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(54) **Clamping construction for drain**

(57) Drain, comprising:

- a collecting tray for collecting water to be discharged, which collecting tray has a bottom surface and standing walls along the bottom surface;
- horizontal flanges arranged directed toward each other on the upper edge of the standing walls;
- a clamping frame arranged above the horizontal flanges for fixedly clamping between the clamping frame and the horizontal flanges a flexible layer surrounding the drain, such as a vinyl layer, wherein the clamping frame surrounds the inflow opening of the drain;
- tensioning means arranged between the clamping frame and the horizontal flanges for tensioning the clamping frame against the flanges.

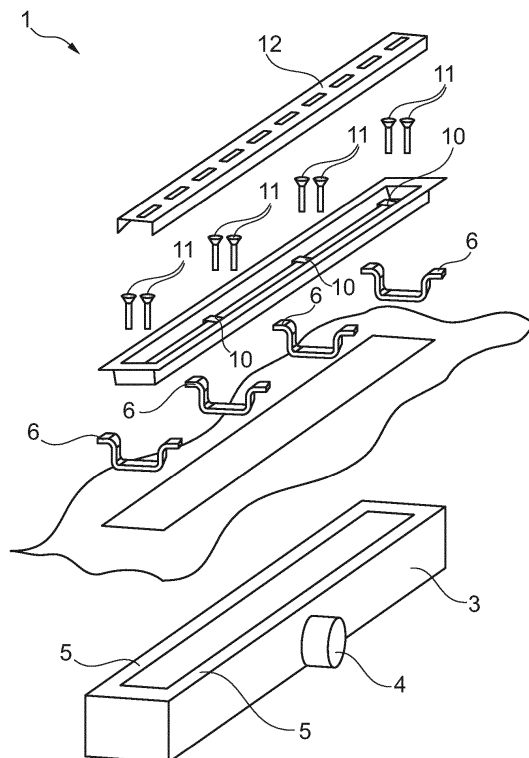


Fig. 1

Description

[0001] The invention relates to a drain, such as a shower drain.

[0002] Drains are usually incorporated into floors. The floor can here be a wooden floor or concrete floor finished with for instance tiles or a covering layer such as vinyl. It is important here that the connection between the drain and the finishing layer is reliable and watertight.

[0003] Use is often made in a tile layer of a silicone sealant to fill the space between the tiles and the drain. This is normally possible because the tile and the adhesive layer with which the tile is glued to the floor is easily more than one centimetre thick, whereby there is sufficient contact surface on the side of the tiles and the drain to arrange a good sealant layer therebetween.

[0004] In the case of a flexible layer such as vinyl the layer thickness is considerably smaller than in the case of tiles. It is therefore not readily possible to obtain a reliable seal by means of a sealant layer. As a result, special drains which are suitable for connection to a thin, flexible layer are known in the prior art.

[0005] EP 1914355 describes a shower drain which is suitable for connection to a flexible layer such as a sealing membrane. The shower drain has for this purpose a collecting tray with a bottom surface and standing walls along the bottom surface. Arranged on the walls are flanges which face outward and away from each other. A clamping frame is arranged over these flanges. The outer end of the flexible layer is placed between the horizontal flanges and the clamping frame, after which screws which clamp the whole together are arranged through the clamping frame, the flexible layer and the horizontal flanges.

[0006] The drawback of this prior art shower drain is that the screws run through the flexible layer, which may result in possible leakage. In addition, the screws are arranged in the outward facing horizontal flange. If the screw connection is overscrewed there is a chance that water will flow along the loose screw and run under the flange, and thereby outside the tray. It is moreover not possible to repair this screw connection without removing the collecting tray from the floor.

[0007] These screws moreover cause a stress in the lower tray itself, which may affect the mounting of the lower tray in the floor.

[0008] It is now an object of the invention to reduce or even obviate the above stated drawbacks.

[0009] This object is achieved with a drain according to the invention, which drain comprises:

- a collecting tray for collecting water to be discharged, which collecting tray has a bottom surface and standing walls along the bottom surface;
- horizontal flanges arranged directed toward each other on the upper edge of the standing walls;
- a clamping frame arranged above the horizontal flanges for fixedly clamping between the clamping

frame and the horizontal flanges a flexible layer surrounding the drain, such as a vinyl layer, wherein the clamping frame surrounds the inflow opening of the drain;

- tensioning means arranged between the clamping frame and the horizontal flanges for tensioning the clamping frame against the flanges.

[0010] By directing the flanges inward they will be situated above the collecting tray. This makes it possible to have the tensioning means engage on the horizontal flanges and the clamping frame without the flexible layer having to be pierced. The tensioning means can in principle pass through the inflow opening of the drain tray. Conversely, it is possible to secure the clamping frame in a more conventional manner using screws, wherein the flexible layer is still pierced. However, because the horizontal flanges are situated inside and above the collecting tray, a possible leakage along the screws will still run into the collecting tray.

[0011] In the invention it is possible to gain access under the flexible layer via the inflow opening. It is hereby possible to have the clamping means engage both below and above the flexible layer, and moreover to remove or to replace them.

[0012] Another additional advantage is that the opening in the flexible layer can easily be cut out along the edge of the inward directed horizontal flanges. In addition, the clamping frame can also be displaced inside the opening in order to align the clamping frame.

