(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 857 029 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.11.2007 Bulletin 2007/47

(51) Int Cl.:
A47K 3/40 *(2006.01)*

(21) Application number: **07105550.3**

(22) Date of filing: **03.04.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **07.04.2006 DK 200600508**

(71) Applicant: **Polyflex ApS**
7480 Vildbjerg (DK)

(72) Inventor: **Sørensen, Villy Juhl**
7430 Ikast (DK)

(74) Representative: **Nielsen, Leif**
Patrade A/S
Fredens Torv 3A
8000 Aarhus C (DK)

(54) **Floor element and method for making a floor element**

(57) A floor element (1) is disclosed. This can be made as a bowl-shaped basin with a floor surface (2) made integral with side walls. In the floor surface (2) there is provided a drain (5) which is preferably formed in a drain depression (4).

The floor element (1) is made of polymeric concrete and the drain is made integral with the basin, as the stub (5) is cast into the lowest part of the floor surface of the floor element.

With a floor element according to the invention, problems with leaky or deficient sealing joints are avoided, while at the same times the advantages of common cast floor elements are achieved.

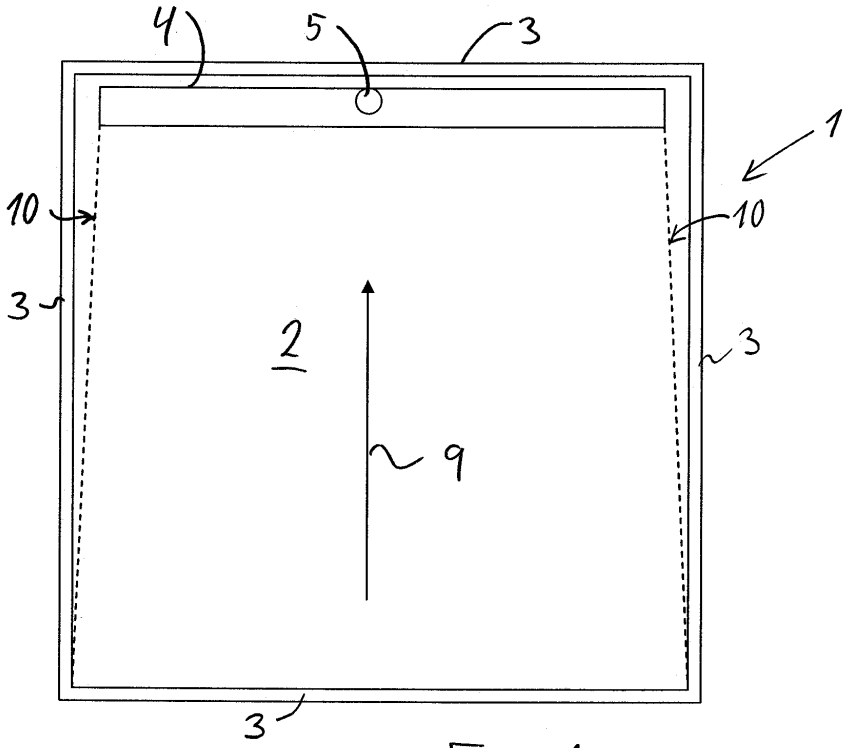

Fig.1

EP 1 857 029 A2

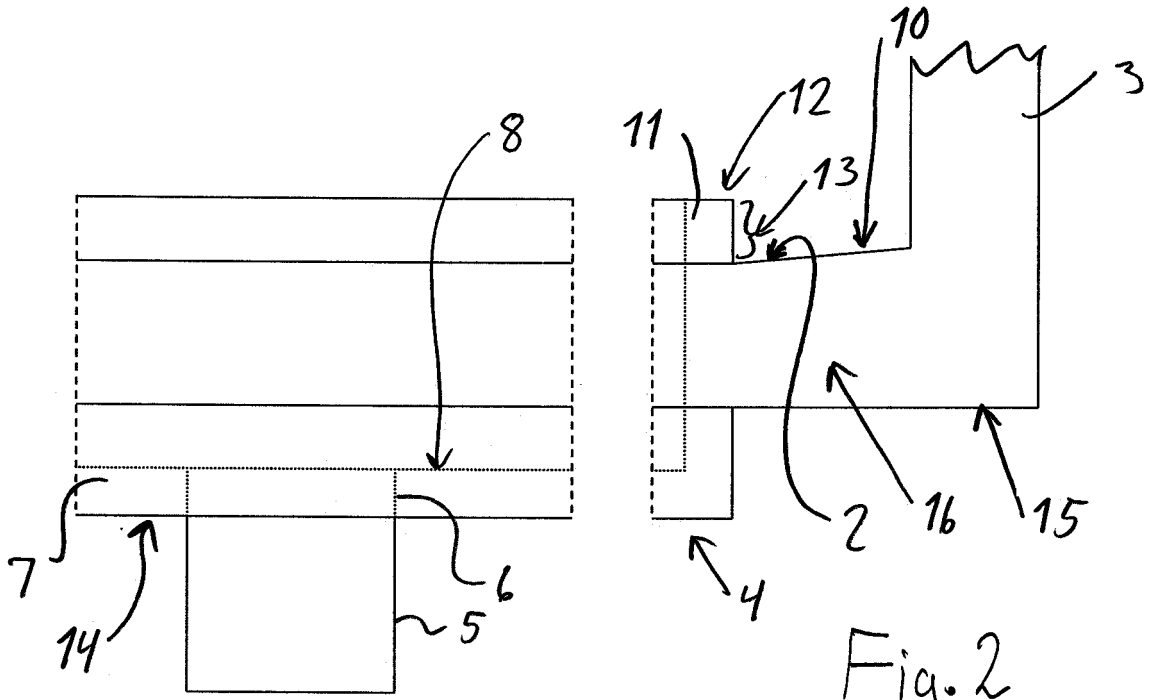

Fig. 2

Description

Field of the Invention

[0001] The present invention concerns a floor element where there is provided at least one side wall around a floor surface integrated with the floor for abutting on a wall in a room in which the floor element is applied, and where a drain is provided in the floor surface.

