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(54) **SHOWER FLOOR SEALING**

(57) A sealing system for a shower floor of a sanitary space, comprising a watertight flexible layer 2, such as a sealing membrane, the flexible layer comprising an insert part 3 for a watertight connection to an outlet opening 5 arranged in the shower floor.

Further disclosed is a combination of a sealing system, a floor 12 in which an outlet pipe 13 is arranged, wherein the insert part 3 of the sealing system protrudes into the outlet pipe, and a finishing layer 17, such as a tile layer, arranged on the floor and over the watertight flexible layer 2.

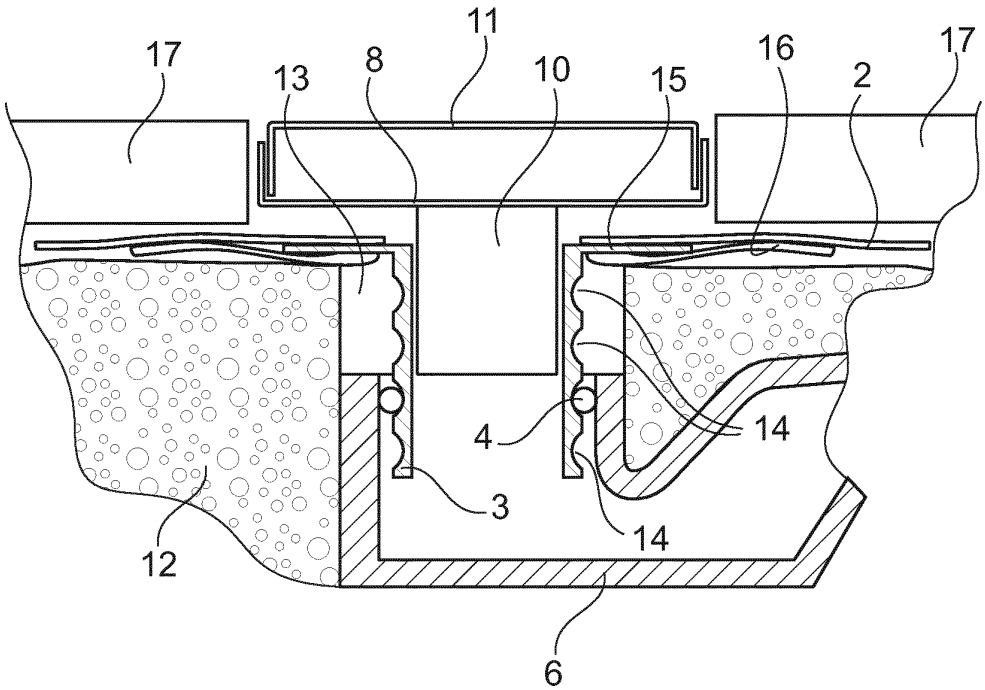

Fig. 2

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Description

[0001] The invention relates to a sealing system for a shower floor of a sanitary space. A shower floor is understood to mean the floor part of a sanitary space, which often deals with large quantities of water, such as a floor beneath a shower head. It is of great importance that no leakage can occur in this part of the floor of the sanitary space. Particularly in the case of a shower space the greater part of the floor must be watertight. When the shower space is part of a larger bathroom, it is then recommended to make the floor part of the shower space watertight.

[0002] During construction of a shower space it is usual to first arrange outlet conduits, after which a floor is cast over the outlet conduits. Such floors are often sand cement floors or cast floors.

[0003] When it is desirable for a drain to be incorporated in the floor, this drain or a part thereof is also first placed together with the outlet conduits, after which the floor is poured or cast. Proper presetting of the height of the drain is important here in order to ensure that, once the floor has been finished with for instance a tile layer, the upper edge of the drain lies flush with the tile layer. Once the floor has been cast, no further substantial changes can be made in the type of drain and the thickness of the finishing layer. Raising elements can possibly provide some compensation, although each additional element increases the chance of leakage.

[0004] After casting of the floor it is also important to arrange a watertight layer on the floor. This prevents leakage. For the purpose of obtaining a watertight layer it is known to attach a piece of watertight membrane to the drain. This attachment usually takes place by adhesion to a horizontal part, although connection can also be made in other manner. Strips of watertight membrane are then adhered to the piece of watertight membrane in order to thus cover the whole surface of the floor.

[0005] The risk with adhesion is that the connections between the different membrane parts are not watertight, whereby leakage may still occur. In addition, incorrect storage of the sealant may adversely affect the properties of the sealant, this having an adverse effect on the reliability of the adhesive connections. A sealant may for instance lose its properties when the sealant is exposed to frost. The finishing layer can then only be arranged when the adhesive layer has cured sufficiently.

[0006] The adhesive surface of the drain will further become soiled during curing of the floor due to workers walking over the floor and therefore over the adhesive surface, and due to the dust of the sand cement. The watertight layer is only arranged once the floor has cured sufficiently. The adhesive surface would then first have to be cleaned for a good adhesion. This is however often not done.

[0007] Overlapping arrangement of different membrane parts can also cause problems when a thin finishing layer is desired. The differences in thickness would have to be compensated with a thick adhesive layer, but it is precisely this which is undesirable in the case of a thin finishing layer.

