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(54) **Height adjustment for tile frame**

(57) The invention relates to a shower drain, comprising:
- a tray with a bottom surface and upright side walls arranged along the periphery;
- a height-adjustable tile frame arranged in the tray and

having at least an upright edge; and
- a grating arranged in the tray;
wherein adjusting means are arranged at least in contact with the upright edge of the tile frame for the purpose of height adjustment of the tile frame.

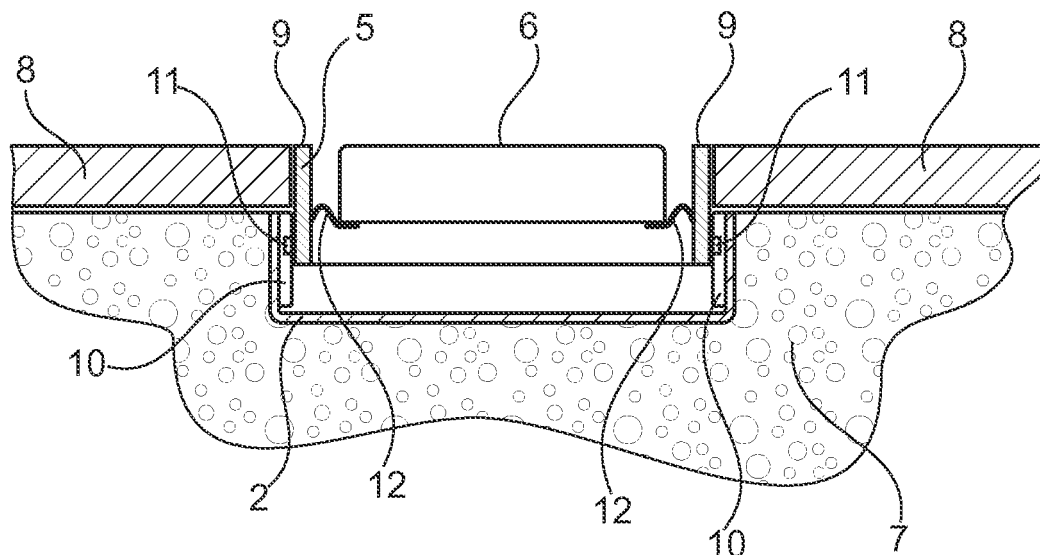


Fig. 2

Description

[0001] The invention relates to a shower drain, comprising:

- a tray with a bottom surface and upright side walls arranged along the periphery;
- a height-adjustable tile frame arranged in the tray and having at least an upright edge; and
- a grating arranged in the tray.

[0002] Such a shower drain is for instance known from the prior art and from the as yet unpublished Netherlands application no. 1034911 of the same applicant. The elongate tray of such a shower drain is first placed in a concrete sub-floor. The tile frame is then placed in the elongate tray, after which the sub-floor is tiled. Depending on the thickness of the tiles used and the thickness of the adhesive layer, the tile frame can be adjusted in the height so that the upper surface of the upright edge lies flush with the upper surface of the tiles. In addition, the tile frame provides for a neat finishing of the sides of the tiles. Finally, a grating which covers the elongate tray is placed in this tile frame.

[0003] In this prior art the height-adjustability of the strip is obtained with a number of bolts arranged in the tile frame, which act as adjustable feet. A part of the tile frame extends for this purpose over the width of the elongate tray, and the bolts are arranged in this part.

[0004] A drawback of such a prior art shower drain is that the adjusting means are visible through the openings in the grating. In addition, the adjusting means impede cleaning of the elongate tray when the grating is removed.

[0005] It is now an object of the invention to alleviate, or even obviate the above stated drawbacks.

[0006] This object is achieved according to the invention with a shower drain according to the preamble, which is **characterized in that** adjusting means are arranged at least in contact with the upright edge of the tile frame for the purpose of height adjustment of the tile frame.

[0007] Because the adjusting means are at least in contact with the upright edge of the tile frame, there is in any case achieved that the tray is easier to clean. In addition, it is possible to arrange the adjusting means on the outer side of the tile frame. The adjusting means hereby come to lie between the tiles and the tile frame. Since this space is normally filled with an elastic mastic, the adjusting means are hereby fully concealed from view.

[0008] In an embodiment of the shower drain according to the invention the adjusting means are partially incorporated into the upright edge. The adjusting means are hereby concealed from view by the upright edge of the tile frame.