[0013] A relatively narrow inflow opening is obtained with the inward directed flanges, while the drain capacity of the lower tray remains large. A small inflow opening is desirable from an aesthetic viewpoint. It is in addition possible due to the narrower inflow opening to provide a more stable clamping frame, whereby fewer tensioning means are necessary.

[0014] Now that the clamping force is applied to the inward directed horizontal flanges, the clamping force will have no effect on the collecting tray, whereby the collecting tray can take a simpler and cheaper form.

[0015] In an embodiment of the drain according to the invention the clamping frame comprises a peripheral profile with a substantially L-shaped cross-section, and wherein the horizontal part of the L-shaped profile lies above the horizontal flanges and wherein the vertical part of the profile protrudes into the opening enclosed by the horizontal flanges. The clamping frame is preferably made from the thinnest possible material, whereby the lowest possible upright edge is obtained.

[0016] The L-shaped cross-section imparts a great rigidity to the clamping frame, whereby the clamping frame can be pressed uniformly onto the flexible layer over a longer length with a limited number of tensioning means.

[0017] In addition, the vertical part of the profile provides for a good finish of the inflow opening of the drain.

[0018] The L-shaped profile further makes it possible to make use of the depth of the lower tray. Owing to this

usable depth it is possible to give parts of the clamping system a stronger form, whereby fewer components are for instance required. This also makes it possible to position possible screws of a clamping construction adjacently of and under the clamping surface, this allowing more freedom of design.

[0019] In a preferred embodiment of the drain according to the invention the tensioning means comprise brackets which engage on the underside of the horizontal flanges. These brackets can be placed under the horizontal flanges in simple manner via the inflow opening of the drain. Should a bracket for instance be damaged, it can be easily exchanged without the collecting tray having to be removed from the floor.

[0020] In a highly preferred embodiment of the drain according to the invention the tensioning means comprise at least one bridge part arranged on the clamping frame and spanning the inflow opening, and fixing means such as bolts or screws, wherein the fixing means engage on both the bridge part and the brackets.

[0021] In this embodiment of the drain the clamping frame can be clamped onto the horizontal flanges of the collecting tray in simple manner by tightening the screws or bolts.

[0022] Each bracket preferably extends between two opposite sides of the collecting tray. This enables each bracket to be properly centred in the tray, whereby the clamping frame can also be clamped centred relative to the collecting tray.

[0023] The dimensions of the bracket can also be chosen such that a bottom is formed between the clamping frame, wherein an outlet opening is arranged in the bottom. This construction results in a double bottom with a tray in the collecting tray. Using a continuous bottom instead of bridge parts makes it easier to keep the visible part of the drain clean. It is also possible to place a separate bottom plate on the bridge parts for finishing purposes.

[0024] In another embodiment of the drain according to the invention a grating is arranged in the inflow opening. This grating can conceal the tensioning means from view while they remain easily accessible under the grating.

[0025] In the drain according to the invention the collecting tray is preferably elongate and comprises an outflow opening to which a siphon is connected. It is also possible to opt for a square or round form of the collecting tray.

[0026] Although the clamping construction according to the invention preferably engages all the way round an inward protruding horizontal flange, it also falls within the invention to have the clamping construction engage on only a single edge or a part thereof. Particularly when the drain is placed against a wall, all-round clamping will not be necessary.

[0027] In another preferred embodiment according to the invention the horizontal flanges directed toward each other are formed by profiles arranged against the stand-

ing walls. Such a profile can for instance be arranged by adhesion.

[0028] The advantage of this embodiment is that a usual lower tray can be used for the drain. It becomes possible to apply the invention by placing the profiles in this usual lower tray. This embodiment thus makes it possible to use existing lower trays already arranged in a floor for the invention, for instance as part of renovation. It will also be possible to limit storage space because use can be made of an existing lower tray for the drain according to the invention.

[0029] Another advantage is that the profile can be placed at a somewhat lower position in the lower tray, thereby creating a recess into which the clamping frame can be flush mounted. The profile can optionally be height-adjustable, whereby the positioning of the profile can be adjusted to the thickness of the flexible layer.

[0030] In addition, the bridge parts of the tensioning system can be integrated with the profiles, whereby the profiles and the bridge parts can be placed as one whole in the lower tray.

[0031] The profiles are preferably made by extrusion. A desired cross-sectional form can hereby be obtained. It is thus also possible to provide an extra groove, in which a sealant layer can be provided for sealing purposes.

[0032] Specially formed end parts can be arranged on the end surfaces of the lower tray, thereby resulting in a rounded finish of the inflow opening. Particularly in the case of vinyl this rounded finish reduces the stress in the flexible layer, thereby preventing tearing.

[0033] In the case of a round drain the profiles can also be embodied as a ring. The clamping frame can therefore take an annular form here. The annular profile and the annular clamping frame can be tightened onto each other by arranging a co-acting screw thread on both parts or a snap connection.

[0034] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 shows a first embodiment of a drain according to the invention with exploded parts.

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

Figure 3 shows a second embodiment of a drain according to the invention.

Figure 4 shows a cross-section of a third embodiment according to the invention.

Figure 5 shows a perspective view of a fourth embodiment of a drain according to the invention.