[0002] The invention furthermore concerns a method for making a floor element where there is provided at least one side wall around a floor surface integrated with the floor for abutting on a wall in a room in which the floor element is applied, and where a drain is provided in the floor surface.

Background of the Invention

[0003] The new wet room regulations require wet room precautions everywhere in the shower booth. Presently, this is effected by applying a kind of rubber skin in a layer thickness of about 2 mm, or by fitting a kind of plates. By the said means it will still be difficult to ensure a 100% sealing at the joints, as e.g. the floor will always work in a different way than the walls. It will also be difficult to ensure sealing between floor and drain bowl/drain depression.

[0004] Various cast floors forming the bottom in wet rooms and in shower booths are known. Such cast floors are cast on site. A drain with drain bowl is selected depending on the shape of the room and/or shower booth. It is possible to mount a drain first and then to cast the floor around the drain. Alternatively, a drain is mounted after casting the floor. In both cases, a sealing joint is to be laid around the drain.

[0005] Moreover, sealing joints are to be laid at the edges of the room/shower booth where the floor surface meets the wall surfaces.

[0006] It is a common problem in bathrooms or other wet rooms that the joints break apart. The joints are often made of silicone. It is not uncommon that such joints will loose adhesion to floor, wall or drain bowl after three to four years.

[0007] Home buyer's reports with marked deficiencies associated with shower booths or wet rooms due to insufficient or defective sealing joints at the bottom of the shower booths will thus appear very frequently.

[0008] Also, it is known with shower booth bottoms which are pre-cast in plastic, glass fibre, steel or ceramics. Such bottoms may be put in place in a bathroom. Together with walls and doors, the bottom will form a complete shower booth or shower cabinet. This will usually be a loose item which may be quickly fitted and removed again. Use of such construction usually necessitates that the floor upon which the bottom is placed, is made according to common sealing requirements for a wet room. The design is inexpedient, as interspaces appear between the bottom and the floor in the room. Moreover, there will be a risk of leaks in pipes connecting a drain from the bottom and a floor drain in the room.

[0009] Such pre-cast shower booth bottoms will usually be bowl-shaped, as a floor surface and side wall extending up from the floor surface will be formed integrally. In such bottoms there will be provided a hole in which a drain or drain bowl is usually retrofitted. Thus there may be a risk of leaking in the rubber joint around the drain in such a pre-cast shower booth bottom.

Object of the Invention

[0010] It is thus the object of the present invention to indicate a floor element of the type specified in the introduction which may be used as floor plate and as a shower booth basin, and which simultaneously enables avoiding the drawbacks of the floor designs that are cast on site and at the same time attain the advantages of prefabricated, pre-cast shower booth bottoms.

[0011] Furthermore, it is desired to secure the most loaded area with regard to the water in a bathroom, namely the shower booth, that the bottom and a section up along the walls are 100% sealed so that the remaining precautions can be made much more easily.

Description of the Invention

[0012] According to the present invention, this is achieved with a floor element of the type specified in the introduction, which is peculiar in that the floor element is cast in polymeric concrete, and that the drain is made integral with the floor element, as a drain stub is cast into a drain area which in use is situated at the lowest part of the floor surface.

[0013] The method according to the invention is peculiar in that the element is cast in polymeric concrete, and that the drain is made integral with the floor element, as a drain stub is cast into a drain area which in use is situated at the lowest part of the floor surface.

[0014] With a system according to the present invention, it will be possible to make a unit cast in one with integrated drain so that a guaranteed sealing is ensured between floor and drain stub/drain bowl and between floor surface and walls in the room where the element is used. Moreover, one may also ensure a guaranteed sealed shower booth. Thus there will be no risk that water draws down into the floor around drain stubs or drain bowls or into the adjacent walls and give rise to damages due to moisture and/or fungal growth. An element according to the present invention will be suited for any type of building, but will particularly be suited for multi-storey buildings.

[0015] With a system according to the invention there is thus achieved an advantage known from the prior art cast-in-one shower booth basins, but may at the same time it may be used in a design in which the construction can be made, as it is known with common cast floor constructions in wet rooms and in shower booths. The only

difference will be that the element is placed on the coarse concrete layer before casting the wearing layer. Polymeric concrete is advantageous as it may be finished and surface coated in a way similar to common concrete, if only treatment of the joints is performed. Thus it will be possible to provide the floor element with tiles, if desired.

[0016] According to a special embodiment, the floor element according to the present invention is peculiar in that around the floor surface there are provided several side walls integrated with the floor for forming a bowl-shaped basin for the formation of a shower booth basin.

[0017] By this new system it is ensured that the most loaded area with regard to the water in a bathroom, namely the shower booth that the bottom and a section up along the wall, preferably minimum 100 mm, are 100% sealed. This renders remaining precautions much easier. A corresponding height of the side walls will, however, also be used even if there is only one or two side walls for disposition against the walls in a room where the element is used as a part of the floor surface of the room.

