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(54) **Drain with unidirectional drainage**

(57) The invention relates to a drain, such as a drain hole or drain channel, comprising:

- a collecting container for collecting water, wherein the collecting container has an outflow on the underside;
- a connecting part for connecting the outflow to an outlet

pipe; wherein the connecting part is provided with a unidirectional passage for admitting water from outside inward into the connecting part.

The invention further relates to a method for arranging a drain according to the invention in a floor.

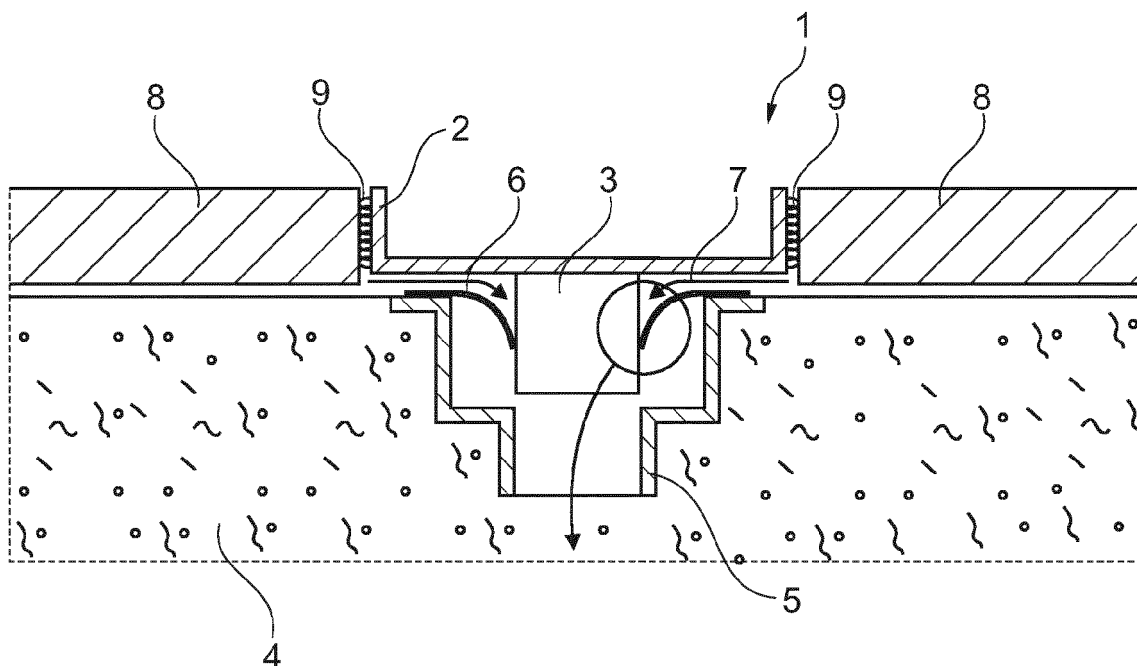


Fig. 1

Description

[0001] The invention relates to a drain, such as a drain hole or drain channel, comprising:

- a collecting container for collecting water, wherein the collecting container has an outflow on the underside;
- a connecting part for connecting the outflow to an outlet pipe.

[0002] A collecting container is understood to mean the part of the drain where the water to be discharged is collected in order to then be further discharged via an outflow. The collecting container can for instance take the form of a tray, but can also be understood to mean a more closed space in which water is collected.

[0003] Such a drain is known and is often used for discharge of for instance shower water to an outlet pipe. The collecting container is usually connected for this purpose to a siphon which is in turn connected to an outlet pipe. The collecting container and siphon are incorporated in the floor and finishing layer, such as a tile layer, so that the upper edge of the collecting container lies flush with the upper surface of the finishing layer.

[0004] In order to prevent falling water permeating between the finishing layer and the collecting container and possibly causing leakage there, it is usual to arrange a sealing mastic layer between the finishing layer and the collecting container.

[0005] If this mastic layer is not replaced after a number of years, leakage may yet still occur. In addition, there is the risk of cracks forming in the finishing layer along which water may permeate between the finishing layer and the floor.

[0006] It is known to provide holes in the side walls of the collecting container at the position of the transition surface between the finishing layer and floor, for instance at the level of the tile adhesive, so that possible leakage water can flow from under the finishing layer into the collecting container. The drawback thereof is that the water from the collecting container can also pass under the finishing layer via the holes. Since the collecting container is partially or wholly filled with drained water during use, in such a prior art collecting container the finishing layer is thus affected from the moment that the collecting container is mounted. Each time the collecting container is used it will thus be possible for water to pass between the finishing layer and the floor via the holes in the side walls. The drained water moreover usually comprises soap residues which affect an adhesive layer between the finishing layer and the floor, whereby for instance tiles are loosened, even if no cracks have yet occurred in the tile layer.

[0007] Similar problems can also occur in drains for industrial application. Particularly in the pasta-processing industry waste water with pasta residues affects the tile adhesive of a normal tile floor. A drain in which holes

for possible leakage water are provided in side walls is likewise undesirable in such a case.

[0008] It is now an object to reduce or even obviate the above stated drawbacks. This object is achieved with a drain according to the invention, which is characterized in that the connecting part is provided with a unidirectional passage for admitting water from outside inward into the connecting part.

[0009] By providing a unidirectional passage only water from outside can flow into the collecting container. Water already present in the collecting container is blocked by the unidirectional passage.

[0010] The drain according to the invention can be installed in a new floor with finishing layer, wherein the finishing layer seals onto the drain. As long as the finishing layer is watertight and the other seals function, no use will be made of the unidirectional passage. Only when a crack occurs in the finishing layer or other seals are defective can possible leakage water still enter the drain via the unidirectional passage. With a drain according to the invention a completely sealed floor with finishing layer can thus be provided which, only in the case of leakage, will still discharge the leakage water reliably as secondary provision.

[0011] In the invention the secondary drainage is thus used only when water has permeated under the finishing layer as a result of a failing seal or cracking in the finishing layer. In normal use the finishing layer is thus not affected by the regular water in the drain tray, as is the case in prior art drain trays.

