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(54) **Screens, e.g. for baths**

(57) A screen (30) including a panel (32), a first member (70) connected to the panel and extending along an edge thereof; a second member (72) extending generally parallel to the first member (70) and adapted to be secured to a supporting surface, and a fastening mechanism connecting the first member (70) to the second member (72); characterised in that the fastening

mechanism comprises a screw-threaded fastening element (78) having respective parts which co-operate with formations (80; 88,89) connected to the first member (70) and second member (72) to connect them to one another, and rotation of the fastening element (78) effects adjustment of the inclination of the members (70,72) relative to one another.

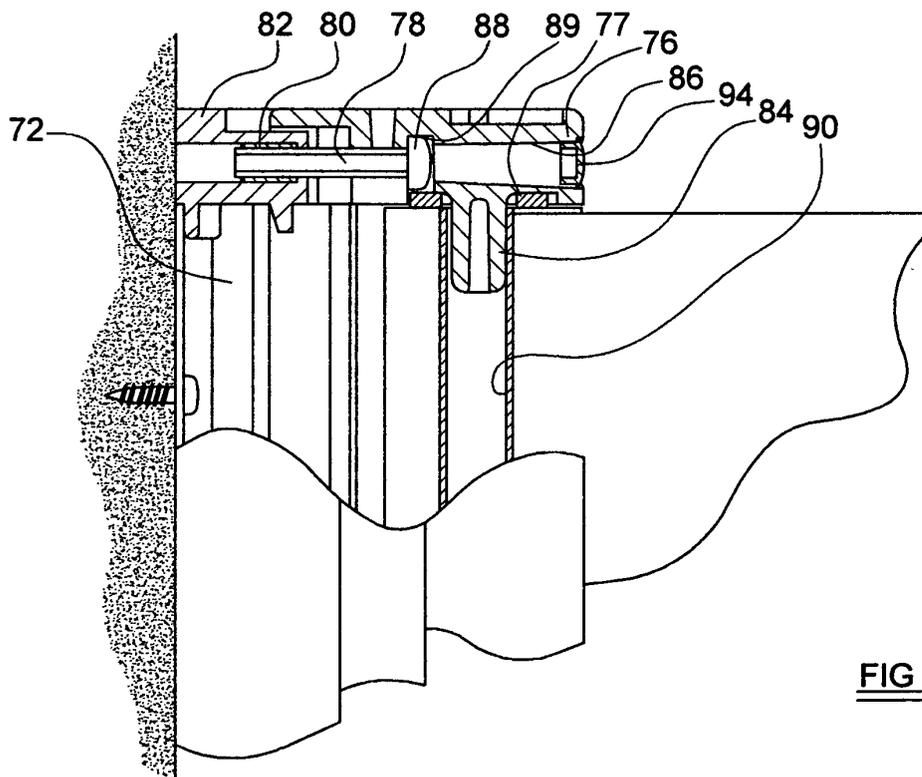


FIG 3C

Description

Description of Invention

[0001] This invention relates to screens, in particular to screens for articles of sanitary-ware, such as baths and showers. In particular, although not exclusively, this invention relates to screens which comprise one or more panels for connection to a wall or other upright surface near the article of sanitary-ware.

[0002] This invention will be described in relation to bath screens, but it will be understood that it has equal relevance to screens for other articles in particular to articles of sanitary-ware such as showers, wash basins, etc.

[0003] Bath screens are generally mounted to extend between a vertically oriented surface (such as a wall) and a horizontally oriented surface afforded by a rim of the bath. A typical screen incorporates a glass panel which usually has edges substantially perpendicular to one another. Along the lower edge of the panel a flexible seal which contacts the rim of the bath is often present. This forms a water-tight seal between the screen and the rim, preventing water splashing onto the bath room floor. In order for the bath screen to be effectively water-tight it must be in contact with the wall and the rim along the length of its respective edges of which one is adjacent the wall and one is adjacent the rim of the bath. In practice however, the wall and the bath rim are rarely perpendicular to each other. Therefore, it is usual to include an adjusting mechanism in the screen to compensate for this.

[0004] A known bath screen having one common system for adjustment is shown in Figure 1 (described in greater detail hereafter). The bath screen comprises a panel 10, an elongate member 14 arranged along one edge of the panel 10 and a wall channel 16 mounted to a wall 20. The adjustment system comprises two horizontal slots 24, 26 in the wall channel, one at the top of the wall channel and one at the bottom. Screws pass through each slot into the bath screen to fix the elongate member and the wall channel together.

[0005] In order to adjust the horizontal inclination of the bath screen it is necessary to loosen the screws, support the weight of the screen, move the screen and then retighten the screws. This is a two-handed, and indeed occasionally, a two person operation. Furthermore, the screws can be insufficient to fully support the weight of the screen, which may rest on the bath rim. In addition, the screws are unsightly and provide crevices that make cleaning difficult.

[0006] According to the present invention, we provide a screen including a panel, a first member connected to the panel and extending along an edge thereof; a second member extending generally parallel to the first member and adapted to be secured to a supporting surface, and a fastening mechanism connecting the first member to the second member; characterised in that

the fastening mechanism comprises a screw-threaded fastening element having respective parts which cooperate with formations connected to the first member and second member to connect them to one another, and rotation of the fastening element effects adjustment of the inclination of the members relative to one another.

[0007] The invention enables the screen to be adjusted using one hand, since the screw-threaded fastening element which connects the first and second members to one another also effects adjustment of the inclination of the members relative to one another. When the fastening element has been engaged with the formations connected to the members, the weight of the screen is fully supported and the adjustment process simply requires rotation of the fastening element until the required inclination is achieved.

[0008] The members may be provided at an edge of the panel which is upright in use, so that adjustment of the inclination of the members relative to one another, and thus of the general orientation of the panel relative to the supporting surface to which the second member is secured, alters the inclination of a lower edge of the panel so that satisfactory engagement of the entire length of a sealing means at such lower edge of the panel with, e.g., the rim of a bath, can be achieved.

[0009] The formations with which the screw-threaded fastening element cooperates may be provided in a first connector member and an end member provided at adjacent ends of the first and second members. The screw-threaded fastening element may extend substantially perpendicular to the direction of the length of the first and second members.

[0010] The first connector member may have a portion engaging the first member to provide for pivoting of the first member relative to the connector member and to the second member. The connector member may be connected to an elongate third member arranged generally parallel to the first member and second member and disposed between them, being pivotable relative to the first member and slidable relative to the second member. Sealing means may be operable between the first member and the third member.

[0011] A fastening mechanism as above set forth may be provided at the top end of the first and second members, whilst at the bottom end of the members they may be connected together in a non-adjustable manner (while allowing for pivoting of the panel).

[0012] Alternatively, such a fastening mechanism can be provided at both the top and bottom of the first and second members, giving slightly greater adjustment possibilities for the screen.

[0013] The screen may comprise a plurality of panels pivotably connected together for pivoting about right axes. Preferably sealing means is provided along a lower edge of panel(s), for engaging the rim of a bath or shower. Seals, preferably magnetic, may be provided between each pair of pivotably-connected panels.