[0018] According to a further embodiment, the element according to the present invention is peculiar in that the floor surface includes a drain depression with a bottom which is countersunk relative to the remaining part of the floor surface which has an even fall towards the drain depression, and that a drain stub and/or a water trap is cast into the bottom of the drain depression.

[0019] By drain depression as used in the present application is meant any kind of depression or recess. Thus it does not need to be an elongated drain recess. The drain depression may be square, edged, round or have other shapes in which the drain stub is mounted. The floor surface surrounding the drain depression will be at a level higher than the bottom of the drain depression, so that water from the floor surface of the element will run towards the drain depression and then via a fall in the drain depression itself towards the drain stub/water trap which is cast into the bottom of the drain depression. It is possible to make a water trap with so low installation height that the entire water trap can be cast into the bottom, but it is also possible to let a stub from a water trap pass through the bottom and have a drain bowl under the bottom.

[0020] According to a particular embodiment, the element is peculiar in that the drain depression has drain depression wall, the upper edge of which being disposed with spacing above the surrounding part of the floor surface, in order that the floor surface may be covered with a surface covering, e.g. tiles, as the said spacing corresponds to the thickness of the surface covering. Since the drain depression has a drain depression wall, the upper edge of which being provided above the surrounding part of the floor surface, it becomes possible to make a traditional surface covering with linoleum, tiles or other, only ensuring that the drain depression wall has a thickness corresponding to the thickness of the surface covering. Subsequently, it will be possible to place a grate element in the drain depression, if desired. Such a grate element may be disposed on a recess in the drain depression wall or rest directly on the bottom, so that the surface of the drain grate will correspond to the upper edge of the wall and thereby the level of the floor surface in the finished shower booth basin.

[0021] According to a particular embodiment, the element is peculiar in that the drain stub/water trap is formed with a plastic stub which is surface coated on the part passing through the bottom wall and cast therein. Here it is noted that the surface treatment will primarily be provided in the form of grinding and coating with glue and sand which ensure adhering to the polymeric concrete. By such a construction, a particularly secure sealing of the drain is achieved, so that there is no risk of liquid seeping out in the area around the drain.

[0022] The plastic stub is normally to be pretreated over a distance extending more than 20 mm, as such dimension would be sufficient thickness on the bottom wall in a floor element, irrespective whether it is provided in the form of a floor plate or a shower booth basin. Usually there may be used a stub with any diameter. Particularly advantageous will be a standard diameter, e.g. 110 mm stub, which is cast on the bottom wall of the element.

[0023] It is noted that the drain stub/water trap does not have to be located in a drain depression, as the floor element can be made as a floor surface where there is a slope towards the drain stub/water trap, which then will constitute the drain area itself Thus it will be possible to make the floor element as a traditional basin with a drain disposed at the centre of the basin, or make the floor element with the drain at a side wall or a corner of the floor surface of the floor element.

[0024] The side walls in the floor element may have any suitable height. It has appeared sufficient to use a height between 100 and 200 mm. Sufficient height is hereby ensured, where no seeping of water can occur in wet rooms. At the upper edge of the side walls, there may be established a traditional connection to walls disposed above in a room or side walls for a shower booth. Such walls may be provided as side walls that constitute a part of the building construction, or may be separate, independent side walls on a shower booth.

[0025] In order to make the element particularly applicable in connection with traditional construction, according to an advantageous embodiment it is peculiar in that it is adapted to be mounted on a coarse concrete layer for a surrounding floor, and that the floor surface has a thickness corresponding to the wearing layer of the surrounding floor in order to provide the same level for the floor surface of the finished floor inside the element and on the surrounding floor. It will thus be possible to establish floor surfaces in the element, e.g. in a shower booth and the surrounding floor in the wet room at the same level. Alternatively, it is possible to provide different levels between the floor surface of the element and the floor surface in the surrounding room.

[0026] According to a further embodiment, the element according to the invention is peculiar in that the internal

surface of the element is surface treated, preferably by grinding or sandblasting, to ensure adhering of a surface covering which is bonded/glued permanently to the element. By such a design there is achieved a particularly secure bonding of the surface covering, e.g. tiles, wet room vinyl or similar that may be fastened to the element. Since the polymeric concrete in itself constitutes a cast-in-one, sealed structure, there will be no special requirements to the sealing of the surface covering. However, it will be advantageous to provide a secure attachment of such a surface covering to the element.

[0027] When a floor is made around a drain by using a floor element according to the invention, it will be preferred that a coarse concrete layer for a surrounding floor is cast, that the cast floor element is mounted upon the coarse concrete, and that a wearing layer is cast on the surrounding floor with a thickness so that the same level is provided on the surface of the finished floor inside the floor element and on the surrounding floor. By making the floor of the wet room in this way, it will in a particularly simple way be possible to establish the same level for the surface on the floor in the element and for a surrounding floor.

[0028] According to a further embodiment, the element according to the invention is peculiar in that at the bottom of the drain depression wall at the top side of the floor surface, drain holes are provided extending into a drain (the water trap) in order hereby to drain away any water seeping down into the tile bonding, so that it is ensured that this water is not trapped, thereby causing loose tiles and possibly sour odour of moisture.

