself can be removed from the frame and, should this be necessary, can be replaced without having to damage the wall.

[0023] It is clear that the decision to configure the lid 23 so as to hide the top edge of the frame 10 constitutes a preferential choice, not a constructional requirement of the invention. In particular, the front or outer portion 13b of the cistern can be of a size and shape whereby its dimensions match or are slightly greater than those of the frame 10 and the cavity 11 in the wall; in this case, the lid 23 can be essentially flat.

[0024] Naturally, the principle of the invention remaining unchanged, embodiments and manufacturing details may vary widely from those described and illustrated purely by way of non-limitative example, without departing thereby from the scope of the invention, as claimed in the appended Claims.

Claims

1. A cistern assembly for a toilet bowl, of a type comprising:

   - a support frame (10) to be embedded and housed in a cavity (11) formed in a wall (12) and defining a frontally open space;
   - a flushing cistern (13) which can be inserted into the frame (10) and removed therefrom through the front aperture of the said space;

   characterised in that the cistern (13) includes:

   - a rear or inner portion (13a) to be housed in the space of the frame (10), and
   - a front or outer portion (13b) of a size and shape such that it projects, once installed, out of the frame (10) and beyond the vertical plane of the wall (12).

2. A cistern assembly according to Claim 1, **characterised in that** the front or outer portion (13b) of the cistern is wider than the rear or inner portion (13a).

3. A cistern assembly according to Claim 1, **characterised in that** the cistern (13) has a lid (23) for closing the top of the outer portion (13b) of the cistern.

4. A cistern assembly according to Claim 1, **characterised in that** the lid (23) is of a shape and size whereby, in the installed condition of the cistern, it covers at least an upper horizontal edge of the frame (10).

5. A cistern assembly according to any Claim from 1 to 4, **characterised in that** with the lid (23) installed, the outer or front portion (13b) of the cistern (13) covers the frame (10) from the outside, concealing it from sight.

6. A cistern assembly according to Claim 1, **characterised in that** the upper portion of the frame (10) forms, or is arranged to form at least one pair of fixed, laterally spaced apertures or seats (19) integral with the frame (10), for receiving a pipe for the intake of water into the cistern (13).

7. A cistern assembly according to Claim 6, **characterised in that** the frame (10) forms or is arranged to form two pairs of laterally spaced apertures or seats (19), integral with the frame (10), with each pair of apertures or seats (19) positioned near a respective side wall (10a, 10b) of the frame, for receiving a respective pipe for the inlet of water into the cistern (13).

8. A cistern assembly according to Claim 6 or 7, **characterised in that** the said seats or apertures (19) are formed in a side wall (10a, 10b) of the frame and in a vertical plate (18a, 18b) arranged near one of the said vertical side walls (10a, 10b).

9. A cistern assembly according to Claim 1, **characterised in that** it also includes an essentially flat cover element (21) separated from the frame (10) and provided for covering the said inner portion (13a) of the cistern.

10. A cistern assembly according to Claim 9, **characterised in that** a pair of support surfaces (20a, 20b) are formed in the upper portion of the frame for the said cover element (21).

11. A cistern assembly according to Claims 8 and 10, **characterised in that** the said support surfaces (20a, 20b) are constituted by horizontal plates each joined to one of the said vertical plate formations (18a, 18b).

12. A cistern assembly according to Claim 11, **characterised in that** the cover element (21) has a pair of laterally spaced slots (22a, 22b) for coupling with the said vertical plate elements (18a, 18b).

13. A cistern assembly according to Claim 11, **characterised in that** at least one additional aperture or cavity (22c, 22d) is formed or can be formed in the cover element (21) to take a pipe for supplying water to the cistern (13).

