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(54) **Drainage device for shower tray**

(57) A drainage device (1) for a shower tray (2; 2'') having an outlet depression (3; 3'; 3'') with an open bottom and having a cup-shaped collecting means (4; 4') which surrounds the outlet depression (3; 3'; 3'') and has at its top an edge portion (5) for sealing engagement with the underside of the shower tray.

The drainage device further has a pressing means (6) for pressing the collecting means against the under-

side of the floor (7; 7'') of the shower tray for sealing along said edge portion (5), at least one peripheral collection space (8) forming between the outlet depression (3; 3'; 3'') and the collecting means (4; 4').

The collecting means (4; 4') has, in its side, an outlet (9; 9') leading to a duct (10) which extends essentially along the underside of the shower floor (7; 7'') and is connectible to a drain, the outlet (9; 9') communicating directly with said peripheral collection space (8).

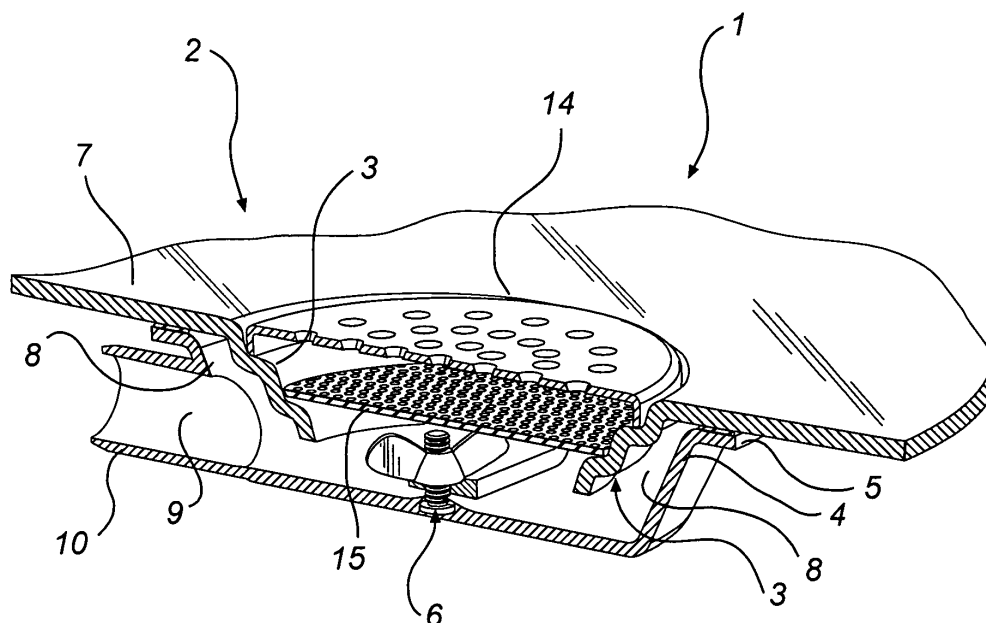


Fig. 2

Description

Technical Field

[0001] The present invention relates to a drainage device for a shower tray having an outlet depression with an open bottom. The drainage device is intended for use in a shower room in general, but is preferably intended for elderly, motor-handicapped or wheelchaired people.

Background Art

[0002] By drainage devices are meant devices of the type which is used in shower rooms or shower cabinets for draining off shower water from the surface of the shower floor and in which the shower water finally reaches a drain.

[0003] In connection with installations of shower trays, especially in shower tray arrangements suitable for disabled people, one wants the overall height of the tray, i.e. the distance between the underlying floor, for instance in a shower room, and the floor of the actual shower tray, to be as low as possible. There are several reasons why the overall height should be low. For instance, people with reduced ability to move, such as wheelchaired people, in many cases need a ramp to be able to get over the edge of the shower tray. Another aspect is that the weight of the shower tray can be reduced if the overall height is low.

[0004] When a shower tray is installed, for example, by way of an outlet duct to an existing drain in the shower space, the shower tray is in many cases placed over this drain which thus is covered, thereby making cleaning of the existing drain difficult. Consequently, this places great requirements on the drainage device so that hair, dirt and other accumulating particles will be stopped and then can easily be removed from the drainage device.

