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(71) Applicant: **Baiguini, Giacomo**
24062 Costa Volpino (Bergamo) (IT)

(72) Inventor: **Baiguini, Giacomo**
24062 Costa Volpino (Bergamo) (IT)

(74) Representative: **Luksch, Giorgio, Dr.-Ing. et al**
Ing. A. Giambrocono & C. S.r.l.
Via Rosolino Pilo, 19/b
20129 Milano (IT)

(54) Independent, self-supporting shower cabinet, with connecting rods

(57) The shower cabinet (1) comprises a shower tray (2), a headpiece (3) and intermediate fixed lateral walls (5a,5b,5c,5d). The fixed lateral walls (5a,5b,5c,5d) are sealedly clamped along their upper and lower edges against gaskets positioned in the shower tray (2) and in the headpiece (3), by the action of tie rods (4a,4b,4c,4d, 4e) interconnecting the shower tray (2) and headpiece (3).

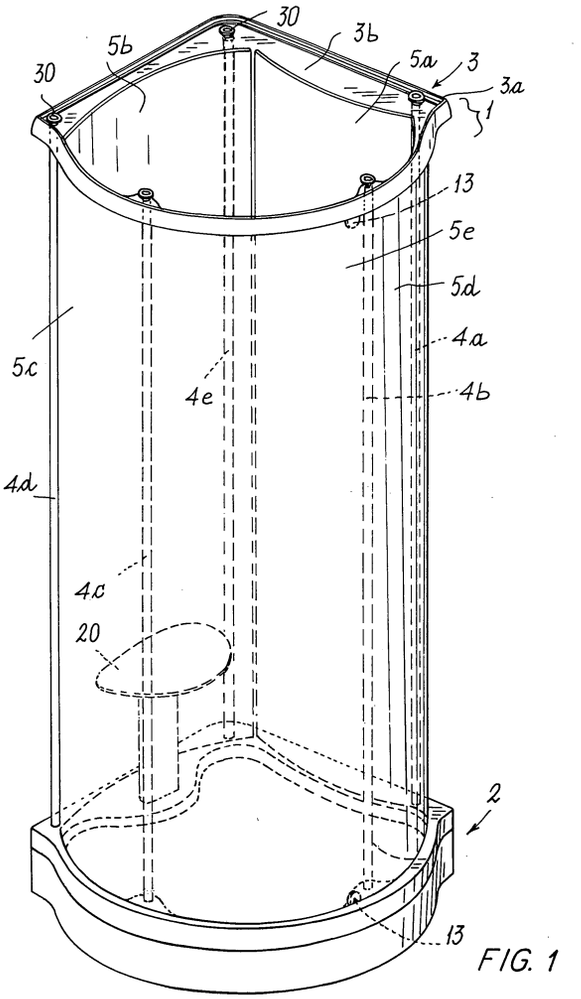


FIG. 1

EP 1 475 026 A2

Description

[0001] The present invention relates to a shower cabinet, in accordance with the introduction to the main claim.

[0002] Shower cabinets are known in the most diverse constructions. Generally, the cabinets have a supporting structure formed from suitable profile bars, generally of aluminium, which define spaces closed by panels of toughened glass or plastic. The said profile bars are connected to a so-called shower tray which forms part of the structure. To provide a seal between the panels, the profile bars and the shower tray, silicone is applied to the various connection points or regions.

[0003] Assembly of these cabinets involves a relatively lengthy time and requires expert labour.

[0004] The silicone application also lengthens the assembly time and is the cause of grime which has to be removed; the silicone allows mould and bacteria to settle, and the operations involved in cleaning the cabinet accelerate silicone degradation, with consequent seal losses.

[0005] Other arrangements also exist in which the panels are joined together and/or to a supporting structure by screws passing through holes in the panels, which can result in damage to the panels in the case of excess stressing.

[0006] An object of the present invention is to provide a shower cabinet which can be easily and quickly assembled without the use of silicone and/or sealant, is easily cleaned and hence hygienic and sanitizable, and ensures an optimum and durable seal.

[0007] This and other objects which will be more apparent on reading the present description are attained by a shower cabinet in accordance with the technical teachings of the accompanying claims.

[0008] The invention will be better understood from the ensuing detailed description provided by way of non-limiting example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the shower cabinet of the invention;
Figure 2 is a perspective view of the first stage of assembly of the shower cabinet;
Figure 3 is a perspective view of a further stage of assembly of the shower cabinet;
Figure 4 is a perspective view, on a different scale, of a detail relative to the upper connection of the components of the shower cabinet;
Figure 5 is a schematic cross-section through the shower cabinet;
Figure 6 is a horizontal detailed section through the joint between two components (fixed curved panels) of the shower cabinet;
Figure 7 is a horizontal detailed section relative to the (rotatable) door of the shower cabinet;
Figure 8 is a schematic vertical section through the lower connection between a tie rod and the shower tray;
Figure 9 is a schematic detailed section showing the pressing of a glass panel against a gasket inserted in the shower tray;
Figure 10 is a schematic vertical section showing the assembly of the seat on the shower tray;
Figure 11 is a section through a profile bar acting both as an interconnection between two adjacent panels and as a tie.