Description of the Drawing

[0029] The invention will now be explained more closely in the following with reference to the accompanying schematic drawing, where:

- Fig. 1 shows a schematic view of an embodiment of a floor element according to the invention in the shape of a shower booth basin, as seen from above;
- Fig. 2 shows a partial section through a detail of the shower booth shown in Fig. 1;
- Fig. 3 shows a plan view of a further embodiment of a floor element according to the invention in the shape of a shower booth basin;
- Fig. 4 shows a first sectional view through the shower booth basin shown in Fig. 3,
- Fig. 5 shows a second sectional view through the shower booth basin shown in Fig. 3;
- Fig. 6 shows a plan view of a further embodiment of a floor element according to the invention in the shape of a plate-shaped floor element with a side wall; and
- Fig. 7 shows a partial, enlarged sectional view through the floor element shown in Fig. 6.

Detailed Description of the Invention

[0030] Firstly, it is to be noted that the accompanying drawing illustrates non-limiting embodiments of the invention. Other embodiments will be possible within the scope of the present invention as defined in the claims.

[0031] Figs. 1 and 2 show a shower booth basin 1. The shower booth basin has a floor surface 2 which is cast in one with side walls 3 for forming a bowl-shaped basin. At one side of the floor surface 2 there is provided a drain depression 4 in which there is provided a drain stub 5. The drain stub 5 will be a plastic stub which at the part 6 embedded in a bottom wall 7 is surface treated by grinding and application of a mixture of glue and sand. The drain stub may hereby adhere in a particularly secure way to the polymeric concrete used for making the shower booth basin 1.

[0032] As it particularly appears from Fig. 1, the drain depression 4 is provided as an elongated drain depression at one side of the shower booth basin and extending largely in parallel with a side wall 3. The drain stub 5 is provided at the centre of the drain depression, but may be provided at other positions. It is only to be ensured that there is a drop towards the drain stub 5 on the bottom 8 of the drain depression (Fig. 2). Furthermore, it is to be ensured that the floor surface 2 has a fall in direction of the arrow 9, so that water can run towards the drain depression 4. There are provided two rim areas 10 in the basin having a fall directed inwards against the central part and inwards against the drain depression 4.

[0033] As it particularly clearly appears from Fig. 2, the drain depression has a drain depression wall 11. The wall 11 has an upper edge 12 provided at a height 13 above the surrounding part of the floor surface 2. Hereby it will be possible to apply a surface covering in the shower booth basin. The surface covering will have a thickness corresponding to the height 13.

[0034] As it appears from Fig. 2, a drain depression provided in the shower booth basin will have a bottom side 14 located at a level which is lower than the bottom side 15 of the bottom wall 16.

[0035] As alternative to the drain depression, a drain stub 5 will be provided directly in the bottom wall 16.

[0036] Figs. 3-5 show a second embodiment of a shower booth basin 1' having side walls 3 at the sides extending upwards so that they have an internal height of minimum 100 mm. The shower booth basin 1' has a drain depression 4 provided as an elongated drain depression or trench 4 at one side of the shower booth basin and extending largely in parallel with a side wall 3. There is a fall in the direction of the arrow 9. In a corner area 17, there is intended an entrance to the shower booth, and the side wall 18 may here be high or low or sloping to facilitate access, e.g. for wheelchair users.

[0037] In Fig. 4 appears a sectional view according to the arrow IV-IV in Fig. 3. It appears that the drain depression wall 11 around the drain depression 4 is provided with drain holes 19 at the bottom of the basin or the floor

surface 2. A fall in the floor surface 2 is formed between the drain holes 19, ensuring that water is conducted to the drain holes and are not caught in tile bonding laid upon the sealed polymeric concrete. This would otherwise cause the tiles to loosen, and sour odour may arise from the still water in the tile bond.

[0038] In Fig. 5 appears a sectional view and an enlarged detail viewed according to the arrow V-V in Fig. 3. It appears that the drain depression 4 has a drain depression wall 11 along one side of a depression 20 in the bottom wall 16. The drain depression 4 may be provided with a stainless edge cast into the basin 1'. The height of the wall 11 corresponds to the height of tile bonding and tile, and there will be drain holes in the wall 11. An internal corner 21 for a grate 22 is formed in the wall 11 and in the side wall 4. At the bottom of the depression 20 there is embedded a drain stub 5.

[0039] Figs. 6-7 show a further embodiment of an element according to the invention in the form of a floor plate 23. The floor plate 23 has a side wall 3 and a largely rectangular drain 24 which is disposed at the centre of the floor surface 4. Alternatively, the drain 24 may be disposed close to the side wall 3. The floor plate 23 may have a side length between 400 and 7000 mm, preferably about 500 mm, and the drain 24 may have side length between 100 and 200 mm, preferably about 150 mm.

[0040] It appears that the sectional view in Fig. 7 is a drain stub 5 embedded in the bottom wall 16. The drain stub can be integrated with a drain bowl 25 which is also embedded in the bottom wall via a flange 26 in order to establish a secure sealing between the floor and the drain bowl/drain stub. A grate 22 is provided above the drain bowl 25 as it rests on an internal corner in the drain depression wall 11 surrounding the drain 24.

Claims

1. A floor element, where there is provided at least one side wall around a floor surface integrated with the floor for abutting on a wall in a room in which the floor element is applied, and where a drain is provided in the floor surface, **characterised in that** the floor element is cast in polymeric concrete, and that the drain is made integral with the floor element, as a drain stub is cast into a drain area which in use is situated at the lowest part of the floor surface.

