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(54) **DRAIN COMPRISING A TUBULAR HOUSING AND A SIPHON**

(57) The invention relates to a drain, comprising:
- a tubular housing with a bottom surface in which a discharge opening is arranged, an upright peripheral edge along the edge of the bottom surface, and an upper sur-

face, wherein an elongate opening is arranged in the upper surface; and
- an upright edge arranged along the periphery of the elongate opening in the bottom surface.

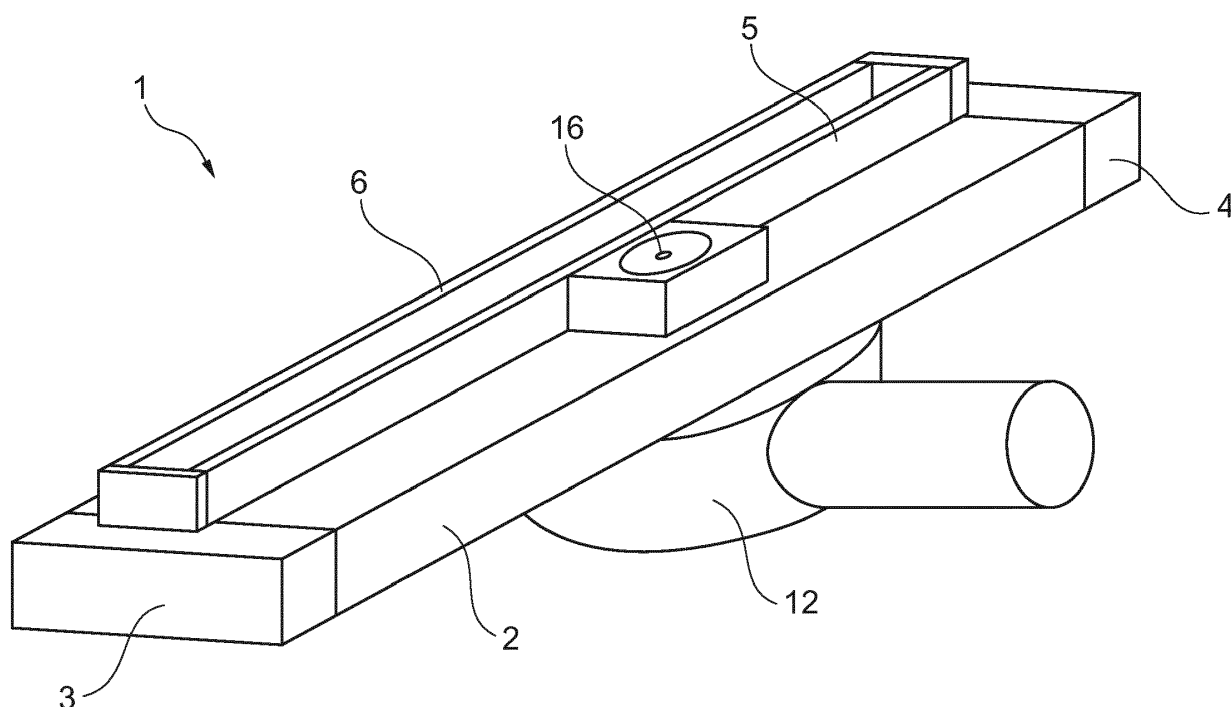


Fig. 1

Description

[0001] The invention relates to a drain such as known for instance from WO 2009/091245. This publication describes an elongate shower drain. This shower drain has a gutter-like tray in which a grating of U-shaped cross-section is placed. According to this publication an adjusting frame is further placed in the lower tray so as to bring the grating to the same height as the surrounding tile floor in simple manner.

[0002] The trend in the field of drains is that the drain must be as little visible as possible. For this purpose the width of the grating is reduced. The drawback hereof is that by reducing the width of the grating the width of the lower tray is simultaneously also reduced. The buffer volume of the lower tray hereby decreases, whereby the quantity of water to be drained per unit of time decreases. The result may be that a layer of water remains on the floor which may spread over the floor surface in an undesired direction.

[0003] Another known elongate drain has at the position of the usual grating a tray-like holder in which a tile can for instance be laid. The water can then flow into the lower tray via a gap between this tile and the surrounding floor. In this tile drain a gap is usually formed on either side of the tray-like holder with tile. In addition, the pattern of tiles of the surrounding floor is disrupted by the tile in the holder, whereby such a known tile drain is also still visible. The construction of particularly the tile holder is in addition unfavourable from a manufacturing viewpoint.

[0004] GB 2210392 shows a drain wherein the drain consists of a lower part and an upper part. The upper part has a threaded part into which a part with a grating can be screwed. The grating can hereby be adjusted in the height. In addition, the upper part is slidable in the lower part, whereby the grating can also be adjusted in the horizontal plane.

[0005] The drawback of the shown embodiment is however that at least both the lower part and the upper part are cast into the floor before a finishing layer such as tiles can be arranged. This is because without casting of the upper part of the drain it is not possible to obtain a flat substrate for the purpose of arranging a finishing layer such as a tile layer.