[0009] With reference to the drawings, the shower cabinet of the illustrated embodiment, indicated overall by 1, comprises a shower tray 2 of moulded engineering polymer, a headpiece 3, a series of screwed tie rods 4a, b, c, d, e, connecting the two together, and a series of fixed curved panels 5a, b, c, d, e, defining the interior of the shower cabinet, one of which, indicated by 5e, being movable and acting as the access door to the interior. The fixed panels are clamped (locked) by the tie rods between the shower tray 2 and the headpiece 3.

[0010] The series of fixed panels, which can be of toughened glass or of high quality engineering polymer such as polymethylmethacrylate, for example of high resilience type, comprises a (rear) first curved panel 5a with its convexity extending towards the cabinet interior, and three fixed lateral curved panels 5b, c, d with their concavity extending towards and/or away from the cabinet interior.

[0011] Five tie rods 4a ,b, c, d, e are provided in this non-limiting embodiment.

[0012] During assembly, these latter (Figure 8) are lowerly screwed into threaded bosses 6 incorporated into the shower tray 2.

[0013] Figure 2 shows the shower cabinet after the tie rods 4a, b, c, d, e have been mounted on the shower tray 2. Three of these tie rods (4a, e, d) are outside the cabinet interior, whereas the other two (4b, c) are inside it and positioned in correspondence with the panel 5e which defines the access door to the cabinet interior.

[0014] One or more grooves 7 are provided in the shower tray 2 (but not in the door region) to receive the lower ends of the fixed panels, the grooves hence having a conforming shape. Flat gaskets 8, for example of PVC, of conforming shape are inserted into these grooves (Figure 9) as far as their base 7a, to receive the glass panels (for example 5c in the figure) inserted with such force as to cut (penetrate) into the gasket and obtain the necessary seal. The grooves 7 outwardly present a continuous side wall 7b, whereas inwardly the side wall is formed of separate portions 7c to facilitate mounting of the fixed panels 5a, b, c, d, this operation following that of Figure 2 and being shown in Figure 3.

[0015] To provide the seal along those vertical edges 9 along which two fixed panels (for example 5a, 5b) face each other, the expedient of Figure 6 is used, employing conventional coextruded connection gaskets 10 presenting an elastic hollow intermediate part 10a (for ex-

ample of engineering elastomeric polymer), from the opposite ends of which there extend U-profiled parts of more rigid engineering polymer with flexible edges, into which the edges of adjacent panels (5a, 5b) are sealedly inserted. The length of these connection gaskets is equal to the length of the vertical edges of the panels.

[0016] After this operation the headpiece 3 (Figures 1, 3 and 4) is installed. In this embodiment the headpiece presents a moulded frame-like part 3a of engineering polymer, and an overlying plate 3b of glass or transparent engineering polymer, this plate being contained within the surrounding side wall of the part 3a. The frame-like part presents in its lower side, in a like manner to the shower tray 2, at least one groove (not visible) to receive as far as its base the flat PVC gasket or gaskets of Figure 9, the groove having a shape and length corresponding to that of the fixed panels 5a, b, c, d, e and into which the upper edges of the fixed panels are inserted.

[0017] Aligned with the tie rods 4a, b, c, d, e, the frame-like part 3a of the headpiece 3 and the relative plate 3b resting on it present holes for passage of the threaded upper ends of the screwed tie rods 4a, b, c, d, e, on the threaded ends of which are screwed clamping nuts 30 or the like to lock (clamp) the fixed panels.

[0018] It should be noted that the frame-like part 3a rests on the edges of the tie rods; these edges project beyond the contour of the threaded end. A similar but lower edge is visible in Figure 8 where it is indicated by 12.

[0019] By means of this clamping operation the fixed structure of the shower cabinet is completed.

[0020] The cabinet itself is completed by the movable panel 5e which forms the access door to the cabinet interior, the door in this embodiment being rotatable on conventional coaxial hinges 13, one upper and the other lower, consisting of a pin 13a seated in a bush (not visible) mounted in the upper frame-like part 3 and in the shower tray 2 respectively. The pin 13a is connected to a U-piece 13b which embraces the movable panel 5e and is fixed to the panel by through screw means, not shown.

[0021] The problem relative to the vertical seal for the cabinet door (i.e. the movable panel 5e) during use is solved, for example, in the following manner (Figures 6 and 7). On the abutting sides of the door 5e and of the adjacent fixed panel 5c a conventional gasket 15 is provided presenting a channel-shaped part 15a into which the vertical edge of the panel 5c is inserted. To this channel-shaped part 15a there is connected (for example by co-moulding) a hollow tubular part 15b with a magnetic or alternatively ferromagnetic plate 15c fixed thereto. A corresponding gasket 16 is mounted on the adjacent edge of the door 5e. If the magnetic plate is fixed to the gasket 15, a ferromagnetic plate is fixed to the gasket 16 and vice versa.

[0022] The door 5e is coupled to the other adjacent fixed panel 5d by a gasket of the type shown in Figure 6, but here indicated by 10a, its flexibility enabling the door 5c to undergo its necessary opening rotation.

[0023] The described shower cabinet can incorporate a seat 20 fixed to the shower tray (Figure 10). In this example, the seat 20 comprises a tubular base 20a resting on the surface of a corresponding projecting part 2a of the shower tray 2. In this projecting part 2a there is fixed a threaded bush 2b into which the threaded lower end of a tie rod 2c is screwed, its other end presenting a head 2d provided with a seat 2e for applying a tightening tool. This head is received in a seat 21 of a cover 22 which closes and bears on the upper end of the tubular base 20a. On one side of the tubular base 20a there is provided a conventional hinge 23 by which the sitting part 20b of the seat 20 is connected, enabling it to be rotated (arrows F) from the position shown in Figure 12, in which it rests via anti-knock gaskets 24 on the tubular base 20a or rather on the relative cover 22, to a raised position (arrows F) when the user requires more space for washing.