[0008] It is thus known to cast a siphon in a floor, the siphon being provided with a flange. The upper surface of this flange must lie flush with the surface of the cast floor. Following curing a protective foil is removed from the flange, after which a flexible membrane can be adhered to the flange.

[0009] There is a risk during adhesion that the connection is not watertight, for instance due to the quality of the adhesive or because the flange has been soiled by dust and grit. The competence of the skilled worker may also play a part in the quality of the connection. In addition, it is necessary after adhesion to wait until the adhesive has cured sufficiently before the finishing layer can be arranged. Walking over the adhesive connections is not allowed during the curing because this may have an adverse effect on the connection.

[0010] Another drawback is that the membrane has to be attached with two different adhesives. The one type of adhesive is used to attach the membrane to the drain, while the other type of adhesive is used to attach the membrane to the floor. It is hereby difficult to monitor whether correct arrangement has taken place.

[0011] Another solution is known wherein the flexible layer is secured to a siphon in the factory. This siphon is cast into a floor, after which the flexible layer is unfolded over the floor. Because the flexible layer is already arranged on the siphon, casting of the floor is made more difficult. There is also a chance of the membrane being soiled during casting of the floor. Droplets of liquid cement can get onto the membrane, which later prevent the membrane from being laid flat on the floor. This solution further ensures that the membrane has many folds. This also makes flat arrangement of the membrane on the floor more difficult. It is now an object of the invention to reduce or even obviate the above stated drawbacks.

[0012] This object is achieved with a sealing system comprising a watertight flexible layer, such as a sealing membrane, the flexible layer comprising an insert part for a watertight connection to an outlet opening arranged in the shower floor.

[0013] An insert part is formed on the flexible layer. This insert part can easily be inserted into an outlet opening of an outlet pipe arranged in a floor, whereby a good sealing on the outlet pipe is obtained immediately without any adhesive or sealant being required. It is thus possible to first cast the floor with an outlet pipe therein, only after which the watertight flexible layer is arranged by inserting the insert part of the flexible layer into the outlet pipe. No adhesive is required here, which increases the reliability of the connection to the outlet pipe.

[0014] In addition, the sealing of the membrane on the outlet pipe takes place on a vertical surface, in contrast to the prior art, wherein the sealing usually takes place on a horizontal surface, such as an adhering flange. Owing to the sealing on a vertical surface, such as the inner

wall of the outlet pipe, the dimensions are limited. In the case the membrane were not to wholly seal on the vertical surface, leakage would then still not occur because the insert part protrudes into the outlet pipe.

[0015] In an embodiment of the sealing system according to the invention the tubular insert part comprises a number of peripheral grooves on the outer surface, wherein a sealing ring is arranged in at least one groove.

[0016] Owing to these grooves the insert part can easily be sawn to size and the sealing ring can be arranged in a suitable peripheral groove.

[0017] The tubular insert part can comprise a flange on which the watertight flexible layer is arranged, for instance by adhesion or vulcanization. This attachment of the flexible layer preferably takes place in a controlled environment, such as in a factory, so that the watertightness of the attachment of the layer to the flange can be guaranteed.

[0018] In another embodiment of the sealing system according to the invention the tubular insert part is formed from a rubber and a protruding flexible peripheral flange is arranged on the inner side. The rubber insert part can be placed in the same manner in the outlet opening of an outlet pipe. By then placing an outlet pipe of for instance a drain in the insert part, the rubber insert part is pressed more tightly into the outlet pipe.

[0019] In a highly preferred embodiment according to the invention the insert part is a rubber ring which is arranged on the watertight flexible layer and which can be placed in a groove arranged in the outlet opening.

[0020] The rubber ring, such as for instance an O-ring, is attached to the layer and placed in a groove in the outlet opening. A tubular outflow of a shower drain can for instance then be placed in the sealing ring so that the ring is pressed against the wall of the outlet pipe.

[0021] The tubular outflow can optionally be provided with a number of grooves so that water passing between the insert part and the tubular outflow can also flow away.

[0022] In another embodiment according to the invention the insert part is a flexible sleeve, and the sealing system comprises a tensioning element arranged in the flexible sleeve for tensioning the flexible sleeve against the wall in the outlet opening.

[0023] The flexible sleeve can even be formed from the membrane itself, if this membrane is sufficiently flexible and stretchable. In a preferred embodiment of the sealing system according to the invention the flexible layer comprises a corner part, whereby the parts adjacent to the corner part are upright. The flexible watertight layer with the upright parts can thus be arranged against a wall. The corner part is preferably stretchable so that small variations in the dimensions can be easily compensated by deforming the corner part. Using such an embodiment it is for instance possible to provide prefab elements. A type of shower tray is thus formed by the arranged corners. The watertight flexible layers can then be provided with corner parts in the factory, whereby the floor of the shower space can be sealed reliably in one operation. These prefab shower trays can then be placed in a large number of similar shower spaces.

[0024] In another preferred embodiment of the sealing system according to the invention two or more insert parts are arranged on the flexible watertight layer. The insert parts are preferably covered by the watertight layer so that only one of the two or more insert parts is placed in an outlet pipe. This enables more variation in the sealing system.