[0014] A screen having the features described above

is particularly suited for an article of sanitary-ware such as bath or a shower.

[0015] Embodiments of the invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:

FIGURE 1 shows schematically three views of a known adjustable bath screen;

FIGURE 1a shows schematically a side view of the screen;

FIGURE 1b shows schematically an enlarged view of part of the screen from the side;

FIGURE 1c shows schematically a section through a plan view of the screen;

FIGURE 2 shows schematically three views of a screen which is a first embodiment of the invention;

FIGURE 2a shows schematically a side view;

FIGURE 2b shows schematically a front view;

FIGURE 2c shows schematically a top view;

FIGURE 3 shows schematically three views of the screen of Figure 2, showing an adjustment and fixing mechanism;

FIGURE 3a shows schematically a top view of the mechanism;

FIGURE 3b shows schematically a top view of the screen with part of the mechanism removed; and

FIGURE 3c shows schematically a side section through the screen with the mechanism in place;

FIGURE 4 shows schematically the screen of Figure 2 when adjusted;

FIGURE 4a shows schematically a top view of the screen;

FIGURE 4b shows schematically a section through a part of the screen near its upper edge;

FIGURE 4c shows schematically a sectional view through a part of the screen near its lower edge;

FIGURE 5 illustrates a second embodiment of the invention, showing a screen having both an upper and a lower adjustment and fixing mechanism;

FIGURE 6 shows schematically a third embodiment of the invention having a different lower adjustment and fixing mechanism;

FIGURE 7 shows a further embodiment of the invention particularly adapted for multiple panel screens;

FIGURE 7a shows schematically a section view through two panels of a multi-panel screen when folded;

FIGURE 7b shows schematically a section view through two panels of a multi panel screen when unfolded;

FIGURE 7c shows schematically a top view of a multi-panel screen;

FIGURE 7d shows schematically a section through a side view through the connection between two panels of a multi-panel screen;

FIGURE 8 shows schematically a further embodiment of the invention, a single panel bath screen;

FIGURE 8a shows schematically a side view of the screen;

FIGURE 8b shows schematically a top view of the screen;

FIGURE 8c shows schematically a front view of the screen.

[0016] Figure 1 shows a known and commonly used mechanism for adjusting a bath screen. The screen 10 extends between a wall 20 and a bath rim 22. The wall 20 is generally vertical whilst the bath rim 22 is generally horizontal. The screen comprises a panel 12, e.g. of glass, a first member 14 which holds the panel 12 and a second member 16 which is arranged to be secured to the wall 20 and to which the first member 14 is connected. The first member 14 comprises a part 14a holding the panel in a recess therein and a part 14b relative to which the part 14a is pivotable and which is adjustable relative to the second member 16. Seal 18 is a flipper seal arranged along a lower edge of the panel, substantially perpendicular to the member 14.

[0017] The adjustment mechanism comprises two slots 24, 26 formed in the second member 16 and two screws 28 which extend through the slots 24, 26 respectively and engage threaded holes in the first member part 14b.

[0018] A screw 28 is driven through each slot into the first member part 14b. The screws may be tightened to fix the position of the first member part 14b in relation to the second member 16. Differential adjustment of the screws 28 in slots 24, 26 allow the panel to be lifted or lowered relative to the bath rim, as shown in Figure 1a. To adjust the inclination of the panel therefore each screw 28 must be loosened, the panel 12 adjusted, and then each screw 28 must be retightened.

[0019] This means that the user must support the weight of the panel during adjustment, making adjustment a two handed operation. In addition, in use, the weight of the screen may overcome the friction provided by the screws 28 against the slot 24, 26 meaning that the seal 18 rests too heavily on the bath rim 22. This makes it difficult for the user to enter and exit the bath, and is, potentially, dangerous.

[0020] The adjustment screws 28 and the slots 24, 26 are unsightly, difficult to clean and exposed to the atmosphere in the bathroom.

[0021] A more easily adjustable screen in accordance with the invention is shown in Figures 2 to 8. Figures 2 to 4 show a first embodiment of a screen 30 which comprises four panels 32, 34, 36, 38. A screen adjustment and fixing mechanism 40 connects the screen as a whole to the wall whilst three panel pivoting mechanisms 42, 44, 46 interconnect the panels 32, 34, 36, 38.

[0022] The screen 30 is connected between a wall 50 along a first of its edges and a bath rim 52 along a second of its edges, as seen best in Figure 2. The second edge is generally perpendicular to the first edge. However, wall 50 and the bath rim 52 are rarely perpendic-

ular so there is, usually, a need to adjust the inclination, or orientation, of the panels in relation to the wall and the bath rim. Another reason for doing this is to ensure that a seal 54, which is provided along the lower edge of the screen 30, provides a water-tight connection between the rim and the panels. The seal 54 is connected to the panels by respective U shaped extruded connectors 56, 58, 60, 62 which embrace the lower edge region of the panels. The seal 54 is flexible, being in the form of a flipper.

[0023] In order for the bath screen to be water-tight, the generally vertical edge of the screen must be in contact with the wall whilst the generally horizontal edge of the seal must be in contact with the rim of the bath. In addition, the interaction of the seal with the bath greatly increases or reduces the friction produced when the bath needs to be swung away from the rim for access to the bath taps or for cleaning purposes. This is particularly important in multiple panel screens which are designed to fold up when not in use - a seal that is too tight on the bath can make folding difficult, whilst one which is too loose may mean that the screen does not stay straight or drifts away from the bath rim whilst in use.

[0024] Figure 3 shows detail of a fastening mechanism which provides adjustment and fixing for this screen. The mechanism comprises a first member 70, a second member, 72, and a third member 74. All these members are elongate and arranged generally parallel to each other and to one edge of the panel 32. The first member 70 is tubular, the second member 72 is generally U shaped whilst the third member 74 is generally H shaped in cross-section. The panel 32 is fixed to the first member by adhesive.

[0025] The various elements of the adjustment and fixing mechanism are connected as follows. The first member 70 is arranged generally along a longitudinal edge of the panel 32, being connected thereto by adhesive. The panel 32 is received in a longitudinal channel in the first member 70. The first member 70 is connected to the second member 72 at a top end by a first connector 76 which is joined by a joining element, a screw 78 to a threaded insert 80 contained in a first end member 82. The first member 70 is connected to the third member 74 at a top end by the first connector 76 which is attached by screws to the third member 74 and pivotally connected to the first member 70. A washer 77 is arranged between the first connector 76 and the first member 70.

[0026] The first end member 82 is generally tubular and is attached to the second member 72, being secured thereto by screws which pass through holes in the end member 82 to receiving formations in the second member 72. A tube extends transversely through the first end member 82 and the generally tubular insert 80 is aligned with the axis of this tube and retained therein by retaining formations which comprise a narrow annulus on one end of the first end member 82.

[0027] The first connector comprises a peg 84 which

extends perpendicularly to a tube 86 formed in the first connector which provides a passageway leading to the screw 78. The screw 78 is retained in the first connector by retaining formations which form a receiving formation 89 in which the head 88 of the screw 78 is received.