Figure 6 shows a cross-sectional view of a fifth embodiment of the invention.

Figure 7 shows a cross-sectional view of a sixth embodiment of the invention.

Figure 8 shows a cross-sectional view of a seventh embodiment of the invention.

Figure 9 shows an eighth embodiment of the invention.

Figure 10 shows a ninth embodiment of the invention.

Figure 11 shows a tenth embodiment of the invention.

Figures 1 and 2 show an embodiment 1 of the drain according to the invention. Drain 1 has a collecting tray with a bottom surface 2 and standing walls 3 along the periphery of the bottom surface. Collecting tray 2, 3 is provided with an outlet opening 4 which can be connected to a siphon or outlet pipe. Horizontal flanges 5 directed toward each other are provided on the upper side of standing walls 3. Flanges 5 protrude inward and thus extend over collecting tray 2, 3.

[0035] Inserted via the opening between flanges 5 are brackets 6 which support against the underside of flanges 5. It is possible by turning brackets 6 to clamp them fixedly against standing walls 3. A flexible layer 7 provided with an opening is first arranged on the upper side of flanges 5. Placed on top of this is a clamping frame 8.

[0036] Clamping frame 8 is formed from a peripheral profile with an L-shaped cross-section (see figure 2 in particular). Bridge parts 10 are arranged between opposite sides of clamping frame 8. Provided in these bridge parts 10 are holes through which pass bolts 11 which are screwed into brackets 6. Clamping frame 8 will hereby be tensioned against horizontal flanges 5 and the flexible material 7 is clamped between clamping frame 8 and flanges 5, thereby creating a watertight connection between flexible material 7 and drain 1.

[0037] A grating 12 with which bridge parts 10 and bolts 11 are concealed from view can further be placed on the bridge parts 10 between clamping frame 8.

[0038] Brackets 6 can optionally be made from spring steel. Bracket 6 is then formed here such that at least the part on which bolts 11 engage is slightly hollow so that bracket 6 deforms due to bolts 11 being tightened and clamps extra-firmly against the underside of horizontal flanges 5.

[0039] In the shown embodiment horizontal flanges 5 are formed by folding over the upper side of standing walls 3. It is however also possible to use a prior art collecting tray with outward directed horizontal flanges. A cover plate with central opening is then arranged on the outward directed horizontal flanges. This cover plate can for instance be adhered. By choosing a central opening smaller than the original inflow opening of the known collecting tray an inward directed edge is thus obtained on which brackets 6 can support.

[0040] Figure 3 shows a second embodiment 20 of a drain according to the invention. In this embodiment 20 a collecting tray 21 is provided with outward directed horizontal flanges 22. A plate 23 is arranged on these horizontal flanges 22, for instance by adhesion, thereby creating inward directed flanges.

[0041] Mounting blocks 24 are arranged under the inward protruding flanges 23. Arranged in these mounting

blocks 24 are screws 25, which via a tongue 26 draw a clamping frame 27 firmly into place on flanges 23 so that a flexible layer 28 can be clamped fixedly onto the upper side of drain 20.

[0042] Figure 4 shows a third embodiment 30 of a drain according to the invention. This embodiment 30 has a collecting tray with bottom surface 31, standing walls 32 and inward directed flanges 33. A flexible layer 34 such as vinyl is arranged on these flanges 33.

[0043] A U-shaped profile 35 is arranged around the outer ends of flexible layer 34 and flanges 33. This U-shaped profile can be deformed in order to clamp flexible layer 34 onto flange 33. It is also possible to make U-shaped profile 35 from for instance spring steel, whereby layer 34 is clamped onto flange 33 by spring force.

[0044] A fourth embodiment 40 of the drain is shown in figure 5. This embodiment 40 is largely similar to embodiment 30, and the same parts are therefore designated with the same reference numerals.

[0045] In embodiment 40 the U-shaped profile 35 is provided with openings 41 into which plugs 42 can be pressed. These plugs 42 can for instance be wedge-shaped. By pressing plugs 42 into openings 41 the space between the underside of the U-shaped profile 35 and the underside of flange 33 is filled, whereby the upper side of the U-shaped profile 35 is pressed into flexible layer 34 and is thereby clamped fixedly to flange 33.

[0046] Figure 6 shows a fifth embodiment of drain 50 according to the invention. This embodiment 50 is largely similar to drain 1 and the same parts are therefore designated with the same reference numerals.

[0047] Collecting tray 51 is provided in this embodiment with a drain 52 on the underside. Clamping frame 8 is integrated with bridge parts 10 and thus form a secondary collecting tray. This secondary collecting tray is provided on the underside with a pipe-like outflow 53 which protrudes into drain 52 and is sealed thereon via an O-ring 54.

[0048] The secondary tray formed by clamping frame 8 and bridge parts 10 are tightened via bolts 11 onto bracket 6. Because bracket 6 supports on the underside of the inward directed flanges 5 a flexible layer 7 such a vinyl layer can be clamped fixedly between flanges 5 and clamping frame 8.

[0049] Figure 7 shows a sixth embodiment of the drain 60 according to the invention.