[0024] In the described shower cabinet two of the tie rods (4b, 4c) extend through the interior of the cabinet, in correspondence with the sides of the door 5e (to enable the user to grip onto them if necessary), whereas the other three tie rods are external to the cabinet. However the scope of the invention also includes different arrangements of the tie rods, which can be all external to the cabinet or hidden, for example embedded (some or all) within the gaskets joining the fixed panels, as indicated by dashed lines in Figure 6, in which the tie rod is indicated by A.

[0025] The fixed panels 5a, b, c, d can be of larger or smaller number than stated.

[0026] The headpiece 3 can be provided with a plastic cover (not visible) which can be removable.

[0027] The shower cabinet is completed by a drain outlet 130 present in the base of the shower tray 2 for connection to a conventional drain pipe, and by the necessary hydraulic part, the taps, mixers and sprinklers of which are mounted on the fixed rear wall 5a convex towards the cabinet interior, with the relative pipes extending hidden behind this wall.

[0028] The water flow controls, the temperature controls etc. can be hidden from view and operated via sensors which sense the fingers of the user for controlling water delivery. Finally, a conventional shower head can be applied to the top of the cabinet interior with the relative piping extending between the said removable cover and the headpiece 3.

[0029] Figure 11 shows a section through a profile bar (for example of aluminium) preferably of circular cross-section indicated overall by 100 and acting both as the interconnection element between two adjacent panels 101, 102 and as a tie rod. In this respect, the interconnection function is performed by two (diametrically) opposite longitudinal grooves 103 in which conventional elastic gaskets 104 are positioned. The tie rod function is performed by its integral tubular core 105 which ex-

tends longitudinally and centrally and comprises at its ends threaded pins, not shown, cooperating with threaded counter-means shown in the preceding figures and indicated therein by 6 and 30. Alternatively the counter-means can themselves present threaded pins which screw into the integral tubular core 105 which may or may not have threaded ends.

[0030] The shower cabinet of the invention has the characteristic of being self-supporting, hence requiring no wall connections for its support, and no support structures.

Claims

1. A shower cabinet (1) comprising a shower tray (2), a headpiece (3) and intermediate fixed lateral walls (5a, b, c, d), **characterised in that** the fixed lateral walls (5a, b, c, d) are sealedly clamped along their upper and lower edges against gaskets (8) positioned in the shower tray (2) and in the headpiece (3), by the action of tie rods (4a, b, c, d, e) interconnecting the shower tray (2) and headpiece (3).

2. A shower cabinet as claimed in claim 1, **characterised by** being self-supporting.

3. A shower cabinet as claimed in claims 1 and 2, wherein the fixed lateral walls (5a, b, c, d) are formed of panels.

4. A shower cabinet as claimed in claims 1 and 2, wherein least some of the panels have a curved cross-section (5a, c, c, d).

5. A shower cabinet as claimed in claim 4, wherein the panels (5a, b, c, d, e) are of toughened glass or engineering polymer.

6. A shower cabinet as claimed in claim 1, wherein the gaskets (8) are embedded in grooves (7) of the headpiece (3) and shower tray (2) respectively, and against which the upper and lower edges of the fixed panels (5a, b, c, d) respectively press.

7. A shower cabinet as claimed in one or more of the preceding claims, wherein the tie rods (4a, b, c, d, e) are provided with threaded ends screwed respectively into threaded seats (6) rigid with the shower tray (2) or with screw means (30) pressing on the headpiece (3).

8. A shower cabinet as claimed in one or more of the preceding claims, wherein the headpiece (3) comprises a frame-shaped first component (3a) containing the gasket or gaskets (8) and a second component (3b) in the form of a plate resting on said first component.

9. A shower cabinet as claimed in one or more of the preceding claims, wherein in correspondence with the adjacent vertical edges of the fixed panels (5a, b, c, d) there are disposed gaskets (10) coupling together two panels (for example 5a, b, Figure 6), said coupling gaskets comprising parts (10b) mounted on said edges and a hollow intermediate elastic articulation part (10a).

10. A shower cabinet as claimed in claim 9, wherein the tie rods (4a, b, c, d, e) extend within the interior of the hollow intermediate elastic part (10a) of the coupling gasket (10).

11. A shower cabinet as claimed in one or more of the preceding claims, comprising a door (5e) formed from a curved panel.

12. A shower cabinet as claimed in claim 11, wherein the door (5e) is hinged between the headpiece (3) and the shower tray (2), and has one of its vertical edges joined by an elastically deformable gasket to one of the fixed panels defining a side of the cabinet opening, whereas on its opposite vertical it presents a gasket cooperating by magnetic attraction with a similar gasket situated along the edge of the other fixed panel defining the opposite side of said opening (Figure 7).

13. A shower cabinet as claimed in one or more of the preceding claims, wherein the panels are interconnected by profile bars provided with longitudinal grooves for receiving the vertical edges of said panels, said profile bars also acting as tie rods.

