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(71) Applicant: **Aqualux Products Limited**
Wednesbury, West Midlands, WS 10 9UZ (GB)

(72) Inventors:
- **Heath, Mike**
  Wednesbury
  West Midlands, WS10 9UZ (GB)
- **Harrison, Neil**
  Wednesbury
  West Midlands, WS10 9UZ (GB)

(74) Representative: **Swindell & Pearson Limited**
48 Friar Gate
Derby
DE1 1GY (GB)

(54) Leg arrangement

(57) A height adjustable leg arrangement 10 comprises a leg member 12, a liner 14, a foot 42 and a plug member 34. The liner 14 is internally threaded at 26. The leg 12 is externally threaded at 16. In use, the liner 14 can be introduced from below, into an aperture formed in an article to be supported (such as a board, and restricted by the flange 28 bearing on the underside of the board. The leg 12 can then be turned in the liner 14 to adjust the height of the board.

The cup 42 may be fixed in position to receive the leg 18 and hold the leg in position. The plug member can reach through the liner 14 to engage internal formations on the leg 12, to turn the leg and thus adjust the height of the board.

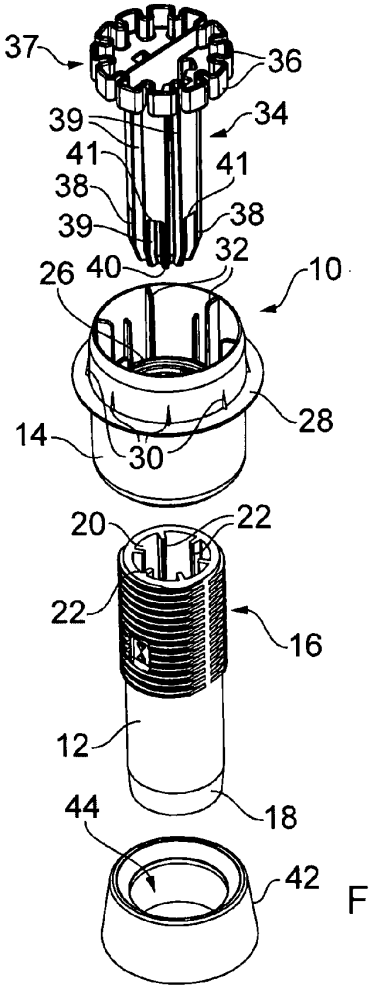

FIG. 1

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Description

[0001] The present invention relates to leg arrangements.

[0002] Examples of structures which are commonly supported on legs include shower trays. The legs support the shower tray above the floor beneath, to allow waste pipes or other plumbing to occupy the space beneath the shower tray. Difficulties can be encountered in gaining access to the legs during installation of the shower tray. A shower tray will often be installed against a wall or in a corner between two walls, making access difficult to one or more of the legs underneath. This makes it difficult to adjust the slope of the shower tray in order to ensure that water runs away to the waste of the tray.

[0003] In one aspect, examples of the present invention provide a height adjustable leg arrangement comprising:

a leg member;

a liner for receipt in a through aperture in an item to be supported;

the liner and the leg member being adjustably engageable for height adjustment;

and the leg projecting in one direction from the liner, and being accessible through the aperture from the opposite direction, for height adjustment.

[0004] The liner and the leg member may be threadedly engageable for adjustment. The leg member may be externally threaded for receipt in a threaded socket in the liner. The leg member may be provided with a formation for engagement with a tool, for adjustment. The formation may be an internally splined socket for engagement with an externally splined tool.

[0005] The liner may be provided with one or more external projections which limit penetration of the liner up into the aperture, from below the item to be supported. The external projection or projections may be provided as a horizontal flange or flanges. The liner may be provided with one or more external projections which engage the item to be supported, to resist movement of the liner in the aperture, once inserted. The external projection or projections may be provided as a flange or flanges which extend upwardly at the external surface of the liner, to cut into the material of the item around the aperture.

[0006] The arrangement may include a releasable lock arrangement operable to restrain adjustment of the leg member relative to the liner. The releasable lock arrangement may include a lock member introducable into the liner from the said opposite direction to engage the liner and the leg member. The releasable lock arrangement may be operable to restrain rotation of the leg member relative to the liner. The releasable lock arrangement may include a plug member, the liner and the plug member having interlocking formations to prevent relative movement of the liner and the plug member. The liner and the plug member may have complementary rings of interfitting teeth. The releasable lock arrangement may include a plug member, the leg member and the plug member having interlocking formations to prevent relative movement of the leg member and the plug member. The leg member and the plug member may include interfitting spline formations.

[0007] The arrangement may include a foot member on which the leg member stands after assembly. The foot member may be receivable in the through aperture, the arrangement further comprising a fixing arrangement operable through the aperture from above the item to secure the foot member to the surface beneath. The liner may be receivable in the aperture, after removal of the item from the secured foot member and for receipt of the leg member to support the item above the foot member. The foot member and the leg member may be engageable to stop horizontal movement of the leg member relative to the foot member. The foot member may be a cup member.

[0008] In another aspect, examples of the invention provide a leg arrangement comprising:

a foot member for receipt in a through aperture in an item to be supported;

a fixing arrangement operable through the aperture from above the item to secure the foot member to the surface beneath;

a leg arrangement operable to stand on the member after removal of the item from the secured foot member, and for receipt in the through aperture to support the item of the foot member.