[0006] It is now an object of the invention to provide a drain, wherein the above stated drawbacks are alleviated or even obviated.

[0007] This object is achieved with a drain according to the invention, which drain comprises:

- a tubular housing with a bottom surface in which a discharge opening is arranged, an upright peripheral edge along the edge of the bottom surface, and an upper surface, wherein an elongate opening is arranged in the upper surface; and
- a siphon arranged on the discharge opening in the bottom surface.

[0008] In a drain according to the invention the tubular housing is integrated into the floor. The upper layer of the surrounding floor, such as for instance a tile floor, is laid over the tubular housing up to the elongate opening. Only an elongate opening is hereby visible. This elongate opening can be a narrow gap, since sufficient drainage capacity is present in the tubular housing directly below the elongate opening.

[0009] Through the use of a tubular housing a flat upper surface is obtained, whereby the tile layer can be easily arranged.

[0010] The drain according to the invention preferably comprises an upright edge arranged along the periphery of the elongate opening in the bottom surface. The tile floor is here laid against the upright edge arranged along the periphery of the elongate opening in the bottom surface. The upright edge provides for a boundary and a neat finish. The upright edge further ensures a good sealing because moisture can no longer get under the tiles.

[0011] It becomes possible with the tubular housing to make a very flat drain. The tubular housing can here be arranged in only a part of the covering floor, whereby it is not necessary to impair the system floor lying thereunder, for instance by hacking a hole in the system floor. A typical height of the tubular housing could be 1 to 2 centimetres.

[0012] The tubular housing can be arranged directly beneath for instance a tile floor since the floor load is low in sanitary applications.

[0013] In an embodiment of the drain according to the invention at least a part of the upright peripheral edge is provided on the upper side with a part folded horizontally outward and an inward folded part connecting thereto, such that the upper side is provided with a horizontal flange of U-shaped cross-section.

[0014] A sealing membrane ensuring a watertight transition between the drain and the surrounding floor can easily be attached to the horizontal flange.

[0015] In a preferred embodiment of the drain according to the invention the upper surface is here a separate sheet part which protrudes with the peripheral edges into the horizontal flange of U-shaped cross-section. The separate sheet part is preferably arranged slidably in the horizontal flange.

[0016] Because the separate sheet part is arranged slidably in the horizontal flange, the position of the upright edge around the elongate opening can be readily adapted to the surrounding floor. It is thus possible to correct an askew placing of the tubular housing by rotating the upper surface relative to the flange. It is also possible by means of adjustment to have the inflow opening connect directly to a whole floor tile.

[0017] In another embodiment of the drain according to the invention the upper edge of the peripheral wall comprises an inward directed horizontal flange, which horizontal flange forms together with a separate sheet part the upper wall of the housing.

[0018] Spacers are preferably arranged on the under-

side of the separate sheet part in order to hold the separate sheet part at a distance from the bottom surface and against the horizontal flange.

[0019] This embodiment provides a drain wherein the inflow opening is slidable while the tubular housing is kept compact.

[0020] In a highly preferred embodiment of the drain according to the invention a closable inspection opening is arranged in the upper surface above the discharge opening. This inspection opening preferably lies flush with the upper side of the upright edge. The inspection opening can be covered here with an aesthetically designed cap.

[0021] The width of the elongate opening in the upper surface is preferably less than 50%, and even more preferably less than 25%, of the width of the tubular housing.

[0022] In yet another embodiment of the drain according to the invention the upright edge is formed by a separate sheet part which is arranged slidably in the elongate opening. The width of the elongate inflow opening can be adjusted using this separate sheet part.

[0023] In yet another embodiment of the drain according to the invention the upper surface is stepped so that wall tiles can for instance be placed on the highest part. Such a drain is thus particularly suitable for arrangement against a wall.

[0024] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 is a perspective view of a first embodiment according to the invention.

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

Figure 3 shows a cross-sectional view of a second embodiment according to the invention.

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

Figure 5 shows a cross-sectional view of a fourth embodiment according to the invention.

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

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

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

[0025] Figure 1 shows a first embodiment of a drain 1 according to the invention. This drain 1 has a tubular housing constructed from an extruded central part 2 and two end parts 3, 4 which close the extruded central part 2 on either side. On the top side the extruded central part has two upright edges 5, 6 which bound the elongate inflow opening 7 (see figure 2).

[0026] Central part 2 has a bottom surface 8, a peripheral edge 9 and an upper surface 10 in which the elongate inflow opening 7 is arranged. Further arranged in bottom surface 8 is a discharge opening 11 to which a siphon

12 is connected.

[0027] Figure 2 shows drain 1 in cross-section. This figure 2 shows here how the drain is arranged in a concrete floor 13. Floor tiles 14 are arranged here on concrete floor 13. Floor tiles 14 are placed here right up to upright edges 5, 6, whereby only inflow opening 7 is visible.