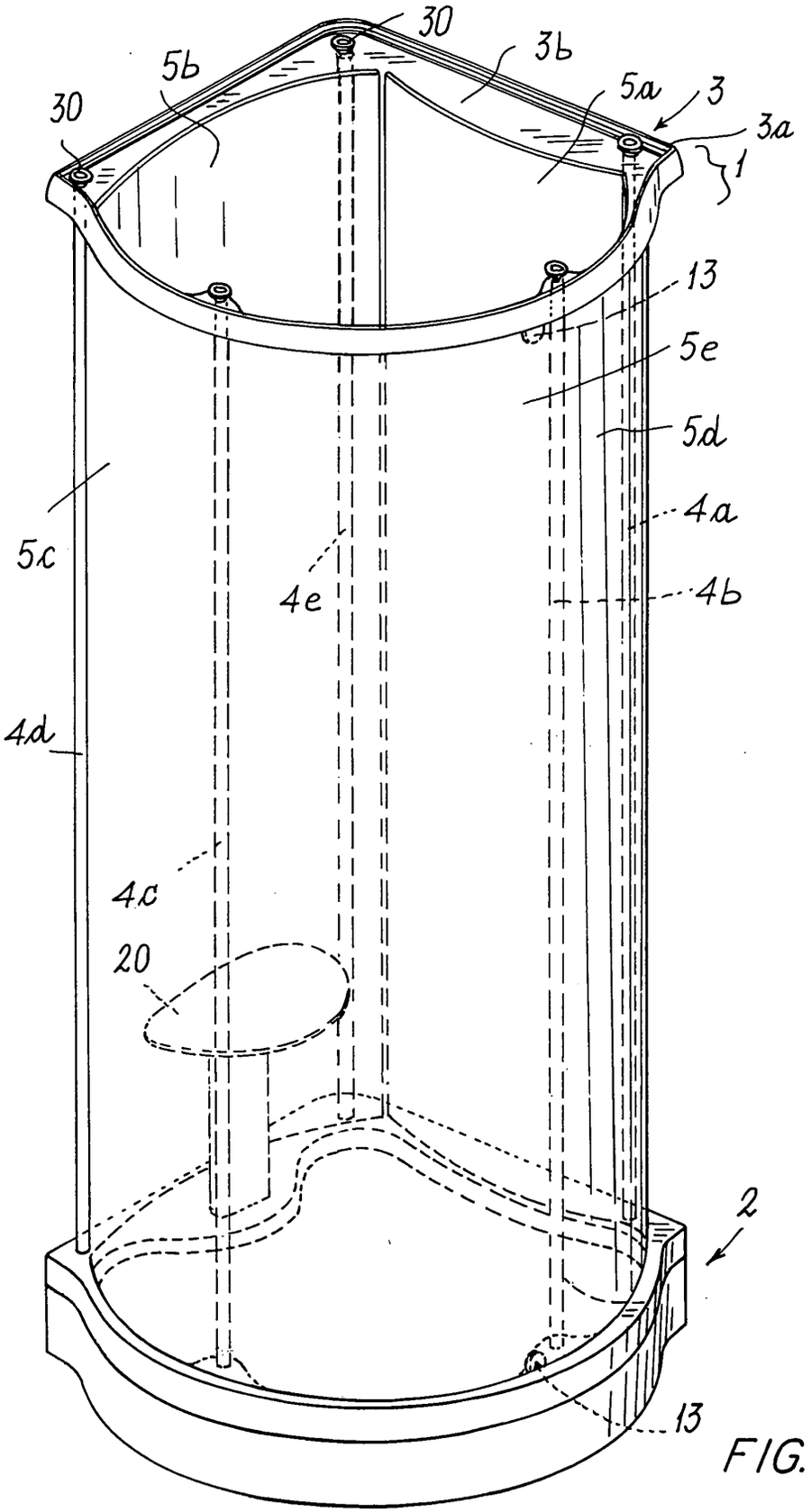


FIG. 1

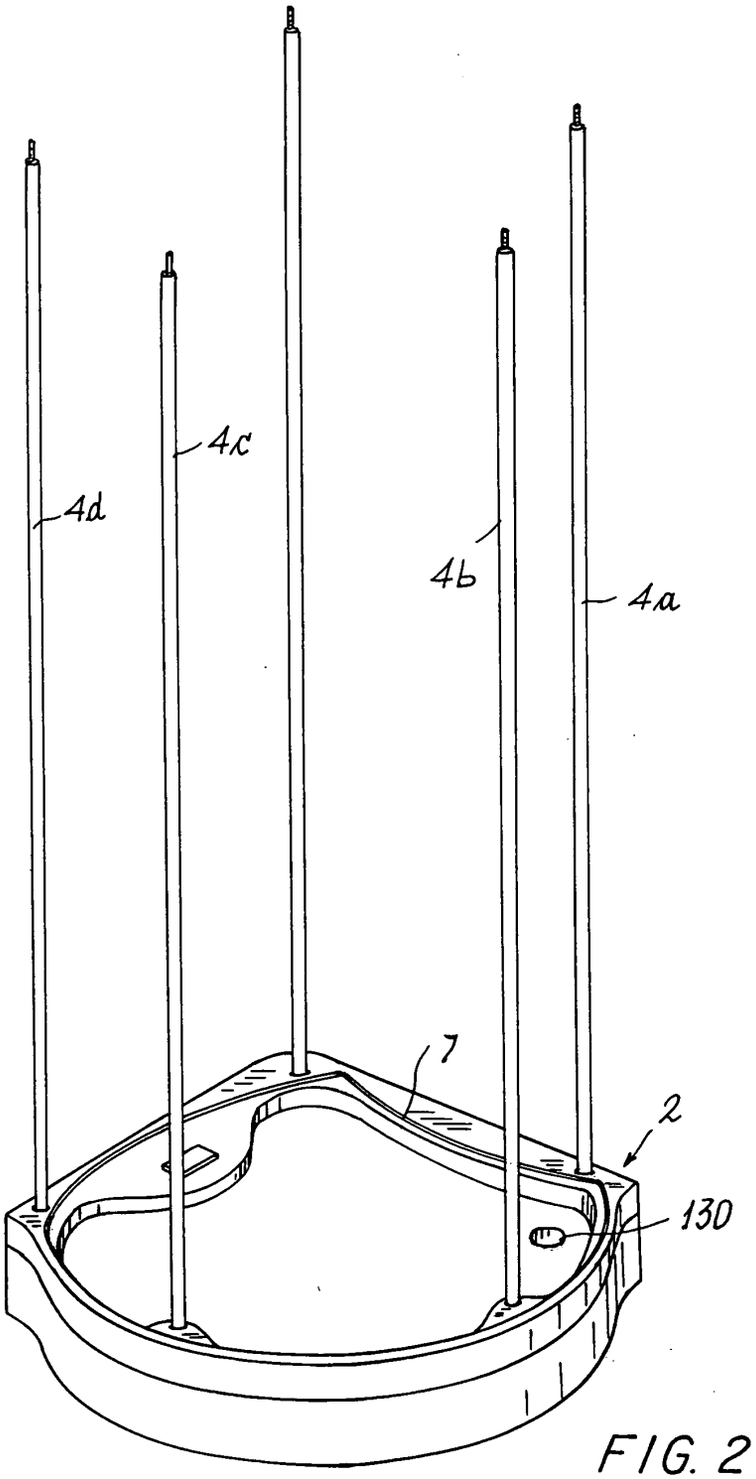


FIG. 2

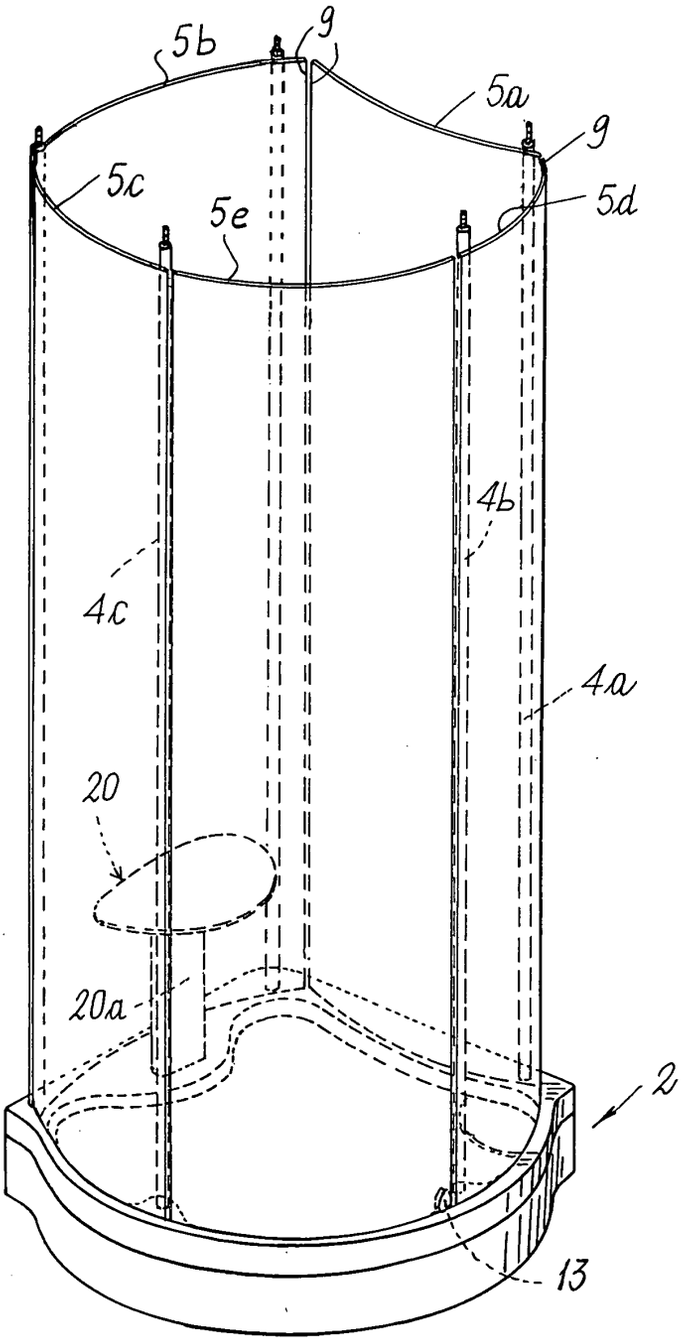