[0028] The peg 84 is engaged with a part-tubular formation 90 which provides a passage through the first member. Brush seals 92 are arranged longitudinally between the first member 70 and the second member 74.

[0029] It can be seen that the first member 70 and the second member 72 are connected into two ways. Firstly there is a pivotal connection provided between the first member 70 and the first connector 76 which, when the first connector 76 is fixed in relation to the second member 72, enables the screen to pivot relative to the second member, and thus to the wall 50, allowing the screen to be folded back to provide entry and exit to the bath.

[0030] Secondly, there is a sliding connection between the two members provided by the screw 78, which passes through the receiving formation 89 into the threaded insert 80 which is retained in the first end member 82. This sliding connection provides for adjustment of the horizontal inclination of the screen.

[0031] In order to adjust the horizontal inclination of the screen a user removes a cover 94 which is push-fit into the tube 86 in the first connector and inserts a screwdriver into the passageway formed by tube 86. The screwdriver can be engaged with the screw 78 and the screw 78 turned, which will move the first connector 70 in relation to the first end member 82 by the rotation of the helical thread of the screw on the helical thread of the threaded insert 80. The orientation of the first member 70 is altered because its horizontal inclination is determined by its connection on the peg 84 of the first connector 70.

[0032] Thus turning the screw 78 changes the inclination of the panel 32 in relation to the second member 72 and thus in relation to the wall 50. This adjusts the position of the seal 54 in relation to the bath rim.

[0033] Figure 4 shows how the screen looks in cross section after adjustment. Figure 4b shows a section through an upper edge of the screen. The first member 70 is spaced from the second member 72 by almost the full extent of longitudinal limbs 93 of the H section, third member 74. At a lower edge of the panel, as shown in Figure 4c, the first member 70 is much closer to the second member 72 because adjustment has led to almost the entire longitudinal extent of the H section third member 74 being contained within longitudinal limbs 95 of the U section of the second member 72.

[0034] Figure 5 shows a preferred adjusting arrangement for multi panel bath screens. This embodiment has two adjustment mechanisms, a top adjustment mechanism 100 which is arranged as has been previously described, and a bottom adjustment mechanism 102 which is arranged as a mirror image of the top adjustment mechanism 100, and contains the same components.

[0035] Specifically, the bottom adjustment mechanism 102 comprises a second connector 104 having a peg 106 and a receiving formation 108 for a screw 110. The screw 110 may be screwed into a second end member 112, either by a threaded insert or directly into the second end member 112, the transverse tube in this moulding may be threaded to receive the screw 110. Turning the screw adjusts the distance between the second connector 104 and the second end member 112 in an identical manner to previously described for the top connector.

[0036] As the first member is part-tubular it is held between the pegs of the connectors. The ability to adjust the top and bottom screws differentially allows fine adjustment of the seal of the screen in relation to the bath rim.

[0037] Figure 6 shows an alternative, simpler, embodiment in which only one adjustment mechanism 120 is provided, at the top of the screen. This adjustment mechanism is identical to those previously described. At the bottom of the screen a pivot mechanism, in fact a double pivot mechanism, is provided. This comprises a second connector 122 which has a peg 124 that is inserted into the tubular first member. The second connector 122 includes a hook 126 which connects to a raised formation 128 provided on a second end member 130. The second end member 130 is screwed into the second member, an aluminium channel which is secured by screws to the wall.

[0038] As may be seen in Figure 6 the hook and projection are vertically oriented and provide engagement of the second connector with the second moulding. This engagement holds the screen to the wall but allows the small rotation that is required to accommodate the change in inclination of the screen when the adjustment screw at the top of the screen is turned.

[0039] Figure 7 shows a further improvement which allows the panels of a multi-panel screen to be more easily secured together and held in a straight line when unfolded. This also improves the contact between the multi-panel screen and the bath rim.

[0040] Figure 7d shows a typical hinge arrangement between two panels 150, 152. These panels 150, 152 are fixed by adhesive to two members a first member 154 and a second member 156.

[0041] A first connector 158 is secured by screws to the top of the first member 154 and a second connector 160 secured by screws to the top of the second member 156. The second connector 160 has a circular peg 162 which engages with a part-tubular formation 162a in the first member 154. In this way, adjacent panels are held together yet are free to pivot in relation to each other when the bath screen is folded.

[0042] Difficulties may arise, however, in maintaining a water-tight seal between the panels and ensuring that the screen remains straight when in use. In order to ensure that there is a water-tight seal between the panels it is common practice to have a vertical flexible seal be-

tween the panels, usually either a flipper seal or a tubular bubble seal. In order for these to work effectively, there needs to be some compression of the seal when panels are straightened. In practice, the resistance of the seal to compression pushes closing faces of adjacent panels apart causing the bath screen to follow a zigzag path along the bath rim. This can cause significant leakage and frustrates the user.

[0043] Therefore, mechanical clips are generally provided at the top and bottom of the first and second members 154, 156. These are intended to hold the panels in a straight line. However, it is difficult to control the strengths of these clips, which are manufactured using injection moulding, to ensure both that the screen stays straight and that it can still be folded easily when required. In addition, the clips look clumsy and gaps between the clips and any seals might lead to a water leak.

[0044] Figures 7a-7c show how these difficulties can be overcome. Vertically extending magnetic seals 162, 164 are arranged in channels 165 which run along the length of the first member 154 and the second member 156. The attraction force between the seals is gentle enough to allow the multi-panel screen to be easily folded but sufficient to pull the faces of the bath screen panels together and hold it in a straight line.

[0045] These seals are on opposing faces of the first member 154 and the second member 156 so that when the panel is in its straight position, as shown in Figure 7b, the seals are in contact down the majority, and preferably the entire, vertical length of the members. Thus, in addition to holding the members in position the seals form an effective barrier to water leakage. A second brush seal 166 is also provided, arranged in a second vertically extending channel 167 in the second member 156.

[0046] The general principles and concepts described above may be applied in a simple one panel bath screen, as shown in Figure 8.

[0047] The first and third members are formed of plastics material and manufactured by extrusion. The second member is an extrusion of aluminium. However, the extrusions may be of metal or of plastics material as required. The connectors and fasteners are of a plastic material and manufactured by injection moulding. Alternatively, these could be made of metal and cast or machined. The magnetic seals are made of a rubber material, but could be of any magnetic material, preferably flexible.

[0048] The adjustment mechanism described above could be used for many different types of screen. Many alternative different forms of the adjustment mechanism could be envisaged which still employ the combination of pivotal and sliding movements between a first member and a second member to adjust the inclination of a panel, providing effective, fluid-tight, sealing between surfaces of different inclinations.