[0012] Because the unidirectional passage is further connected to the connecting part, it is possible to arrange this passage not directly against the drain tray but at more of a distance therefrom. A saving in height can hereby be obtained in that the unidirectional passage is not necessarily arranged in the drain tray.

[0013] In an embodiment of the drain according to the invention the outflow of the collecting container is tubular and the connecting part has an opening into which the tubular outflow protrudes. Owing to this tubular outflow the distance between the connecting part and the collecting container can be varied and the height of the collecting container in the floor can thus be adjusted.

[0014] In a preferred embodiment of the drain according to the invention a flexible collar is arranged in the outflow. The free edge of the flexible collar preferably lies here against the tubular outflow.

[0015] The flexible collar enables some variation between the position of the connecting part and the position of the collecting container. In addition, the flexible collar will hold back water rising between the connecting part and the tubular outlet, while possible leakage water falling onto the flexible collar from above can flow into the connecting part because the water will press the flexible collar downward.

[0016] The flexible collar preferably runs along the whole periphery of the tubular outflow, but can also run only partially along the periphery of the tubular outflow.

[0017] In a highly preferred embodiment of the drain according to the invention a peripheral part of the flexible collar adjacent to the free edge has a substantial directional component the same as the direction of insertion of the outflow. Because the tubular outflow is inserted into the collar, the free edge of the collar will be automatically co-displaced, wherein this edge lies lower than the other part of the collar. Possible leakage water will automatically run over the collar to the free edge and, due to the weight of the leakage water, a small passage will be created between the free edge of the collar and the outflow which will automatically close again. Due to the shape of the collar, water coming from below will however press the free edge further against the outflow, whereby water is prevented from seeping through from below.

[0018] In an embodiment the connecting part is integrated into a siphon. In another embodiment of the invention the collecting container is an elongate tray of U-shaped cross-section.

[0019] The invention further comprises a method for arranging a drain according to the invention in a floor, the method comprising the steps of:

- incorporating, for instance casting, the connecting part into the floor;
- applying an adhesive using an adhesive comb, wherein the adhesive ridges are directed toward the connecting part;
- arranging the collecting container on the connecting part;
- arranging a finishing layer, such as a tile layer, in the adhesive.

[0020] Directing the adhesive ridges toward the connecting part creates channels between the finishing layer and the floor which can guide possible leakage water to the drain.

[0021] In a preferred embodiment of the method according to the invention a filler piece is arranged over the connecting part before the adhesive is applied, and the adhesive ridges are then arranged directed toward the filler piece, after which the filler piece is then removed.

[0022] In the case of a relatively small drain, such as for instance a square drain, it is sufficient to direct the adhesive ridges toward the connecting part. In the case of an elongate drain channel however, leakage may occur along the whole periphery of the channel. By now arranging a filler piece a discharge channel is formed under the collecting container so that leakage water which reaches the drain via the adhesive ridges enters the discharge channel and is then carried to the connecting part.

[0023] The filler piece and the collecting container are preferably elongate.

[0024] In some cases a second sealing layer is arranged in the floor. An example hereof is that a first sealing layer, for instance a bitumen layer, is arranged on the concrete floor. A sand cement layer is subsequently ar-

ranged on this first sealing layer. A second sealing layer is arranged hereon, after which the finishing layer, such as a tile floor, is arranged.

[0025] It is possible to provide the unidirectional passage according to the invention for each of the sealing levels. The connecting part of the drain can be provided here with two separate unidirectional passages for each sealing layer.

[0026] The unidirectional passage can further also be provided by arranging this passage at a position in the connecting part, or discharge path, such that return flow of waste water via this passage is precluded.

[0027] Although the invention is particularly suitable for application in the sanitary field, the drain according to the invention can optionally also be applied on an industrial scale.

[0028] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 shows a cross-sectional view of an embodiment of the invention.

Figure 2 shows a detail of the embodiment according to figure 1.

Figures 3, 4, 5 show schematically different steps of a method according to the invention.

Figure 6 shows a second embodiment of the invention.

Figure 7 shows a third embodiment of the invention. Figure 8 shows a fourth embodiment of the invention. Figure 9 shows a cross-sectional view of the embodiment according to figure 8.

Figure 10 shows a fifth embodiment of the invention. Figure 11 shows a sixth embodiment of the invention. Figure 12 shows a seventh embodiment of the invention.

Figure 13 shows a cross-sectional view along the line XXIII-XXIII of figure 12.

Figure 1 shows a cross-sectional view of a drain 1 according to the invention. Drain 1 has a collecting container 2 with a tubular outflow 3 on the underside.

[0029] Provided under collecting container 2 is a floor 4 having therein a connecting part 5 which is connected to an outlet pipe (not shown). Connecting part 5 has on the upper side an opening in which a flexible collar 6 is arranged. Tubular outflow 3 protrudes through this flexible collar 6 into connecting part 5.

[0030] A sealant layer 9 is further provided between collecting container 2 and finishing layer 8 in order to provide a good sealing of the upper surface.

[0031] Possible leakage water 7 present between finishing layer 8 and floor 4 can flow over flexible collar 6 to outflow 3. As shown in detail in figure 2, the weight of leakage water 7 will press aside the flexible collar 6 of outflow 3, whereby a passage is created and water can flow away.

[0032] If water were to press against flexible collar 6

from below, flexible collar 6 is then pressed against outflow 3, thereby creating a good seal. A unidirectional passage is in this way obtained.

[0033] Figure 3 shows a first step of a method according to the invention. A connecting part 11 is provided in a floor 10. An elongate filler piece 12 is arranged over connecting part 11 (see also figure 4). Adhesive ridges 13, which are directed toward filler piece 12, are then applied using an adhesive comb. Once adhesive 13 has been applied filler piece 12 is removed, whereby a discharge channel 14 is created between adhesive ridges 13.

[0034] Finally, an outflow 15 of a collecting container 16 is inserted into connecting part 11. Tiles 17 are further arranged in adhesive 13.

