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AUSTRALIA

PATENTS ACT 1990

PATENT REQUEST: STANDARD PATENT

I/We, the Applicant(s) and Nominated Person(s) specified below, request I/We be granted a patent for the invention disclosed in the accompanying standard complete specification.

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[54] Invention: A Cistern

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ASSOCIATED PROVISIONAL APPLICATION DETAILS

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By:

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NOTICE OF ENTITLEMENT

I, Fraser Patison Old, of Spruson & Ferguson, St Martins Tower, 31 Market Street, Sydney 2000, New South Wales, Australia being the patent attorney for the Applicant/Nominated Person in respect of an application entitled:

A Cistern

state the following:-

The Applicant/Nominated Person has entitlement from the actual inventor(s) as follows:-

The Applicant/Nominated Person is the assignee of the actual inventor(s).

The Applicant/Nominated Person is the applicant of the provisional application(s) listed on the Patent Request.

DATED this Thirty-First day of October 1994

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F. P. Old

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(56) Prior Art Documents
AU 278379 44195/64 86.2
AU 271962 20960/62 86.2
AU 125568 17200/44 86.2

(57) Claim

1. A cistern assembly for mounting in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of substantially vertical studs, said cistern assembly being adapted for mounting between an adjacent pair of said studs and comprising a cistern body and a cistern lid each of which has a front to rear maximum dimension less than that dimension of the studs which determines the front to rear spacing between said layers and each of which has a left to right maximum dimension which is less than the spacing between said adjacent pair of studs, said cistern body having a pair of support surfaces adjacent the base of said body; and said assembly further comprising a pair of support brackets each having a mounting surface adapted to be secured to one of the opposed faces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, the maximum external dimension of each said bracket between said edge restraint means being less than or equal to the front to rear stud dimension and the interior dimension between said edge restraint means being greater than said front to rear maximum dimension of said cistern body and lid.

7. A method of mounting a cistern in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of vertical studs, said method comprising the steps of, after said studs have been erected but before both said layers are secured thereto,

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(i) mounting a pair of the support brackets between a pair of adjacent studs, said brackets each having a mounting surface adapted to be secured to one of the opposed forces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, said brackets being mounted with said support flanges lowermost and facing each other,

(ii) sliding the cistern body and lid into the space formed between each pair of edge restraint means from above until said support surfaces of said cistern body abut said support flanges, and

The present invention relates to cisterns and, in particular, to a cistern assembly able to be mounted in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a number of substantially vertical studs.

There has long been a demand for cisterns which are effectively hidden from view behind a wall surface, or false partition of a bathroom or toilet.

Because cisterns have a substantial front to rear dimension, it has not hitherto been possible to mount such cisterns within a standard frame wall in which the front to rear dimension of studs, and hence the spacing between the interior of the front and rear surfaces of the wall, is only 70 mm. Instead, the cisterns are mounted within a false wall specially built for the purpose, typically spaced a short distance in front of a structural wall, and provided with only a front cladding layer since the rear surface of the frame wall faces the structural wall and is therefore not seen. This arrangements adds substantially to the cost of fabricating bathrooms since a concealed system has not hitherto been able to be located within the cavity formed by a conventional internal dividing wall formed from two layers of plaster board, for example, secured to either wooden or metal studs.

It is the object of the present invention to provide a cistern assembly which is able to be so mounted and thereby reduce the cost of fabrication of bathrooms having concealed cisterns.

In accordance with a first aspect of the present invention there is disclosed a cistern assembly for mounting in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of substantially vertical studs, said cistern assembly being adapted for mounting between an adjacent pair of said studs and comprising a cistern body and a cistern lid each of which has a front to rear maximum dimension less than that dimension of the studs which determines the front to rear spacing between said layers and each of which has a left to right maximum dimension which is less than the spacing between said adjacent pair of studs, said cistern body having a pair of support surfaces adjacent the base of said body; and said assembly further comprising a pair of support brackets each having a mounting surface adapted to be secured to one of the opposed faces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, the maximum external dimension of each said bracket between said edge restraint means being less than or equal to the front to rear stud dimension and the interior dimension between said edge restraint means being greater than said front to rear maximum dimension of said cistern body and lid.