[0025] In yet another embodiment the watertight flexible layer is an integral whole and extends at least over the whole surface of the shower floor.

[0026] Because the flexible layer extends over the whole surface to be sealed and is integrally formed, the chance of leakage is precluded. Adhesive transitions, which in the prior art could result in leakage, are no longer present.

[0027] The position of the outlet pipe can be varied by selecting dimensions of the flexible layer which are larger than the dimensions of the shower floor to be sealed, whereby the flexible layer can be placed such that the insert part can be inserted into the outlet pipe and the shower floor is covered by the flexible layer.

[0028] The invention further comprises a combination of a sealing system according to the invention, a floor in which an outlet pipe is arranged, wherein the insert part of the sealing system protrudes into the outlet pipe, and a finishing layer, such as a tile layer, arranged over the flexible layer.

[0029] In a preferred embodiment of the combination according to the invention a space is present between the floor and the insert part of the sealing system such that the insert part lies loosely relative to the floor.

[0030] The flexible layer and the insert part attached thereto can thus still be inserted after curing of the floor. In the case of renovation it is hereby further possible to easily replace the flexible layer with a new layer. It otherwise suffices to leave a space the same size as the opening of the outlet pipe, since the insert part is inserted into the outlet pipe.

[0031] The outlet pipe arranged in the floor preferably comprises a siphon. In addition, the upper edge of the insert part preferably lies below the upper surface of the finishing layer.

[0032] The sealing system can hereby be used as drain without additional measures being necessary. The flexible layer provides for a watertight sealing of the underlying floor, whereby the water can flow into the insert part and thus into the outlet pipe. The optionally arranged siphon prevents possible undesirable odours.

[0033] In addition, the siphon can extend as far as the finishing layer, thereby obtaining a small overall depth of the whole.

[0034] A preferred embodiment of the combination according to the invention further comprises a collecting tray with an outlet opening and a tube part arranged on the outlet opening, wherein the tube part is pressed into the insert part of the watertight flexible layer.

[0035] The collecting tray is preferably an elongate tray and comprises a grating which is placed in the elongate tray. It can optionally be advantageous to attach the elongate tray to the flexible layer, for instance by means of adhesion.

[0036] It is also possible to arrange a flat plate of for instance stainless steel on the membrane and over the outlet opening. The finishing layer, such as a tile layer, can then be arranged. A collecting tray can thus be formed above the flat plate by omitting a number of tiles. An exact alignment is not necessary between the flat plate and the finishing layer. A finishing strip can optionally be further arranged against the edge of the finishing layer.

[0037] Because the seal lies below the collecting tray the watertightness of the collecting tray is of minor importance. Expensive collecting trays, wherein the welds at the corners are of a high quality such that watertightness of the collecting tray is guaranteed, are therefore no longer necessary in a combination according to the invention. Nor is it necessary to arrange a sealant between the collecting tray and the finishing layer. This is because the seal lies below the collecting tray.

[0038] There is also less sound transmission because the collecting tray lies on the floor and not, as in the prior art, partially in the floor. Another advantage is that fluctuations in the temperature of the lower tray have less effect and crack formation is less likely.

[0039] Because the watertight layer lies wholly below the lower tray, no earthing of the lower tray is necessary. Anchoring of the lower tray can also be dispensed with.

[0040] The lower tray can be embodied in plastic. The weight of the combination is hereby reduced, this having advantages in respect of transport costs.

[0041] Yet another embodiment of a combination according to the invention comprises a sloping plate with a flat lower surface and a flat upper surface, wherein the upper surface forms an angle with the lower surface, the sloping plate being placed on the watertight flexible layer, wherein the finishing layer extends over the sloping plate and wherein the slope is directed toward the outlet opening.

[0042] A slope can be created in simple manner by arranging an inclined plate on the watertight layer. The sloping plate can optionally take a porous form so that, in the case of leakage through the finishing layer, the water can still be carried along the watertight layer to the outlet opening. The floor plate can also be given a porous form by means of channels.

[0043] Although the sealing system is particularly suitable for sealing floors, it can also be used to seal for instance an outlet pipe arranged in a wall. The sealing system can also be used to properly seal passages through walls or floors.

[0044] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 shows a perspective view with exploded parts of an embodiment according to the invention.
Figure 2 shows a cross-sectional view of the embodiment according to the invention.
Figure 3 shows a schematic view of a sanitary space with a sealing system according to the invention.
Figure 4 shows a second embodiment of a sealing system according to the invention.
Figure 5 shows a third embodiment of a sealing system according to the invention.
Figure 6 shows a fourth embodiment of a sealing system according to the invention.
Figure 7 shows a fifth embodiment of a sealing system according to the invention.

[0045] Figure 1 shows an embodiment 1 of a combination according to the invention. Combination 1 has a watertight flexible membrane 2 on which a tubular insert part 3 is arranged. A sealing ring 4 is arranged on the outer surface of insert part 3. This tubular insert part 3 is inserted into outlet opening 5 of a siphon 6. Siphon 6 is connected to an outlet pipe 7.