2. Floor element according to claim 1, **characterised in that** around the floor surface there are provided several side walls integrated with the floor for forming a bowl-shaped basin for the formation of a shower booth basin.

3. Floor element according to claim 1 or 2, **characterised in that** the floor surface includes a drain depression with a bottom which is countersunk relative to the remaining part of the floor surface which has an even fall towards the drain depression, and that a drain stub and/or a water trap is cast into the bottom of the drain depression.

4. Floor element according to claim 3, **characterised in that** the drain depression has an encircling wall, the upper edge of which being disposed with spacing above the surrounding part of the floor surface, in order that the floor surface may be covered with a surface covering, e.g. tiles, as the said spacing corresponds to the thickness of the surface covering.

5. Floor element according to any preceding claim, **characterised in that** the drain stub/water trap is formed with a plastic stub which is surface coated on the part passing through the floor and cast therein.

6. Floor element according to claim 5, **characterised in that** the plastic stub/water trap is ground and coated with glue and sand in order to ensure adhesion to the polymeric concrete.

7. Floor element according to any preceding claim, **characterised in that** the at least one side wall has a height between 100 and 200 mm.

8. Floor element according to any preceding claim, **characterised in that** it is adapted to be mounted on a coarse concrete layer for a surrounding floor, and that the floor surface has a thickness corresponding to the wearing layer of the surrounding floor in order to provide the same level for the floor surface of the finished floor inside the floor element and on the surrounding floor.

9. Floor element according to any preceding claim, **characterised in that** the internal surface of the floor element is surface treated, preferably by grinding or sandblasting to ensure adhering of a surface covering which is bonded/glued permanently to the element.

10. Floor element according to any of claims 4 -9, **characterised in that** at the bottom of the drain depression wall at the top side of the floor surface there are provided drain holes extending into a drain in order hereby to drain away water seeping down into the tile bonding.

11. A method for making a floor element, where around a floor surface there is provided at least one side wall integrated with the floor for abutting on a wall in a room in which the floor element is applied, and where a drain is provided in the floor surface, **characterised in that** the element is cast in polymeric concrete, and that the drain is made integral with the floor element, as a drain stub is cast into a drain area which in use is situated at the lowest part of the floor

surface.

12. Method according to claim 11, **characterised in that** a coarse concrete layer for a surrounding floor is cast, that the cast floor element is mounted upon the coarse concrete, and that a wearing layer is cast on the surrounding floor with a thickness so that the same level is provided on the surface of the finished floor inside the basin and on the surrounding floor.