[0050] In this embodiment 60 a standard lower tray 62 with outward directed horizontal flanges 63 is arranged in a foam plate 61. A finishing layer 64, such as for instance a Trespa panel, is arranged over foam plate 61 and horizontal flanges 63 and connected to foam plate 61 and horizontal flanges 63.

[0051] Through the use of finishing layer 61 it is possible using a standard lower tray 62 to provide an opening 65 of desired dimensions which do not depend on the dimensions of lower tray 62. A lower tray 62 with a length of 90 cm can for instance thus be provided, while opening 65 is only 80 centimetres long.

[0052] A flexible layer such as a vinyl layer 68 is further arranged over the finishing layer. The edge of opening 65 in finishing layer 61 is provided with a recess in which are arranged the edge of vinyl layer 68 and the clamping frame 66 which edge is fixedly clamped via bridge parts 67. The upper surface of clamping frame 66 can hereby lie flush with the upper surface of vinyl layer 68.

[0053] Figure 8 shows a seventh embodiment 70 of a drain according to the invention. Lower tray 71 is formed here from an extrusion profile which can have any desired length. The end surfaces of the extrusion profile are sealed by caps, so creating a watertight lower tray.

[0054] The advantage of an extrusion profile is that the length of drain 70 can be chosen as desired. In addition, a complex cross-sectional form can be extruded in simple manner. In embodiment 70 a beaded edge 73 is thus provided on either side under horizontal flanges 72. Screws can for instance be screwed into this beaded edge 73, whereby the caps can be fixed to the end surfaces of the extrusion profile. A watertight layer 74 or sealing membrane can be secured on the outward directed part of horizontal flange 72. Recesses in which a sealant, such as butylene sealant, can be arranged can optionally be arranged in this horizontal flange 72. The use of extrusion further makes it easy to provide the inward protruding part of horizontal flange 72 with a recess in which the clamping frame can be arranged.

[0055] Figure 9 shows an eighth embodiment 80 of the invention. A plate part 83 is arranged on the outward directed horizontal flanges 81 of lower tray 82, thereby creating inward directed flanges. The edge 84 of these flanges runs downward.

[0056] A flexible layer 85 which lies along the downward running edge 84 is arranged over plate part 83. This flexible layer is then clamped fixedly by pulling a secondary tray 87 downward via screws 86. By having edge 84 run at a slight incline an increasing clamping force can be obtained when secondary tray 87 is tightened.

[0057] Figure 10 shows a ninth embodiment 90 according to the invention. In this embodiment 90 lower tray 91 is provided with usual outward directed horizontal flanges 92. A sealing membrane 99 is arranged on the outward directed horizontal flanges.

[0058] A profile 93 of substantially L-shaped cross-section is arranged against the side walls in lower tray 91. This L-shaped profile 93 is connected via an adhesive layer 94 or sealant layer to the side walls of lower tray 91

[0059] Profile 93 provides for horizontal flanges which are directed inward. It is hereby possible to clamp a flexible layer 98 with a clamping frame 95, bridge parts 96 and screws 97.

[0060] Because profile 93 is a separate part, it is easy to adjust the height of profile 93 so that a recess is obtained for flexible layer 98 and clamping frame 95.

[0061] Figure 11 shows a tenth embodiment 100 of the invention.

[0062] This drain 100 has a collecting tray with a bottom surface 101, inclining standing walls 102 and out-

ward directed horizontal flanges 103. The resulting form of collecting tray 101, 102, 103 has a dovetail shape, whereby the lower tray can be anchored firmly in a floor.

[0063] A flexible membrane 104 such as a sealing membrane is attached to horizontal flanges 103.

[0064] In collecting tray 101 - 103 extrusion profiles 105 are arranged against standing walls 102. Extrusion profiles 105 are provided with an upper surface 106 and a recess 107. A bridge part 108 protrudes into this recess 107.

[0065] A layer of vinyl 109 extends over horizontal flanges 103 and upper surface 106 of profile 105 which, together with recess 107, forms an inward directed flange. This layer of vinyl 109 is clamped fixedly by a clamping frame 110 which is screwed fixedly to the bridge part using screws 111.

Claims

1. Drain, comprising:

- a collecting tray for collecting water to be discharged, which collecting tray has a bottom surface and standing walls along the bottom surface;
- horizontal flanges arranged directed toward each other on the upper edge of the standing walls;
- a clamping frame arranged above the horizontal flanges for fixedly clamping between the clamping frame and the horizontal flanges a flexible layer surrounding the drain, such as a vinyl layer, wherein the clamping frame surrounds the inflow opening of the drain;
- tensioning means arranged between the clamping frame and the horizontal flanges for tensioning the clamping frame against the flanges.

2. Drain as claimed in claim 1, wherein the clamping frame comprises a peripheral profile with a substantially L-shaped cross-section, and wherein the horizontal part of the L-shaped profile lies above the horizontal flanges and wherein the vertical part of the profile protrudes into the opening enclosed by the horizontal flanges.

3. Drain as claimed in claim 1 or 2, wherein the tensioning means comprise brackets which engage on the underside of the horizontal flanges.

4. Drain as claimed in claim 3, wherein the tensioning means comprise at least one bridge part arranged on the clamping frame and spanning the inflow opening, and fixing means such as bolts or screws, wherein the fixing means engage on both the bridge part and the brackets.