[0005] Prior-art drainage devices are mounted in a hollow bottom portion which usually is countersunk into a shower tray. In that case the drainage device often consists of an upper externally threaded sealing sleeve which is placed in the bottom portion on the upper side of the shower tray. The drainage device further has an internally threaded sealing socket which is placed in the bottom portion on the underside of the shower tray. The sealing socket has an outlet duct which is connected thereto and which leads to, for instance, a floor drain. The drainage device is held together and sealed by the sealing socket being fitted on the sealing sleeve, whereby the respective elements abut against respectively the upper side and the underside of the shower tray.

[0006] A problem with this prior-art technique is to ensure that the sealing sleeve and the sealing socket fit tightly against the shower tray. A further problem with prior-art technique is that it is usually necessary to put the shower tray on its lateral edge so as to allow the sealing socket to be easily reached. This procedure occurs, for instance, when the connecting duct is to be ori-

ented towards a drain before the shower tray is arranged horizontally. Another corresponding problem according to prior art arises when hair, dirt and other particles accumulate and the pipe socket should be released, in which case the shower tray may again need to be put on its lateral edge for releasing the pipe socket.

[0007] According to prior-art technique, it is also difficult to provide a low overall height without negatively affecting the flow on its way towards the drain.

[0008] The object of the present invention is to provide a drainage device according to one or more of the following points:

- that the drainage device ensures a good draining function
- that the sealing of the drainage device is easy and reliable
- that the drainage device comprises few components and that the mounting thereof is easy
- that the drainage device is flexible and has as low an overall height as possible
- that the drainage device is easy and inexpensive to manufacture.

Summary of the Invention

[0009] One object of the present invention therefore is to provide a drainage device which satisfies one or more of the above points. A further object is to solve one or more of the above problems.

[0010] This is achieved by the drainage device defined by way of introduction further having a cup-shaped collecting means which surrounds the outlet depression and has, at its top, an edge portion for sealing engagement with the underside of the shower tray. Moreover the drainage device has a pressing device for pressing the collecting means against the underside of the floor of the shower tray for sealing along said edge portion, at least one peripheral collection space forming between the outlet depression and the collecting means. The collecting means further has, in its side, an outlet leading to a duct which extends essentially along the underside of the shower floor and is connectible to a drain, the outlet communicating directly with said peripheral collection space.

[0011] When the drainage device is mounted as intended in a shower space, the pressing device will thus forcefully press the cup-shaped collecting means at the edge portion to seal against the underside of the shower tray. Moreover, when using the drainage device, for instance shower water will flow along the shower tray and down into the outlet depression. Subsequently the shower water flows from the bottom of the outlet depression on to the collecting means. From there the shower water flows to the peripheral collection space which is located between the collecting means and the outlet depression. The shower water then flows from the collection space through the outlet to the duct which is con-

nected to a drain or the like.

[0012] By cup-shaped collecting means is in the first place meant a vessel-shaped cavity or cup for collecting liquid and the like. The peripheral collection space is in the first place the boundary area which forms on the outside of the outlet depression adjacent to at least an outer portion of the inside of the collecting means and which is positioned between the outlet depression and the collecting means.

[0013] Thus the drainage device allows good drainage while at the same time a device requiring a minimum space above all in the vertical direction is ensured. The drainage device also allows easy and reliable sealing. Moreover the drainage device has a small number of components, which allows easy mounting thereof.

[0014] The pressing device is preferably operable from the upper side of the floor of the shower tray. This gives the advantage that the pressing force can be controlled in an easy way without requiring access from the underside of the shower tray. For instance mounting and dismounting can take place without having to put the tray on one of its lateral edges.

[0015] The cup-shaped collecting means is preferably turnable relative to the shower tray for orienting said outlet. This means that the outlet, and its duct, can easily be oriented towards, for instance, a connecting drain, such as a floor drain.

[0016] The outlet depression suitably is formed in one piece with the floor of the shower tray. This facilitates mounting of the drainage device since these parts are made in one piece when being manufactured. Moreover drainage occurs in a reliable and tight manner.