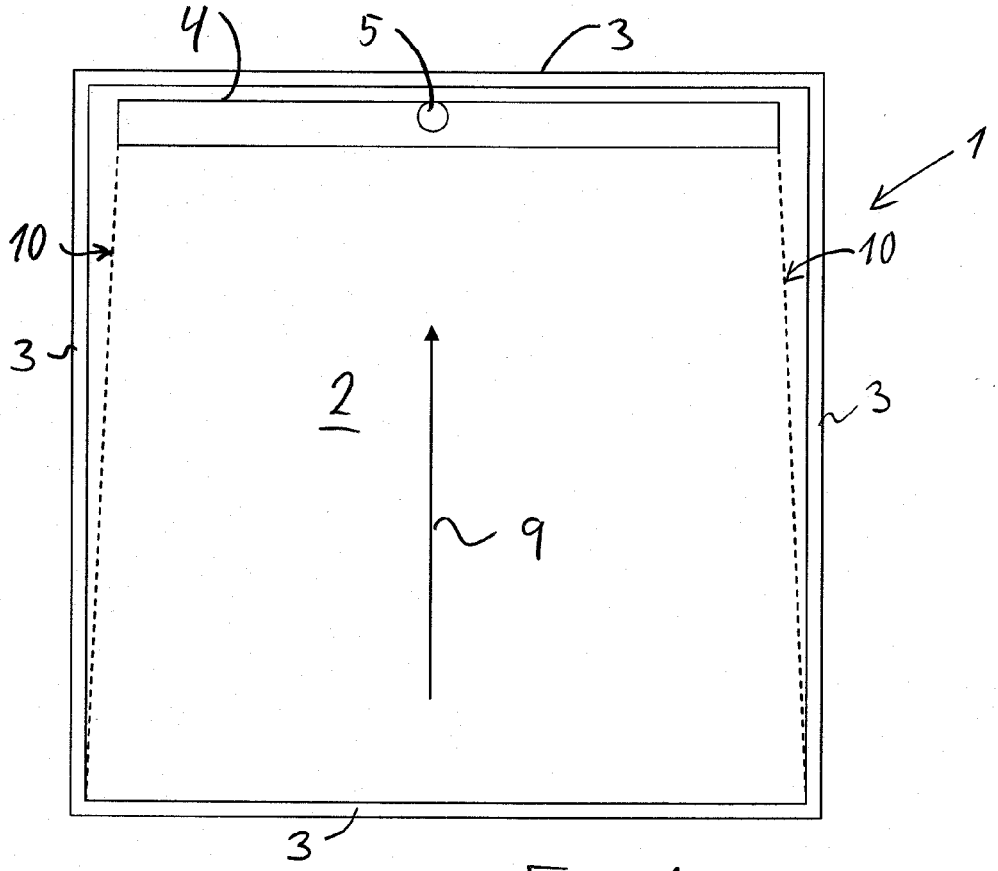

Fig.1

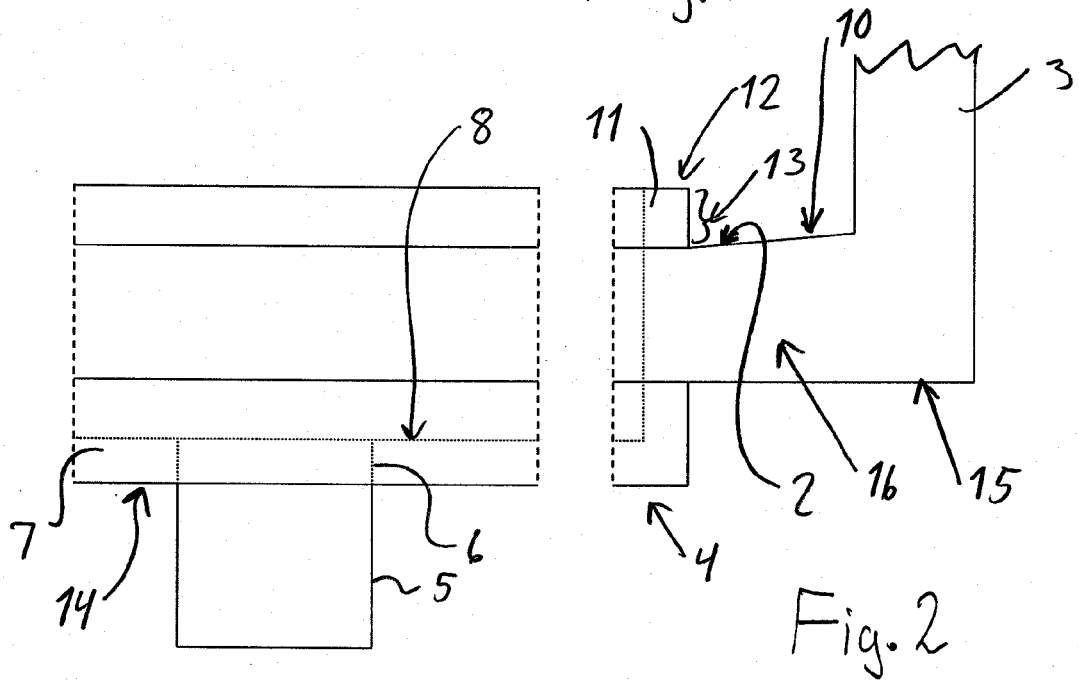

Fig.2