FIG. 3

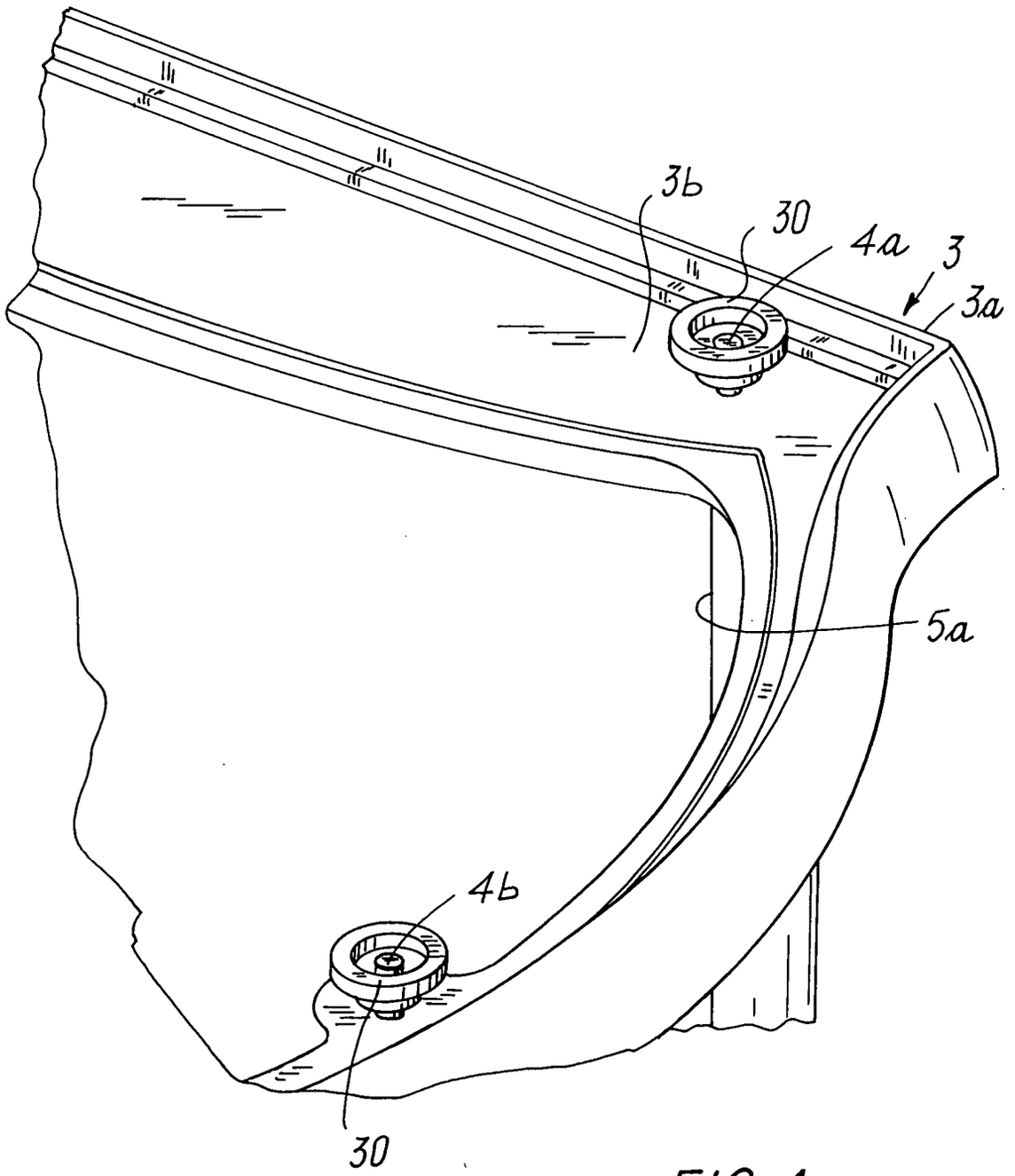


FIG. 4

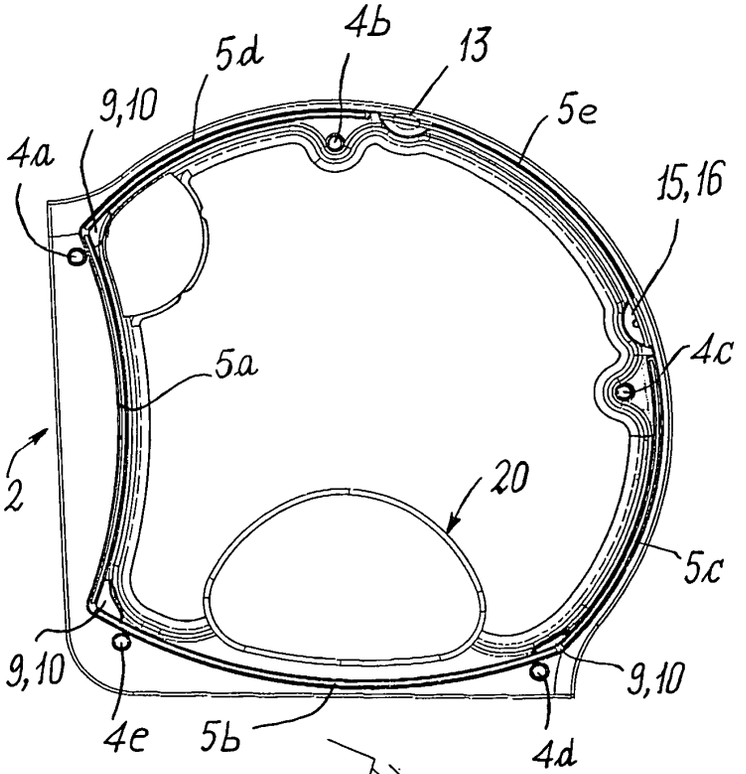

4b
13
5d
9,10