[0009] In another embodiment of the shower drain according to the invention the tile frame comprises a strip running peripherally along the upright side walls of the tray.

[0010] In a preferred embodiment of the shower drain

according to the invention the adjusting means comprise a rising surface and a pin resting on the rising surface and slidable over the surface. In this embodiment the pin can be arranged fixedly on the tile frame and a for instance wedge-shaped part is pushed under the pin, whereby the height of the tile frame can as a result be set. It is also possible to arrange the rising surface in the tile frame, for instance through a recess in the upright edge. A displaceable pin can then subsequently protrude into this recess and support on the bottom surface of the tray. The height of the tile frame can then be adjusted by sliding the pin.

[0011] In a further preferred embodiment of the shower drain according to the invention the rising surface is stepped. The contact of the pin against the stepped rising surface is hereby more stable. Vertical recesses of different height, into which the pin drops, can optionally even be provided.

[0012] In a preferred embodiment of the shower drain according to the invention adjusting means are arranged opposite each other on either side of the tray, wherein the adjusting means are mutually coupled by a coupling element. The adjusting means lying opposite each other can be adjusted simultaneously with this coupling element. The coupling element is preferably arranged releasably on the adjusting means. During assembly the adjusting means can hereby be set simultaneously via the coupling element, after which the coupling element can be removed and the adjusting means are minimally visible.

[0013] The coupling element is preferably a pin bent substantially in a U-shape. Owing to the U-shape the coupling element is resilient and can then be easily arranged in or removed from the adjusting means by hand.

[0014] In another embodiment of the shower drain according to the invention the adjusting means comprise an adjusting pin arranged in the tile frame and provided with screw thread. This is a very simple method of adjusting the tile frame. Because the adjusting pin is arranged in the tile frame, it is therefore almost invisible.

[0015] The adjusting pin can preferably be engaged on the top side by a tool, such as an open-end spanner, screwdriver or Allen key. This is possible because the top side of the adjusting pin lies at least partially clear, or because there is arranged in the adjusting frame a channel through which for instance the Allen key can be inserted.

[0016] In yet another embodiment of the shower drain according to the invention the adjusting means comprise an adjusting foot, this adjusting foot being provided with a number of grooves varying in height, wherein the tile frame engages on one of the grooves.

[0017] The tray is preferably an elongate tray so that an elongate shower drain is formed.

[0018] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 shows a perspective view of an embodiment of the shower drain according to the invention.

Figure 2 shows a cross-sectional view of the shower drain according to figure 1.

Figure 3 shows a schematic perspective view of the adjusting means of the embodiment according to figure 1.

Figure 4 shows schematically a second embodiment of the invention.

Figure 5 shows schematically a third embodiment of the invention.

Figure 6 shows a perspective view of a fourth embodiment of the invention.

Figure 7 shows a perspective view of a fifth embodiment of the invention.

Figure 8 shows a perspective bottom view of a sixth embodiment of the invention.

Figure 9 shows a perspective view of a seventh embodiment of the invention.

Figure 1 shows a first embodiment of a shower drain 1 according to the invention. This shower drain 1 has an elongate tray 2 under which a siphon housing 3 is arranged. This siphon housing 3 provides a stench trap and connection to an outlet pipe 4.

[0019] A height-adjustable tile frame 5 is arranged in elongate tray 2. A grating 6, which is perforated on the top side, further rests in this tile frame 5.

[0020] Figure 2 shows a cross-sectional view of shower drain 1. In this figure the elongate tray 2 of shower drain 1 is cast into a sub-floor 7. A tile layer 8 is further arranged on this sub-floor 7. Tile frame 5 is here adjusted in the height such that the upper side of edge 9 lies flush with the upper side of tile layer 8.

[0021] Grating 6 rests on cams 12 arranged on the inner side of tile frame 5. This ensures that the upper surface of grating 6 is at the same height as the upper edge of tile frame 5.

[0022] Arranged between the upright walls of elongate tray 2 and tile frame 5 are wedge-shaped elements 10 which co-act with pins 11 arranged on the tile frame.

[0023] If possible, and depending on the set height, tiles 8 extend over pins 11.

[0024] Figure 3 shows adjusting means 10, 11 in more detail. Wedge-shaped part 10 is provided with a stepped, rising upper surface 12. Pin 11, which is connected to the tile frame, rests on this upper surface 12. Tile frame 5 can be adjusted in the height by displacing wedge-shaped part 10 relative to this tile frame 5.