[0017] The outlet depression advantageously has a highest liquid passage extending a distance under a lowest liquid passage of said outlet to provide, in said collection space, a water trap function in the drainage device. In this way, odorous gases from the drainage device can be prevented from spreading in the shower room. Moreover the drainage device can be connected, for instance, to a drain that has no water trap.

[0018] The outlet depression is suitably funnel-shaped and thus obtains good drainage and flow of shower water or the like. Moreover it will be possible to insert and arrange suitable functional means in the funnel-shaped outlet depression.

[0019] The outlet depression is advantageously covered with at least one removable strainer means. The drainage device can thus easily stop and separate hair, dirt, particles and objects that should not get into the collecting means and subsequently into the drain. Furthermore the drainage device can easily be cleaned by means of the removable strainer means.

[0020] The outlet depression is advantageously stepped with associated steps intended for at least one strainer means. Moreover, the stepped makes it possible to arrange a plurality of functional means, such as a pressing device for applying a force, for instance, on the collecting means.

[0021] The outlet depression has advantageously a portion bridging the same, which serves as abutment for the pressing device. The bridging portion will have the function of being an abutment for the pressing device and also provide a possibility of attaching the pressing device. For example, the pressing device is a screw joint. The collecting means can thus easily be attached and sealed against the underside of the shower tray. Moreover the pressing device can easily be operated and controlled.

Brief Description of the Drawings

[0022] The invention will now be described with reference to the accompanying drawings which by way of example illustrate preferred embodiments of the invention.

[0023] Fig. 1 is a schematic exploded view of a drainage device according to a first embodiment of the invention.

[0024] Fig. 2 is a schematic cross-sectional view of the drainage device, in the assembled state, in Fig. 1.

[0025] Fig. 3 is a schematic vertical section of a drainage device according to a first embodiment of the invention.

[0026] Fig. 4 is a schematic vertical section of a drainage device according to a second embodiment of the invention.

[0027] Fig. 5 is a schematic exploded view of a drainage device and a portion of a shower tray, according to a third embodiment of the invention.

Description of Preferred Embodiments

[0028] Fig. 1 illustrates a piece of a shower tray 2 with a drainage device 1 according to a first preferred embodiment of the invention. The arrangement is, for instance, intended to be installed in a bathroom or the like, to replace an existing bathtub. Since parts in addition to the drainage device in the shower tray do not directly constitute part of the present invention, they are not shown in the drawings and will thus not be described.

[0029] The shower tray has a floor 7 which comprises at least one outlet depression 3 having an opening in a lower edge portion 17. The floor of the shower tray has, in the intended position in the shower room, suitably a surface with such an inclination that any liquids flow towards the outlet depression 3. The shower tray is preferably made in one piece of preferably glass fibre reinforced polyester, but, of course, other materials are conceivable, such as other plastics and composites, also stainless steel or enamelled sheet metal.

[0030] The outlet depression 3 is suitably stepped and is circular in cross-section, the outlet depression stepwise decreasing in diameter away from the floor 7 to the lower edge portion 17.

[0031] According to Fig. 1, the outlet depression 3 is preferably, but not necessarily, provided with a bridging

portion 16 which extends between at least two side portions of the outlet depression 3. In the central part of the bridging portion 16 there is, for instance, a hole 22 which is intended for a pressing device 6. In the currently preferred embodiment, the lower edge portion 17 has two semilunar holes 18 with their respective straight sides directed towards each other, towards the centre of the intermediate bridging portion 16.

[0032] The drainage device 1 has a cup-shaped collecting means 4, which preferably is essentially circular in cross-section but can, of course, have other shapes, such as oval, square or some other kind of polygonal shape. The cup-shaped collecting means 4 is at its upper side provided with an upper edge portion 5. The edge portion 5 can suitably be provided with a corresponding circular sealing means 19, such as a packing of, for instance, rubber. The collecting means 4 tapers, for instance, in a funnel-shaped manner, the diameter decreasing slightly from the edge portion 5 to the bottom of the collecting means. In the bottom portion of the collecting means, there is in the centre a fastening element 21, for instance fixed by casting, of said pressing device 6, said fastening element 21 preferably being a screw. The threaded free end of the screw 21 is directed towards the centre of the cup of the collecting means 4. The pressing device can, of course, be of some other type than a screw joint, such as splines, key and mechanical joint, and also press and shrink fit.