[0009] The foot member and the leg member may be engageable to stop horizontal movement of the leg member relative to the foot member. The foot member may be a cup member. The leg arrangement may be height adjustable. The leg arrangement may be a height adjustable leg arrangement in accordance with the first aspect of the invention.

[0010] Examples of the invention will now be described in more detail, by way of example only, and with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view from above of a height adjustable leg arrangement prior to assembly;

Fig. 2 is a perspective view from above of the arrangement of Fig. 1, after assembly;

Fig. 3 and Fig. 4 correspond with Fig. 1 and Fig. 2, respectively, viewed from below;

Fig. 5 to Fig. 9 illustrate a sequence for using the leg

arrangement of Fig. 1 to Fig. 4 to install a shower tray, with Figs 5a, 6a, 8a and 9a being details of the corresponding drawings, on an enlarged scale; and

Fig. 10 is a perspective view of the installed shower tray.

[0011] Referring to Figs 1 to 4, a height adjustable leg arrangement 10 comprises a leg member 12. A liner 14 is provided for receipt in a through aperture (not shown in Fig. 1) in an item (not shown) to be supported. The liner 14 and the leg member 12 are adjustably engageable for height adjustment, as will be described. After installation, the leg 12 will project in one (downward) direction from the liner 14, and be accessible through the aperture from the opposite direction (from above), for height adjustment.

[0012] In more detail, the leg member 12 is in the form of a column which has an externally threaded region 16 towards its upper end, and narrows slightly at 18, at its lower end. The top end face of the leg 12 is recessed. The recess 20 is internally splined at 22, for reasons which will be described below.

[0013] The liner 14 is in the general form of a short cylinder, open at both ends. The liner 14 is internally threaded at 26. The internal thread 26 is complementary with the external thread 16 of the leg 12. Thus, the liner 14 and the leg 12 are threadedly engageable by introducing the leg 12 into the liner 14 and engaging the threads 16, 26. This allows the relative positions of the liner 14 and the leg 12 to be changed by relative rotation of the liner 14 and the leg 12.

[0014] The outer face of the liner 14 carries a circumferential, horizontal flange 28. This will limit penetration of the liner 14 up into an aperture in an item to be supported, when introduced from below, as will be described below. The outer face of the liner 14 also carries several short flanges 30 which extend upwardly from the flange 28 (in the orientation illustrated in Figs 1 to 4). The short flanges 30 reduce in radial extent away from the flange 28, to form a set of teeth which will cut into the material around an aperture into which the liner 14 is introduced, as will be described, thereby resisting movement of the liner in the aperture, particularly resisting rotation of the liner 14 within the aperture.

[0015] Another set of flanges 32 are provided in the internal space of the liner 14, above the internal thread 26. The purpose of these will be described below.

[0016] The arrangement 10 also includes a plug member 34. This has a ring of teeth 36 around the circumference of a disc 37, at its upper extremity. Relatively narrow gaps exist between adjacent teeth 36. When the plug member 34 is introduced into the liner 14 from above, as can be understood by considering Fig. 1 and Fig. 2, the teeth 36 interfit with the flanges 32, which act as a further ring of teeth to act as interlocking formations which prevent relative movement of the liner 14 and the plug member 34. In particular, the interlocking flanges 32 and teeth 36 prevent relative rotation of the liner 14 and the plug member 34. The plug member 34 also has spline flanges 38 which extend along the plug member 34, to define channels 39 between adjacent spline flanges. Around the circumference of the plug member 34, the channels 39 alternately extend from the tip 40 of the plug member 34 to the disc 37 or stop short at ledges 41. The angular separation of the channels 39 is one half that of the flanges 22 in the socket 20. When the plug member 34 is introduced into the liner 14 from above, the tip 40 enters the socket 20 in the leg member 12 by meshing the channels 39 and the flanges 22, which therefore act as interlocking formations which prevent relative movement of the leg member 12 and the plug member 34.

[0017] The depth of penetration of the plug member 34 into the socket 20 depends on the relative alignment. In one alignment, the penetration is limited by abutment of the flanges 22 with the ledges 41. In another alignment, the flanges 22 are in full length channels 39, allowing deeper penetration.

[0018] The arrangement 10 also includes a foot member 42 which has a cup recess 44 for receiving the lower end of the leg 12. The narrowing 18 provides a lead-in surface to assist in locating the leg 12 in the cup 44. The foot member 42 also has a central hole 46 for receiving a fixing screw (not shown in Figs 1 to 4).

[0019] The remaining drawings illustrate the manner in which the arrangement 10 can be used for height adjustable installation of an item to be supported. In this example, the item is a shower tray.

[0020] Fig. 5 illustrates a support board 48 for installation immediately below a moulded shower tray (not shown). In this example, the board 48 is shaped appropriately for a shower tray installed in a corner between two walls, the board 48 having two straight edges 50 connected by a rounded edge 52. Various apertures 54 are provided in the board 48. In particular, apertures 54 are provided along the rounded edge 52 and also close to the corner between the straight edges 50. An additional line of apertures 54 is spaced further back from the edge 52, allowing the board 48 to be cut down to a smaller size, if required. Other apertures 54 can be provided across the board 48, according to the size of the board and the degree of support required after installation. A larger aperture 56 is provided to receive the waste of a shower tray.

[0021] Fig. 5 shows a foot 42 positioned in one of the apertures 54. As can be seen, the outermost diameter of the foot 42 is a close fit in the aperture 54, resulting in the position of the foot 42 being fixed relative to the board 48, by introduction of the foot 42 into the aperture 54.