[0025] For the purpose of simultaneous adjustment of two mutually opposite adjusting means 10, 11, these adjusting means 10, 11 are mutually connected by means of a U-shaped bracket 13. One side of the tile frame can thus be adjusted in the height in simple manner by sliding bracket 13 back and forth.

[0026] Once adjusting means 10, 11 have been set to the correct height, bracket 13 can be removed by squeezing flanges 14 on bracket 13 toward each other. Bracket

13 is hereby pulled out of holes 15 in wedge-shaped elements 10.

[0027] Figure 4 shows schematically a second embodiment of the shower drain according to the invention. Tile frame 20, which is manufactured from a flat strip of material, is provided on the underside with a recess 21. Upper edge 22 of this recess rises and is stepped. A triangular support 23 is placed in this recess 21. Tile frame 20 can be easily adjusted in the height by sliding this support 23.

[0028] Figure 5 shows a cross-sectional view of a third embodiment 30 of the shower drain according to the invention. Shower drain 30 has an elongate lower tray 31 which is cast into a sub-floor 32. A tile frame with an upright edge 33 is arranged in the elongate lower tray 31. In this embodiment the adjusting means take the form of adjusting bolts 34 which lie against upright edge 33. The tip of adjusting bolts 34 is accessible to a tool such as an Allen key 36 via a channel 35. Adjusting bolt 34 can hereby be rotated, and thereby adjusted in the height.

[0029] A connecting rod 37, on which grating 38 rests, runs between adjusting bolts 34. Connecting rod 37 is advantageous particularly when the part of tile frame 33 into which adjusting bolts 34 protrude is made of plastic. In such a case the connecting rod provides a wear-resistant support surface for grating 38. If grating 38 were to lie directly on plastic, the plastic would wear away in the course of time, whereby grating 38 would no longer lie at the correct height.

[0030] Figure 6 shows a fourth embodiment of the invention. In this embodiment tile frame 40 is provided with transverse connections 41. These transverse connections 41 are provided with a bend 42 close to tile frame 40. A grating (not shown) can be centred within tile frame 40 by means of these bends 42, which are arranged on either side of transverse connections 41.

[0031] Transverse connection 41 protrudes through tile frame 40 so that a cam 43 is created on the outside of tile frame 40. An adjusting foot 44 is placed on this cam 43. A stepped groove 45 is arranged in this adjusting foot 44. The height can thus be adjusted by placing cam 43 on one of the different steps. The shown adjusting foot 44 has the additional advantage that the foot can be rotated 90°. A different range of height adjustment can hereby be achieved due to the elongate form. In addition, a wide range of height adjustment can be obtained by a suitable choice of dimensions. Each step can for instance be 2 mm. In addition, the distance from the first step to the underside of the block is for instance 1 mm, and the distance from the final step to the top side 2 mm. An adjustment of 1 mm, 3 mm, 5 mm, 7 mm can hereby be obtained in the one position, and an adjustment of 2 mm, 4 mm, 6 mm, 8 mm by turning over the adjusting foot.

[0032] Figure 7 shows a fifth embodiment. Adjusting feet 51 are here arranged on tile frame 50. These adjusting feet 51 have a shaft end 52 with which they are rotatably mounted in tile frame 50. An internal hexagon 53 is arranged in shaft end 52 so that adjusting foot 51 can

be easily adjusted using an Allen key.

[0033] Shaft end 52 is arranged eccentrically on adjusting foot 51. The different side surfaces 54, 55, 56, 57, 58, 59 can hereby be used as support surface through rotation of adjusting foot 51, whereby a corresponding different adjustment height h1, h2 is simultaneously obtained.

[0034] Figure 8 shows a bottom view of a sixth embodiment. Two recesses 61 are here arranged in the underside of tile frame 60, thereby resulting in a free shaft end 62 in tile frame 60. This shaft end 62 is provided with screw thread so that a nut 63 can be arranged on this screw thread. The peripheral surface of nut 63 is provided with a number of ridges 64, whereby nut 63 can be easily adjusted by hand.