[0033] The collecting means 4 has in its one side wall, between its bottom portion and the edge portion 5, an outlet 9 with a preferably tubular duct 11. The duct 10 is essentially parallel to the circular cross-section of the collecting means. The duct is further connected, by way of an extension duct 20, to preferably a drain 11, such as a floor drain. The collecting means 4 is suitably, in its bottom portion, provided with an arrow (not shown) indicating the direction of the outlet 9, for example for orienting the collecting means 4 towards a floor drain 11.

[0034] With reference once more to Fig. 1, the collecting means 4 is adapted to abut against the underside of the shower floor 7 along the edge portion 5 with the intermediate sealing means 19. Moreover, the screw 21 of the collecting means is insertable into the hole 22 in the bridging portion 16. The screw 21 is adapted to receive a fastening means 23, such as a wing nut, to allow the connection to be accomplished when the screw 21 is in the hole 22 of the bridging portion 16.

[0035] The drainage device according to the first embodiment, which is shown in the assembled state in Fig. 2 and in a cross-sectional side view in Fig. 3, has preferably an upper strainer means 14, which has a set of coarse straining holes. The upper strainer means 14 suitably abuts at the bottom against a first of the steps of the outlet depression 3. At the top, the surface portion of the strainer means 14 is essentially flush with the neighbouring surface portion of the shower floor 7.

[0036] The drainage device 1 suitably has also a lower strainer means 15 which has a set of fine straining

holes. The lower strainer means 15 suitably abuts with its underside against a second of the steps of the inlet depression 3. The lower strainer means 15 further has on its top surface a projecting portion (not shown), whereby the strainer means can easily be removed from the outlet depression for cleaning. The strainer means 14, 15 which are placed in the preferably stepped outlet depression are arranged at a distance from each other that is adapted to the respective hole diameters of the strainer means, with regard to flow and in consideration of a large amount of hair and dirt that is often accumulated in use.

[0037] With reference to Fig. 3, the drainage device 1 according to the first embodiment forms between the outlet depression 3 and the collecting means 4 a peripheral collection space 8. The collection space 8 which preferably is positioned outside and round the outlet depression 3 communicates directly with the outlet 9. The collection space 8 can thus hold an amount of liquid which can then flow on, in direct connection, to the outlet 9.

[0038] The function of the drainage device will now be described. Once the drainage device, as shown in Figs 2 and 3, is arranged in the intended place in an assembled drainage device 1, the pressing device 6 will hold the collecting means in place in, at least indirectly, sealing engagement with the underside of the shower floor.

[0039] When the collecting means 4 is arranged in the intended place on the underside of the shower floor 7, the screw 21 is inserted into the hole of the bridging portion 16. In this position, before the wing nut 23 is tightened, the collecting means 4 is preferably turnable through 360 degrees relative to the shower floor 7 for putting the duct 10 in a suitable direction.

[0040] Moreover, when the wing nut 23 or the like is fitted on the screw 21 and the intermediate bridging portion 16, the edge portion 5 of the collecting means is pressed against the underside of the shower floor 7 by means of the bridging portion 16 which acts as an abutment. The collecting means 4 is thus held in place by an essentially axial force which is applied by the pressing device 6.

[0041] In the case where, for instance, a person steps on the upper strainer means 14, the person's weight does not act on the pressing device 6 but is taken up by the subjacent step of the outlet depression.

[0042] In use of the drainage device mounted in the intended place, any shower water will follow the floor upper side of the shower tray and flow down into the outlet depression and through the respective strainer means 14, 15. Any hair and other particles are stopped by the strainer means 14, 15. If hair and dirt are possibly stopped by the strainer means 14 or the strainer means 15 depends on the diameter of the straining holes of the strainer means 14, 15, see Fig. 1.

[0043] The shower water that has passed through the strainer means 14, 15 and the outlet depression 3 flows down into the more central bottom portions of the col-

lecting means 4. From there the shower water flows to the peripheral collection space 8 which is positioned between the collecting means and the outlet depression. From the collection space 8 the shower water flows on through the outlet 9 to the duct 10 which is connected to a floor drain 11 or the like.