5. Drain as claimed in claim 3 or 4, wherein each bracket extends between two opposite sides of the collecting tray.
6. Drain as claimed in any of the foregoing claims, wherein a grating is arranged in the inflow opening. 5
7. Drain as claimed in any of the foregoing claims, wherein the collecting tray is elongate and comprises an outflow opening to which a siphon is connected. 10
8. Drain as claimed in any of the foregoing claims, wherein the horizontal flanges directed toward each other are formed by profiles arranged against the standing walls. 15

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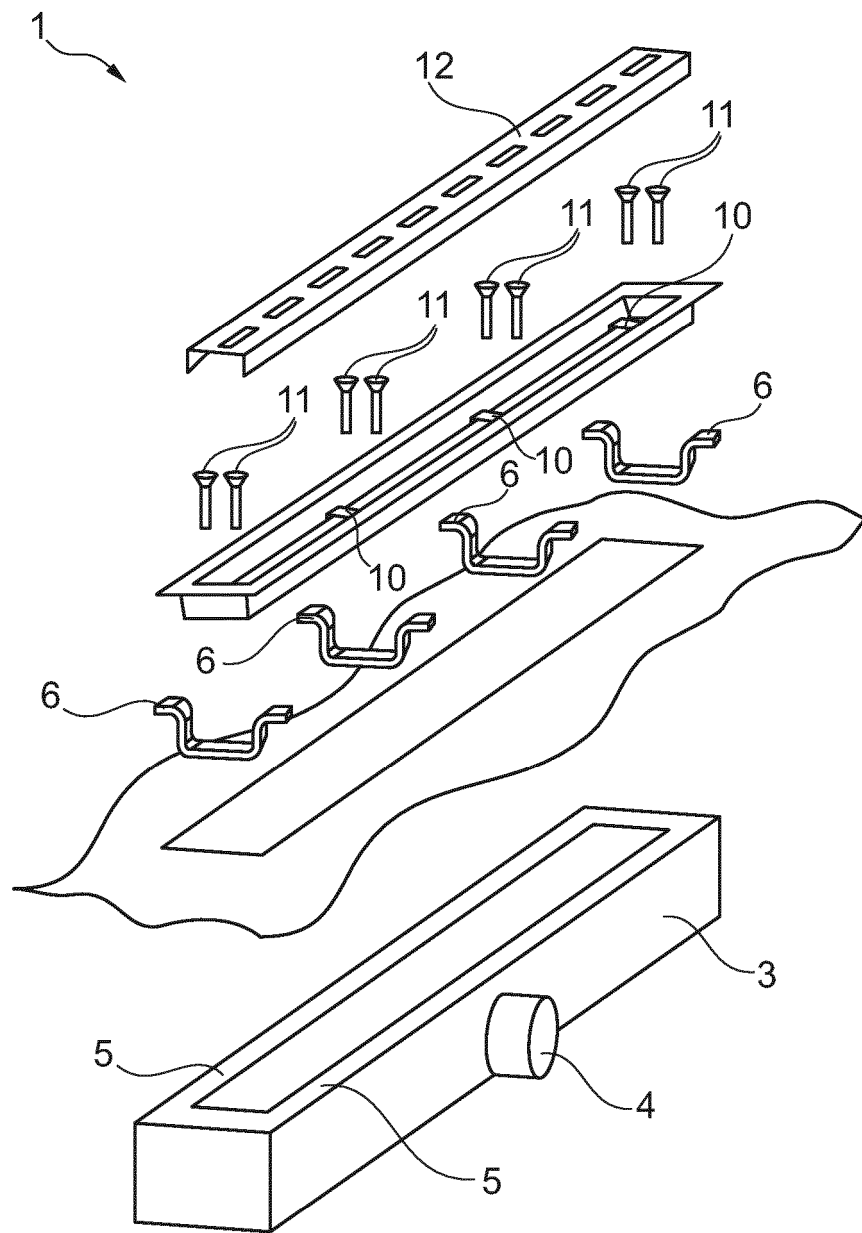
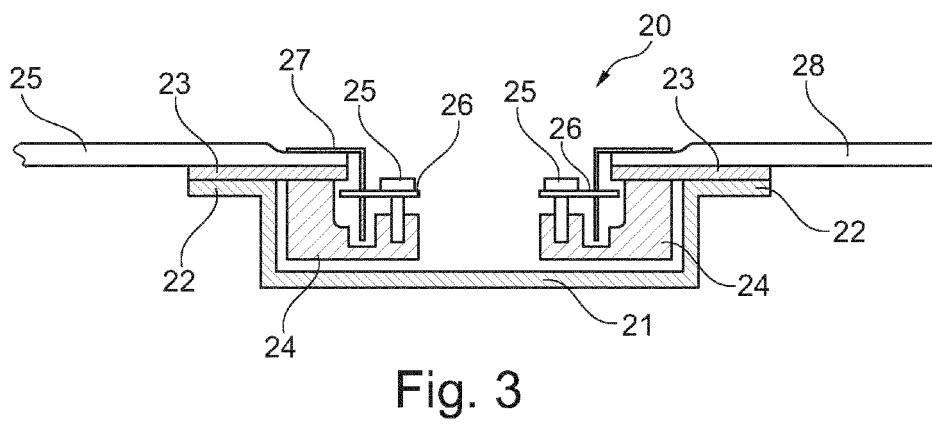
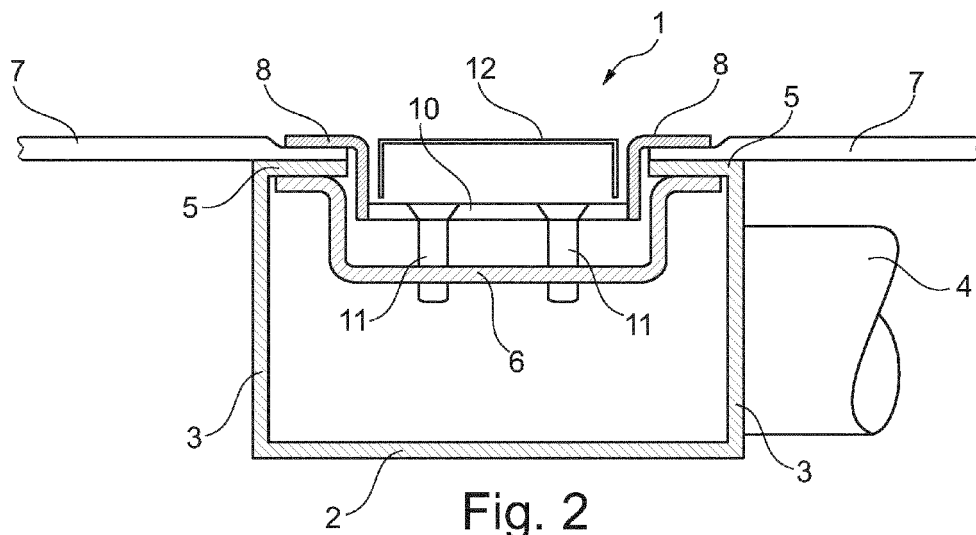