[0049] When used in this specification and claims, the terms "comprises" and "comprising" and variations

thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

[0050] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A screen (30) including a panel (32), a first member (70) connected to the panel and extending along an edge thereof; a second member (72) extending generally parallel to the first member (70) and adapted to be secured to a supporting surface, and a fastening mechanism connecting the first member (70) to the second member (72);
characterised in that the fastening mechanism comprises a screw-threaded fastening element (78) having respective parts which cooperate with formations (80; 89) connected to the first member (70) and second member (72) to connect them to one another, and rotation of the fastening element (78) effects adjustment of the inclination of the members (70,72) relative to one another. 5
2. A screen according to claim 1 further **characterised in that** the members (70,72) are provided at an edge of the panel which is upright in use. 20
3. A screen according to claim 1 or claim 2 wherein the formations (89; 80) are provided in a first connector member (76) and an end member (82) provided at adjacent ends of the first member (70) and the second member (72), respectively. 25
4. A screen according to any one of the preceding claims further **characterised in that** the screw-threaded fastening element (78) extends substantially perpendicular to the length of the first and second members (70,72). 30
5. A screen according to any one of the preceding claims, further **characterised in that** the first connector member (76) has a portion (84) engaging the first member (70) to provide for pivoting of the first member (70) relative to the connector member (76) and to the second member (72). 35
6. A screen according to claim 5, further **characterised in that** the connector member (76) is connected to an elongate third member (74) arranged generally parallel to the first member (70) and second member (72) and disposed between them, being pivotable relative to the first member (70) and slidable relative to the second member (72). 40
7. A screen according to claim 6, further **characterised by** sealing means (92) operable between the first member (70) and the third member (74). 45
8. A screen according to claim 2 or any claim appendant thereto, further **characterised in that** said fastening mechanism is provided at the top end of the members (72,72). 50
9. A screen according to claim 8, further **characterised in that** a further said fastening mechanism is provided at the bottom end of the members (70,72). 55
10. A screen according to any one of the preceding claims, further **characterised by** a plurality of panels (32,34,36,38) pivotably connected together for pivoting about upright axes.
11. A panel according to any one of the preceding claims, further **characterised by** sealing means extending along a lower edge of the panel(s).
12. A screen according to any one of the preceding claims, adapted to be used in relation to a bath or shower.

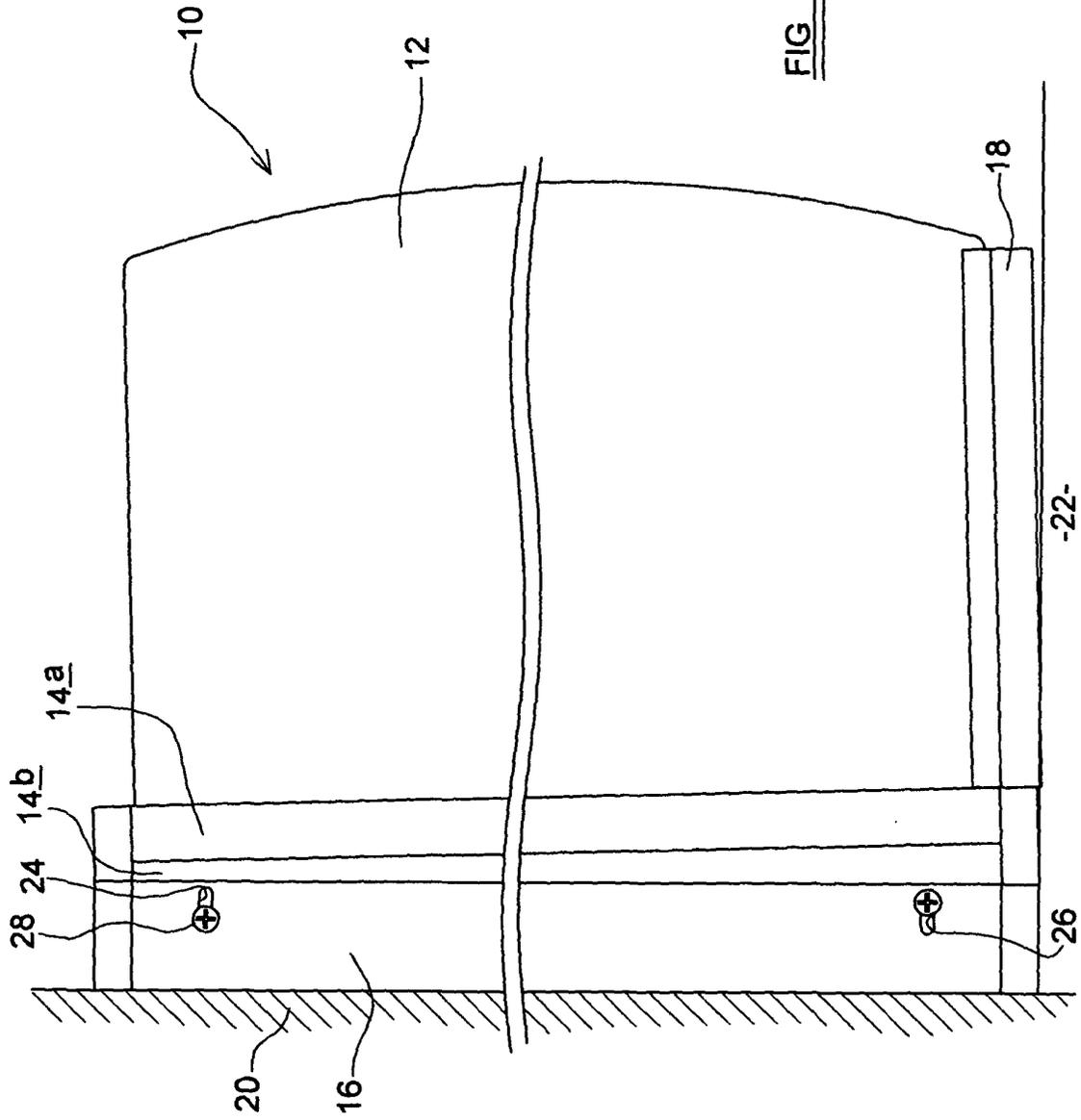


FIG 1a (PRIOR ART)

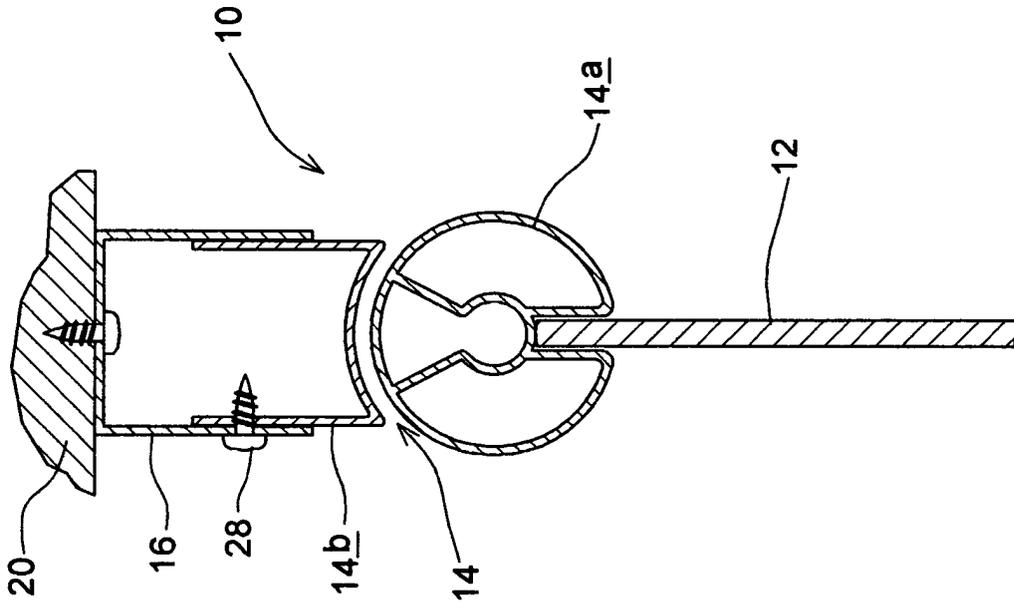


FIG 1c (PRIOR ART)