5e
4a
15,16
4c
5a
2
20
5c
9,10
9,10
4e
5b
4d

FIG. 5

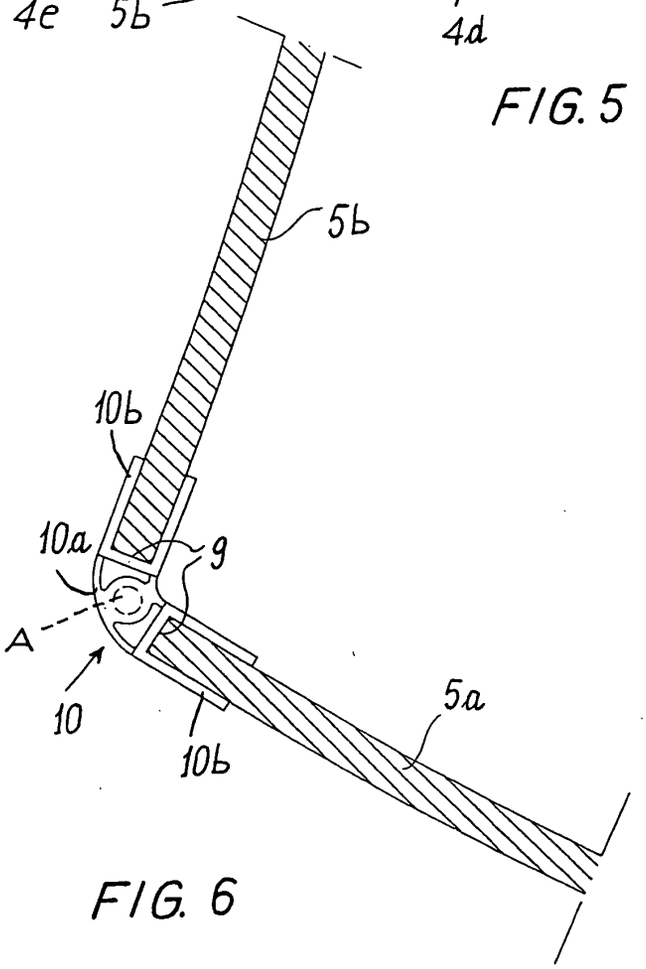

5b
10b
10a
9
A
10
10b
5a

FIG. 6