[0022] In a preparatory installation step, a foot 42 is positioned in each of the apertures 54 required for support in the finished installation (i.e., wherever a supporting leg will be required). The board 48 is then placed onto the floor directly under the intended finished position of the shower tray. This sets the feet 42 in position on the floor, allowing fixing screws to be introduced from above

the board 48, through the holes 46 to secure the feet 42 to the floor. The layout of the feet 42 across the floor will be precisely in alignment with the layout of the relevant apertures 54 across the board 48.

[0023] After installation of the feet 42, the board 48 can be removed, leaving the feet 42 secured to the floor. The board 48 is then inverted (Fig. 6). Note that this reveals various markings 58 which can be used as a guide for cutting the board 48 to a smaller size, if required. Fig. 6 also shows a leg 12 screwed into a liner 14, the liner being offered to an aperture 54. The outer diameter of the liner 14 (apart from the flanges 28, 30) is a close fit in the aperture 54. Thus, as the liner 14 is introduced into the aperture 54, pressure must be applied to force the flanges 30 to bite into the material of the board 48, around the aperture 54. This prevents the liner 14 from turning in the aperture 54. The liner 14 is forced into the aperture 54 until the flange 28 bears against the face of the board 48, preventing further penetration of the liner 14 into the aperture 54. The legs 12 provide a grip which facilitates the installation of the liners 14 in this way.

[0024] The board 48, with installed liners 14 and legs 12, can then be inverted again (Fig. 7) and moved to the installation position. As this is done, each of the legs 12 will come into alignment directly above one of the feet 42 by virtue of the installation step described above in relation to Fig. 5. Thus, the board 48 can be lowered to introduce each leg 12 into the corresponding foot 42 (Fig. 8). The board is now correctly positioned but may be not correctly sloped to ensure that water drains away adequately to the waste of the shower tray being installed. Accordingly, the slope of the board 48 is now adjusted by turning the legs 12. The threaded engagement between the legs 12 and the liners 14 allows the liner 14 to rise or lower as the leg 12 turns. Each adjustment can conveniently be made, from above, by using the plug member 34 as a tool, as follows. The plug member 34 can be aligned to penetrate the socket 20 until the splines 22 abut the ledges 41. This partial penetration leaves the disc 37 above the liner 14, allowing the disc 37 to be conveniently used to turn the leg 12. Alternatively, it may be possible to reach into the liner 14 with a finger and thumb to grip and turn the leg 12, or to engage the leg 12 with another tool.

[0025] Once each leg 12 has been height adjusted in the manner just described, to the appropriate height, further changes to the slope of the board 48 can be prevented by removing the plug member 34 and turning it sufficiently to align the splines 22 with the full length channels 39. The plug member 34 can then penetrate more deeply into the socket 20, until the disc 37 enters the liner 14 from above, with the teeth 36 engaging the internal flanges 32 in the liner 14. This results in the leg 12 being locked against rotation relative to the liner 14, which is itself locked against rotation within the aperture 54, by engagement of the flanges 30 with the material of the board 48 around the apertures 54. Consequently, the height of the leg 12 is now locked. In addition, the legs 12 are prevented from moving horizontally across the floor below, by their fitting into the feet 42, which are in turn secured to the floor, as has been described. Thus, the position and orientation of the board 48 is now fixed.

[0026] A shower tray 60 can now be introduced and fitted onto the board 48. The tray 60 covers the whole of the board 48, including the locations of the apertures 54, to complete the aesthetic effect of the installation. The tray may be a moulded tray, for example.

[0027] It can be understood from the above description that the arrangements described are expected to provide various advantages, as follows. The installation process is convenient, particularly because the whole process at the installation location can be conducted from above the board 48. That is, once the feet 42 have been introduced into the apertures 54, they can then be secured to the floor by working from above the board 48. Subsequently, once the legs 12 and liners 14 have been installed in the apertures 54, the height adjustment can be made from above the board 48 by reaching the legs 12 through the liners 14. Thus, because the apertures 54 provide through apertures through the board 48, the legs 12 extend in one direction from the apertures 54 but remain accessible through the aperture 54 from the other, opposite direction, for height adjustment. It is not necessary to work underneath the tray 60, once the tray is in position, either to install the feet 42 or the legs 12, or to adjust the legs 12.

[0028] Many variations modifications can be made to the apparatus described above, without departing from the scope of the present invention. For example, many other arrangements could be envisaged for providing adjustable engagement between the liner and the leg. Many dimensions, relative dimensions and materials could be used. It is envisaged that the leg member 12, liner 14, plug member 34 and foot 42 could all be manufactured from a synthetic plastic material.

[0029] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A height adjustable leg arrangement comprising:

a leg member;
a liner for receipt in a through aperture in an item to be supported;
the liner and the leg member being adjustably engageable for height adjustment;
and the leg projecting in one direction from the liner, and being accessible through the aperture from the opposite direction, for height adjust-

ment.

2. An arrangement according to claim 1, wherein the liner and the leg member are threadedly engageable for adjustment.

3. An arrangement according to claim 1 or 2, wherein the leg member is provided with a formation for engagement with a tool, for adjustment.

4. An arrangement according to any preceding claim, wherein the liner is provided with one or more external projections which limit penetration of the liner up into the aperture, from below the item to be supported.

5. An arrangement according to any preceding claim, further comprising a releasable lock arrangement operable to restrain adjustment of the leg member relative to the liner.

6. An arrangement according to claim 5, wherein the releasable lock arrangement includes a lock member introducable into the liner from the said opposite direction to engage the liner and the leg member.