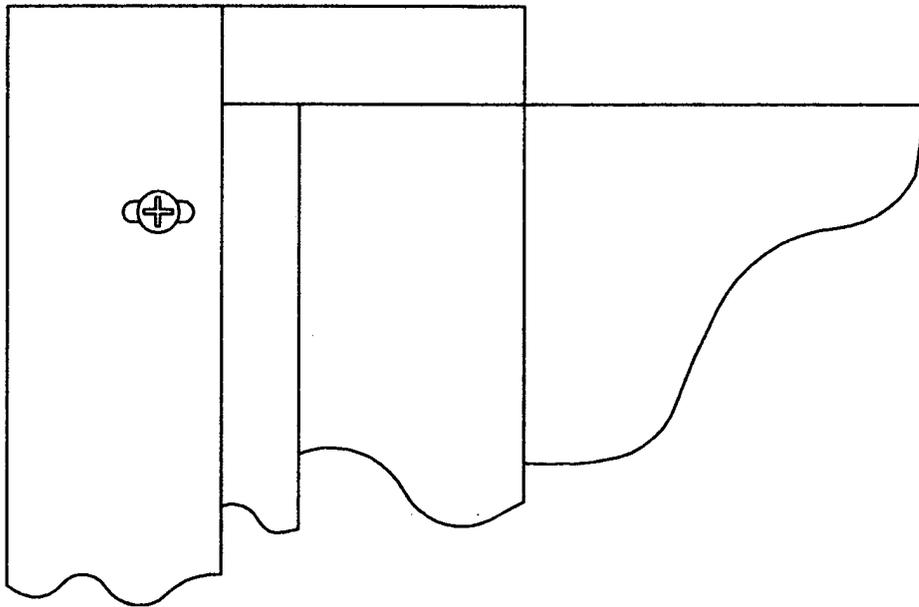
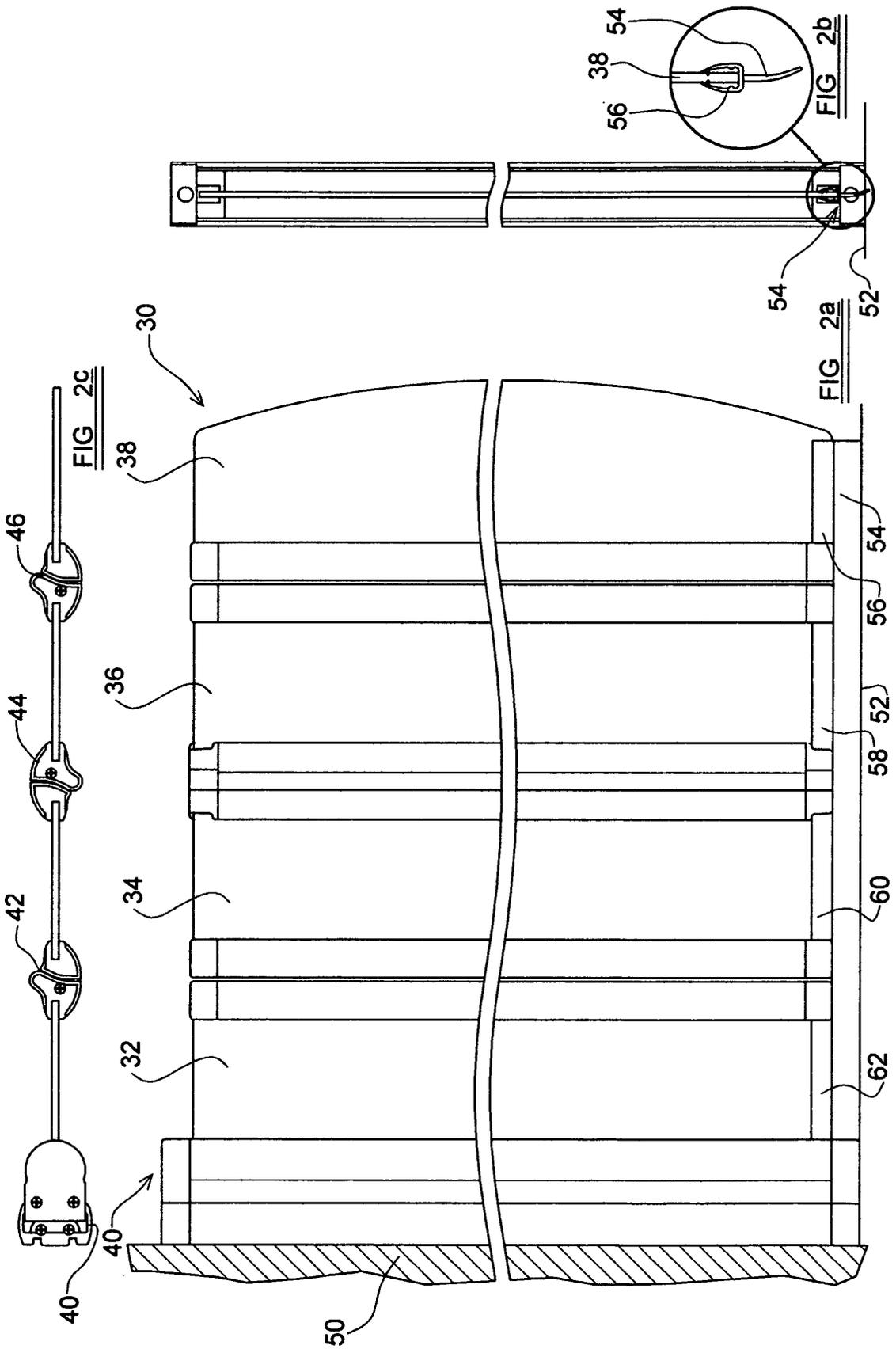


FIG 1b (PRIOR ART)