[0028] In order to nevertheless retain access to siphon 12 an inspection opening 15 is arranged in upper surface 10. A plug 16 is arranged in this inspection opening 15. After removal of plug 16 easy access can be gained to discharge opening 11 via inspection opening 15.

[0029] Water falling onto tile floor 14 during use will flow via the elongate inflow opening 7 into tubular housing 2. Since the volume of tubular housing 2 is large, the water can flow without obstruction to discharge opening 11 and there be drained via siphon 12.

[0030] Figure 3 shows a cross-sectional view of a second embodiment 20 of a drain. This drain 20 is preferably manufactured from sheet material.

[0031] The lower tray of drain 20 has a bottom surface 21 and a peripheral wall 22. Arranged on the upper side of peripheral wall 22 is a horizontal flange which comprises an outward bent part 23 and a subsequent inward bent part 24 so that horizontal flange 23, 24 has a U-shaped cross-section.

[0032] Upper wall 25 of drain 20 is a separate part which protrudes into U-shaped horizontal flange 23, 24. It is hereby possible to slide the upper wall reciprocally.

[0033] An elongate inflow opening 26 is arranged in upper wall 25. An upright edge 27 is arranged along this inflow opening 26. Because upper wall 25 can slide reciprocally, the distance between upright edge 27 and a surrounding tile floor which can be laid on upper wall 25 can thus be adjusted.

[0034] A sealing membrane 28 can further be arranged on horizontal flange 23, 24. The edge of sealing membrane 28 is provided with a double edge, between which the horizontal flange can be received in order to thus obtain a good seal.

[0035] Figure 4 shows a third embodiment of a drain 40. This drain 40 is preferably also manufactured from sheet material. Drain 40 consists here of two parts, wherein the bottom part comprises a bottom wall 41, a peripheral wall 42 and an inward directed horizontal flange 43 arranged on the top side of peripheral wall 42.

[0036] The upper part of drain 40 consists of a wall part 44 held at a distance from bottom wall 41 by spacers 45. An elongate inflow opening 46 is further arranged in wall part 44. An upright edge 47 is further also arranged around this elongate inflow opening 46.

[0037] Because wall part 44 is narrower than the width of bottom part 41, 42, 43, wall part 44 can slide reciprocally so that inflow opening 46 can be adjusted to a floor, such as a tile floor, arranged on drain 40.

[0038] The wall tiles can be placed on flange 43. Upright edge 47 lies here against the wall tiles. The drain can then be sealed here relative to the wall tiles. Should

moisture nevertheless enter between the wall tiles and upright edge 47, this moisture will still pass into the bottom part of drain 40. Wall part 44 can optionally also be provided with a perforation for a better drainage of such leaking liquid.

[0039] The above described perforations can also be applied in the other embodiments.

[0040] Figure 5 shows a fourth embodiment of a drain 50 according to the invention. The shown cross-section runs over outlet pipe 51. Drain 50 has a bottom surface 52 with a peripheral wall 53. Upper surface 54, 55, 56 is a combination of previously shown embodiments. Formed on the one side is an inward bent flange 53 which co-acts with upper surface 54, while on the other side an inward bent flange is provided which co-acts with a flange 56 bent in a U-shape.

[0041] Upper surface 54, 55, 56 further has an inflow opening 57 which is bordered by upright edge 58.

[0042] Further arranged in bottom surface 52 is a discharge opening 59 to which connects a siphon constructed from a depending wall 60 and an upright wall 61. These two walls 60, 61 provide the necessary stench-trap.

[0043] Figure 6 shows a fifth embodiment of a drain 70 according to the invention. Drain 70 has a bottom surface 71 with an upright edge 72 and an inward directed flange 73. Together with wall part 74, flange 73 forms the upper wall of a tubular housing. Wall parts 74 are held at a distance from bottom surface 71 by means of spacers 75.

[0044] An adjusting frame 77, as known from for instance WO 2009/091245, is further arranged in inflow opening 76 which is formed between wall parts 74.

[0045] Because wall parts 74 can slide in horizontal direction relative to flanges 73 and adjusting frame 77 can in addition displace in vertical direction, the upper edge of adjusting frame 77 can thus be fully adapted to a surrounding floor, such as for instance a tiled floor.

[0046] Figure 7 shows a sixth embodiment of a drain 80 according to the invention. This drain 80 has a bottom surface 81, an upright peripheral wall 82 and an inward directed flange 83 on the upper side of peripheral wall 82.

[0047] Together with sheet parts 84, 85 this flange 83 forms the upper surface of a tubular housing. Sheet parts 84, 85 bound the elongate inflow opening 86.

[0048] A tile floor 87 is arranged on top of the tubular housing, whereby only the elongate inflow opening 86 is visible. The tubular housing is arranged in the upper part of a covering floor 88 arranged on a system floor 89.

[0049] A siphon 90 connected to an outlet pipe 91 is further also arranged on the underside of bottom surface 81. Only this siphon 90 and outlet pipe 91 are partially recessed into system floor 89.