[0046] An elongate collecting tray 8 can be provided above the watertight flexible membrane 2. This collecting tray 8 has an outlet opening 9 on which a tube part 10 is arranged. This tube part 10 protrudes from above into insert part 3. A grating 11 is placed in collecting tray 8.

[0047] Figure 2 shows a cross-sectional view of combination 1 in the assembled state.

[0048] Siphon 6 is cast into a floor 12, wherein an opening 13 is left clear above the siphon. Insert part 3 can hereby be placed into outlet opening 5 of siphon 6 after curing of floor 12.

[0049] Insert part 3 has a number of peripheral grooves 14 into which a sealing ring 4 can be placed. In addition, peripheral grooves 14 can be used to make insert part 3 to size.

[0050] On the top side insert part 3 is provided with a flange 15 with which the insert part is attached to membrane 2. A second membrane 16 is arranged under flange 15.

[0051] Once insert part 3 has been inserted into outlet opening 5 and floor 12 has been covered with the watertight flexible membrane 2, the finishing layer 17, such as for instance tiles, can be arranged. During finishing the collecting tray 8 is further arranged and grating 11 is placed in collecting tray 8.

[0052] Figure 3 shows a schematic representation of a sanitary space 20. Sanitary space 20 has a floor 21 and two walls 22, 23. Under shower head 24 the floor part is provided with a sealing system 25 according to the invention. The additional sealing system 25 is only necessary where floor 21 comes into intensive contact with water.

[0053] The membrane of sealing system 25 is folded upward along walls 22, 23 by means of the stretchable corner part 26. If the dimensions of sealing system 25 do not correspond wholly with floor 21 and walls 22, 23, cor-

ner part 26 can be stretched to compensate for this.

[0054] Figure 4 shows a cross-sectional view of a second embodiment 30 of a sealing system according to the invention. This sealing system 30 has a flexible watertight membrane 31 on which a rubber ring 32 is arranged. This rubber ring 32 protrudes into a groove 33 arranged in an outlet pipe 34. Outlet pipe 34 is cast into a floor 35.

[0055] Rubber ring 32 is pressed against the wall of outlet pipe 34 by insertion of a tube part 36 of a shower drain 37.

[0056] A finishing tile layer 38 is then arranged over the flexible watertight membrane 31.

[0057] A third embodiment 40 is shown in figure 5. A watertight layer 41 is provided here with a flexible sleeve 42 which protrudes into an outlet pipe 43 arranged in floor 44.

[0058] Outlet pipe 43 is provided on the inner side with a groove 45. Flexible sleeve 42 is pressed into this groove 45 by a spring ring 46, whereby a watertight connection of layer 41 to outlet pipe 43 is obtained.

[0059] Figure 6 shows a cross-section of a fourth embodiment 50 according to the invention. In this embodiment a siphon 51 is incorporated into floor 52. Siphon 51 has a feed opening 53 on which two flanges 54, 55 are arranged. Depending on the overall depth, upper flange 54 can be removed from the siphon.

[0060] During casting of floor 52 a temporary filling piece is provided above siphon 51 so that a recess 56 is created in floor 51.

[0061] Arranged over floor 52 is a sealing membrane 57 which is provided with a tubular insert part 58. This insert part 58 protrudes into siphon 51 and lies against an O-ring 59.

[0062] Subsequently provided on top of sealing membrane 57 is a lower tray 60 of a shower drain, the tubular outflow 61 of which protrudes into insert part 58. Owing to recess 56 the lower tray 60 is countersunk to some extent in floor 52, whereby thinner tiles 62 can be arranged over sealing membrane 57. Because sealing membrane 57 provides for a watertight layer, a seal is not necessary between outflow 61 and insert part 58.

[0063] Figure 7 shows a fifth embodiment 70. A watertight layer 71 with an insert part 72 is inserted here into a siphon 73, whereby floor 74 is sealed watertightly. A lower tray 75 of a shower drain is further placed into insert part 72.

[0064] In order to obtain a slope, whereby the water flows toward lower tray 75, a plate 76 is provided adjacently of lower tray 75.

[0065] In this embodiment plate 76 is constructed from a lower wall 77 and an upper wall 78, which are held at a distance from each other by separating walls 79. Lower wall 77 and upper wall 78 extend slightly apart, whereby a slope is created when they are placed on a flat floor 74.

[0066] The space between upper wall 78 and lower wall 77 creates drain channels which can guide possible leakage water in the direction of siphon 73.

[0067] Plate 76 can however also take a solid form and optionally be arranged under sealing layer 71.

Claims

1. Sealing system for a shower floor of a sanitary space, comprising a watertight flexible layer, such as a sealing membrane, the flexible layer comprising an insert part for a watertight connection to an outlet opening arranged in the shower floor.

2. Sealing system as claimed in claim 1, wherein the insert part is tubular.

3. Sealing system as claimed in claim 2, wherein the tubular insert part comprises a number of peripheral grooves on the outer surface, wherein a sealing ring is arranged in at least one groove.

4. Sealing system as claimed in claim 2 or 3, wherein the tubular insert part comprises a flange on which the watertight flexible layer is arranged, for instance by adhesion or vulcanization.