7. An arrangement according to claim 5 or 6, wherein the releasable lock arrangement is operable to restrain rotation of the leg member relative to the liner.

8. An arrangement according to any of claims 5 to 7, wherein the releasable lock arrangement includes a plug member, the liner and the plug member having interlocking formations to prevent relative movement of the liner and the plug member.

9. An arrangement according to any of claims 5 to 8, wherein the releasable lock arrangement include a plug member, the leg member and the plug member having interlocking formations to prevent relative movement of the leg member and the plug member.

10. An arrangement according to any preceding claim, comprising a foot member on which the leg member stands after assembly.

11. An arrangement according to claim 10, wherein the foot member and the leg member are engageable to stop horizontal movement of the leg member relative to the foot member.

12. A leg arrangement comprising:

a foot member for receipt in a through aperture in an item to be supported;
a fixing arrangement operable through the aperture from above the item to secure the foot member to the surface beneath;
a leg arrangement operable to stand on the foot member after removal of the item from the secured foot member, and for receipt in the through aperture to support the item of the foot member.

13. An arrangement according to claim 12, wherein the foot member and the leg member are engageable to stop horizontal movement of the leg member relative to the foot member.

14. An arrangement according to claim 12 or 13, wherein the foot member is a cup member.

15. An arrangement according to claim 12, 13 or 14, wherein the leg arrangement is height adjustable.

16. An arrangement according to any of claims 12 to 15, wherein the leg arrangement is a height adjustable leg arrangement in accordance with any of claims 1 to 11.