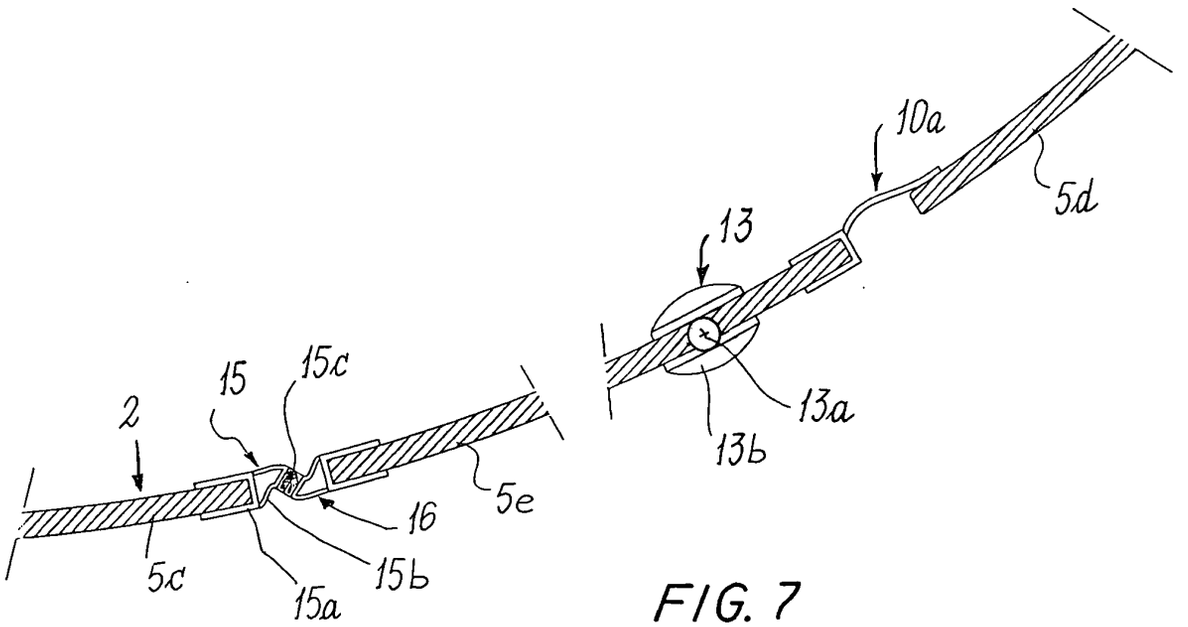


FIG. 7

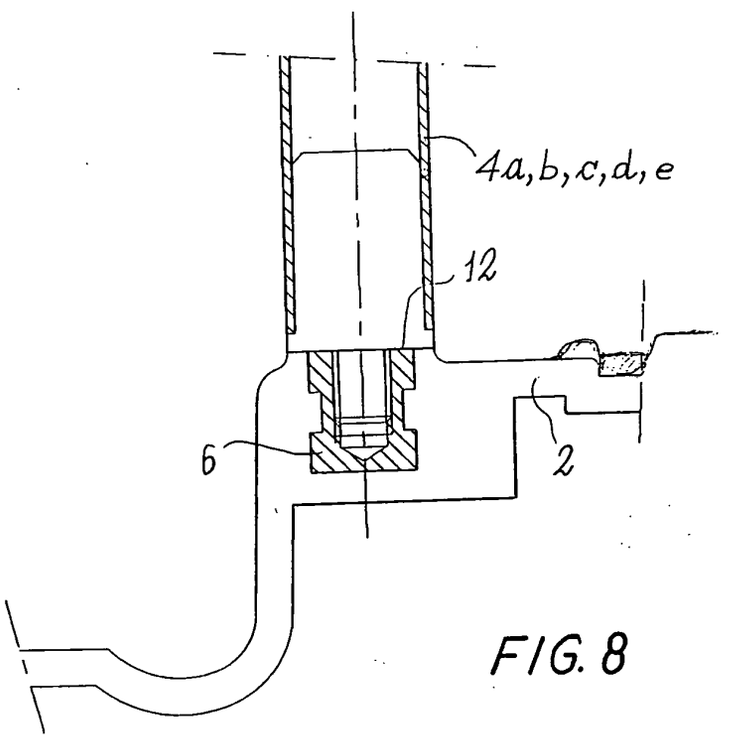


FIG. 8

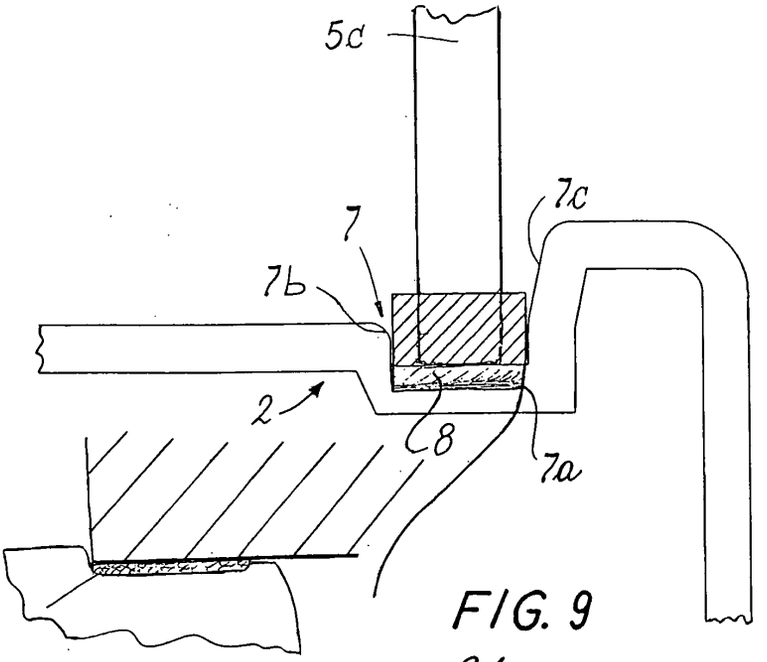