Preferably each support bracket includes a latch means engageable with said cistern body and opposed to said support flange.

Preferably the edge restraint means comprises the opposed side walls of a substantially U-shaped trough having as its base said mounting surface.

Preferably at the other (upper) end of each bracket the side walls are extended to form a pair of spaced apart lugs.

According to a second aspect of the present invention there is disclosed a method of mounting a cistern in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of vertical studs, said method comprising the steps of, after said studs have been erected but before both said layers are secured thereto,

(i) mounting a pair of the support brackets between a pair of adjacent studs, said brackets each having a mounting surface adapted to be secured to one of the opposed faces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, said brackets being mounted with said support flanges lowermost and facing each other,

(ii) sliding the cistern body and lid into the space formed between each pair of edge restraint means from above until said support surfaces of said cistern body abut said support flanges, and

(iii) securing one or both of said layers to said studs.

Preferably, the brackets include a latch means and the cistern body is clamped between the latch means and the supporting flange of each bracket prior to step (iii) above.

A preferred embodiment of the present invention will now be described with reference to the drawings in which:

Fig. 1 is a side elevational view of a lavatory pan and cistern in accordance with the preferred embodiment, the frame wall within which the cistern is mounted being illustrated in cross-section;

Fig. 2 is a perspective view of the cistern body and cistern lid of the preferred embodiment;

Fig. 3 is a plan view of the cistern of Fig. 2;

Fig. 4 is a front view of the cistern of Fig. 2;

Fig. 5 is an inverted plan of the cistern of Fig. 2;

Fig. 6 is a rear view of the cistern of Fig. 2;

Figs. 7 and 8 are respectively left and right hand side views of the cistern of Fig. 2; and

Fig. 9 is an exploded perspective view illustrating the support brackets and the adjacent pair of studs between which the cistern is mounted.

As seen in Fig. 1, a lavatory pan 1 is mounted on the floor 2 of a bathroom or toilet 3. Located behind, and above, the pan 1 is a concealed cistern 4 which is connected to the pan via an L-shaped flush pipe 5. As indicated by means of dotted lines in Fig. 1, the pan 1 can be provided with either an S-trap 6 or a P-trap 7 which connects the pan 1 to the sewer in conventional fashion (but not illustrated).

The wall 10 within which the cistern 4 is mounted is formed from a front layer 11 and a rear layer 12 which can be formed from plasterboard, tile covered plywood, sheet metal or other substantially conventional cladding surface. Located on the front layer 11, at a position central to, but above, the cistern 4 is an access plate 13. Located on the access plate 13 are one or more flush buttons 14.

It will be appreciated by those skilled in the art that the spacing between the interior of the front layer 11 and rear layer 12 is only 70 mm since the wall 10 is a substantially conventional internal wall and can be used to separate the bathroom 3 from an adjacent room 15.

As best seen in Figs. 2-8, the cistern 4 is preferably moulded in two pieces from plastics and so has a cistern body 18 and a cistern lid 19. Located within the lid 19 is an inlet 22.

The cistern body 18 is provided with a hollow flush outlet 23 which also functions as an "internal" overflow directed into the toilet bowl. Since in some applications, eg. septic tanks, an external overflow is required, the cistern body also has an overflow outlet 24 which is connected to a generally vertically extending overflow tube (not illustrated) within the interior of the cistern, and two support surfaces 25. The overflow outlet 24 extends through one of the support surfaces 25 and as indicated in Fig. 5 provision can be made for either a right or a left handed positioning of the overflow outlet 24.

As seen in Fig. 9, two identical support brackets 30 are used to mount the cistern 4 between a pair of adjacent studs 31 to which the front layer 11 and rear layer 12 are ultimately secured.

Each support bracket 30 has a substantially flat mounting surface 32 with two apertures 33 therein which enable the support brackets 30 to be nailed, or otherwise secured to the two opposing faces of the studs 31. In addition, each support bracket 30 has a support flange 34 at its lower end. Each support flange 34 has a bight 35 which is shaped to receive the overflow outlet 24 yet still enable the support surfaces 25 to abut the support flanges 34.