[0035] Figure 9 shows a seventh embodiment 70. This embodiment 70 has an elongate tray 71 with a bottom surface 72 and upright walls 73. A grating 74 is arranged in elongate tray 71. This grating 74 has a substantially C-shaped cross-section. Arranged in free edge 75 of this C-shaped cross-section is a slot 76 into which protrudes an adjusting foot 77. This adjusting foot 77 is provided with two locking cams 78 with which adjusting foot 77 can be tightened in slot 76.

[0036] Further arranged on adjusting foot 77 is a cam 79 with which the adjusting foot, and thereby grating 74, is held at distance from tray 71 and can thus be centred.

[0037] A bolt 80 with which grating 74 can be adjusted in the height is further arranged in the underside of adjusting foot 77.

[0038] In addition to the shown embodiments, it is further possible to fix adjusting blocks to the underside of the tile frame.

[0039] Finally, it should be noted that although the invention is elucidated on the basis of elongate shower drains, the invention can also be applied to drains of other forms, such as quarter-circular, round or square.

Claims

1. Shower drain, comprising:

- a tray with a bottom surface and upright side walls arranged along the periphery;
 - a height-adjustable tile frame arranged in the tray and having at least an upright edge; and
 - a grating arranged in the tray;
- characterized in that** adjusting means are arranged at least in contact with the upright edge of the tile frame for the purpose of height adjustment of the tile frame.

2. Shower drain as claimed in claim 1, wherein the adjusting means are partially incorporated into the upright edge.

3. Shower drain as claimed in claim 1 or 2, wherein the

tile frame comprises a strip running peripherally along the upright side walls of the tray.

4. Shower drain as claimed in any of the foregoing claims, wherein the adjusting means comprise a rising surface and a pin resting on the rising surface and slidable over the surface.

5. Shower drain as claimed in claim 4, wherein the rising surface is stepped.

6. Shower drain as claimed in either of the claims 4 or 5, wherein adjusting means are arranged opposite each other on either side of the tray, wherein the adjusting means are mutually coupled by a coupling element.

7. Shower drain as claimed in claim 6, wherein the coupling element is arranged releasably on the adjusting means.

8. Shower drain as claimed in claim 6 or 7, wherein the coupling element is a pin bent substantially in a U-shape.

9. Shower drain as claimed in any of the claims 4-8, wherein the rising surface is arranged in the tile frame.

10. Shower drain as claimed in claim 4 or 5, comprising a plate-like foot and a stepped groove which is arranged in the plate-like foot and into which the pin protrudes.

11. Shower drain as claimed in any of the claims 1-3, wherein the adjusting means comprise an adjusting pin arranged in the tile frame and provided with screw thread.

12. Shower drain as claimed in claim 11, wherein the adjusting pin can be engaged on the top side by a tool, such as an open-end spanner, screwdriver or Allen key.

13. Shower drain as claimed in any of the claims 1-3, wherein the adjusting means comprise a plate-like part and a shaft end arranged eccentrically on the plate-like part, the shaft end being bearing-mounted in the tile frame.

14. Shower drain as claimed in claim 13, wherein a hexagonal hole is arranged in the shaft end.

15. Shower drain as claimed in claim 13 or 14, wherein the plate-like part is polygonal and formed such that the distance from a side to the eccentrically placed shaft end is unique for each side.