5. Sealing system as claimed in claim 2, wherein the tubular insert part is formed from a rubber and wherein a protruding flexible peripheral flange is arranged on the inner side.

6. Sealing system as claimed in claim 1, wherein the insert part is a rubber ring which is arranged on the watertight flexible layer and which can be placed in a groove arranged in the outlet opening.

7. Sealing system as claimed in claim 1, wherein the insert part is a flexible sleeve, and wherein the sealing system comprises a tensioning element arranged in the flexible sleeve for tensioning the flexible sleeve against the wall in the outlet opening.

8. Sealing system as claimed in any of the foregoing claims, wherein the flexible layer comprises a stretchable corner part, whereby the parts adjacent to the corner part are upright.

9. Sealing system as claimed in any of the foregoing claims, wherein two or more insert parts are arranged on the flexible watertight layer.

10. Sealing system as claimed in any of the foregoing claims, wherein the watertight flexible layer is an integral whole and extends at least over the whole surface of the shower floor.

11. Combination of a sealing system as claimed in any of the foregoing claims, a floor in which an outlet pipe is arranged, wherein the insert part of the sealing system protrudes into the outlet pipe, and a finishing

layer, such as a tile layer, arranged on the floor and over the watertight flexible layer.

12. Combination as claimed in claim 11, wherein a space is present between the floor and the insert part of the sealing system such that the insert part lies loosely relative to the floor.

13. Combination as claimed in claim 11 or 12, wherein the outlet pipe arranged in the floor comprises a siphon.

14. Combination as claimed in any of the claims 11-13, wherein the upper edge of the insert part lies below the upper surface of the finishing layer.

15. Combination as claimed in any of the foregoing claims 11-14, further comprising a collecting tray with an outlet opening and a tube part arranged on the outlet opening, wherein the tube part is pressed into the insert part of the watertight flexible layer.

16. Combination as claimed in claim 15, wherein the collecting tray is an elongate tray and comprises a grating which is placed in the elongate tray.

17. Combination as claimed in any of the claims 11-16, comprising a sloping plate with a flat lower surface and a flat upper surface, wherein the upper surface forms an angle with the lower surface, the sloping plate being placed on the watertight flexible layer, wherein the finishing layer extends over the sloping plate and wherein the slope is directed toward the outlet opening.