Each support bracket 30 has a substantially U-shaped appearance having a pair of side walls 37 which together with the mounting surface 32 forms a generally U-shaped trough. At the upper end of the support bracket 34 the side walls 37 are extended to form a pair of lugs 38.

Pressed out of the mounting surface 32 is a releasable spring latch 39, the free end of which is able to engage with a recess 40 located at the upper edge of each of the side walls of the cistern 4.

In order to carry out the mounting procedure, the studs of the wall 10 are erected and the front layer 11 is preferably secured to the studs. Then openings are cut in the front layer 11 for the flush pipe 5 and access plate 13. Then the pan 1 is mounted to

the floor 2 and the flush pipe 5 secured in position working from the rear, that is from within the adjacent room 15.

Next the pair of brackets 30 are nailed to the studs 31, each at the same height above the floor 2 and the cistern 4 is slid from above into the space between the lugs 38 and side walls 37. This sliding motion is continued until the support surfaces 25 abut the support flanges 34 at which time the spring latches 37 which have been depressed towards the mounting surfaces 32 by the side walls of the cistern 4, snap into engagement with the recesses 40 so as to firmly lock or clamp the cistern 4 in position. The remaining plumbing connections to the inlet 22, flush outlet 23 and overflow outlet 24 are then completed. Then the rear layer 12 is secured to the studs 31.

It will be apparent that in the event that servicing of the cistern 4 is required, for example to replace perishable rubber components in the inlet or flush valves of the cistern mechanism, then access to the interior of the cistern 4 can be obtained via the access plate 13 and removal of the lid 19.

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A cistern assembly for mounting in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of substantially vertical studs, said cistern assembly being adapted for mounting between an adjacent pair of said studs and comprising a cistern body and a cistern lid each of which has a front to rear maximum dimension less than that dimension of the studs which determines the front to rear spacing between said layers and each of which has a left to right maximum dimension which is less than the spacing between said adjacent pair of studs, said cistern body having a pair of support surfaces adjacent the base of said body; and said assembly further comprising a pair of support brackets each having a mounting surface adapted to be secured to one of the opposed faces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, the maximum external dimension of each said bracket between said edge restraint means being less than or equal to the front to rear stud dimension and the interior dimension between said edge restraint means being greater than said front to rear maximum dimension of said cistern body and lid.

2. An assembly as claimed in claim 1 wherein each support bracket includes a latch means engageable with said cistern body and opposed to said support flange.

3. An assembly as claimed in claim 2 wherein said latch means is formed from the material of said bracket.

4. An assembly as claimed in any one of claims 1 to 3 wherein said edge restraint means comprises the opposed side walls of a substantially U-shaped trough having as its base said mounting surface.

5. An assembly as claimed in claim 4 wherein at the other (upper) end of said bracket said side walls are extended to form a pair of spaced apart lugs.

6. An assembly as claimed in any one of claims 1 to 5 wherein said support surfaces are substantially horizontal when said brackets are secured to said studs and said mounting surface is substantially flat.

7. A method of mounting a cistern in a frame wall comprising a front and a rear layer spaced apart by, and secured to, a plurality of vertical studs, said method comprising the steps of, after said studs have been erected but before both said layers are secured thereto,

(i) mounting a pair of the support brackets between a pair of adjacent studs, said brackets each having a mounting surface adapted to be secured to one of the opposed forces of said adjacent pair of studs, a support flange at one (lower) end of each said bracket, and a pair of spaced apart edge restraint means between which said mounting surface and support flange are located, said brackets being mounted with said support flanges lowermost and facing each other,

(ii) sliding the cistern body and lid into the space formed between each pair of edge restraint means from above until said support surfaces of said cistern body abut said support flanges, and

(iii) securing one or both of said layers to said studs.

8. A method as claimed in claim 7 wherein each of said brackets includes a latch means co-operable with said cistern body and said cistern body is clamped between said latch means and said supporting flange of each bracket prior to step (iii).

9. A method as claimed in claim 7 or 8 including the step of making plumbing connections to said cistern prior to step (iii).

10. A method as claimed in any one of claims 7 to 9 including the step of forming an access aperture in one of said layers and covering same with an access plate.