[0050] Figure 8 shows a seventh embodiment of a drain 100. This drain 100 is particularly suitable for placing against a wall. For this purpose drain 100 is provided with a bottom surface 101 and a peripheral wall 102, 103. The part 102 of the peripheral wall which lies against a wall is higher than the other part 103 of the peripheral wall.

[0051] A horizontal flange 104 is arranged on the high

part 102. A sealing membrane 105 and a finishing strip 106 are arranged on this flange. This finishing strip 106 can slide inward and outward on flange 104, whereby various adjustments can be made to the thickness of wall tiles 107. Wall tiles 107 are arranged on sealing membrane 105 and horizontal flange 104.

[0052] A horizontal flange 108, which together with a separate sheet part 109 forms the upper surface of a tubular housing, is likewise arranged on the low part 103 of the peripheral wall. The separate sheet part 109 can slide reciprocally so that the elongate inflow opening 110 can be adjusted in the width and can moreover be adapted to floor tiles 111.

[0053] The separate sheet part 109 has an upright edge which shields space 112 at the corner of the floor tile. The sealing compound arranged here is thus protected from cleaning agents and soap residues by the upright edge.

Claims

1. Drain, comprising a tubular housing with a bottom surface in which a discharge opening is arranged, an upright peripheral edge along the edge of the bottom surface, and an upper surface, wherein an elongate opening is arranged in the upper surface; and
- a siphon arranged on the discharge opening in the bottom surface.
2. Drain, comprising an upright edge arranged along at least a part of the periphery of the elongate opening in the bottom surface.
3. Drain as claimed in claim 1 or 2, wherein at least a part of the upright peripheral edge is provided on the upper side with a part folded horizontally outward and an inward folded part connecting thereto, such that the upper side is provided with a horizontal flange of U-shaped cross-section.
4. Drain as claimed in claim 3, wherein the upper surface is a separate sheet part which protrudes with the peripheral edges into the horizontal flange of U-shaped cross-section.
5. Drain as claimed in claim 4, wherein the separate sheet part is arranged slidably in the horizontal flange.
6. Drain as claimed in any of the foregoing claims, wherein the upper edge of the peripheral wall comprises an inward directed horizontal flange, which horizontal flange forms together with a separate sheet part the upper wall of the housing.
7. Drain as claimed in claim 6, wherein spacers are

arranged on the underside of the separate sheet part in order to hold the separate sheet part at a distance from the bottom surface and against the horizontal flange.

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8. Drain as claimed in any of the foregoing claims, wherein a closable inspection opening is arranged in the upper surface above the discharge opening.

9. Drain as claimed in any of the foregoing claims, wherein the upright edge is formed by a separate sheet part which is arranged slidably in the elongate opening.

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10. Drain as claimed in any of the foregoing claims, wherein the upper surface is stepped so that wall tiles can for instance be placed on the highest part.

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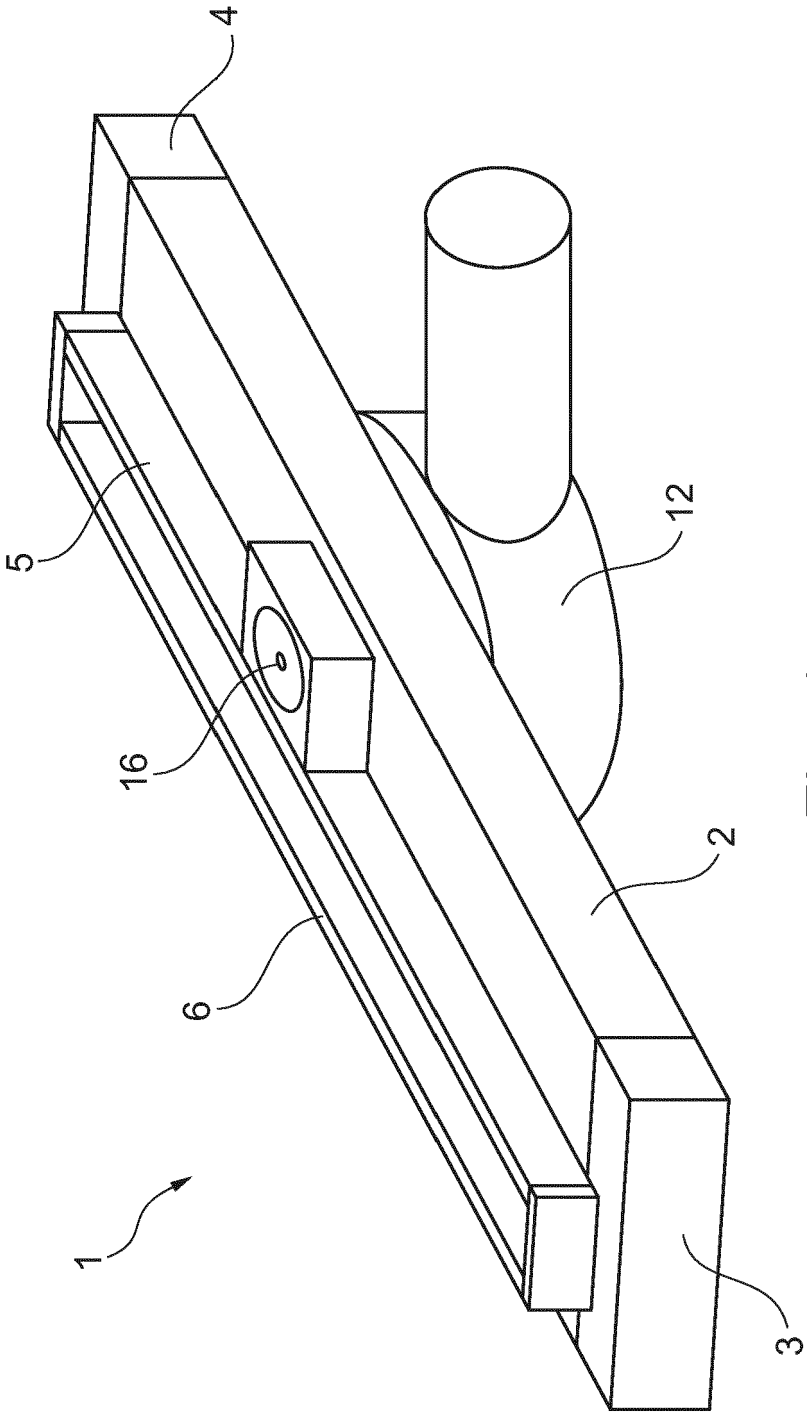