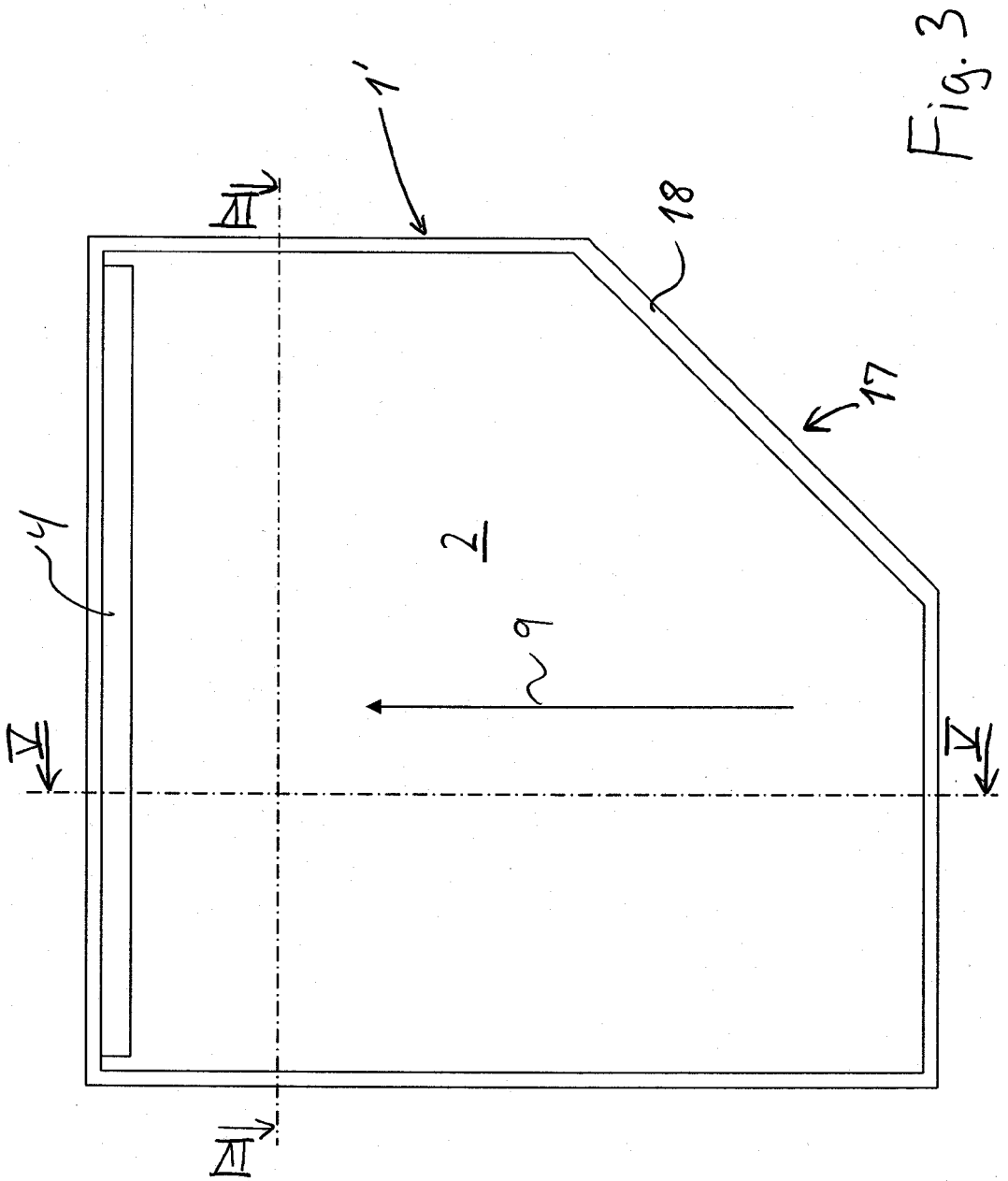

Fig. 3

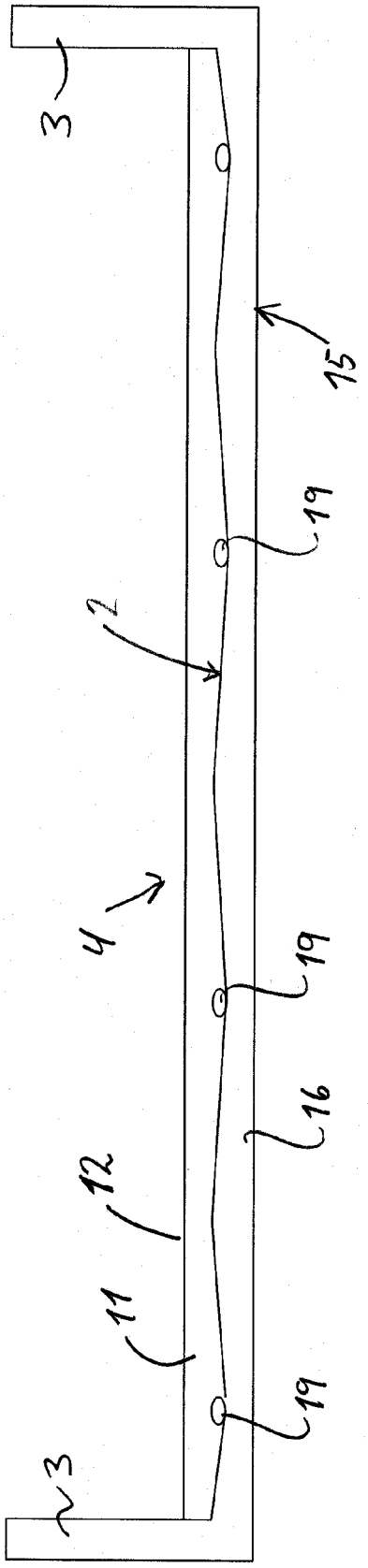

Fig. 4

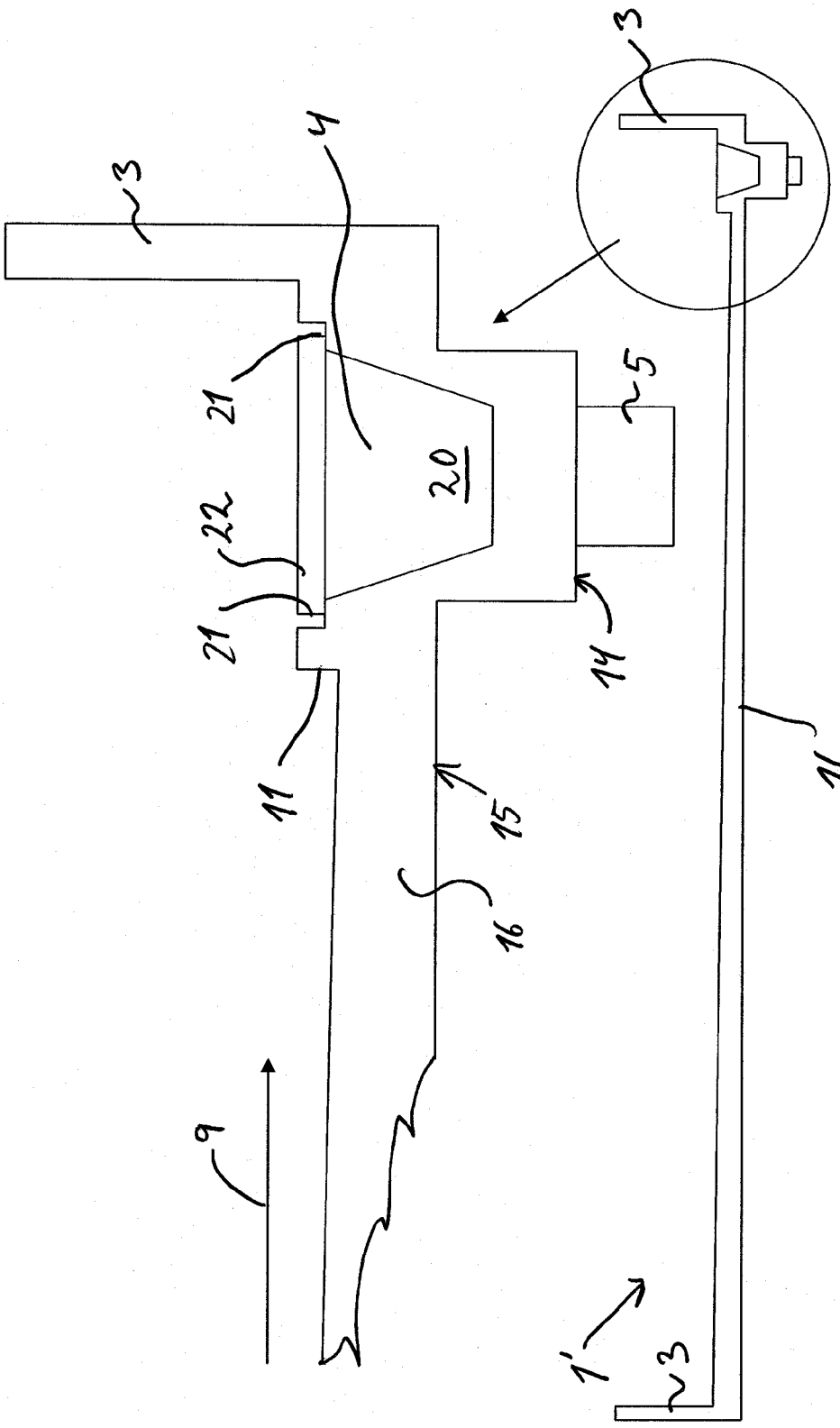