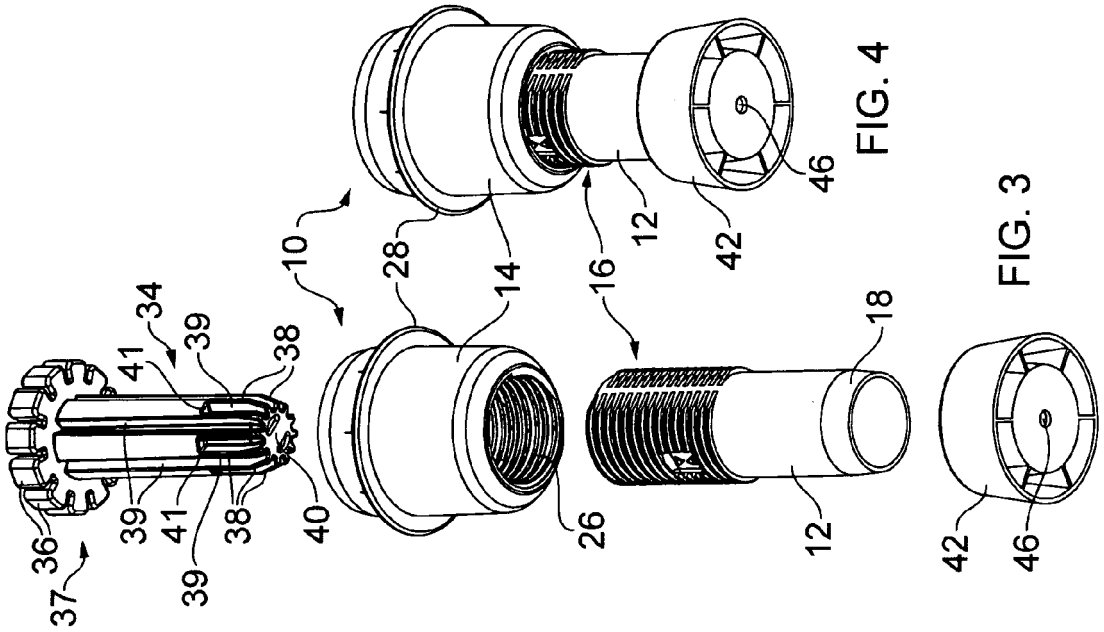

FIG. 4

FIG. 3

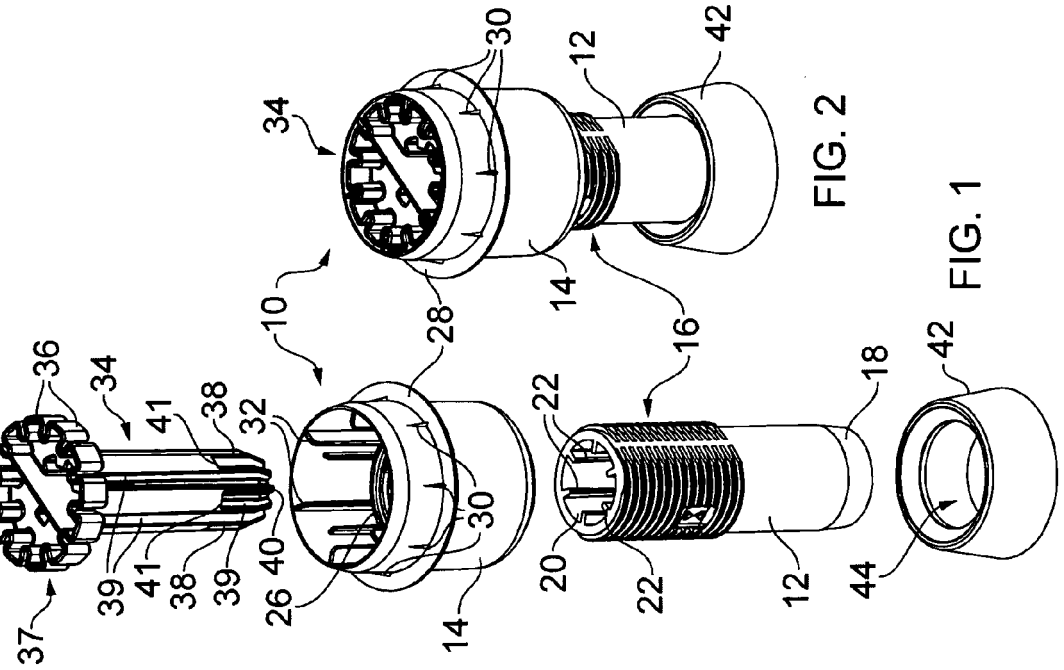

FIG. 2

FIG. 1

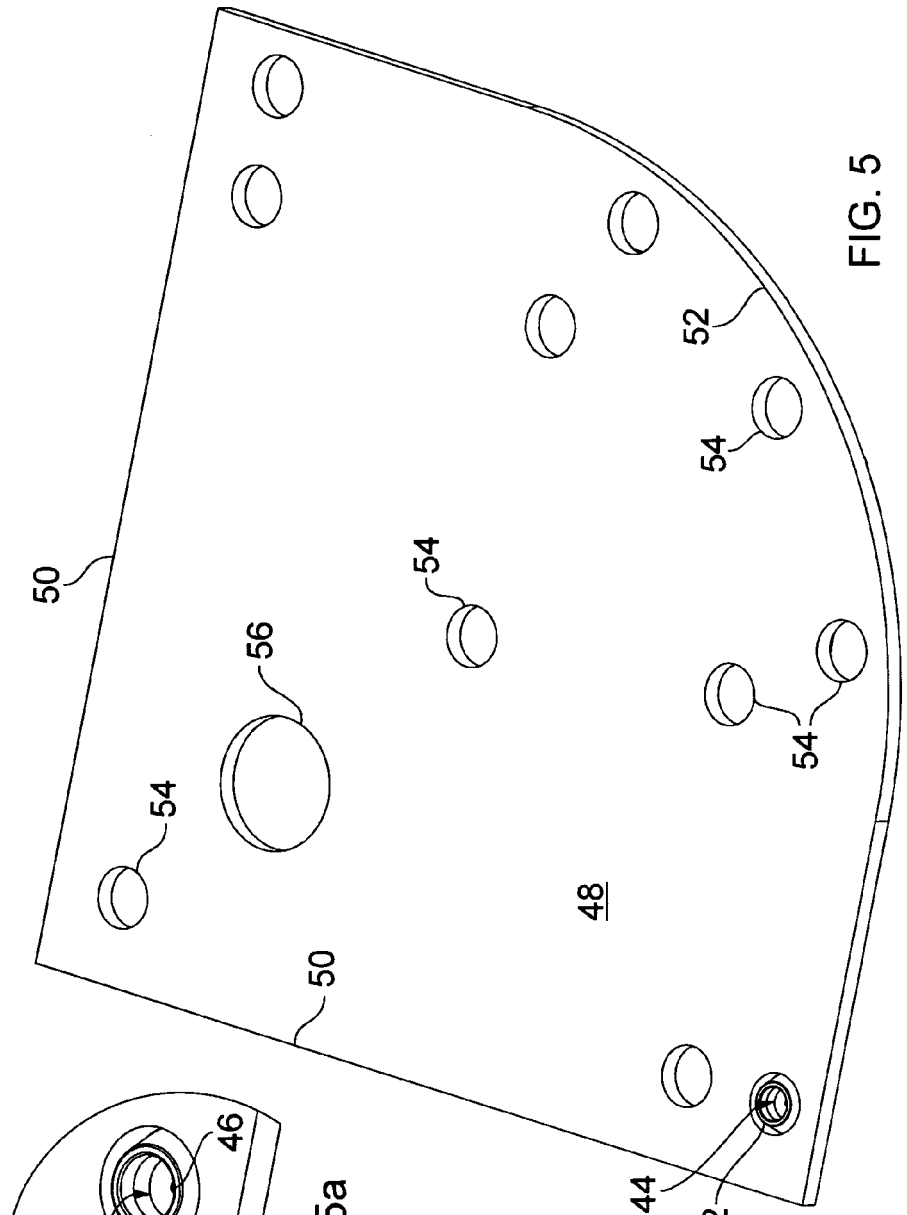

FIG. 5