11. A cistern assembly for mounting in a frame wall, said assembly being substantially as herein described with reference to the accompanying drawings.

12. A method of mounting a cistern in a frame wall, said method being substantially as herein described with reference to the accompanying drawings.

DATED this THIRTY-FIRST day of OCTOBER 1994

Caroma Industries Limited

Patent Attorneys for the Applicant
SPRUSON & FERGUSON

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ABSTRACT

The present invention discloses a cistern (4) able to be mounted between a pair of adjacent studs (31) of a conventional frame wall. The front-to-rear dimension of the cistern (4) is less than the front-to-rear dimension of the studs (31) which can be covered with any conventional cladding material. Two support brackets (30) mounted one to each stud (31) and opposing each other hold the cistern (4) in position.

Fig. 9

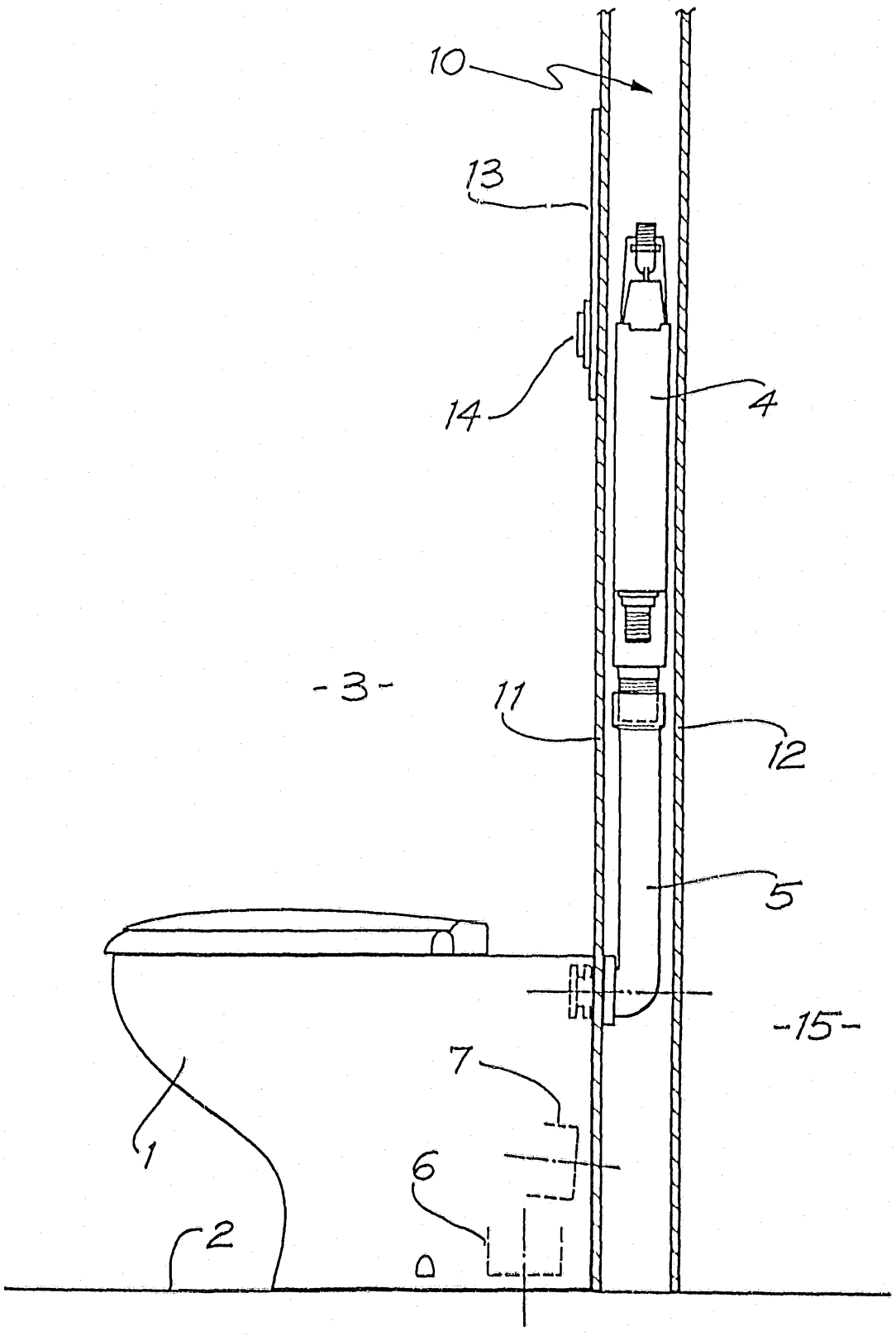

FIG. 1

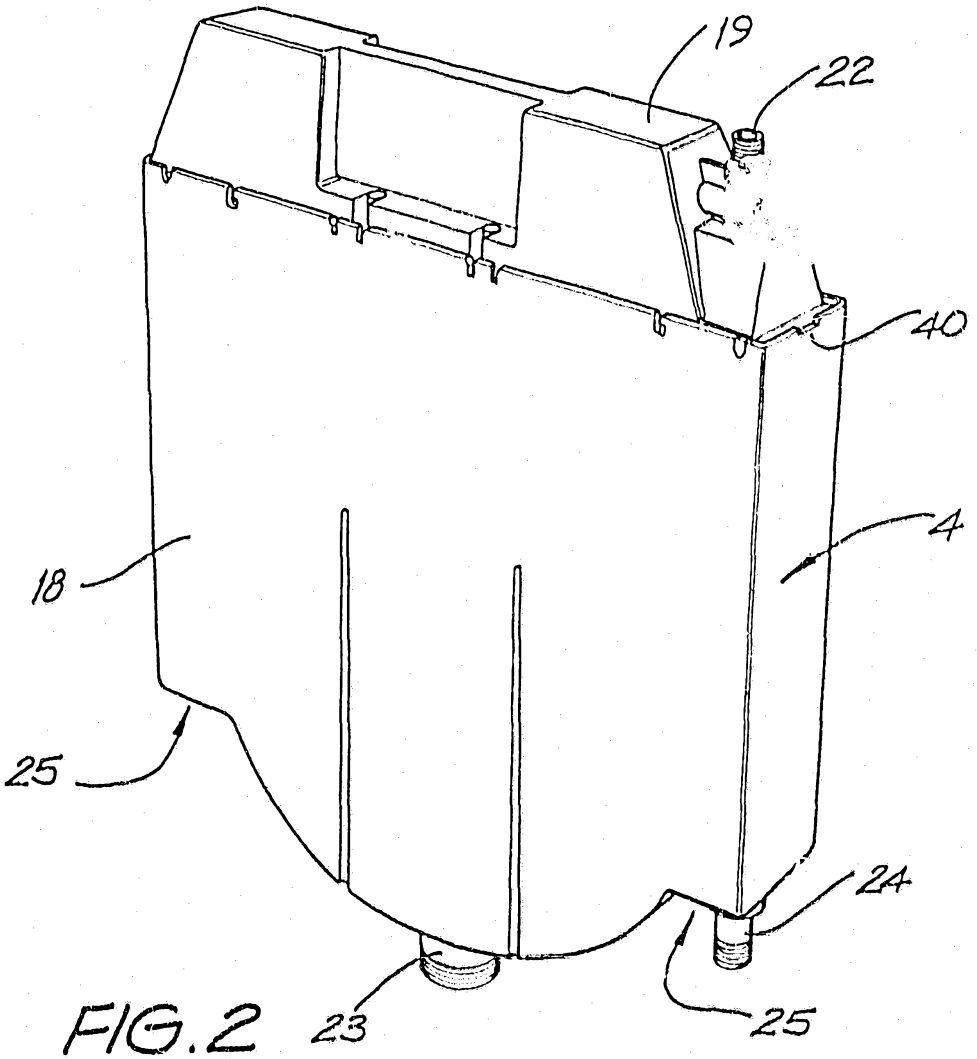

FIG. 2

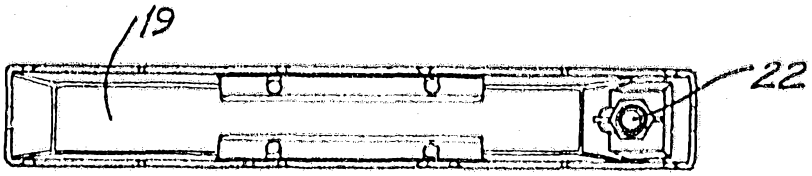

FIG. 3

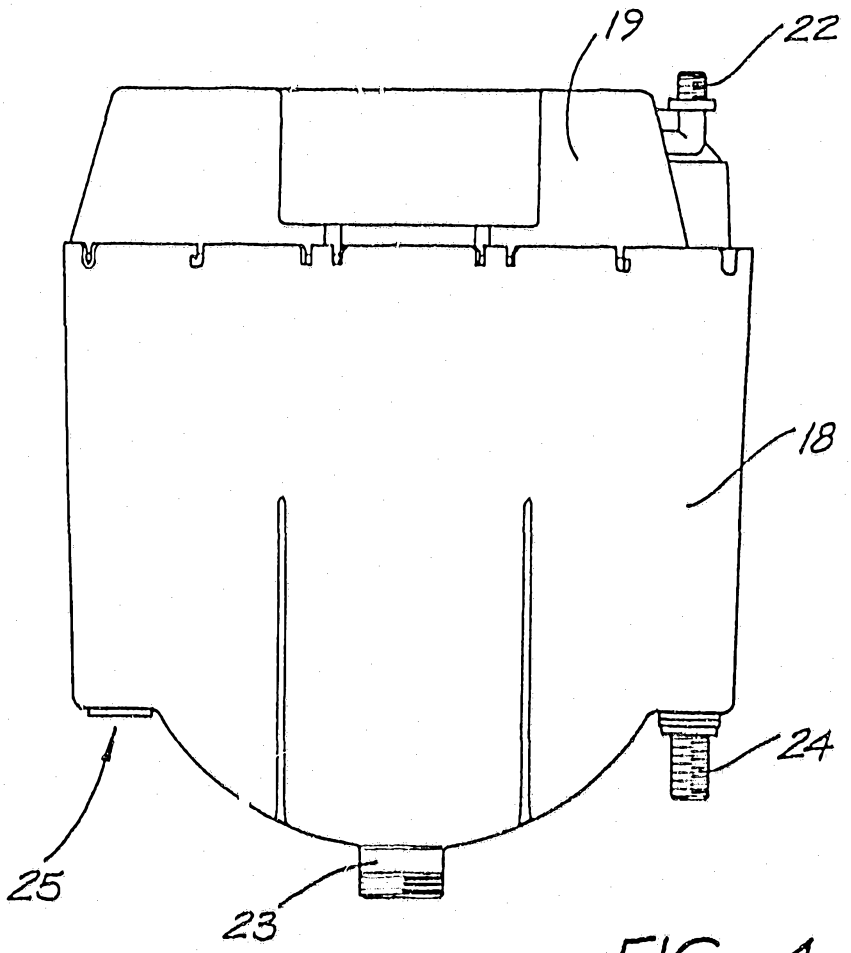

FIG. 4