Fig. 1

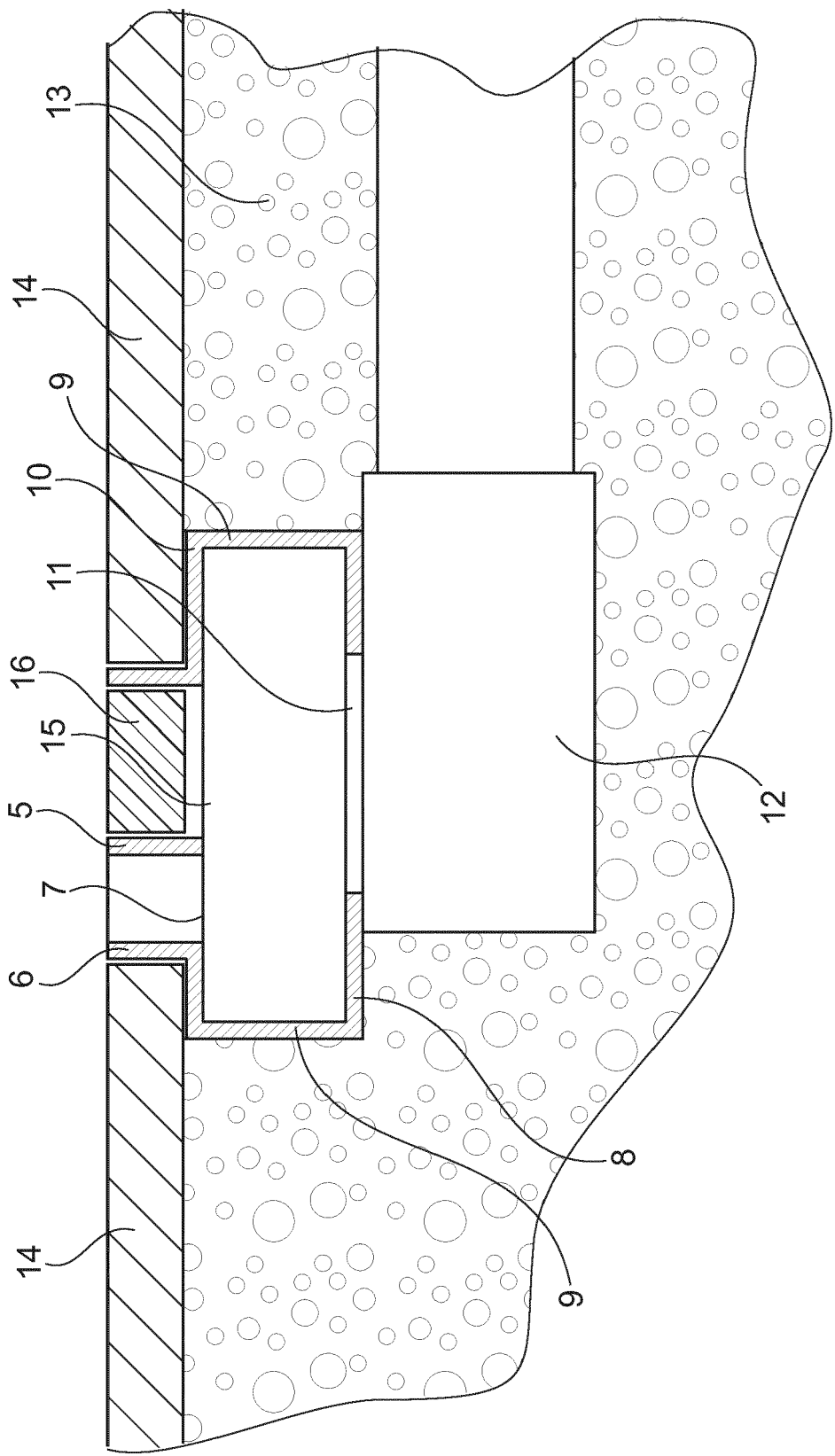


Fig. 2

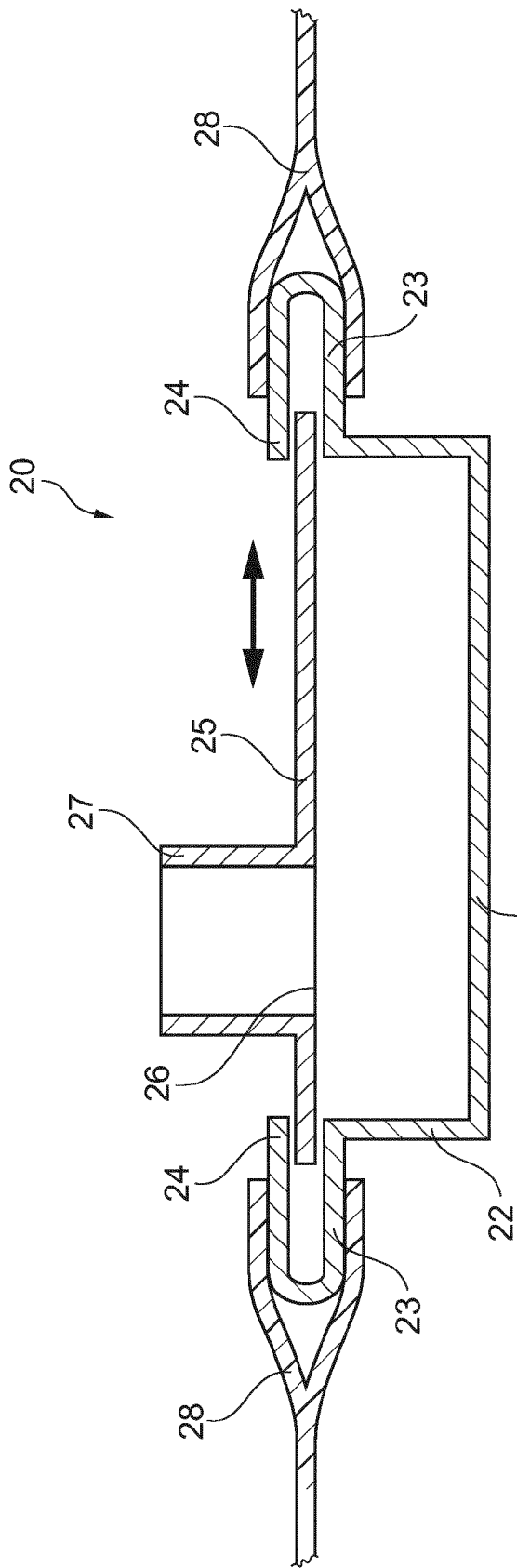


Fig. 3

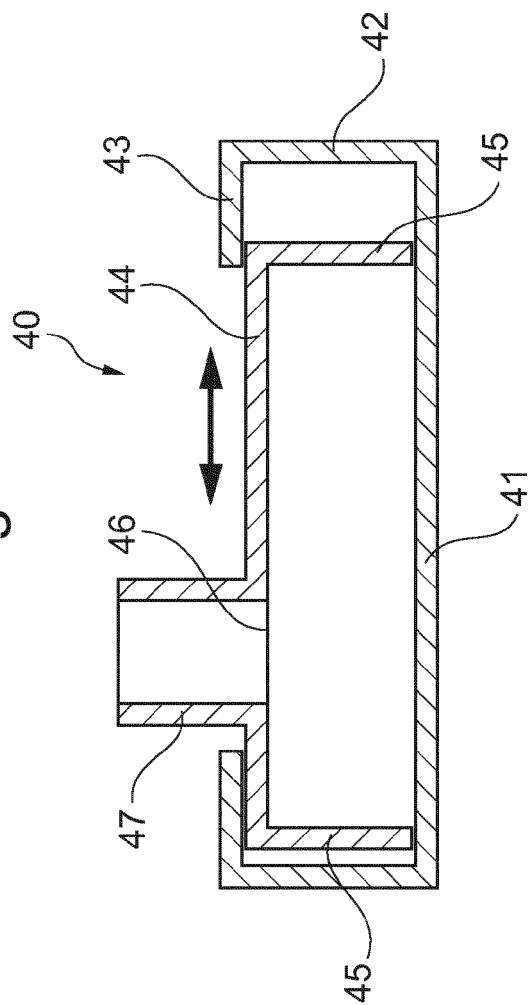


Fig. 4