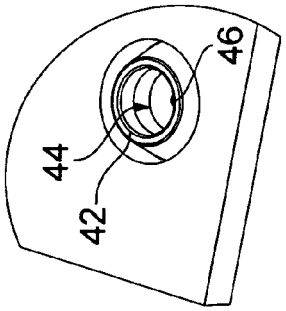

FIG. 5a

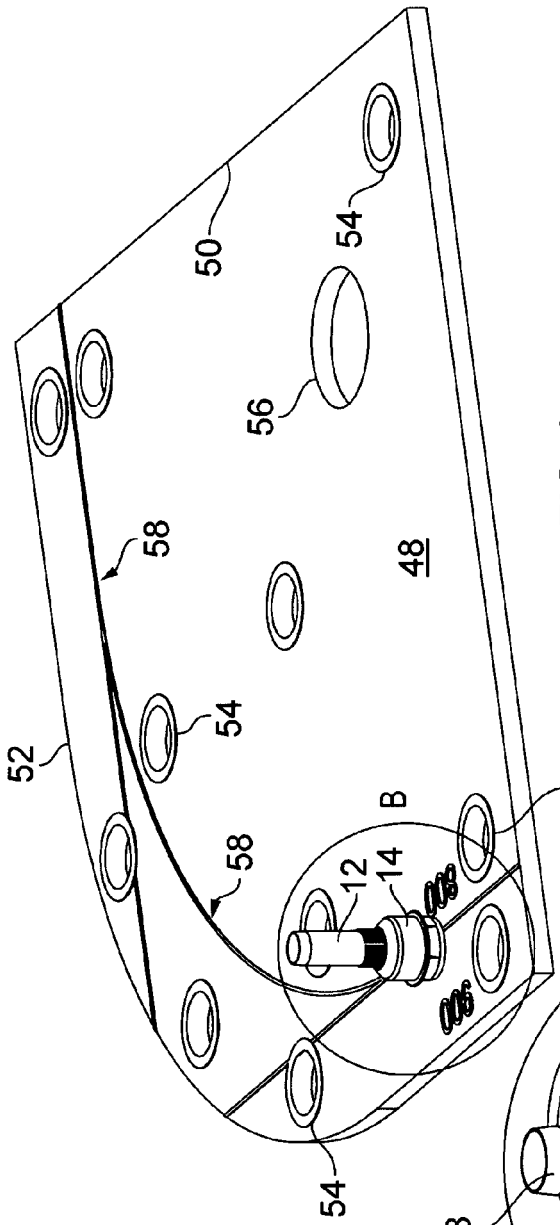

FIG. 6

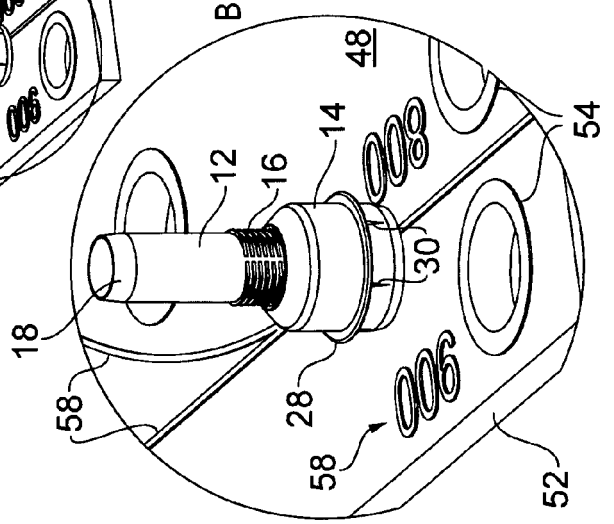

FIG. 6a

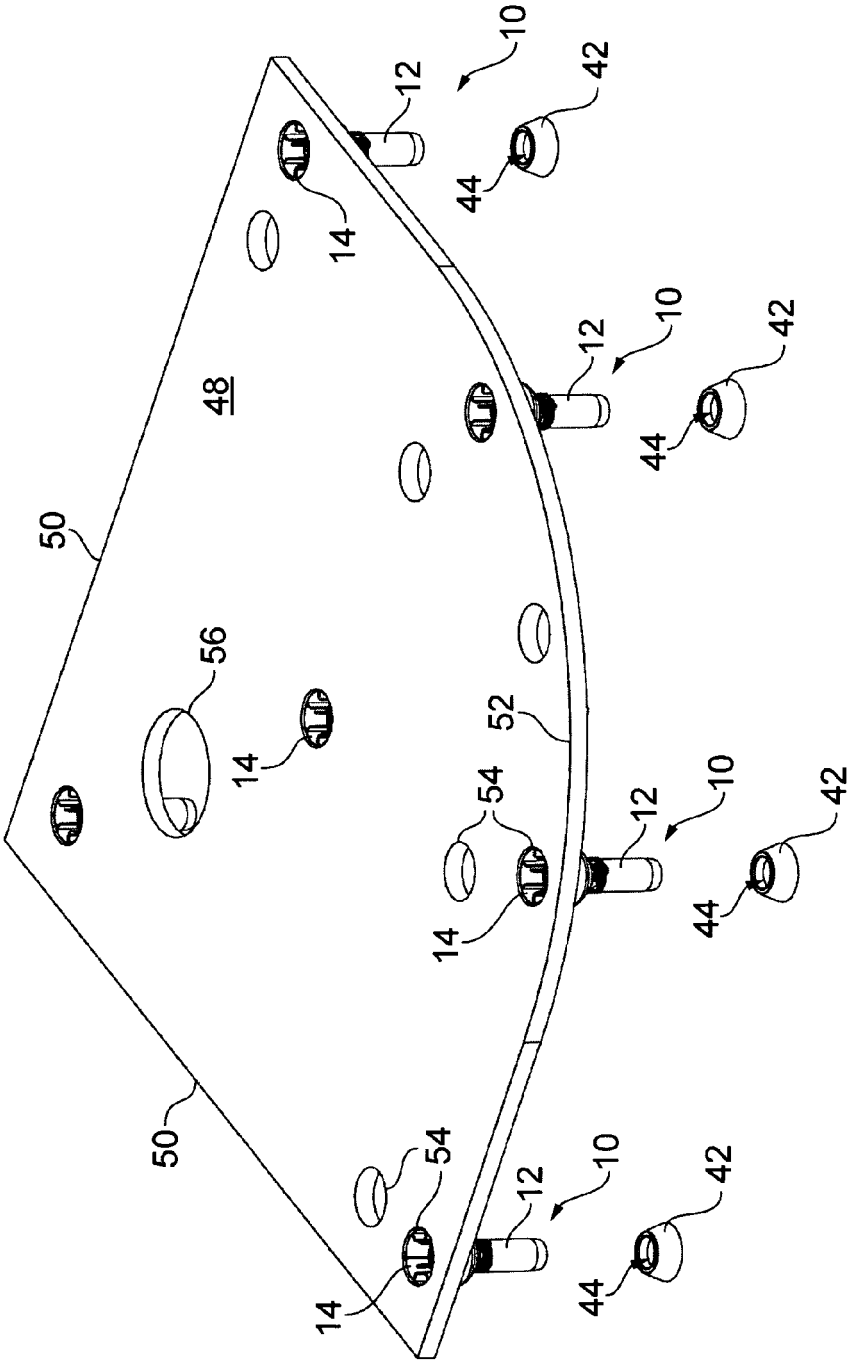