[0035] Using this method a discharge channel 14 is now formed under collecting container 16. Possible leakage water reaching collecting container 16 along adhesive ridges 13 can then flow via discharge channel 14 to connecting part 11.

[0036] Figure 6 shows a second embodiment of a drain 20 according to the invention. This drain 20 has a collecting container 21 with a tubular outflow 22. This outflow 22 protrudes into a siphon housing 23 coupled to an outlet pipe 24.

[0037] Tubular outflow 22 is sealed onto the depending flange 26 of siphon housing 23 via O-ring 25. Secondary drainage openings 27 are arranged in siphon housing 23 just behind this depending flange 26. Water falls onto a sealing flap 28 which is arranged at the bottom of depending flange 26 and lies against a second depending flange 29.

[0038] In this embodiment 20 possible leakage water permeating under tile layer 30 can still enter outlet pipe 24 via secondary drainage openings 27, while regular water is held back by sealing flap 28.

[0039] Sealing flap 28 is arranged under outflow 22 so that this sealing flap 28 can optionally be replaced after drain 20 has been installed.

[0040] A mastic layer 31 is further provided between collecting container 21 and tile layer 30 for the purpose of sealing the upper surface.

[0041] Figure 7 shows a third embodiment of a drain 40 according to the invention. This drain has a collecting container 41 with a tubular outflow 42 which protrudes into a siphon housing 43.

[0042] Siphon housing 43 has two depending, concentric flanges 44, 45 around the inflow opening into which outflow 42 protrudes. Provided in first flange 44 is a groove in which is arranged an O-ring 46 which provides for sealing between tubular outflow 42 and siphon housing 43.

[0043] Arranged in siphon housing 43 are secondary drainage openings 47 which debouch in the space between the two concentric flanges 44, 45. This space is closed on the underside by a flexible sleeve 48 which protrudes into outflow 42 of collecting container 41. Possible leakage water can hereby enter siphon housing 43

via openings 47, while regular water is prevented by flexible sleeve 48 from flowing into the space between the two depending flanges 44, 45.

[0044] Figures 8 and 9 show a fourth embodiment 50 of a drain according to the invention. This figure shows an elongate shower drain 50. The collecting container is formed here by two upright, elongate strips 51 situated in a lower tray 52. This lower tray 52 has upright walls 53 and inward directed flanges 54 which lie against strips 51.

[0045] A number of openings 55 in which rubber parts 56 are arranged are provided in flanges 54. These rubber parts 56 have two flaps which lie against each other. Each rubber part 56 hereby functions as a one-way valve, whereby possible leakage water can enter lower tray 52 via opening 55, while regular water cannot flow out of lower tray 52.

[0046] In figure 8 rubber parts 56 take a round form. It is also possible to give rubber parts 56 an elongate form and arrange them along the edge of lower tray 52.

[0047] As is apparent from figure 9, a mastic layer 58 is further provided between strips 51 and tile layer 57 for the purpose of sealing the upper surface.

[0048] Figure 10 shows a fifth embodiment 60 of a drain according to the invention. This drain 60 has a collecting container 61 with an outflow 62. This outflow 62 protrudes into a connecting part 63.

[0049] Connecting part 63 is provided along the outer periphery with a number of grooves 64 in which an O-ring 65 is arranged for sealing onto for instance an outlet pipe 66. Grooves 64 can be used to make connecting part 63 easily to size.

[0050] Secondary openings 68 are arranged in upper flange 67 of connecting part 63. Leakage water can flow into connecting part 63 along these. Secondary openings 68 are sealed in unidirectional manner by a rubber sleeve 69 of O-ring 70.

[0051] A sealing membrane 71 can further be arranged on upper flange 67 of connecting part 63.

[0052] Figure 11 shows a sixth embodiment 80 of a drain according to the invention. This drain 80 has a collecting container 81. A connecting part 82 is placed in this collecting container 81. This connecting part 82 is formed from a thin double-folded plate, which also provides for the finishing of a tile layer 83.

[0053] Unidirectional passages 84 are provided in the connecting part close to the bottom of collecting container 81. Possible leakage water permeating under tile layer 83 can flow via these passages into collecting container 81.

[0054] Tile layer 83 is sealed onto connecting part 82 using a sealing mastic 85. A watertight whole is thus ensured.

[0055] Figures 12 and 13 show a seventh embodiment 90 of a drain according to the invention.

[0056] In this embodiment 90 the collecting container and the connecting part take an integral form. The drain is provided with a horizontal flange 91 with a square,

upright flange 92 thereon. This upright flange 92 forms a boundary for tile layer 93. Flange 92 is sealed onto tile layer 93 via a sealing mastic 103.

[0057] A siphon housing 94 with an outlet pipe 95 is arranged under horizontal flange 91. A removable inflow part 96 is arranged centrally in siphon housing 94. This inflow part 96 seals onto siphon housing 94 via an O-ring 97.

[0058] O-ring 97 is provided with a depending edge 98 which thereby seals a passage opening 99. Possible leakage water can flow via this passage opening 99 into siphon housing 94. The leakage water flows from under tile layer 93 via passage 100 and channel 101 to passage opening 99.

[0059] A closable inspection opening 102 can further also be provided in horizontal flange 91 for visual monitoring of possible leakage. Via this inspection opening 102 it is possible to periodically monitor whether any leakage has occurred. Depending on the result of this monitoring, the leakage can then be repaired.

Claims

1. Drain, such as a drain hole or drain channel, comprising:
 - a collecting container for collecting water, wherein the collecting container has an outflow on the underside;
 - a connecting part for connecting the outflow to an outlet pipe;

characterized in that
the connecting part is provided with a unidirectional passage for admitting water from outside inward into the connecting part.
2. Drain as claimed in claim 1, wherein the outflow of the collecting container is tubular and the connecting part has an opening into which the tubular outflow protrudes.
3. Drain as claimed in claim 2, wherein a flexible collar is arranged in the outflow.
4. Drain as claimed in claim 3, wherein the free edge of the flexible collar lies against the tubular outflow.
5. Drain as claimed in claim 4, wherein a peripheral part of the flexible collar adjacent to the free edge has a substantial directional component the same as the direction of insertion of the outflow.
6. Drain as claimed in any of the foregoing claims, wherein the connecting part is integrated into a siphon.
7. Drain as claimed in any of the foregoing claims,

wherein the collecting container is an elongate tray of U-shaped cross-section.