Fig.5

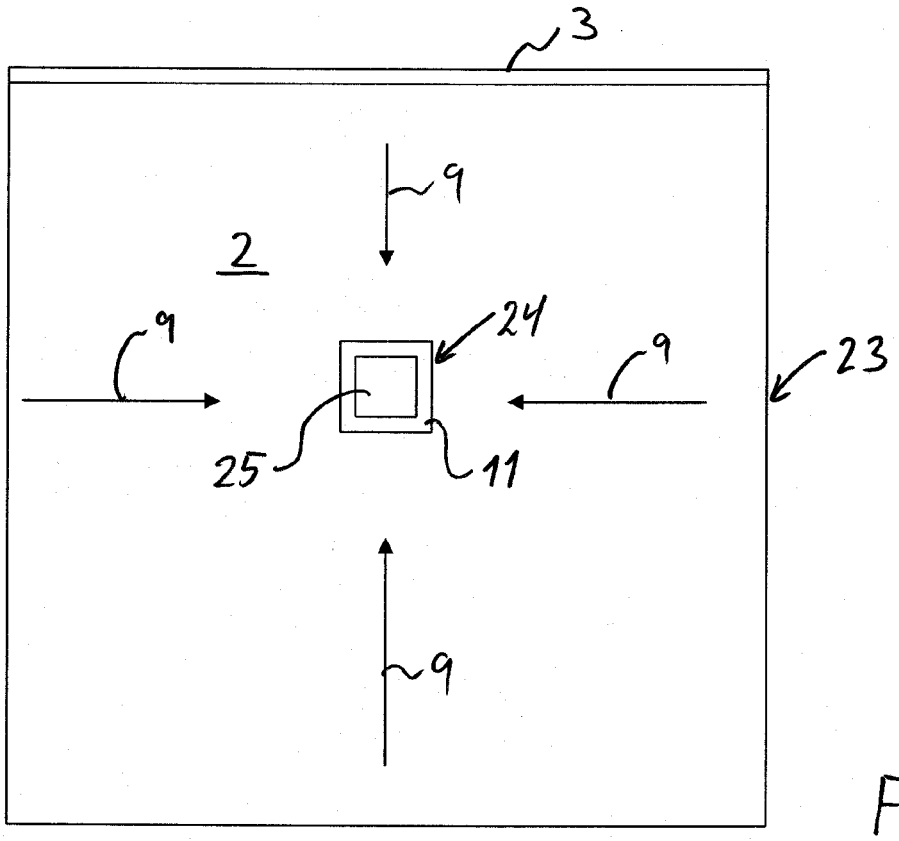

Fig. 6

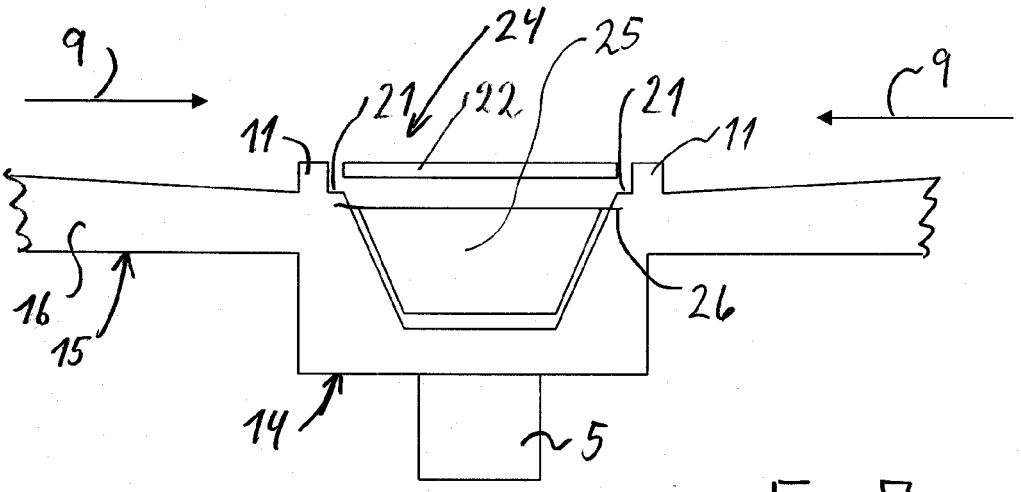

Fig. 7