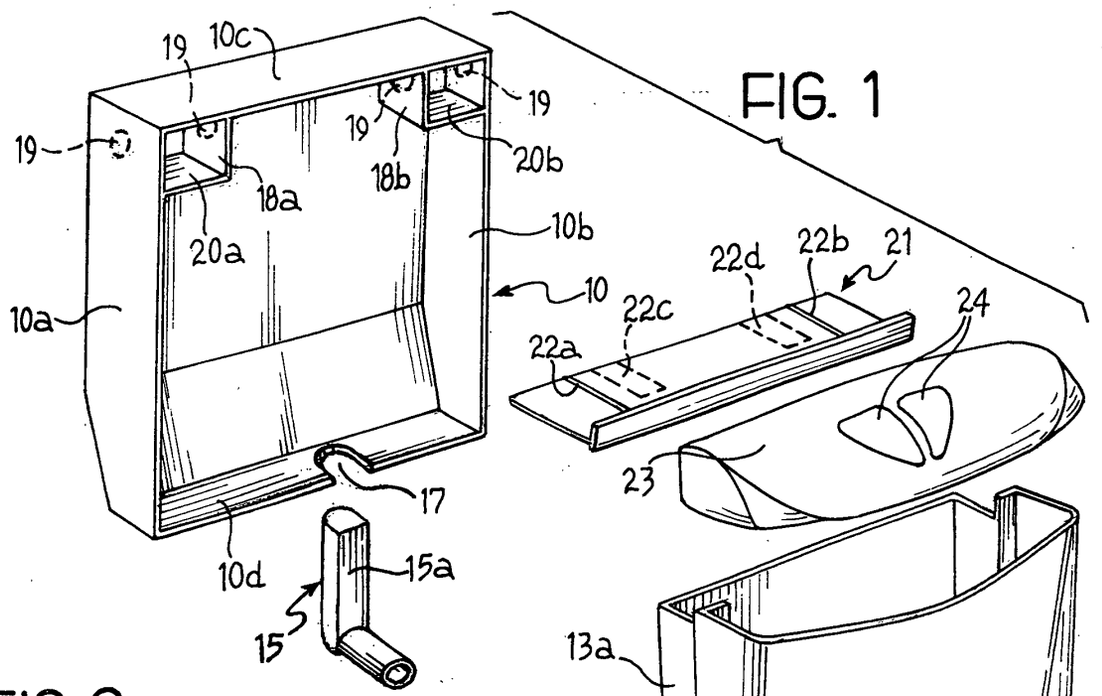

FIG. 1

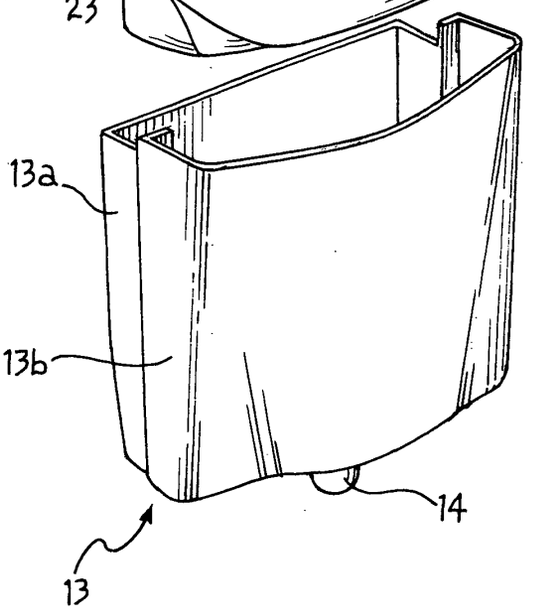

FIG. 2

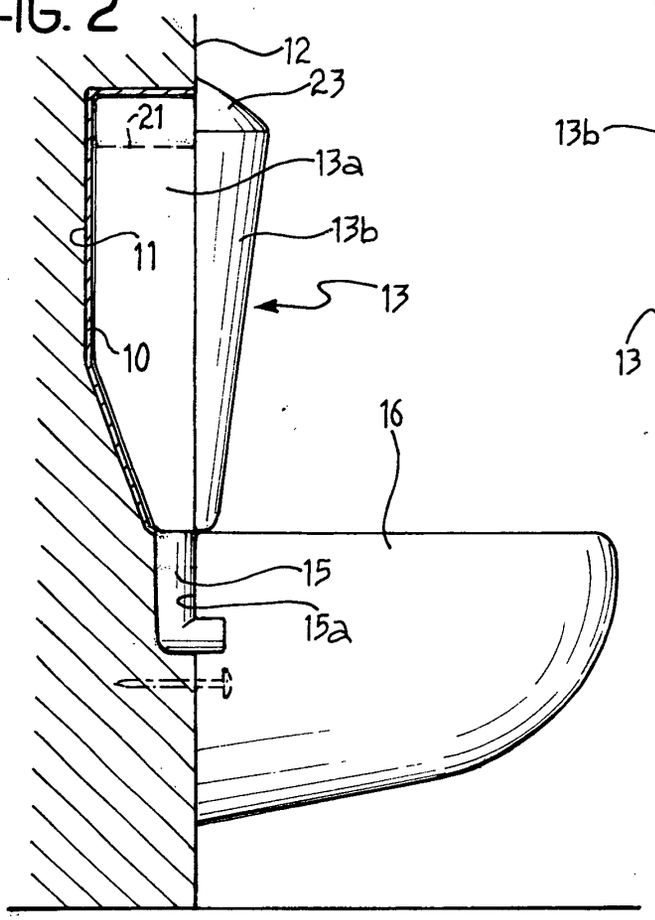

FIG. 3