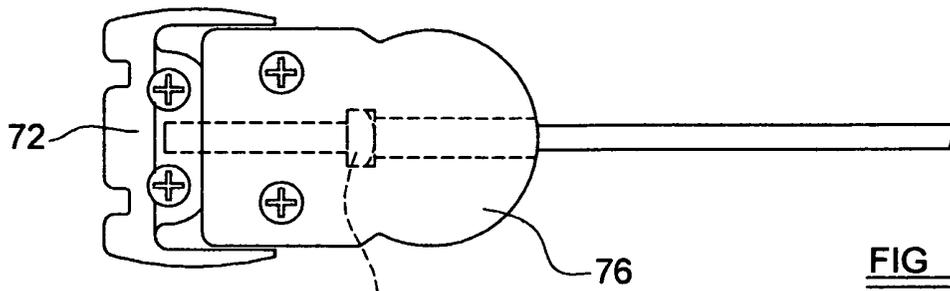


FIG 3a

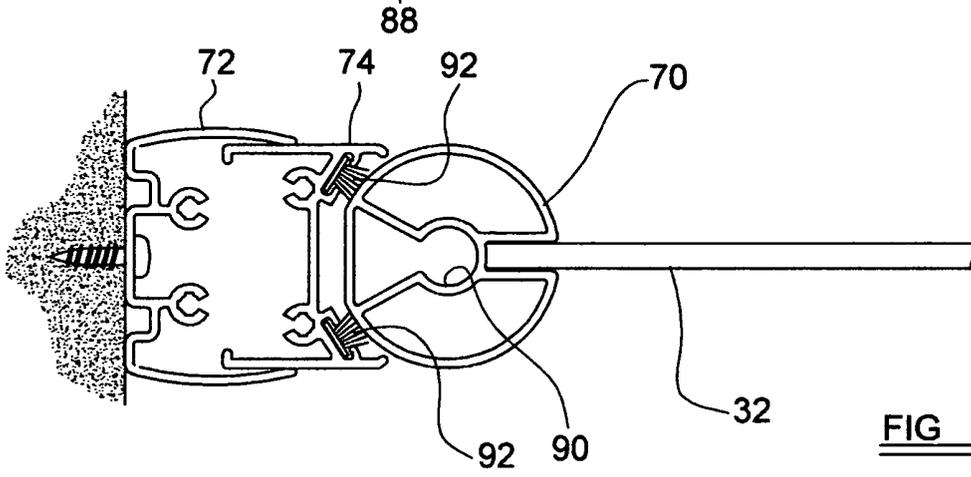


FIG 3b

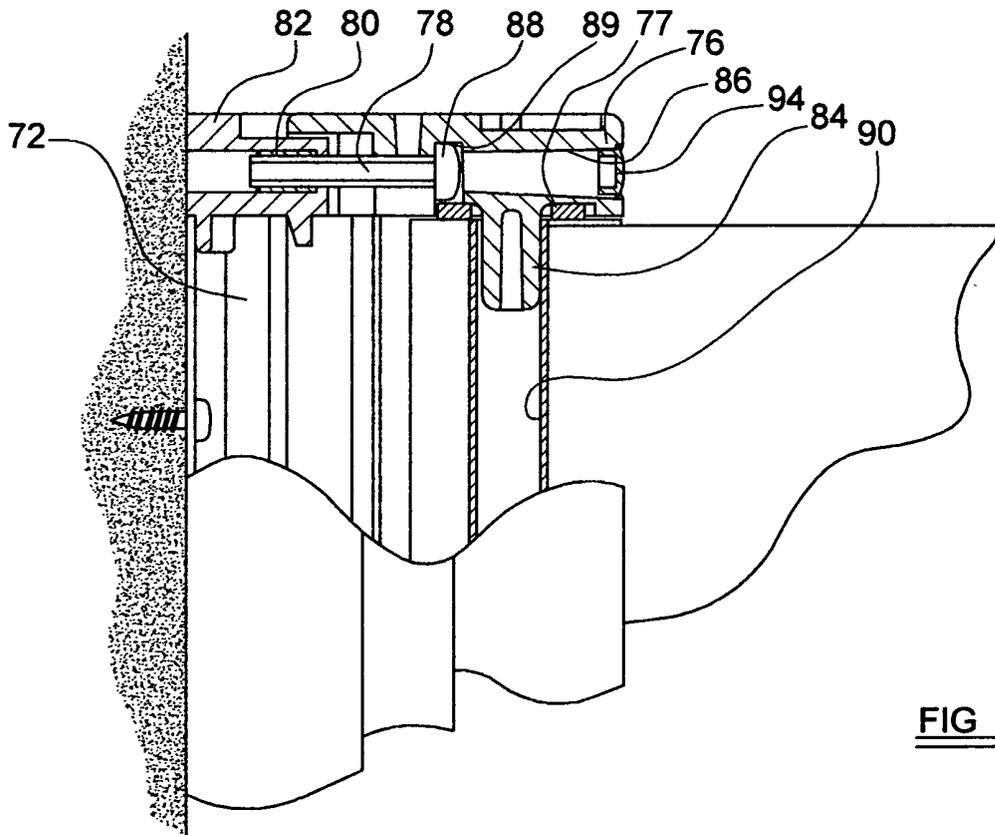


FIG 3c

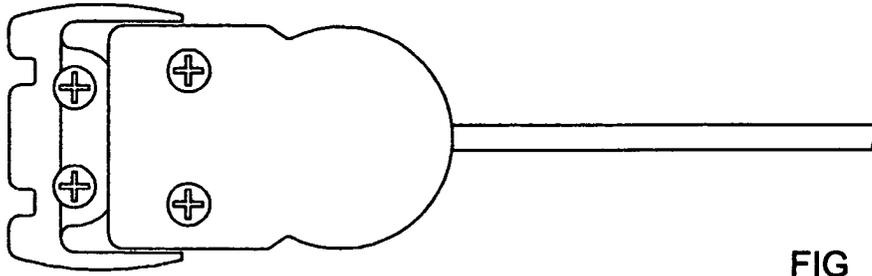