Fig. 1



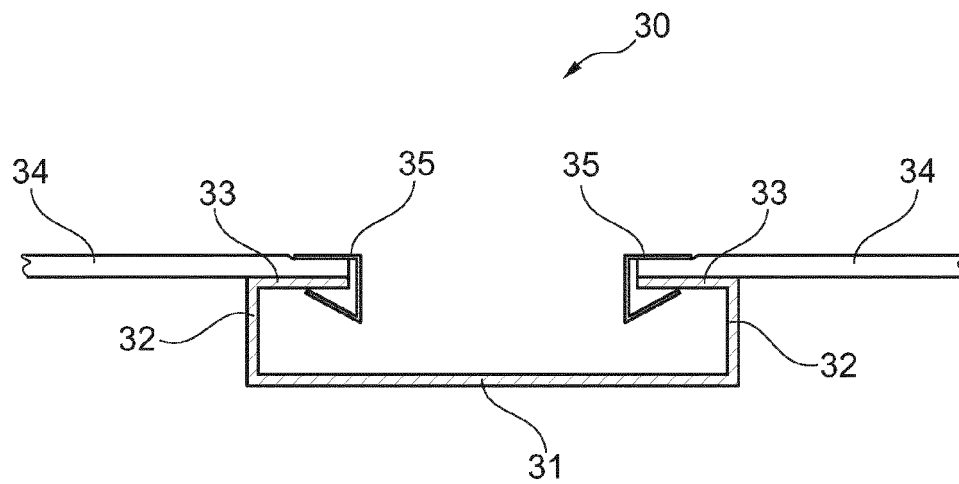


Fig. 4

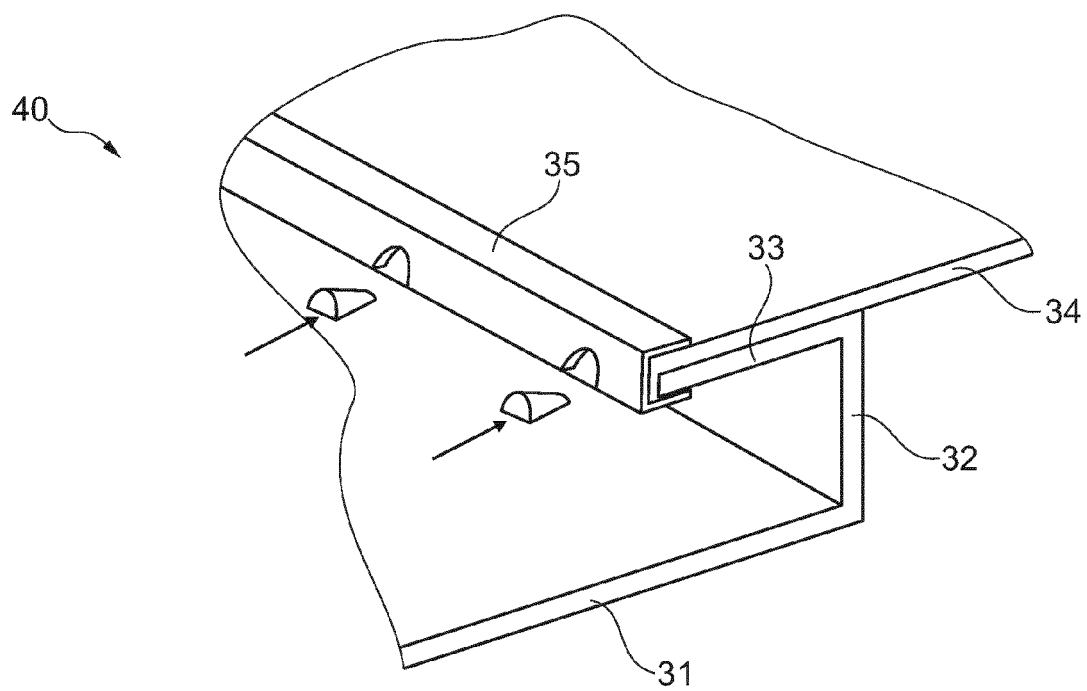


Fig. 5

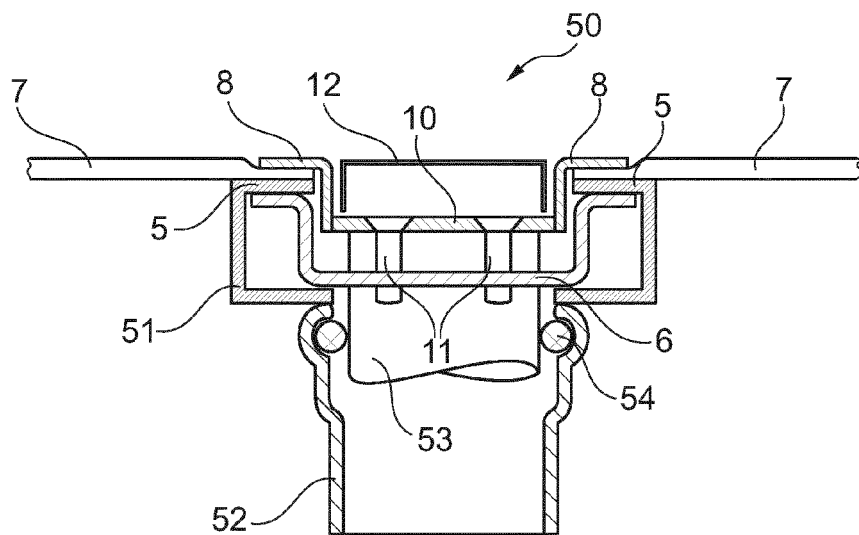


Fig. 6

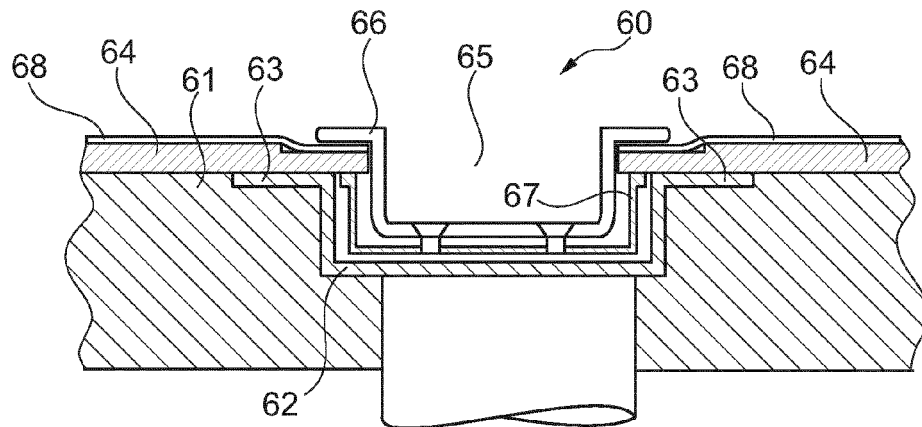


Fig. 7