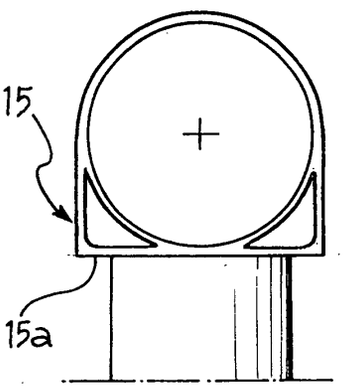

FIG. 4

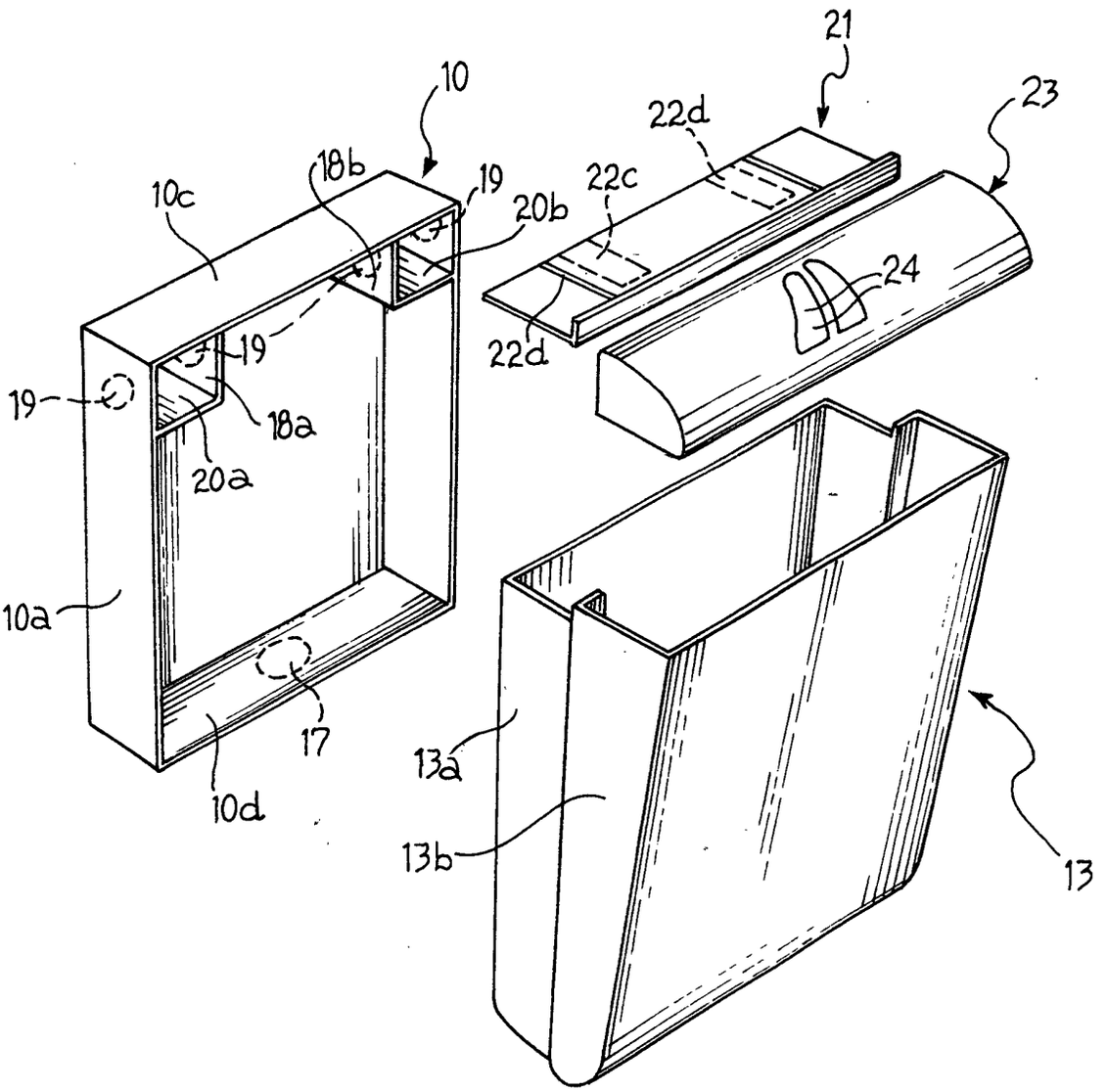
21
10
22d
23
18b
19
10c
22c
20b
24
22d
19
19
18a
20a
10a
17
13a
10d
13b
13