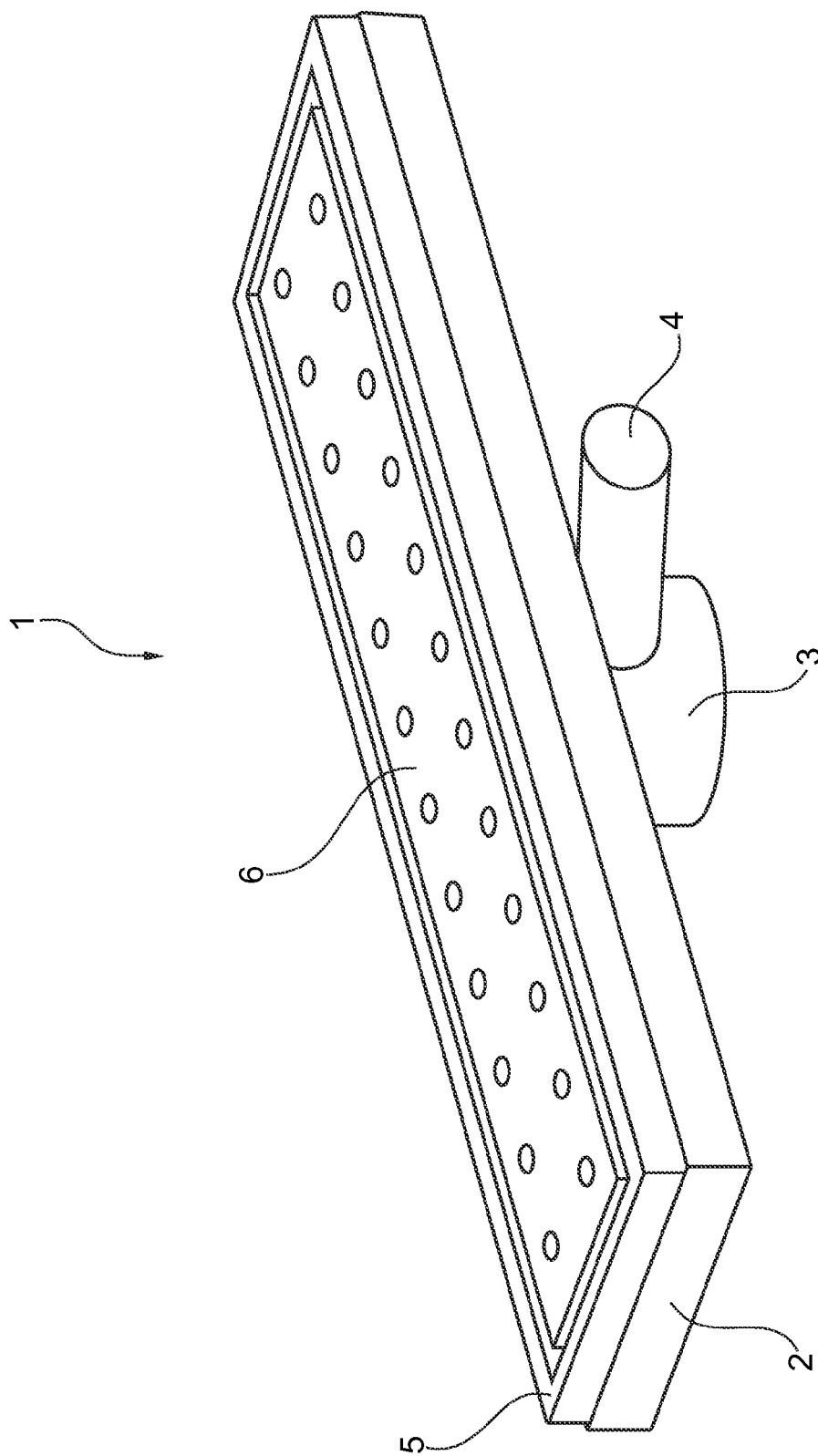


Fig. 1

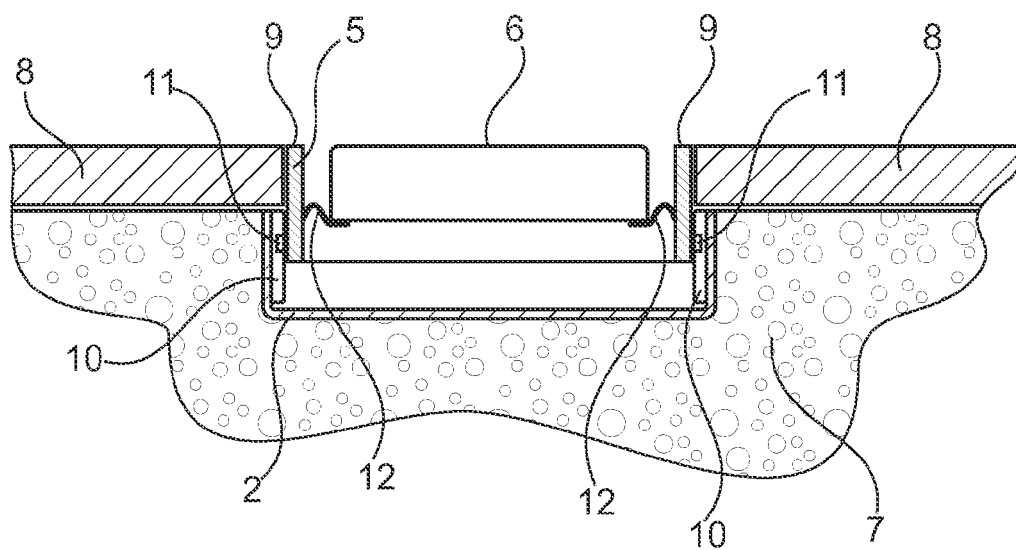


Fig. 2

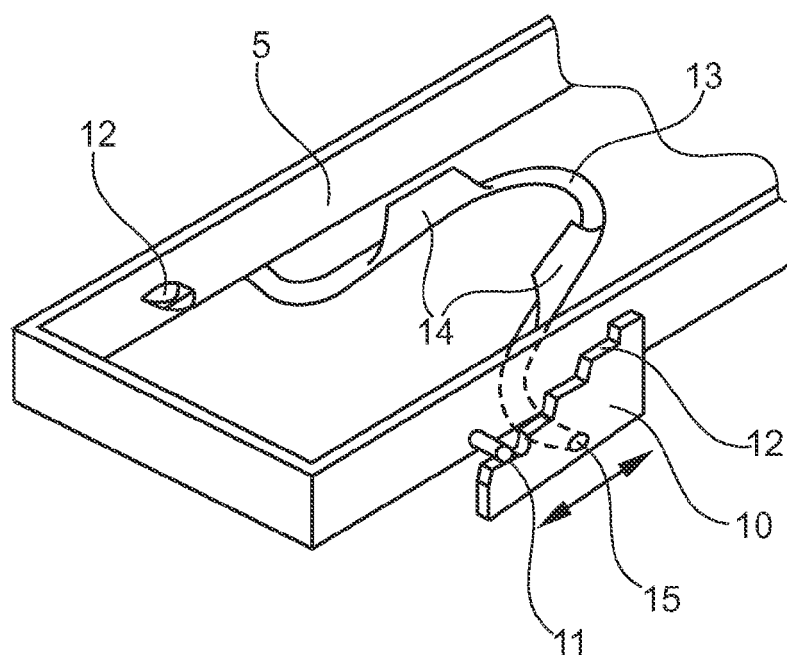


Fig. 3

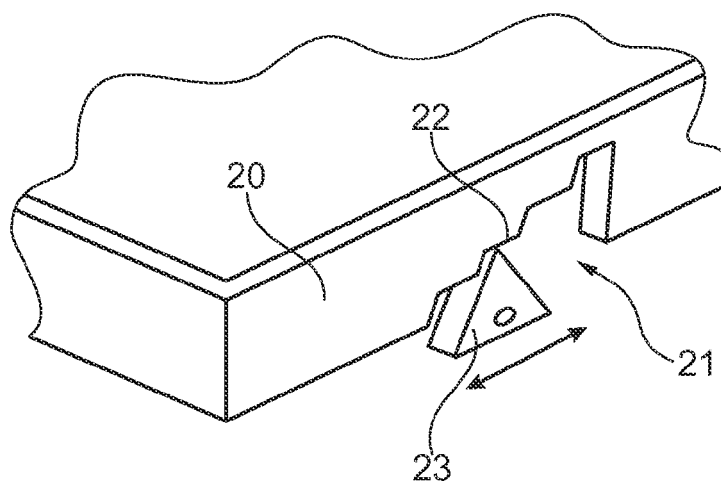


Fig. 4

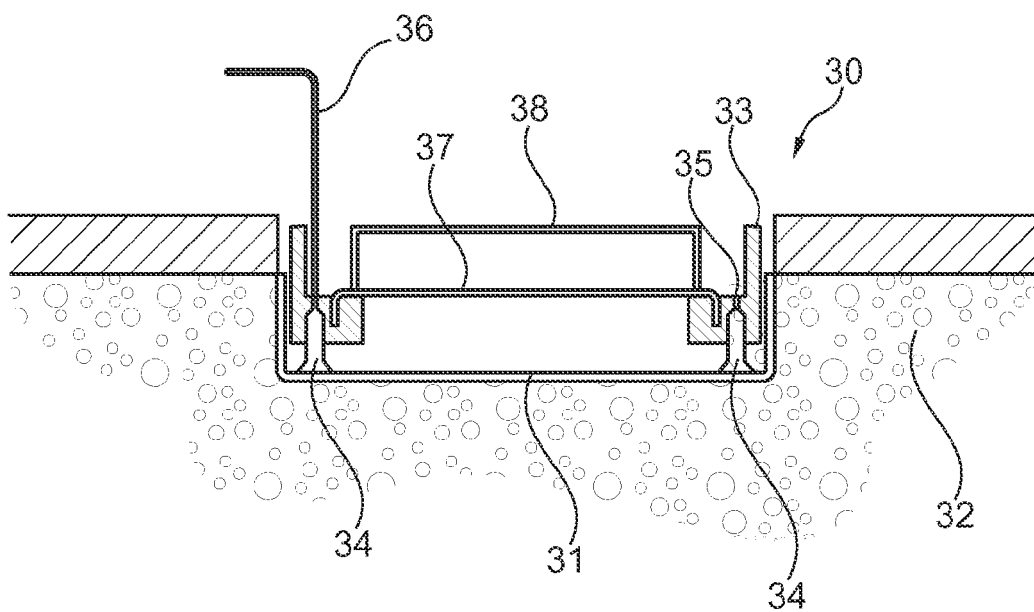