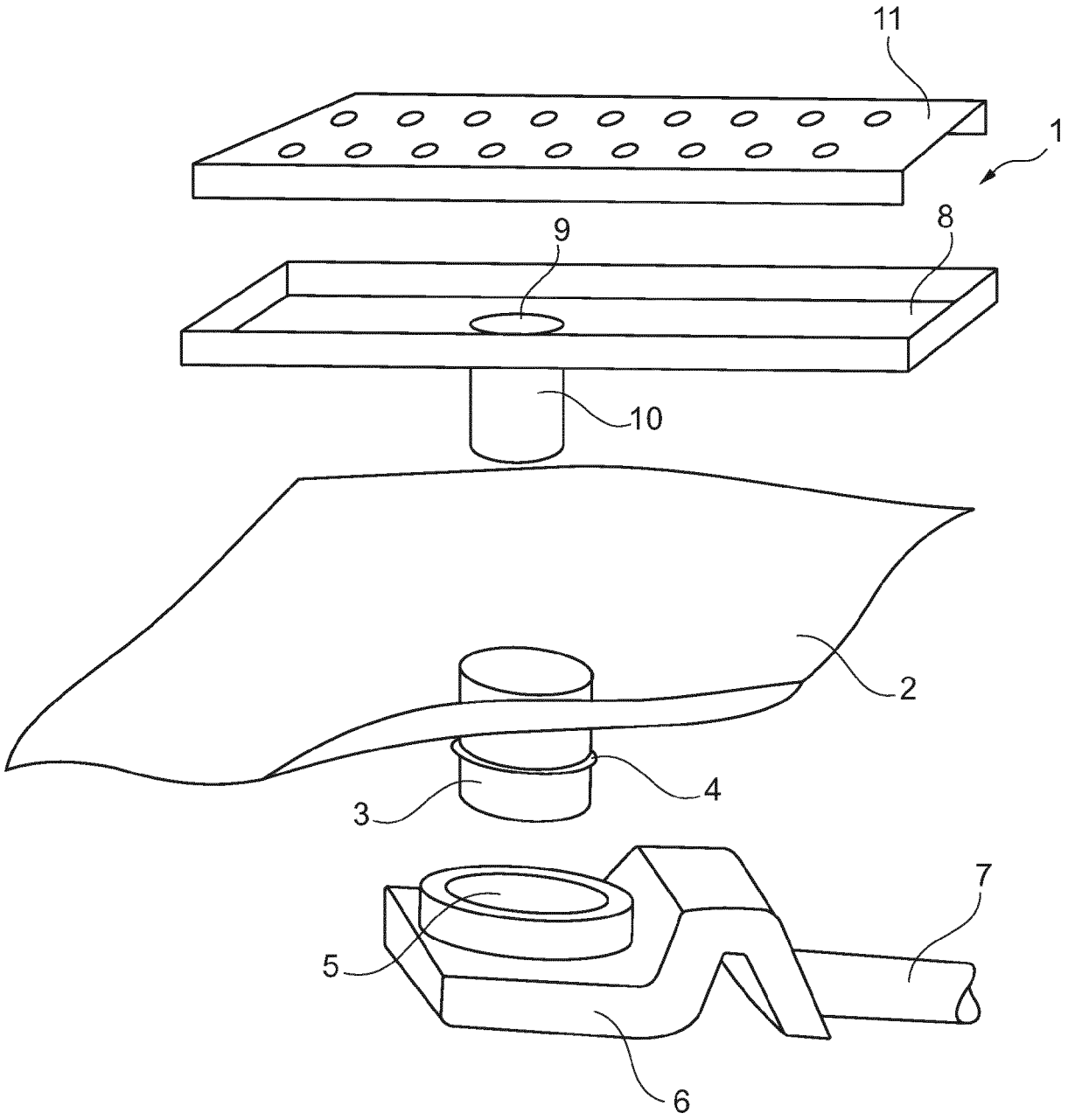

Fig. 1

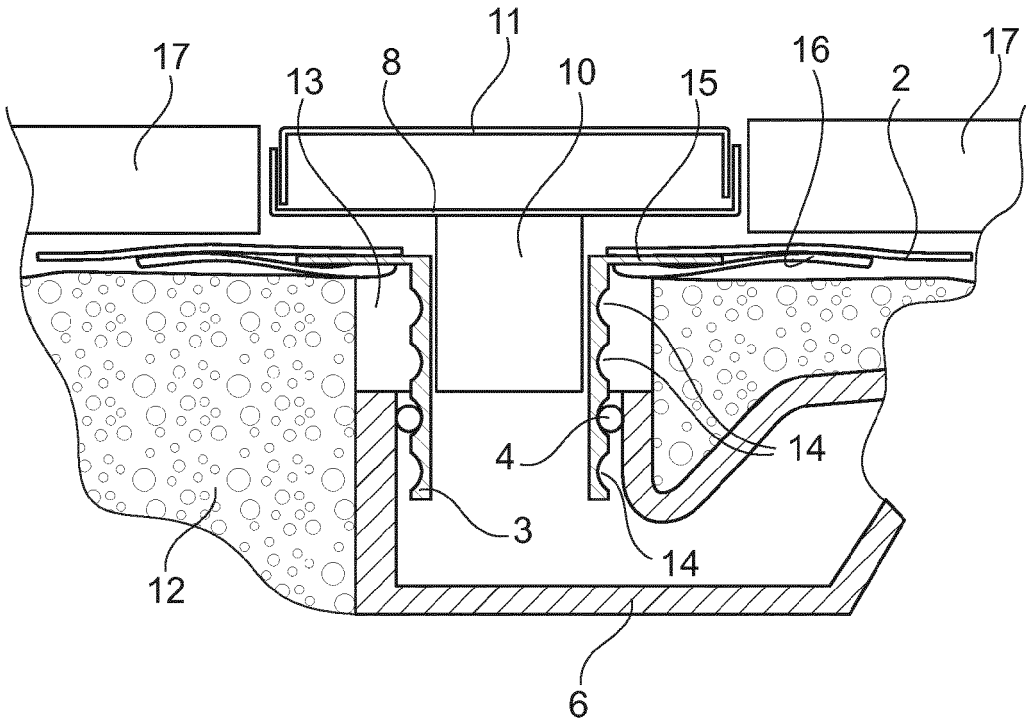

Fig. 2

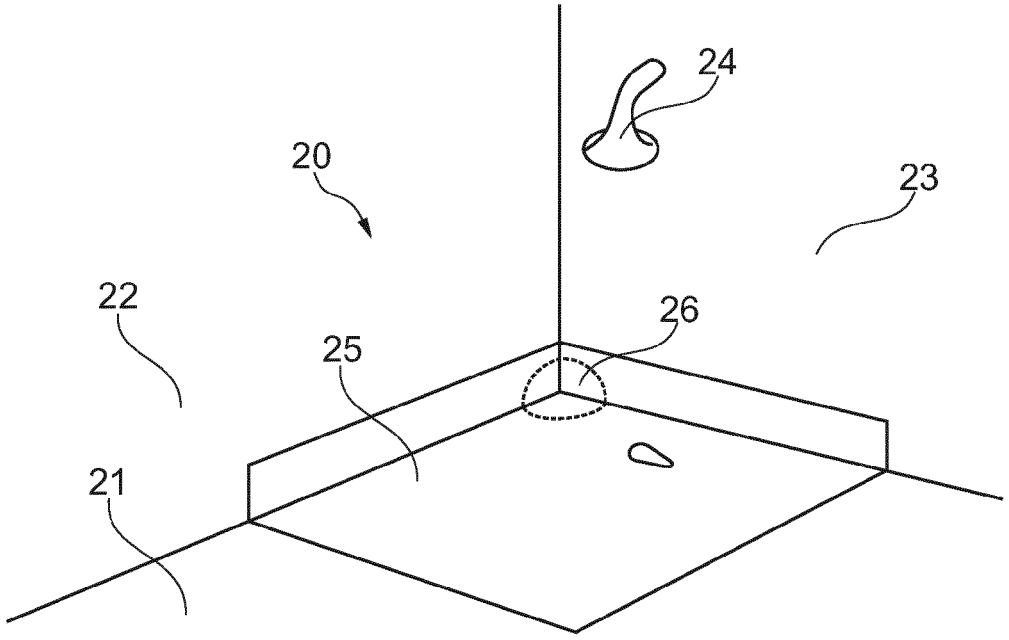

Fig. 3

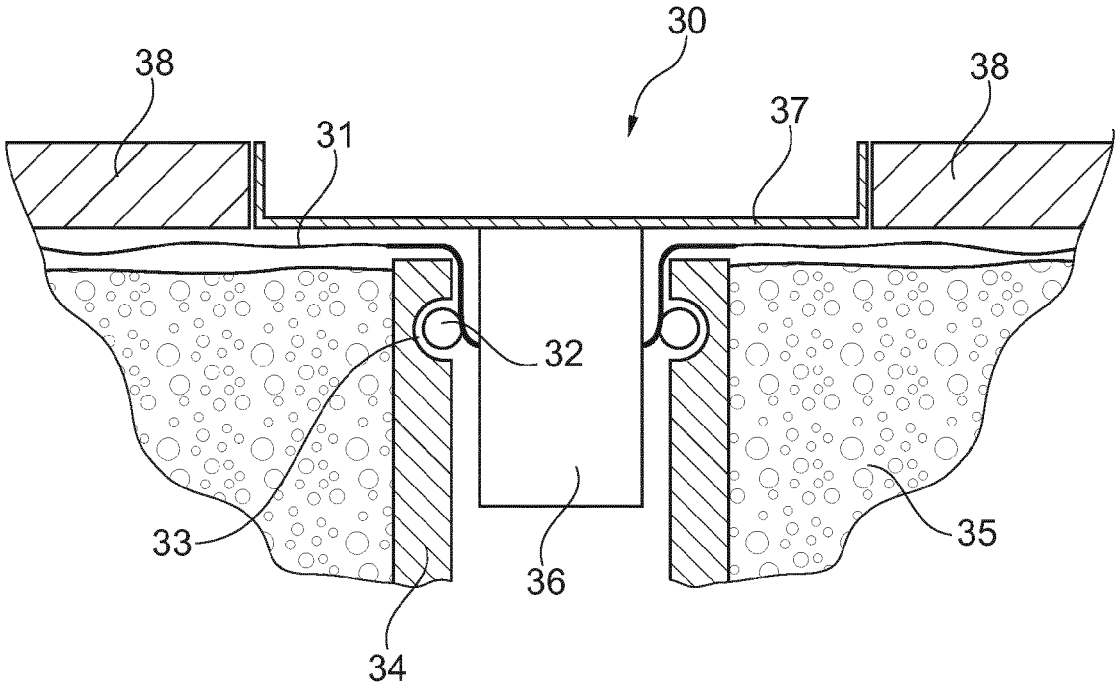

Fig. 4

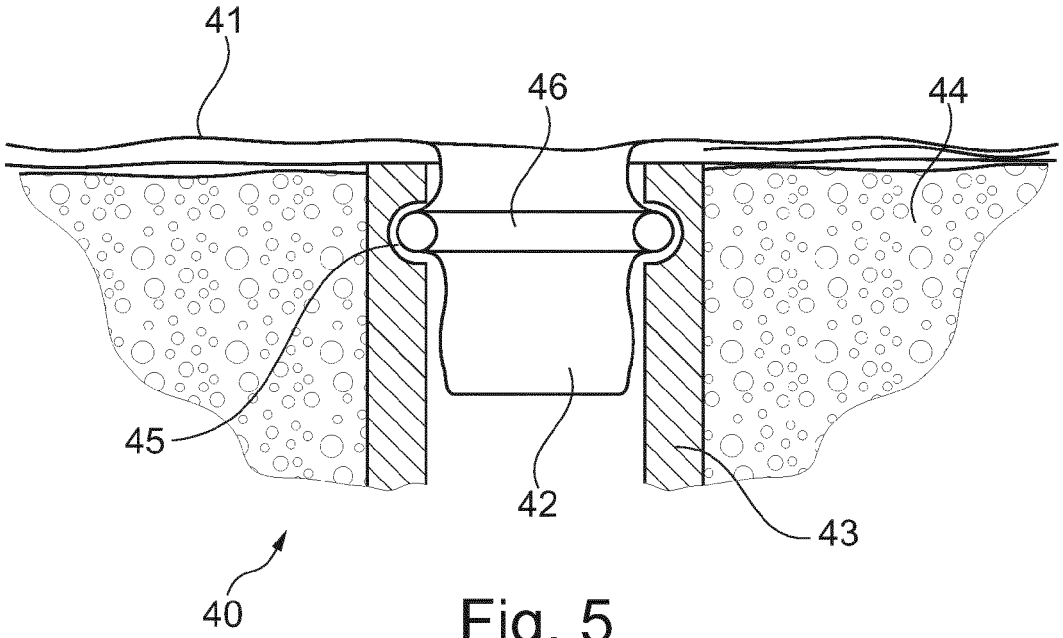

Fig. 5

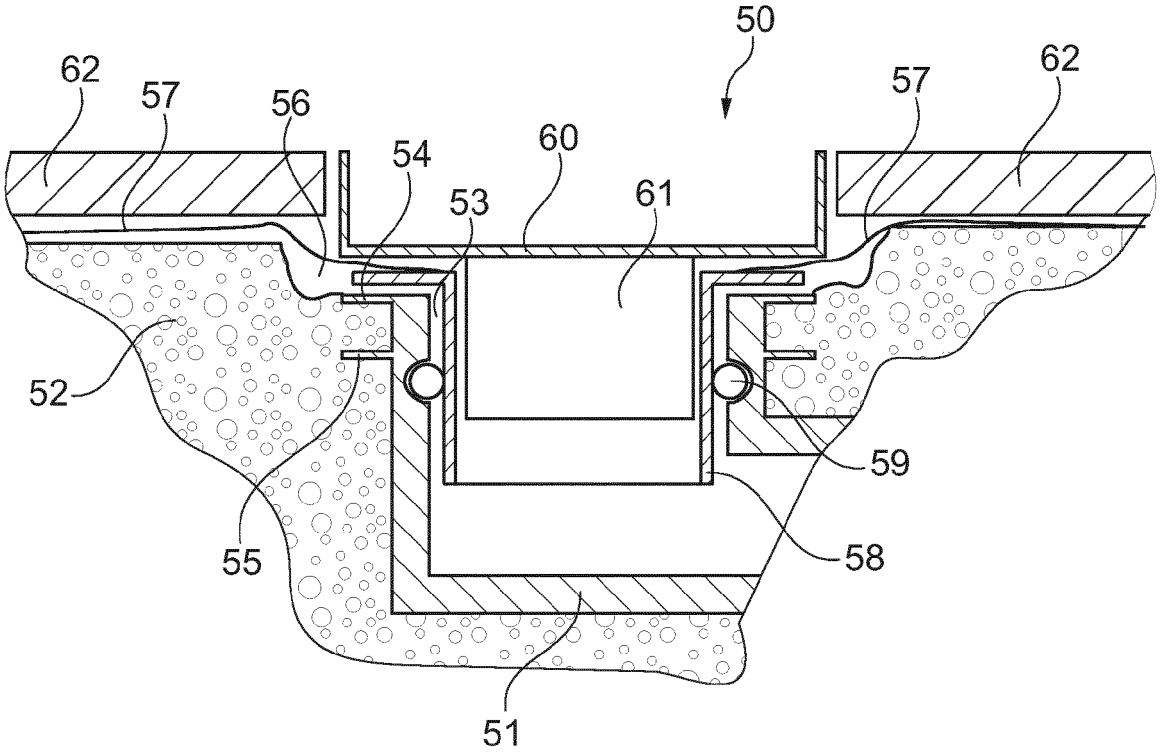