FIG. 7

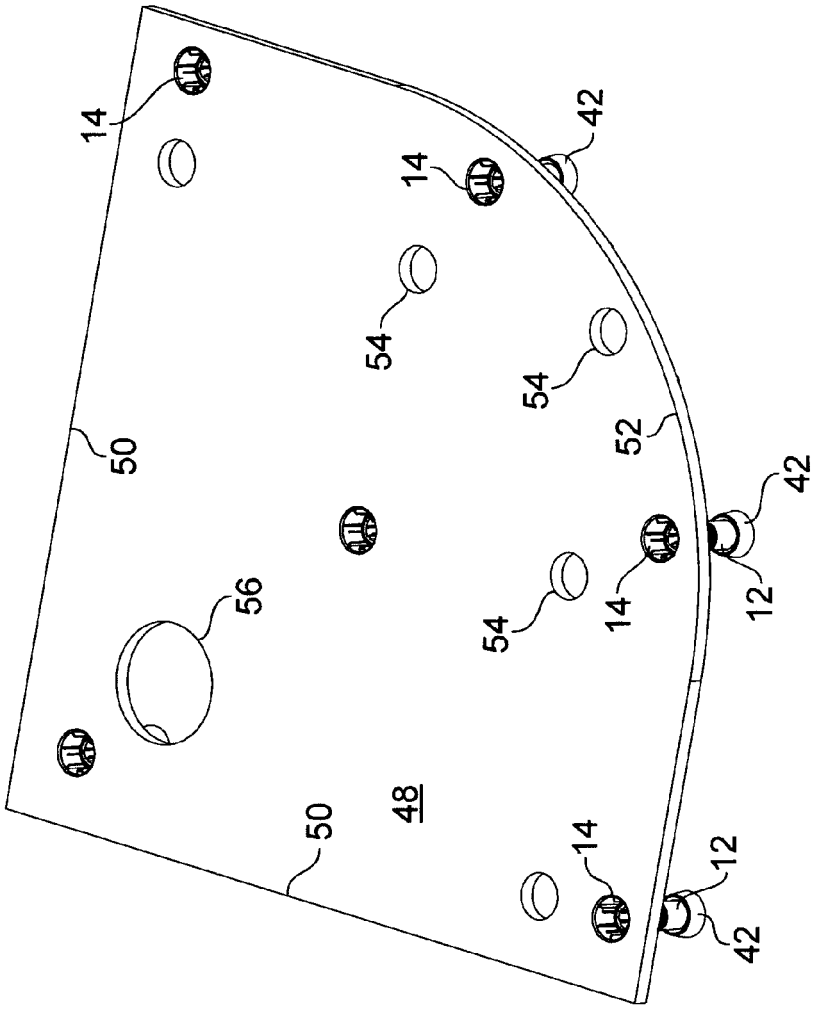

FIG. 8

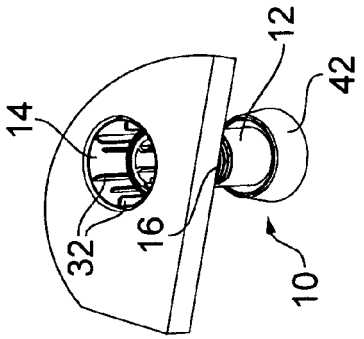

FIG. 8a

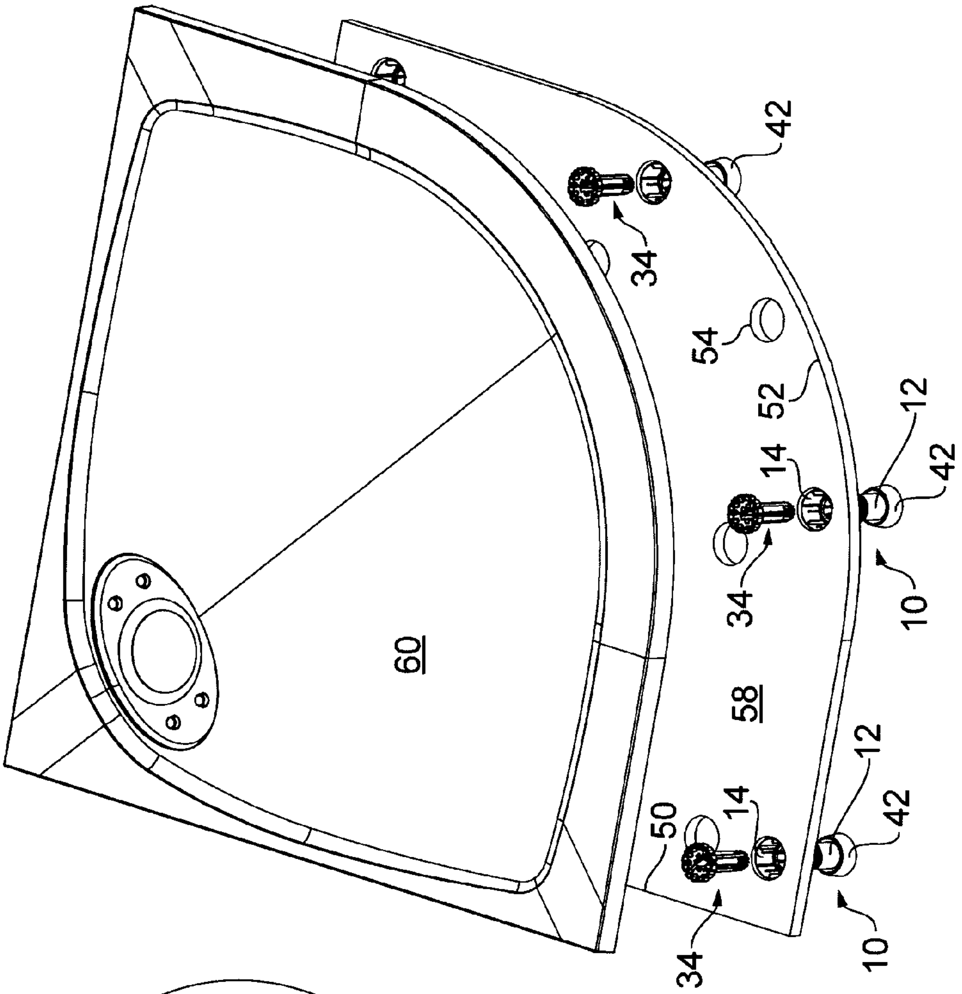
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FIG. 