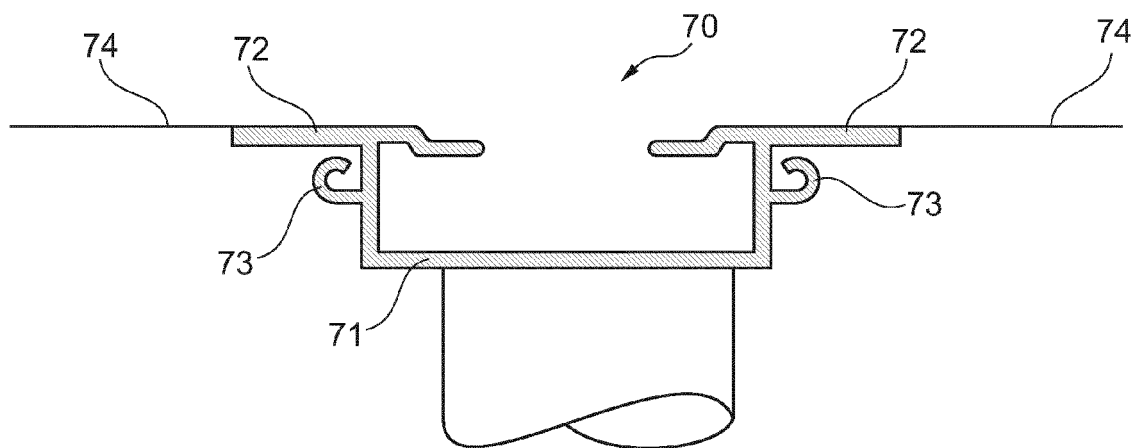


Fig. 8

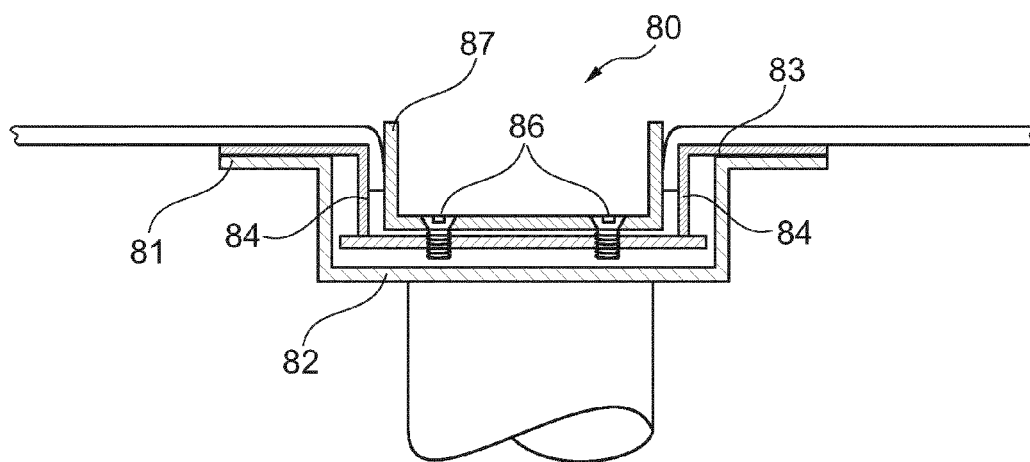


Fig. 9

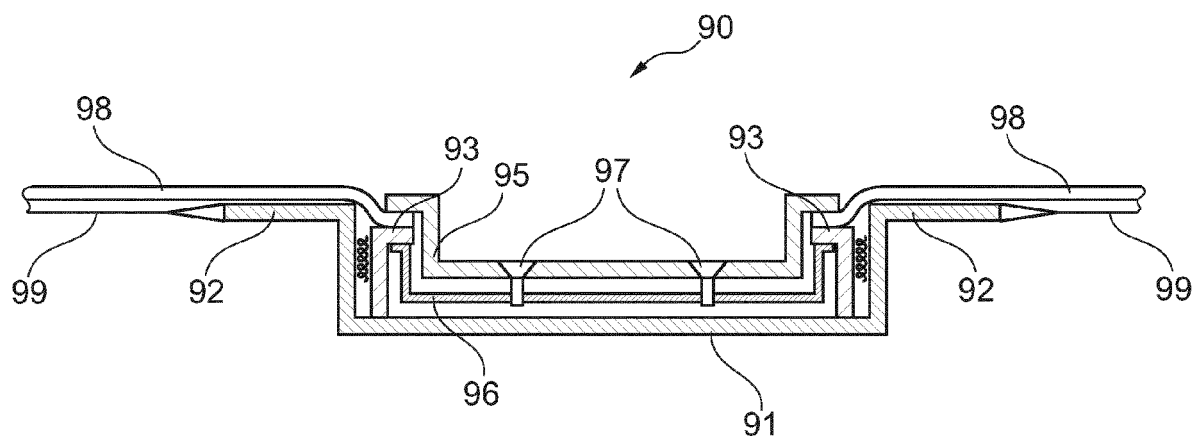


Fig. 10

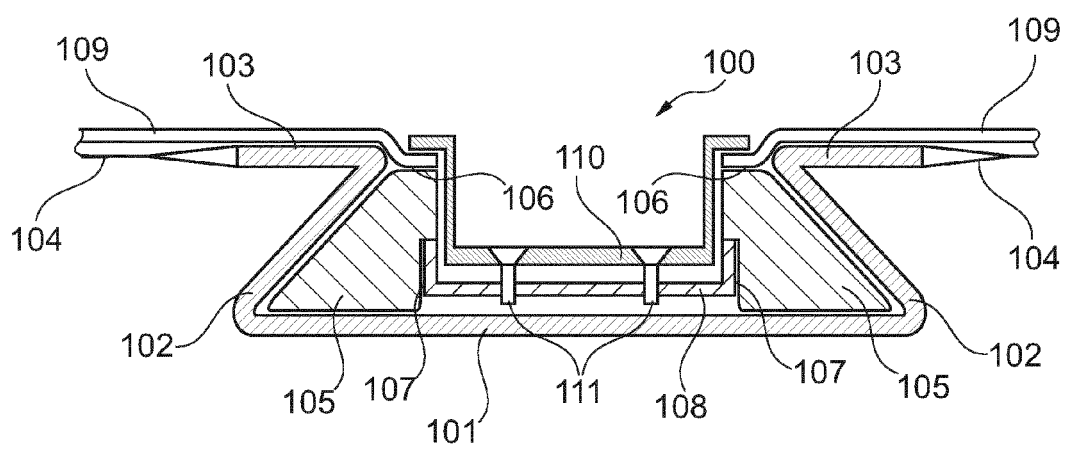


Fig. 11



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 9397

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 September 2012	Examiner Urbahn, Stephanie
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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