8. Method for arranging a drain as claimed in any of the foregoing claims in a floor, the method comprising the steps of:
 - incorporating, for instance casting, the connecting part into the floor;
 - applying an adhesive using an adhesive comb, wherein the adhesive ridges are directed toward the connecting part;
 - arranging the collecting container on the connecting part;
 - arranging a finishing layer, such as a tile layer, in the adhesive.
9. Method as claimed in claim 8, wherein a filler piece is arranged over the connecting part before the adhesive is applied, and wherein the adhesive ridges are then arranged directed toward the filler piece, after which the filler piece is then removed.
10. Method as claimed in claim 9, wherein the filler piece and the collecting container are elongate.

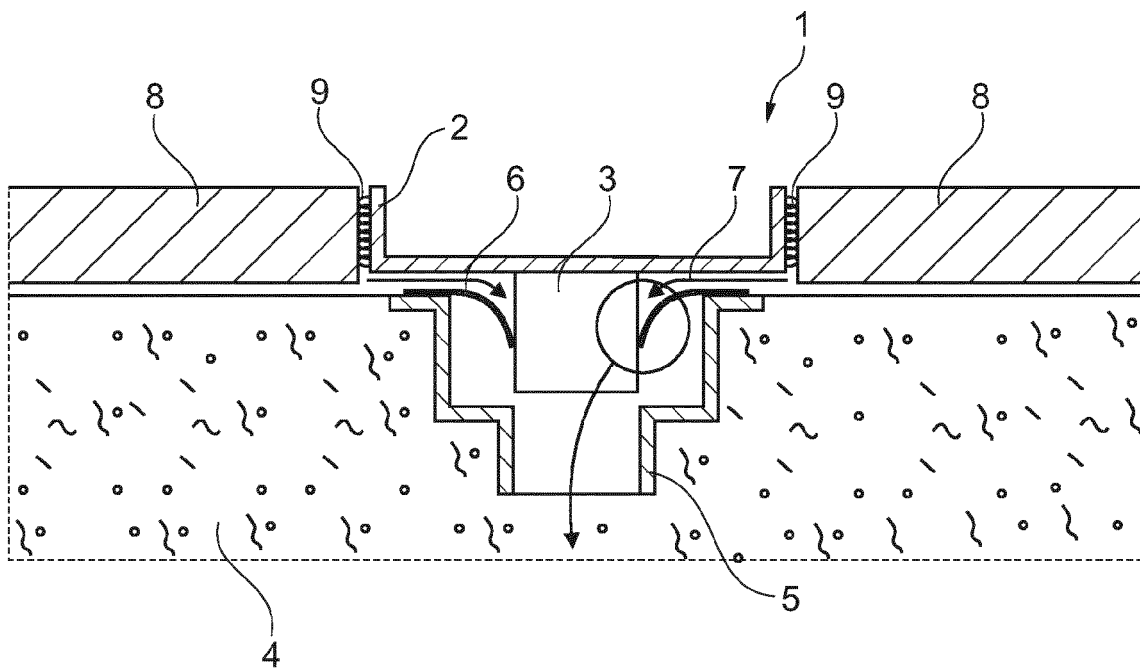


Fig. 1

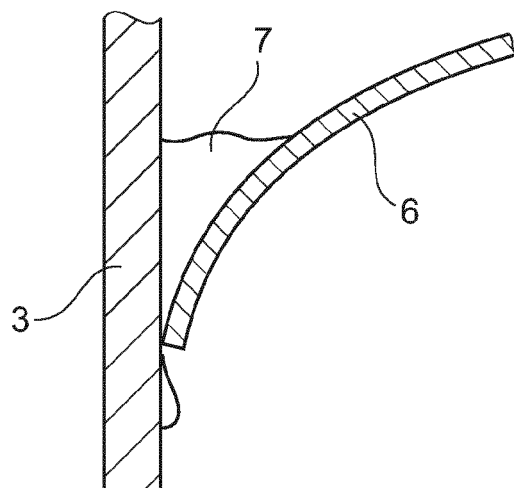


Fig. 2

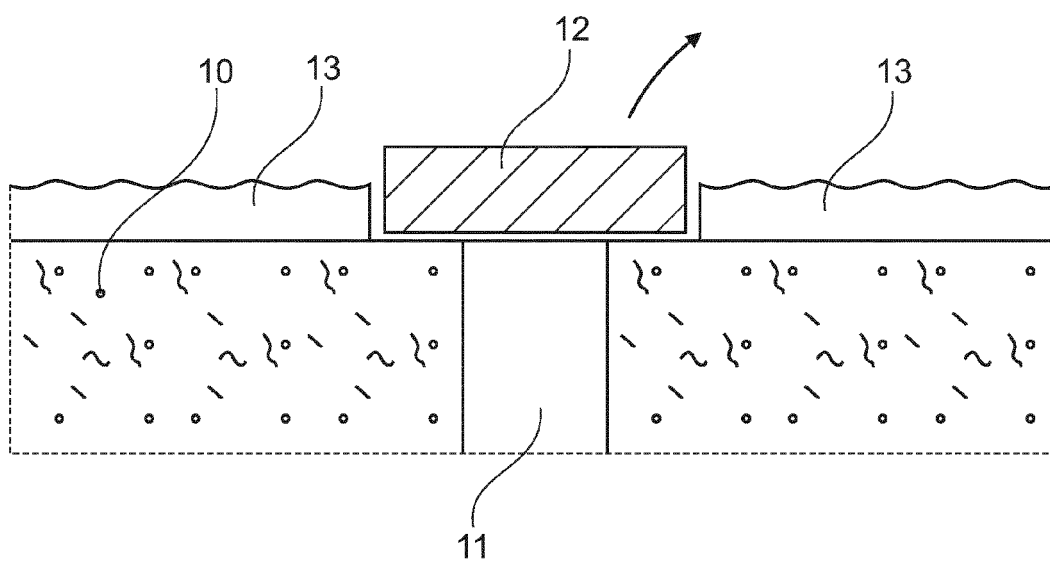


Fig. 3

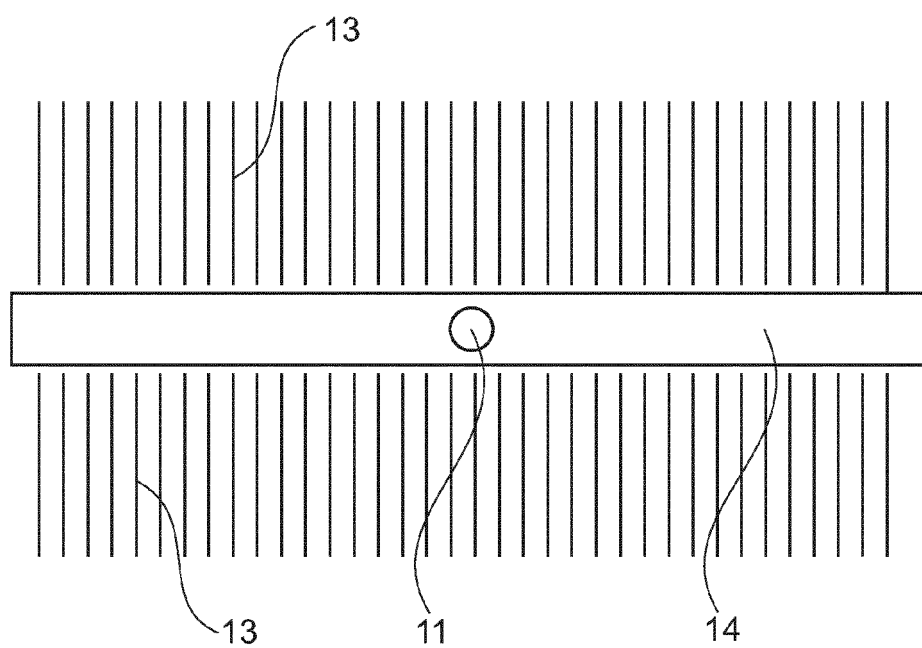


Fig. 4

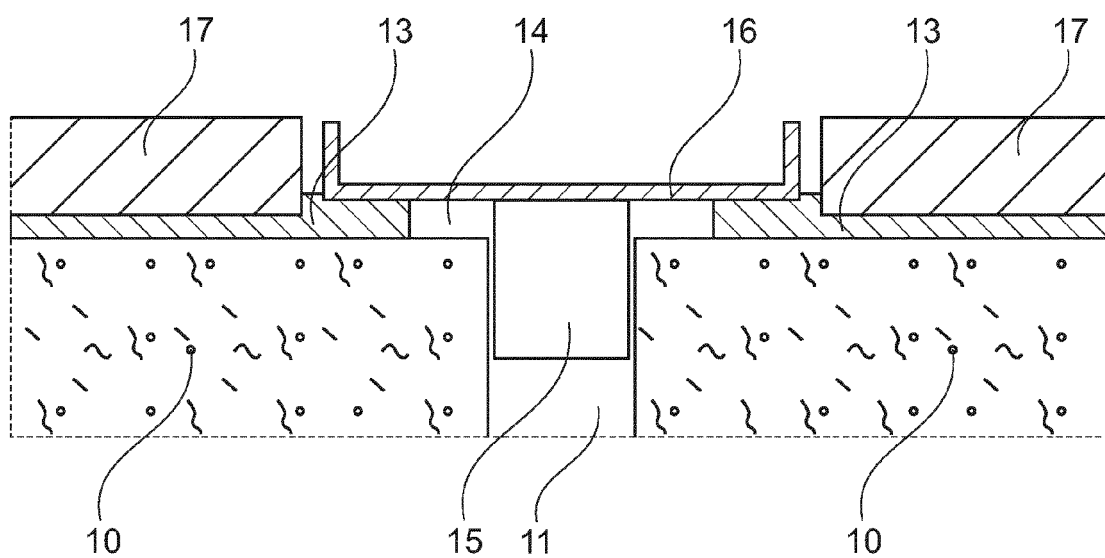


Fig. 5

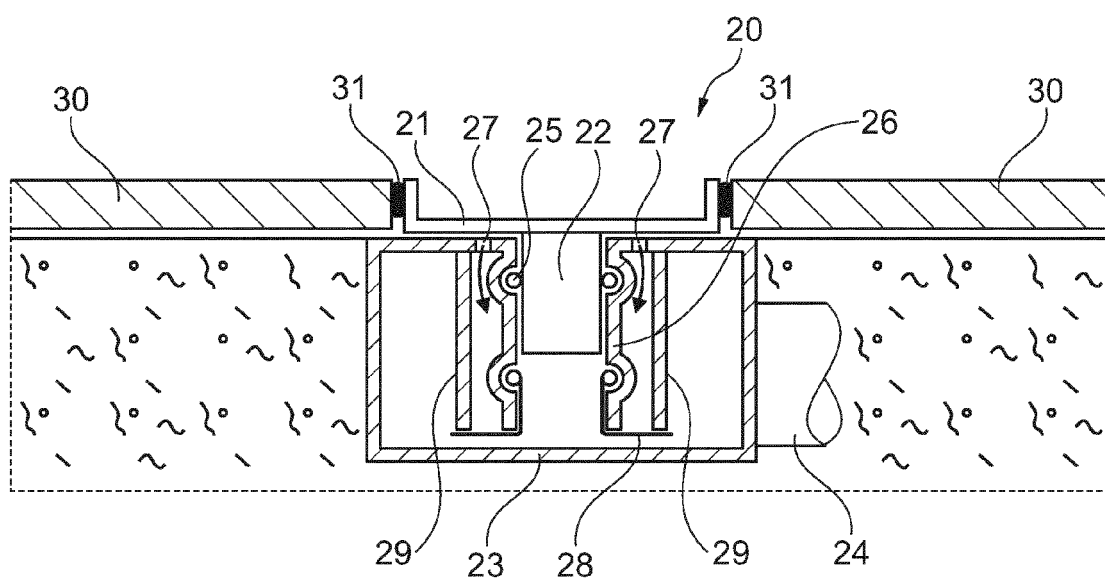


Fig. 6

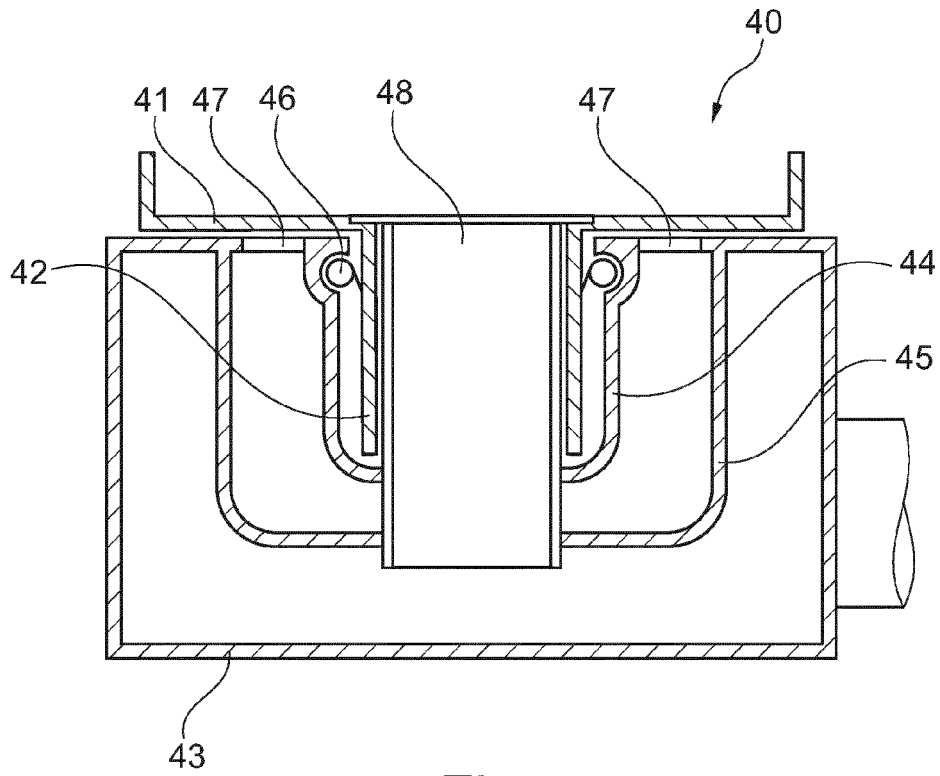