FIG 4a

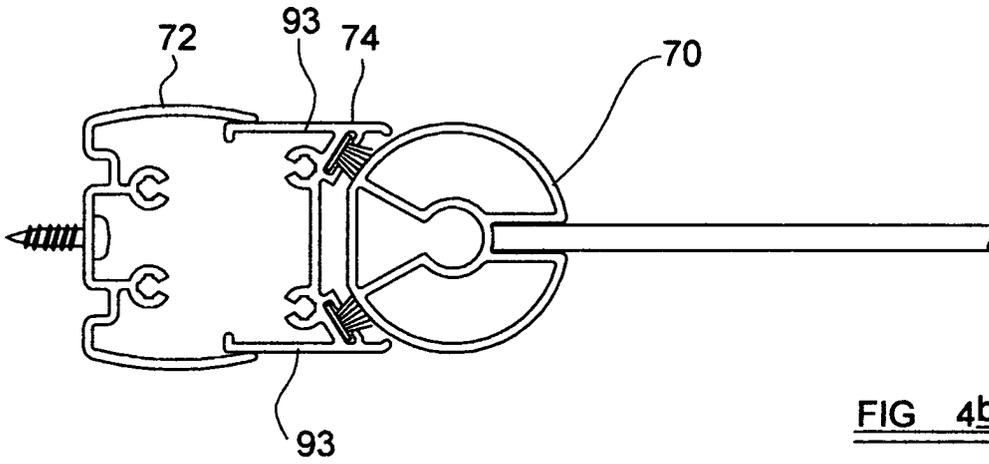


FIG 4b

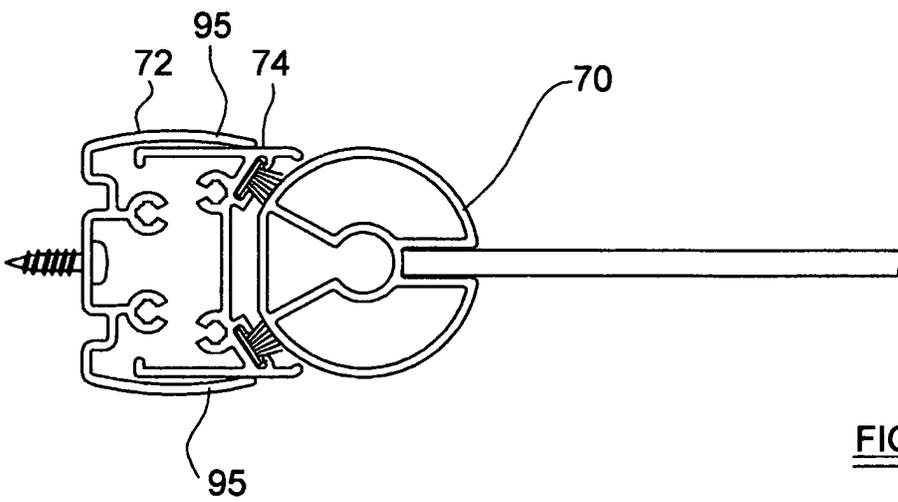


FIG 4c

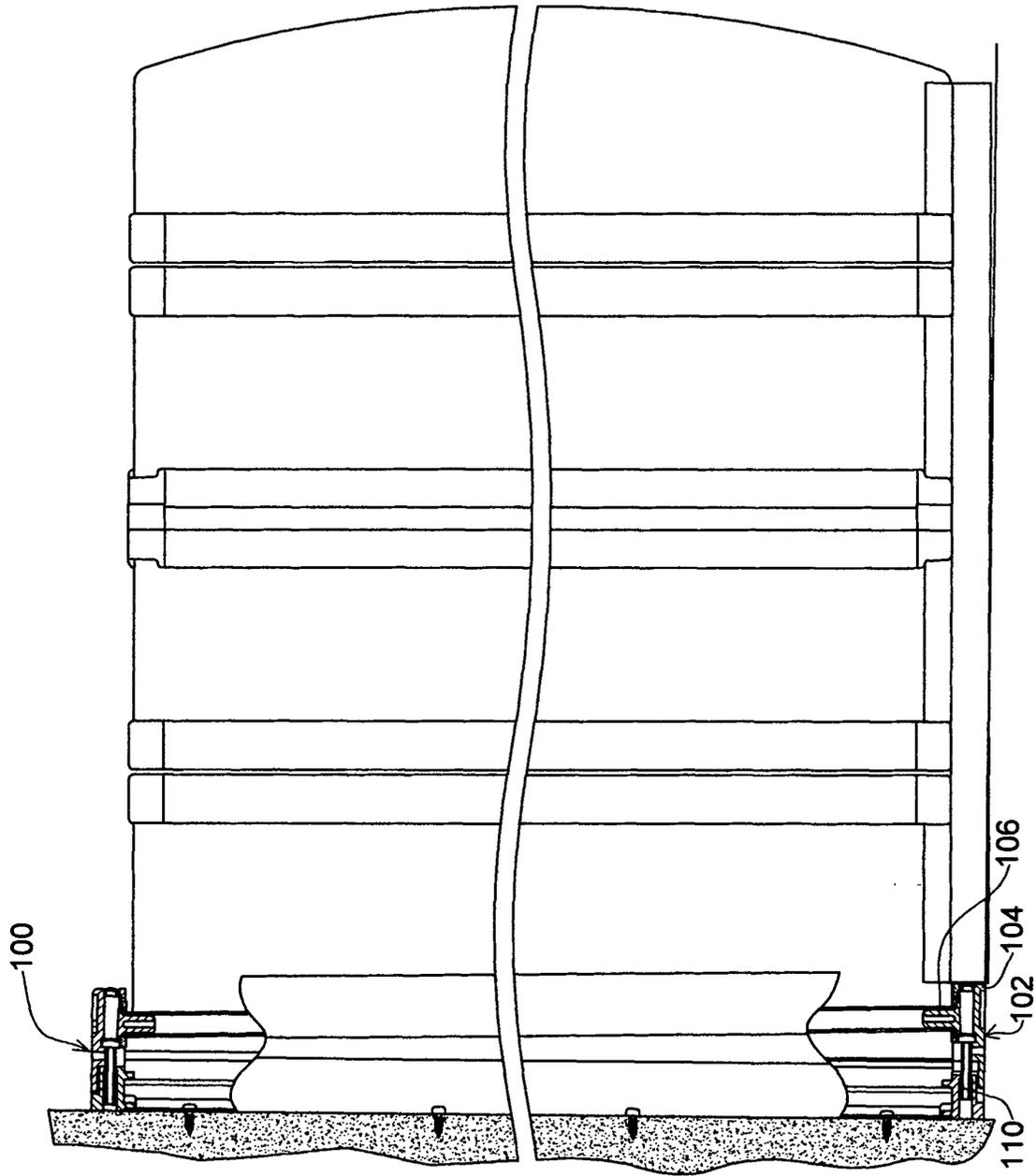
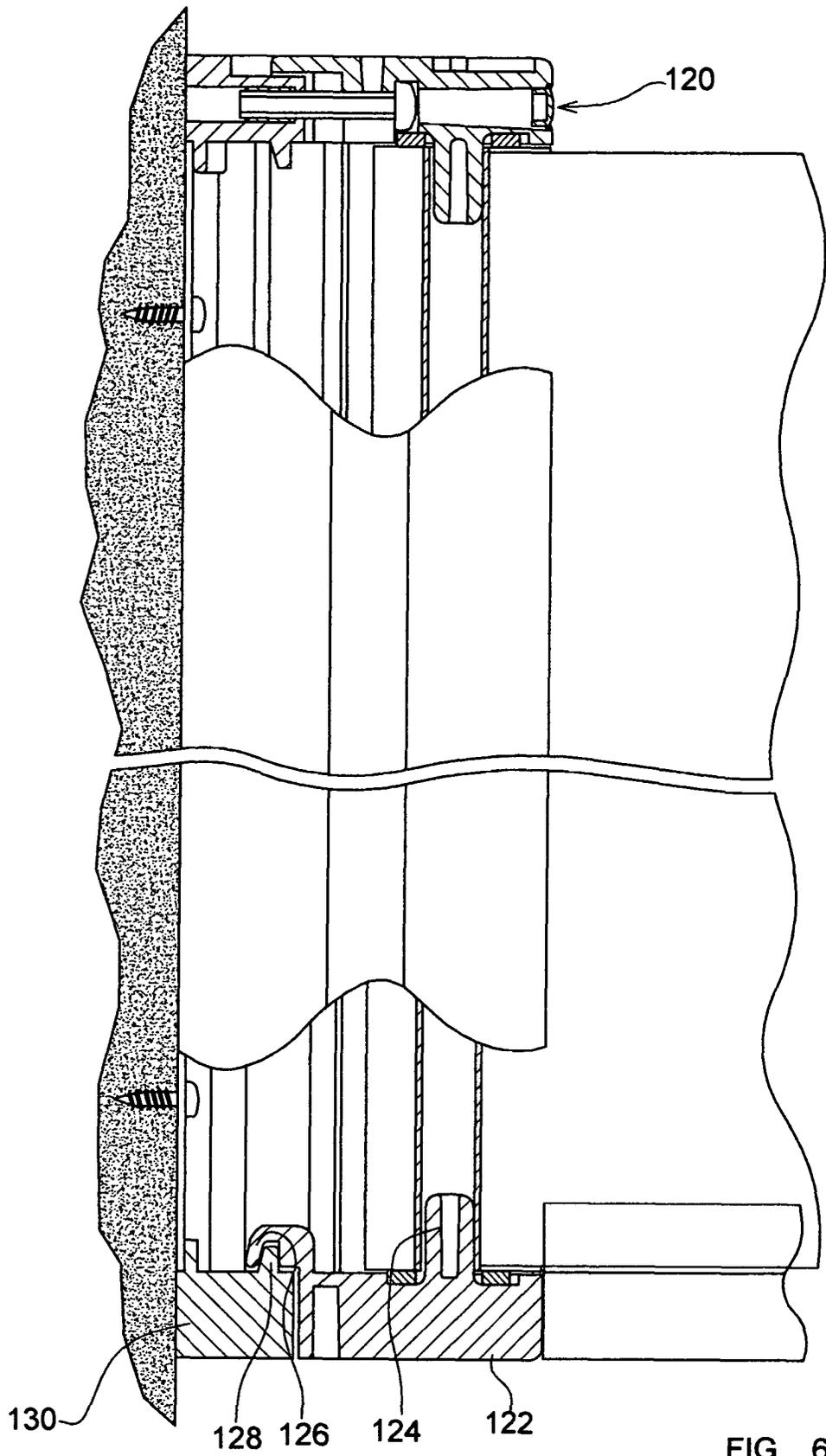