9

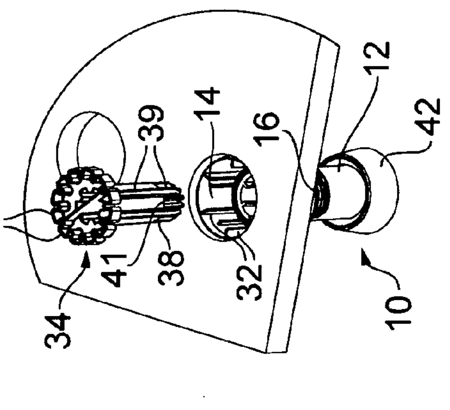
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FIG. 9a

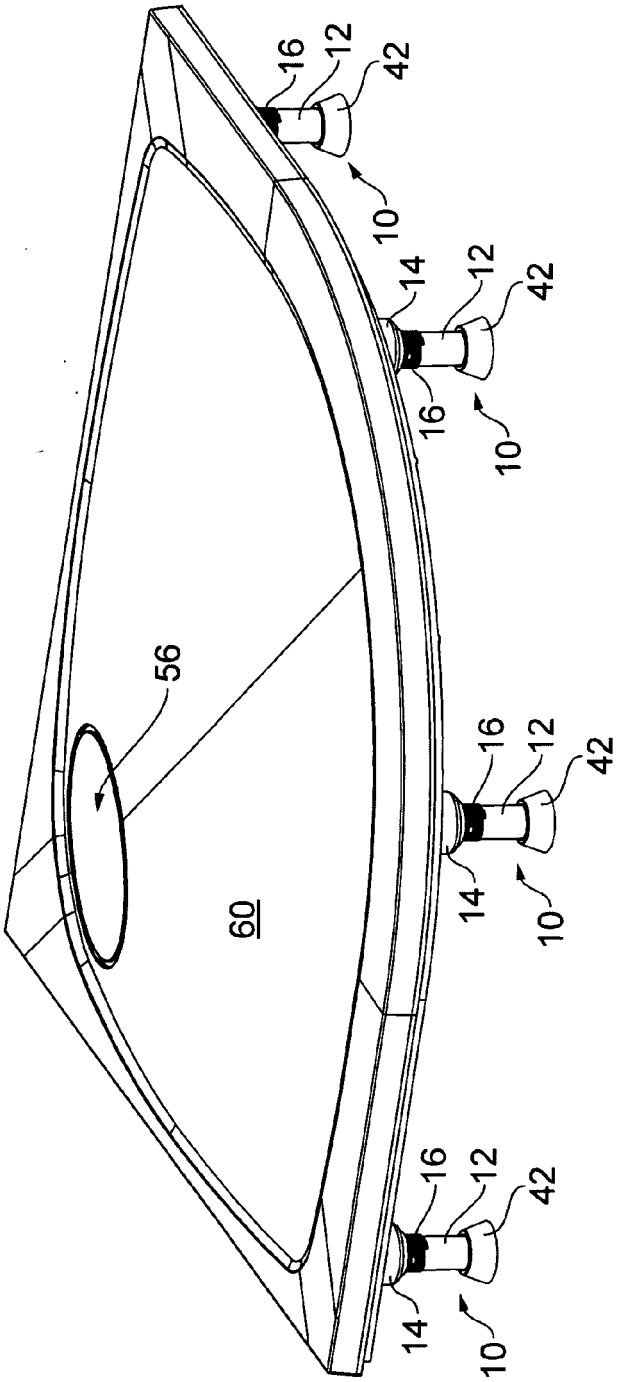

FIG. 10