Fig. 7

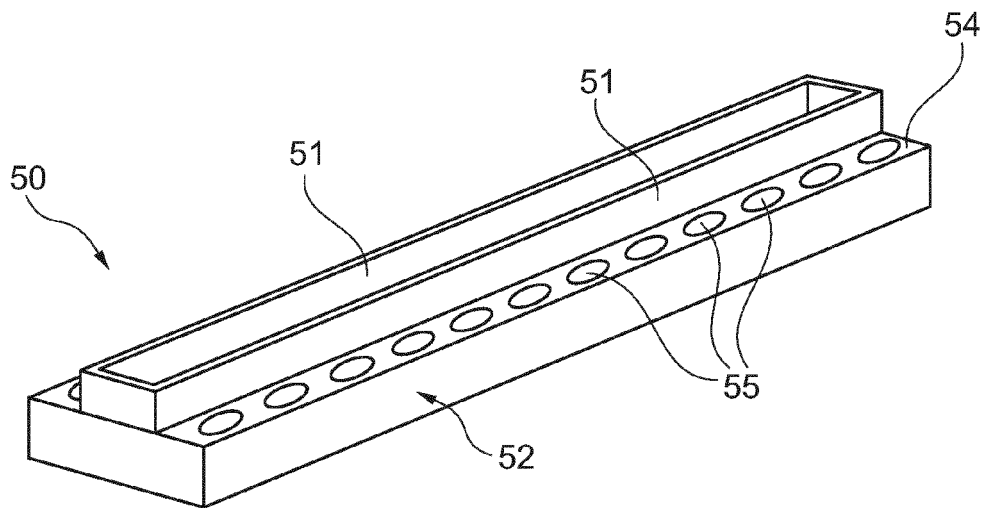


Fig. 8

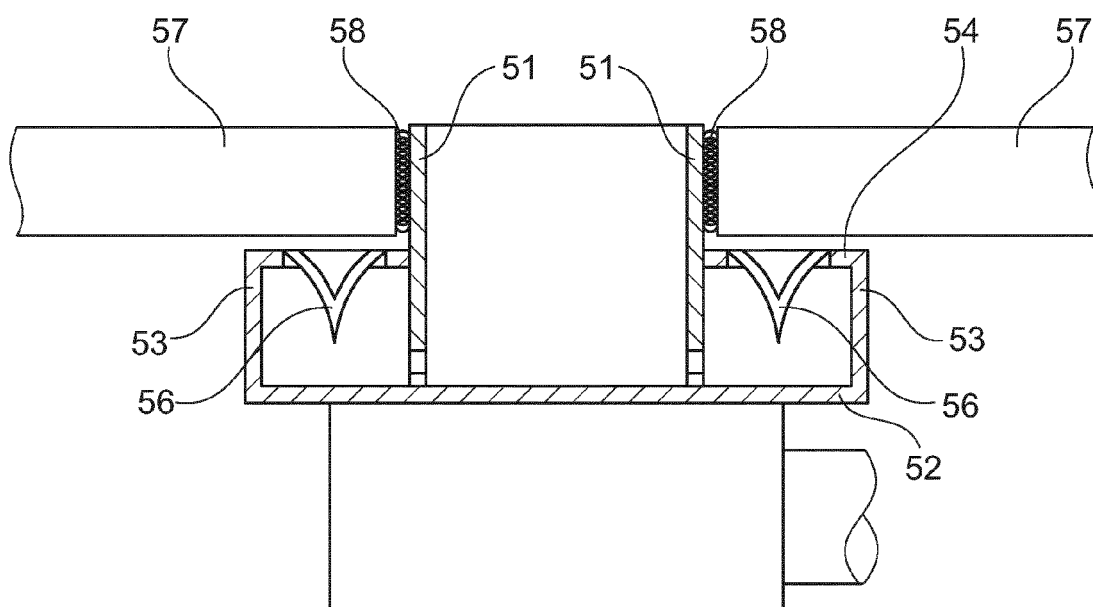


Fig. 9

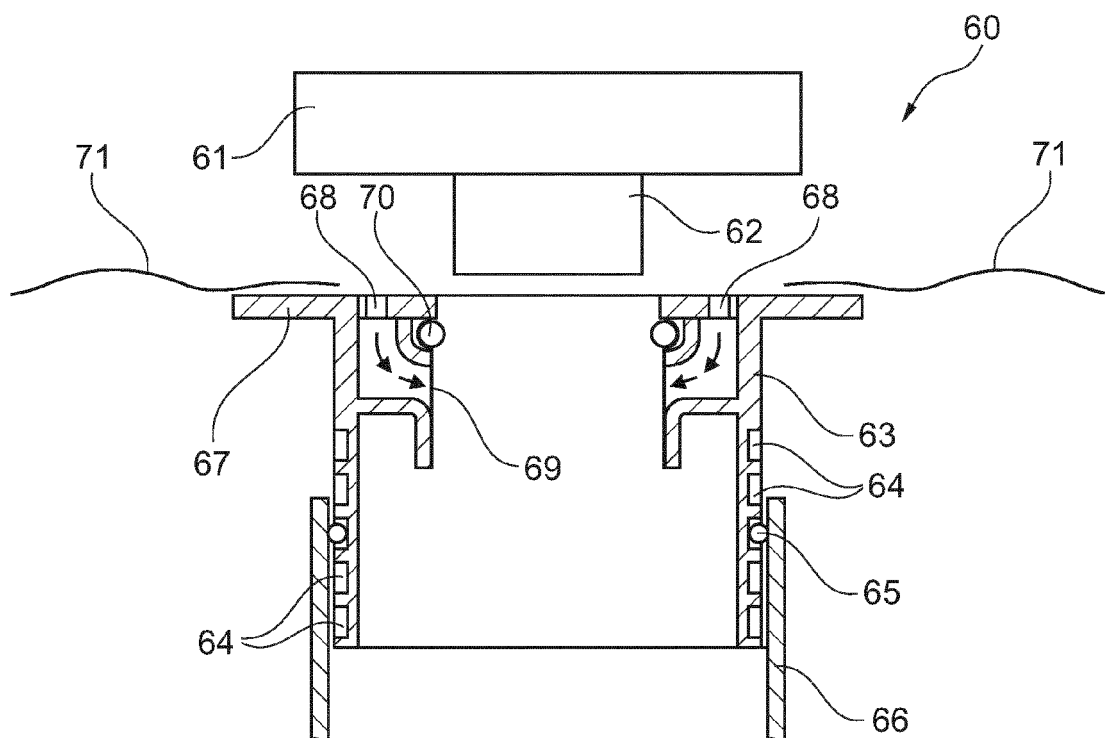


Fig. 10

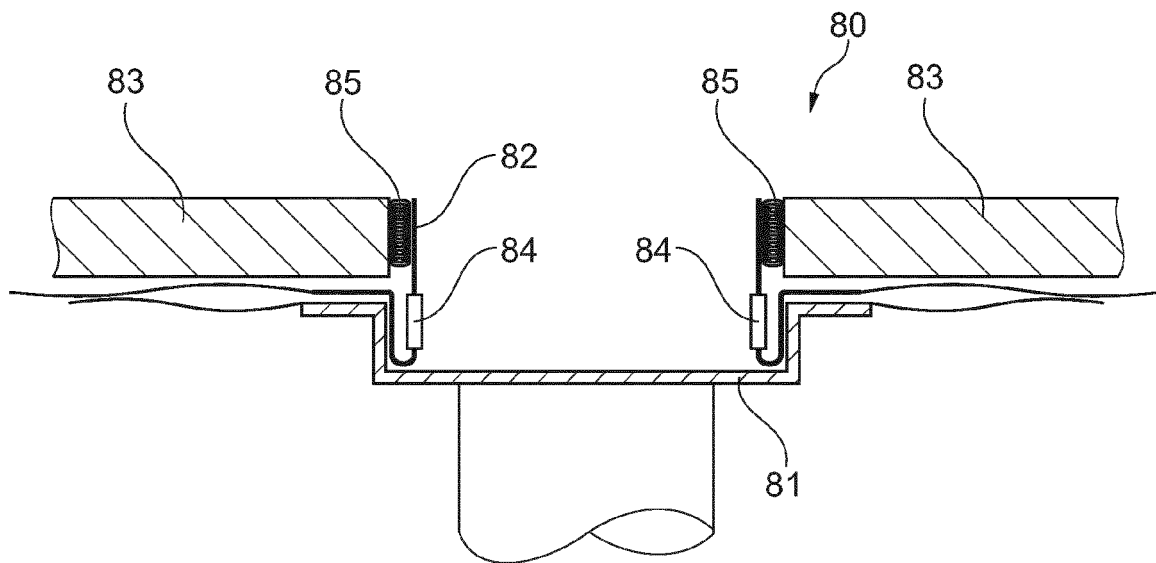


Fig. 11

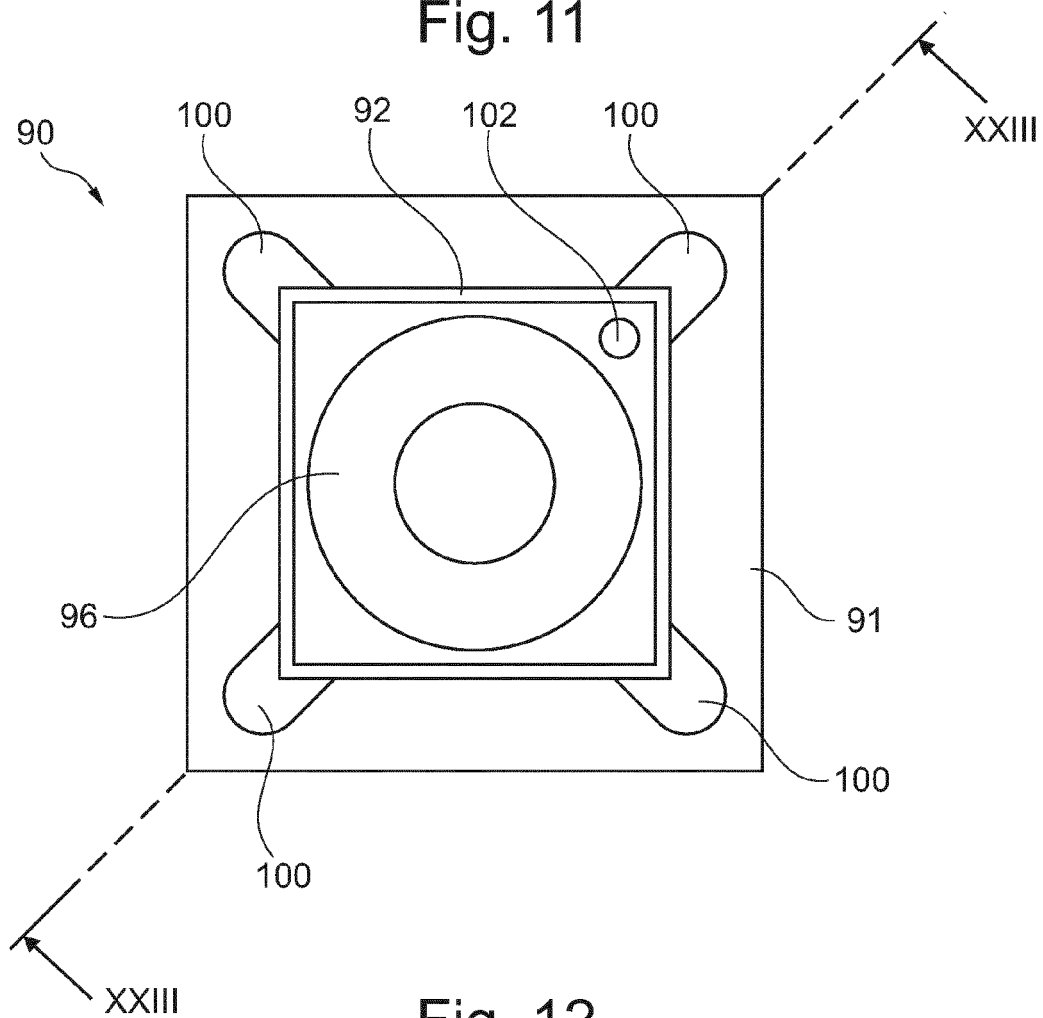


Fig. 12

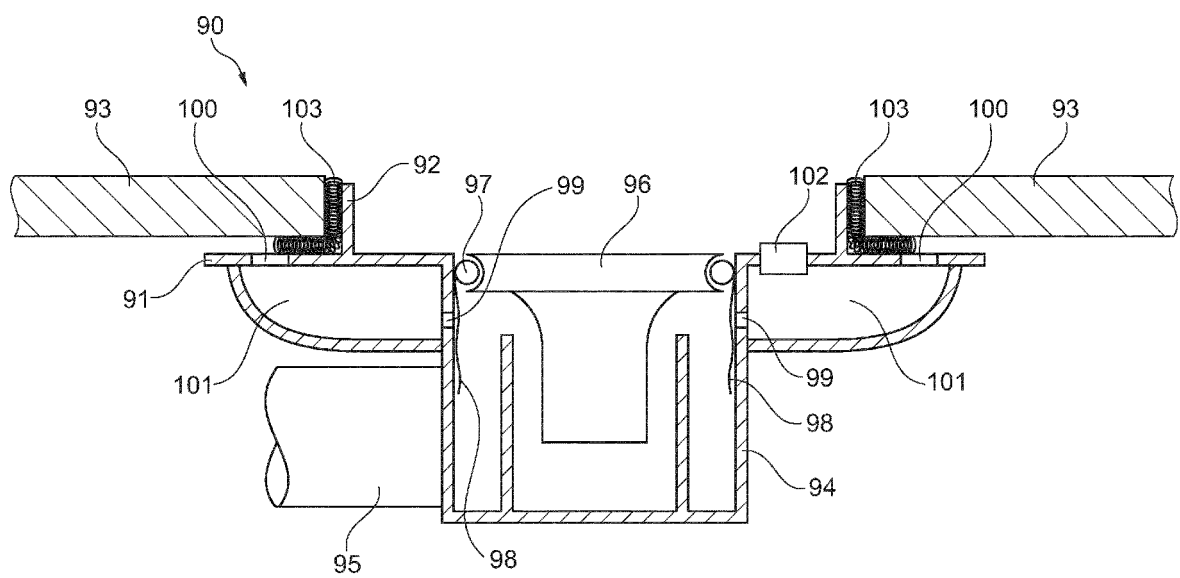


Fig. 13



EUROPEAN SEARCH REPORT

Application Number
EP 11 19 2351

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A	* column 7, line 64 - column 9, line 60; figure 6 *	8	
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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 13 February 2012	Examiner Van Bost, Sonia
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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