FIG 5



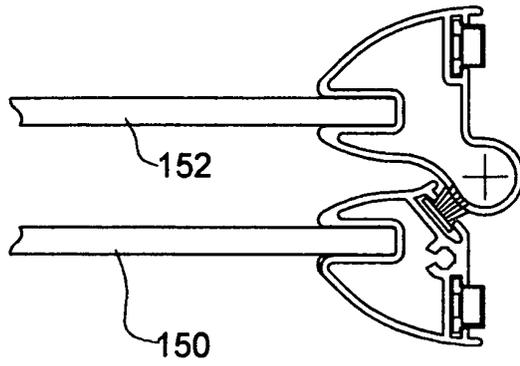


FIG 7a

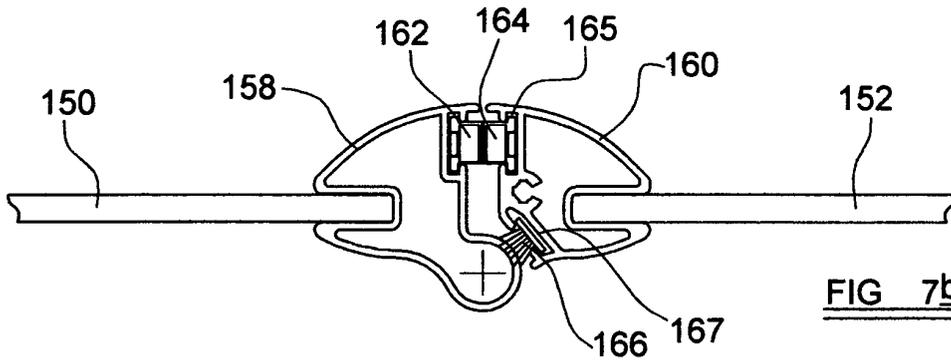


FIG 7b

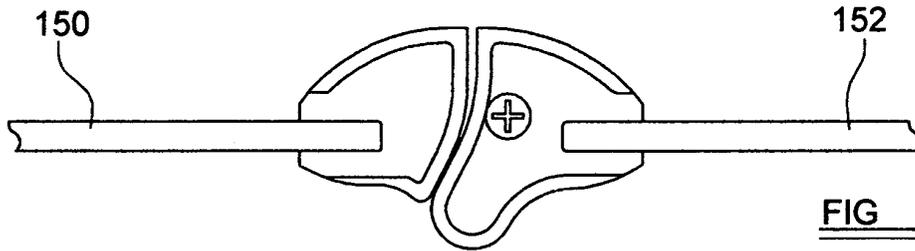


FIG 7c

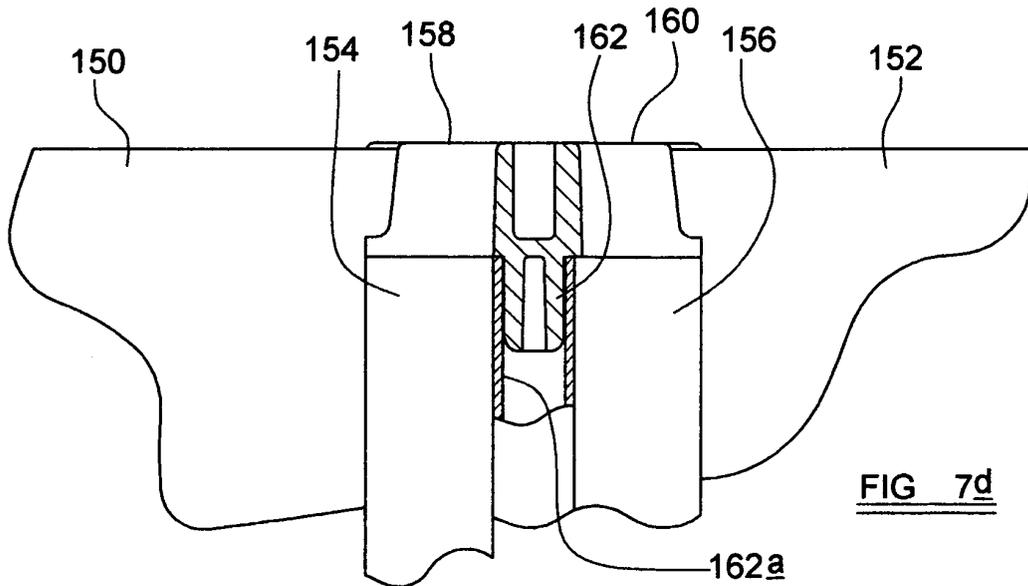


FIG 7d