FIG. 9

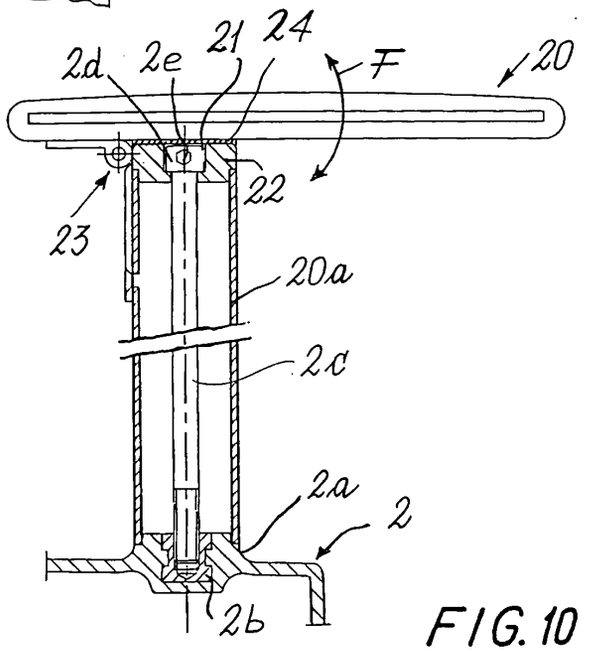


FIG. 10

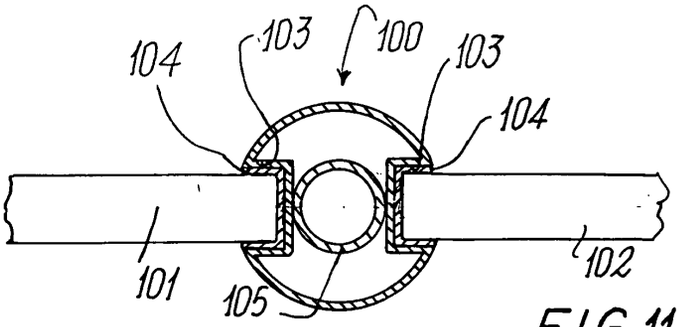


FIG. 11