Fig. 5

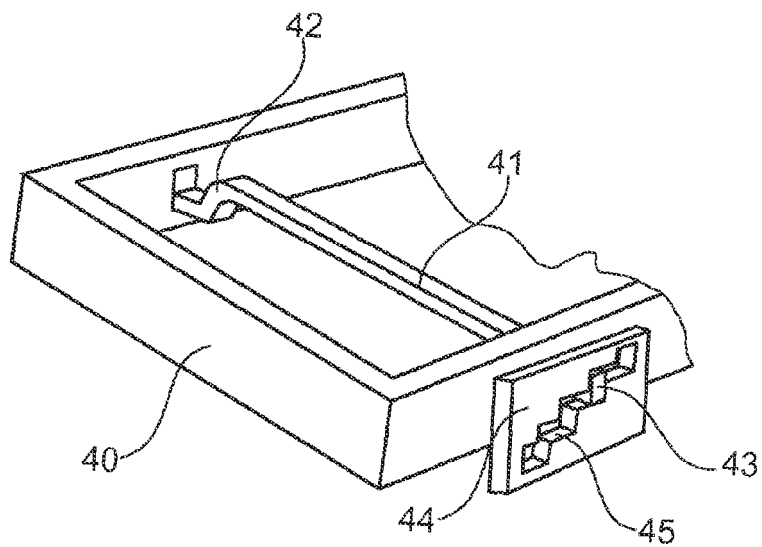


Fig. 6

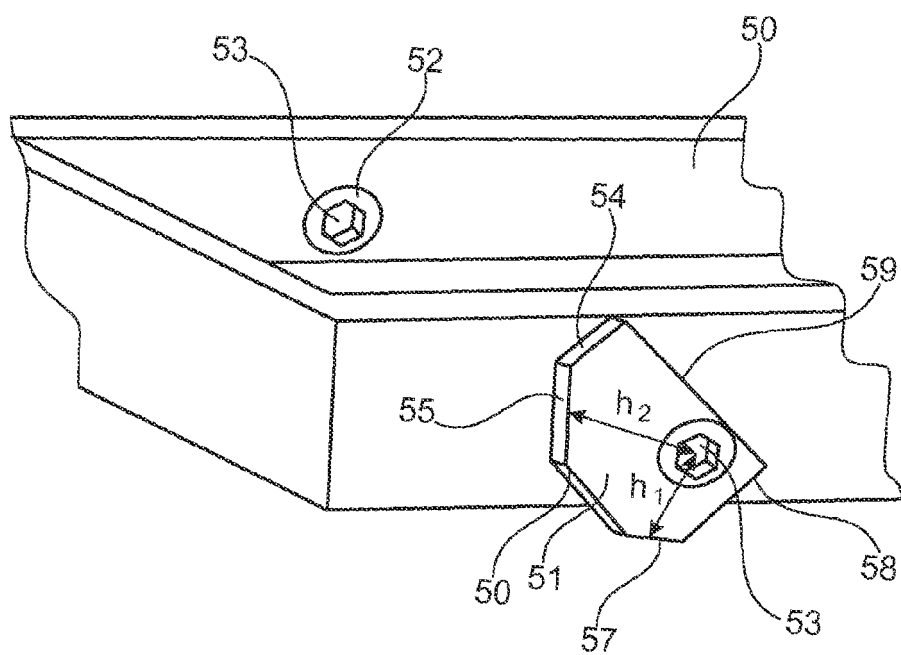


Fig. 7

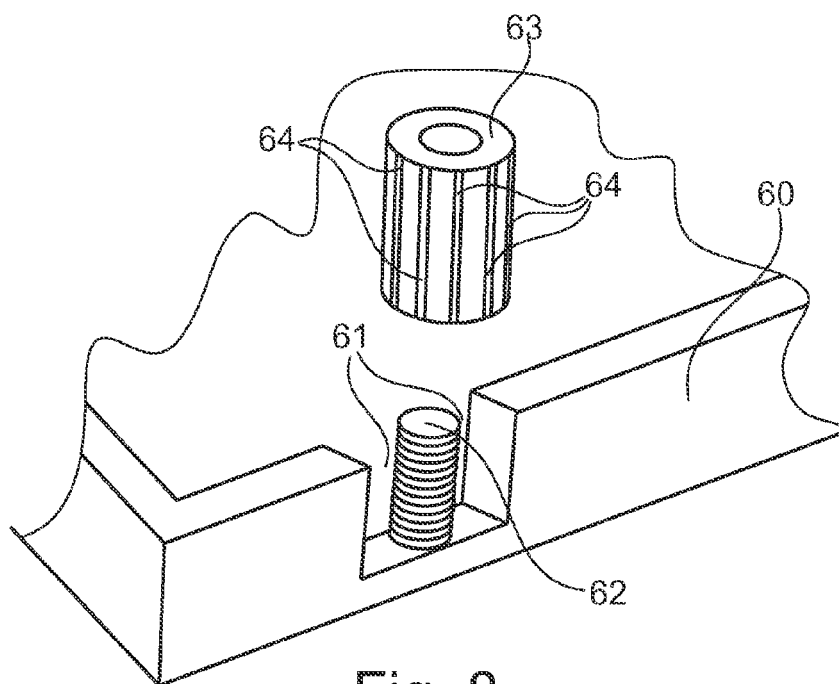


Fig. 8

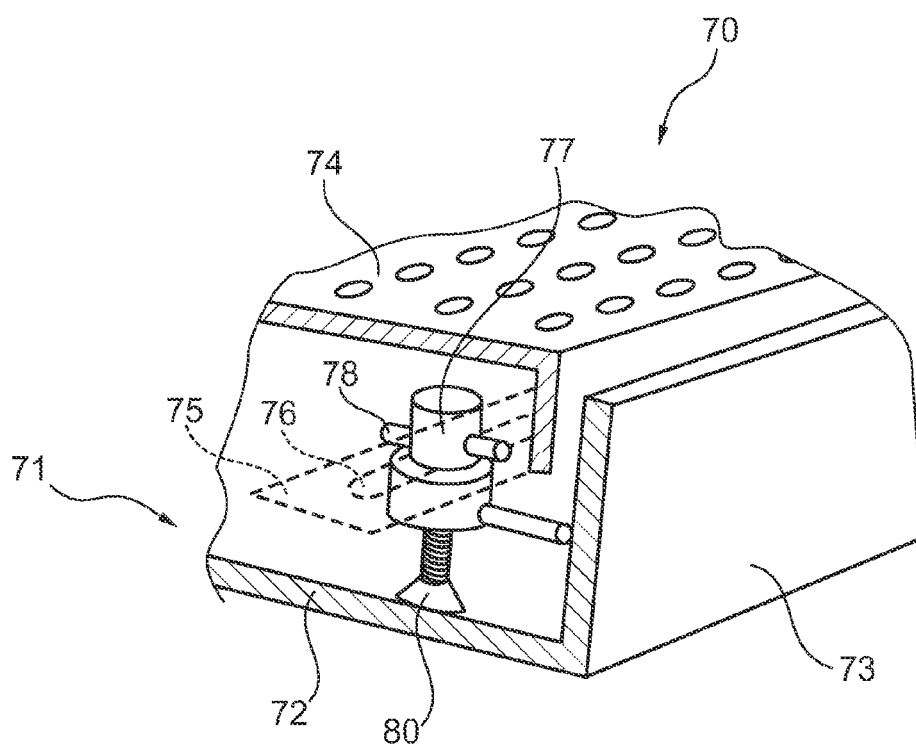


Fig. 9



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 9750

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E03F
Place of search		Date of completion of the search	Examiner
The Hague		14 July 2010	De Coene, Petrus
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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14-07-2010

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REFERENCES CITED IN THE DESCRIPTION

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