FIG. 6

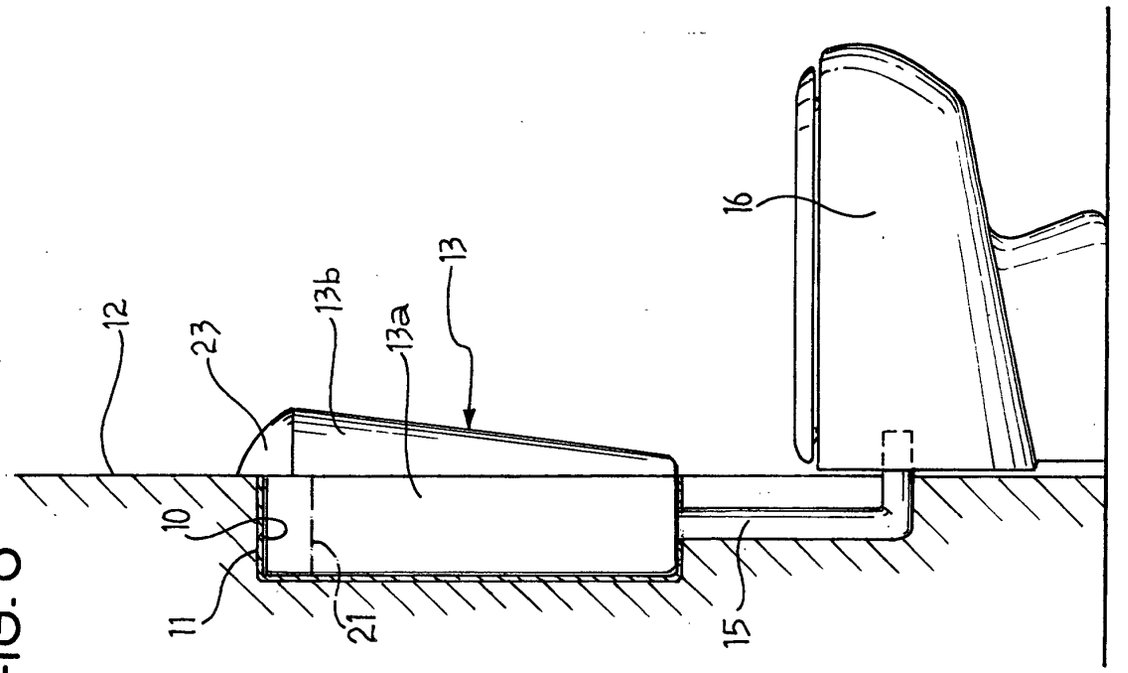

FIG. 5