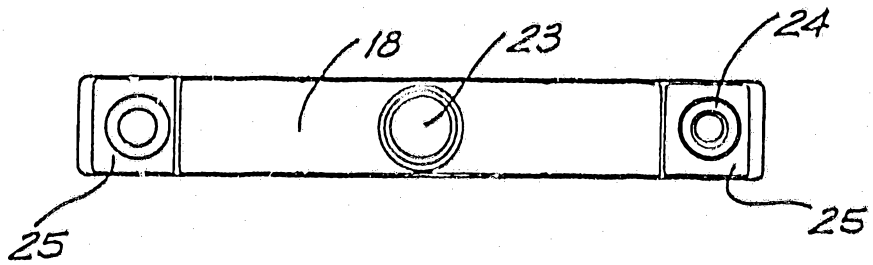

FIG. 5

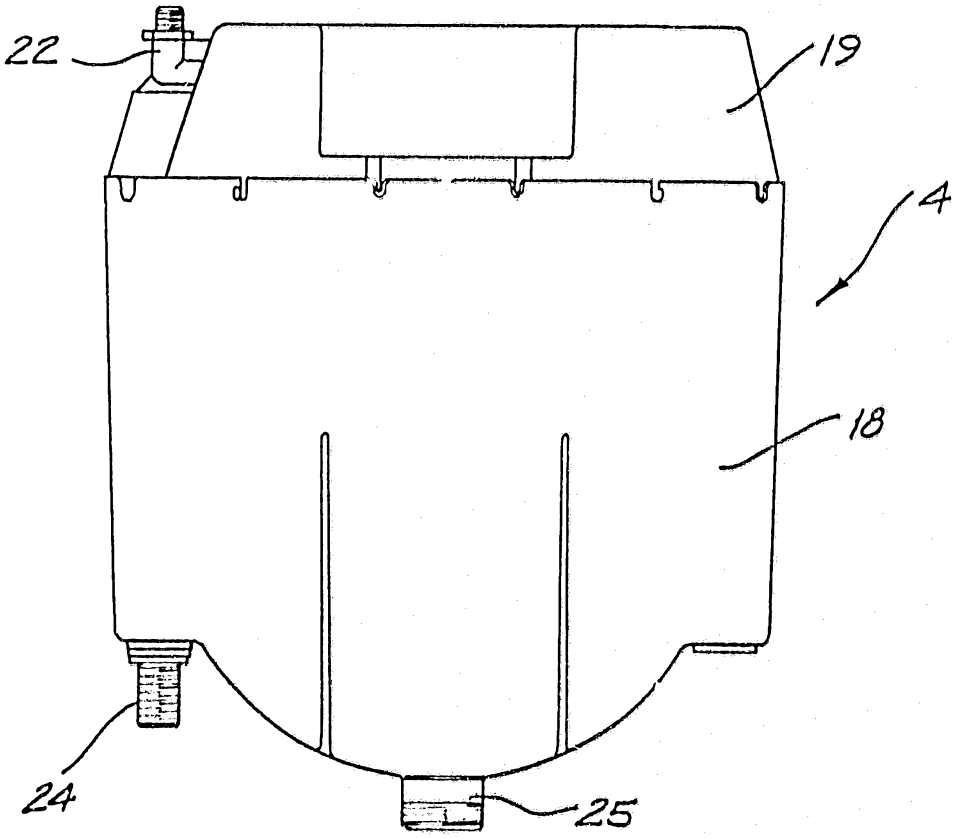

FIG. 6

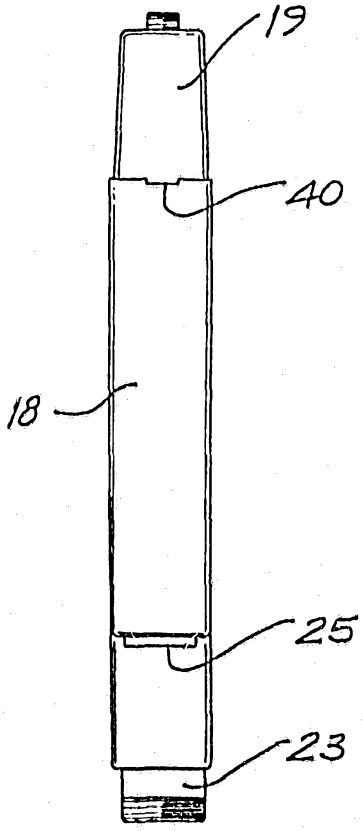

FIG. 7

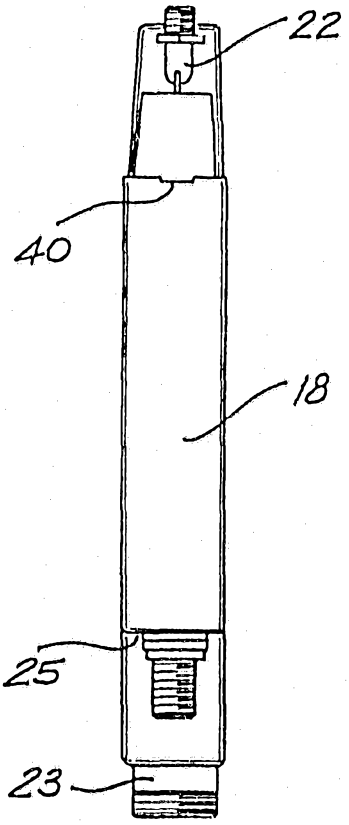

FIG. 8

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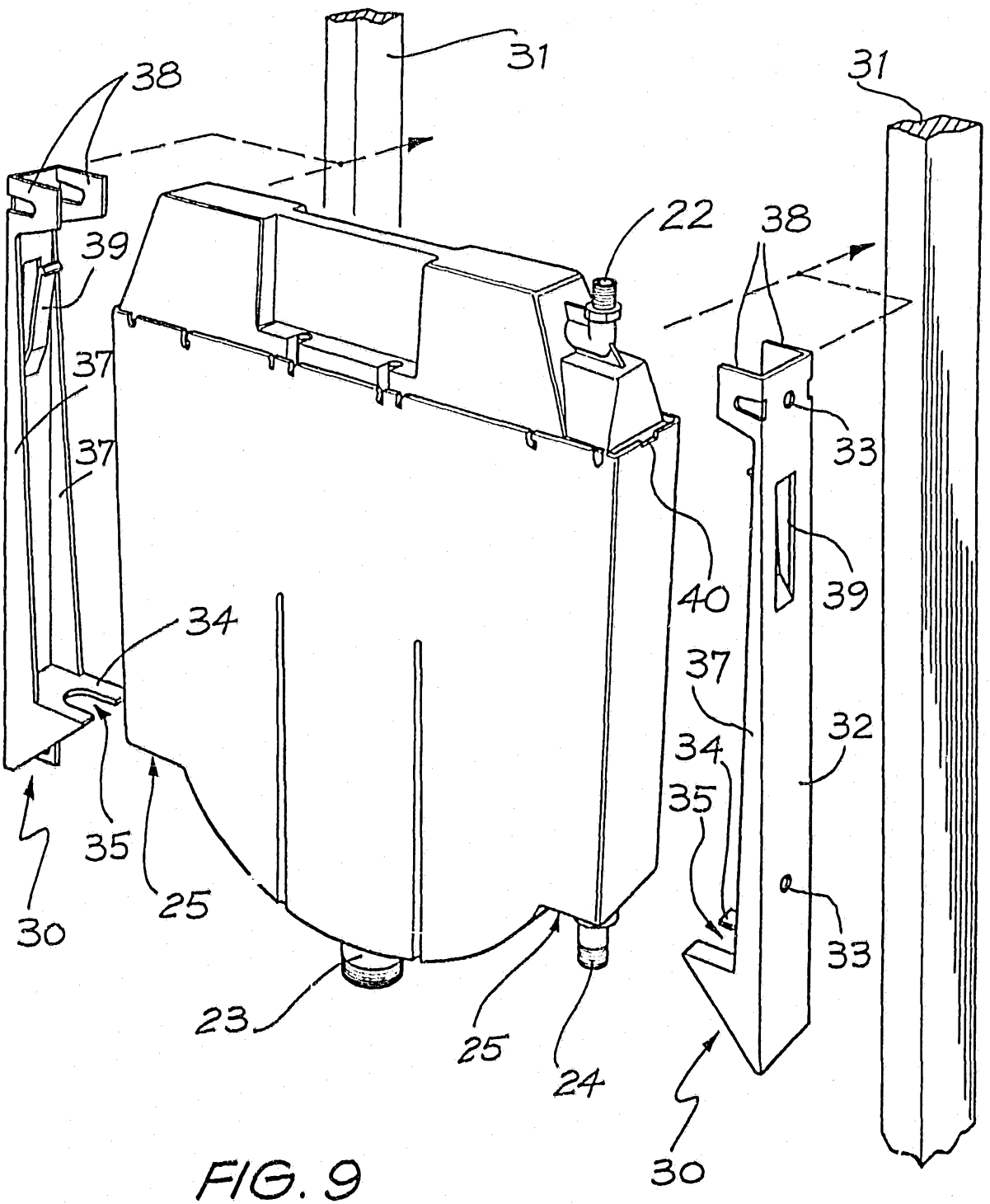

FIG. 9