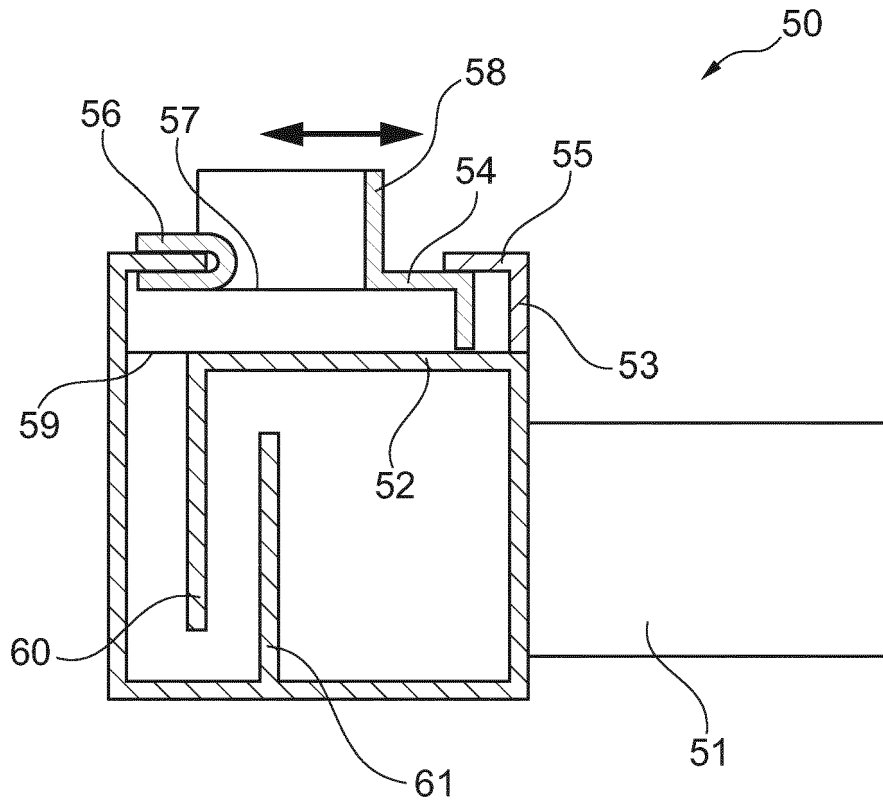


Fig. 5

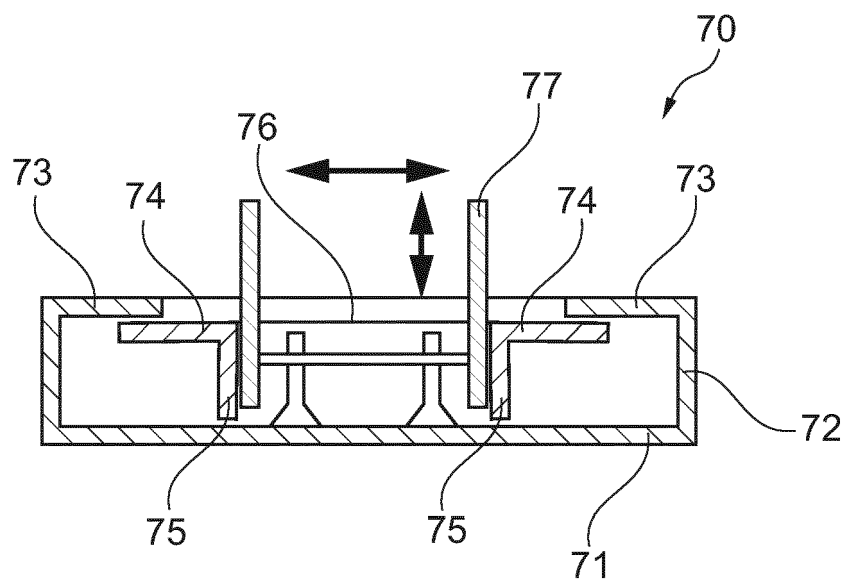


Fig. 6

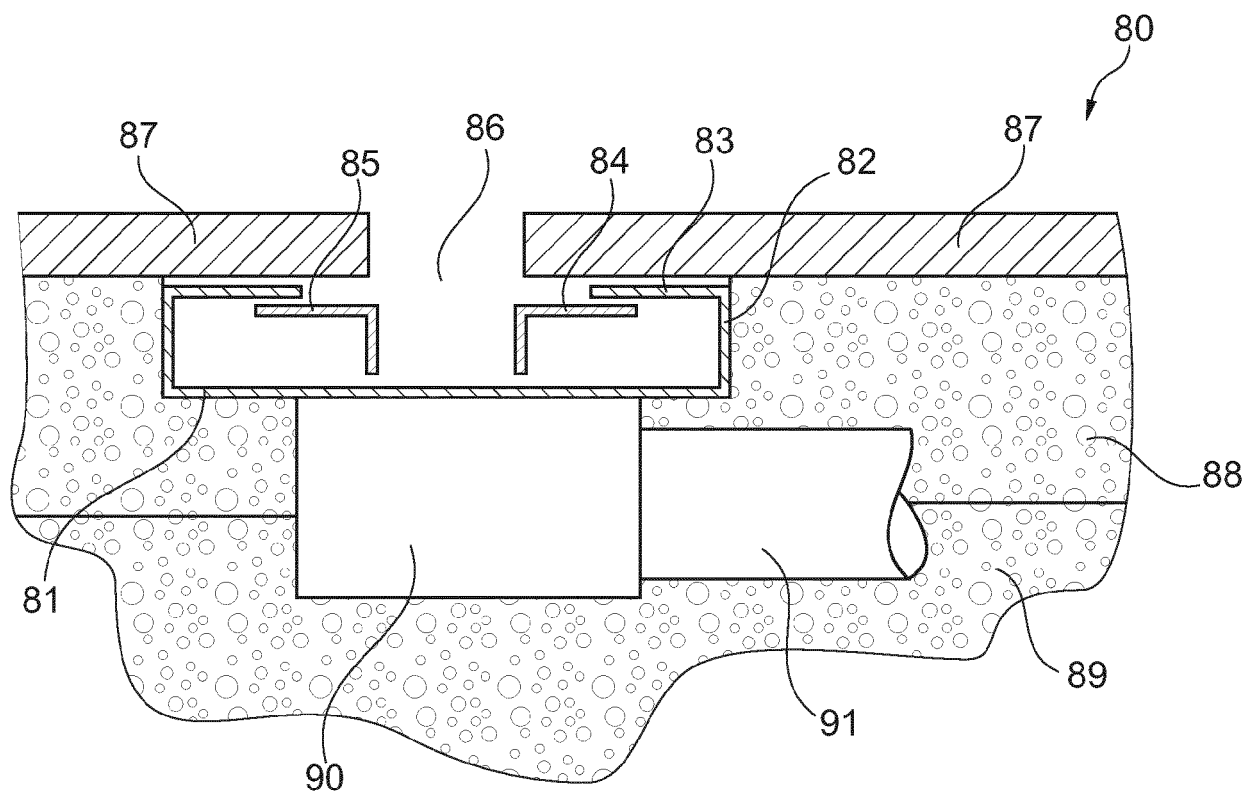


Fig. 7

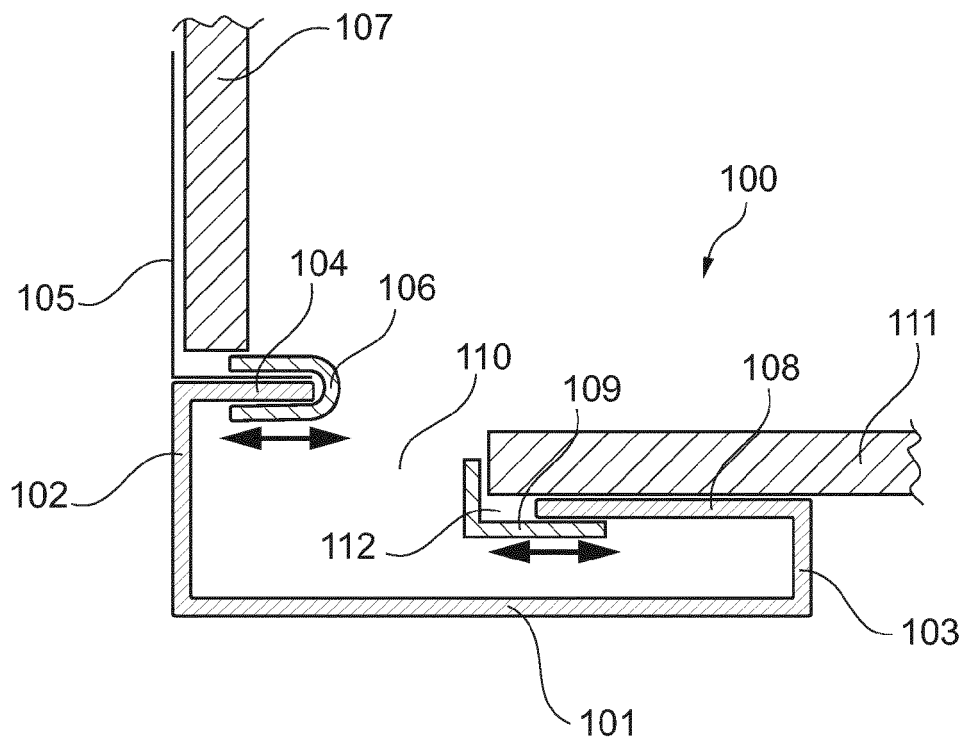


Fig. 8



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Application Number
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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 28 February 2018	Examiner Van Bost, Sonia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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