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Fig. 6

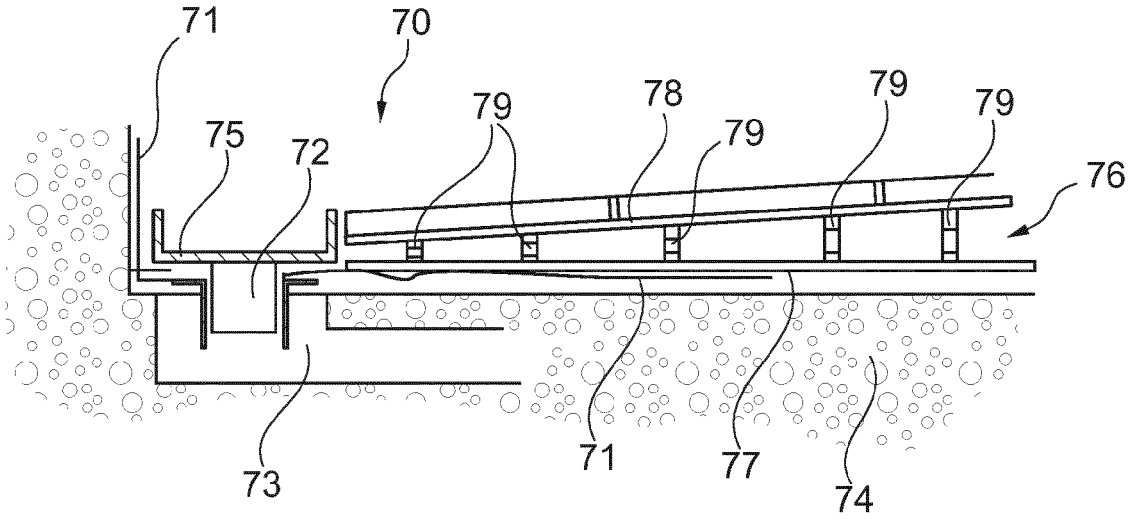
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Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 16 19 0055

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A	* paragraph [0045] - paragraph [0046] * * paragraph [0073] - paragraph [0077]; figures 4,6 *	17	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 January 2017	Urbahn, Stephanie

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 19 0055

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