[0044] With reference once more to Fig. 1, the shower tray 2 is, as mentioned above, in many cases placed over the floor drain 11 and will thus not be directly accessible for cleaning for instance. The drainage device 1 stops and separates with the aid of the strainer means hair and dirt which otherwise might get into the existing floor drain 11 with a possibly ensuing clogging of the floor drain 11. The strainer means 14, 15 can thus be removed from the outlet depression 4 and cleaned.

[0045] Since the existing arrangement is preferably made of glass fibre reinforced plastic and the drainage device is suitably made of a plastic material, both exhibiting the material properties that are required according to one or more of the objects of the invention, it is possible to manufacture the drainage device in a cost-effective fashion. Thus, according to the description above, a drainage device is provided which, relative to prior art, has a good throughput to the drain while at the same time a very low overall height is made possible. Prior-art drainage devices often have an overall height of 90-100 mm. The drainage device according to the present invention has an overall height which can be lower than 90 mm, preferably in the range 35-90 mm, more preferred in the range 40-80 mm, and most preferred in the range 55-70 mm.

[0046] Moreover, the outlet depression 3 and the collecting means may have, relative to prior-art, a great diameter in combination with said low overall height. The minimum measurement of the overall height is limited only by the vertical measurement of the outlet depression, the other parameters being adjustable.

[0047] With reference to Fig. 4, a second embodiment of the present invention will now be described. The definitions, components and variations of the previously described first embodiment, that will not be directly mentioned below in connection with the second embodiment, are similar to those of the second embodiment, and therefore the description thereof will be omitted with reference to the description above.

[0048] As is evident from Fig. 4 which schematically illustrates a second embodiment of the drainage device in the assembled state, the collecting means 4' has at its outlet 9' a lowest liquid passage 13' which, for instance, is slightly raised to prevent water from flowing out through the outlet 9'. Furthermore, a highest liquid passage 12' of the outlet depression 3' extends under the lowest liquid passage 13' of the outlet 9'. As a result, the drainage device 1' obtains a water trap function. Thus according to the second embodiment of the invention, there may be water in the collection space 8' and also at the inner side of the outlet depression 3' adjacent to the highest liquid passage 12', thereby preventing

odorous gases from spreading from the drainage device.

[0049] With reference to Fig. 5, a third embodiment of the present invention will now be described. The definitions, components and variations of the previously described embodiments, that will not be directly mentioned below in connection with the third embodiment, are similar to those of the other embodiments, and therefore the description thereof will be omitted with reference to the description above.

[0050] Fig. 5 shows schematically a third embodiment of the drainage device in parts and a portion of a shower tray. In contrast to the first and second embodiments, the drainage device has a separate outlet depression 4" which is connectible to the floor 7" preferably on the underside of the floor. The outlet depression 4" has a shape that is adapted to an opening 24" in the shower floor 7.

[0051] The outlet depression 4" is preferably welded to the floor 7 but may, of course, be attached by means of some other permanent joint, such as a glue or rivet joint. Also removable joints, such as screw, splines, key and mechanical joints, and also press and shrink fits are conceivable.

[0052] It is thus possible to make the outlet depression 4" of a different material which ensures the desirable material properties of the drainage device.

[0053] It will be appreciated that the above-described embodiments of the invention can be modified and varied by a person skilled in the art without departing from the inventive idea defined in the claims. For instance, the drainage device described above can with relatively simple means be adjusted in order for the collecting means 4 also to comprise, in its side, an inlet which allows a plurality of drainage devices to be connected to each other in one or a plurality of shower trays 2.

[0054] The drainage device can also have other shapes than those stated above. It goes without saying that, for instance, the stated preferably circular holes, openings, ducts and the like can have another cross-section, such as oval or polygonal. Moreover, the drainage device may consist of several parts which in some applications can facilitate mounting, dismounting and manufacture.

[0055] Further the drainage device may consist of a plurality of different materials which exhibit the elastic properties that are required according to the objects of the invention.

[0056] The peripheral collection space may also consist of only one piece of the entire periphery of the collecting means.

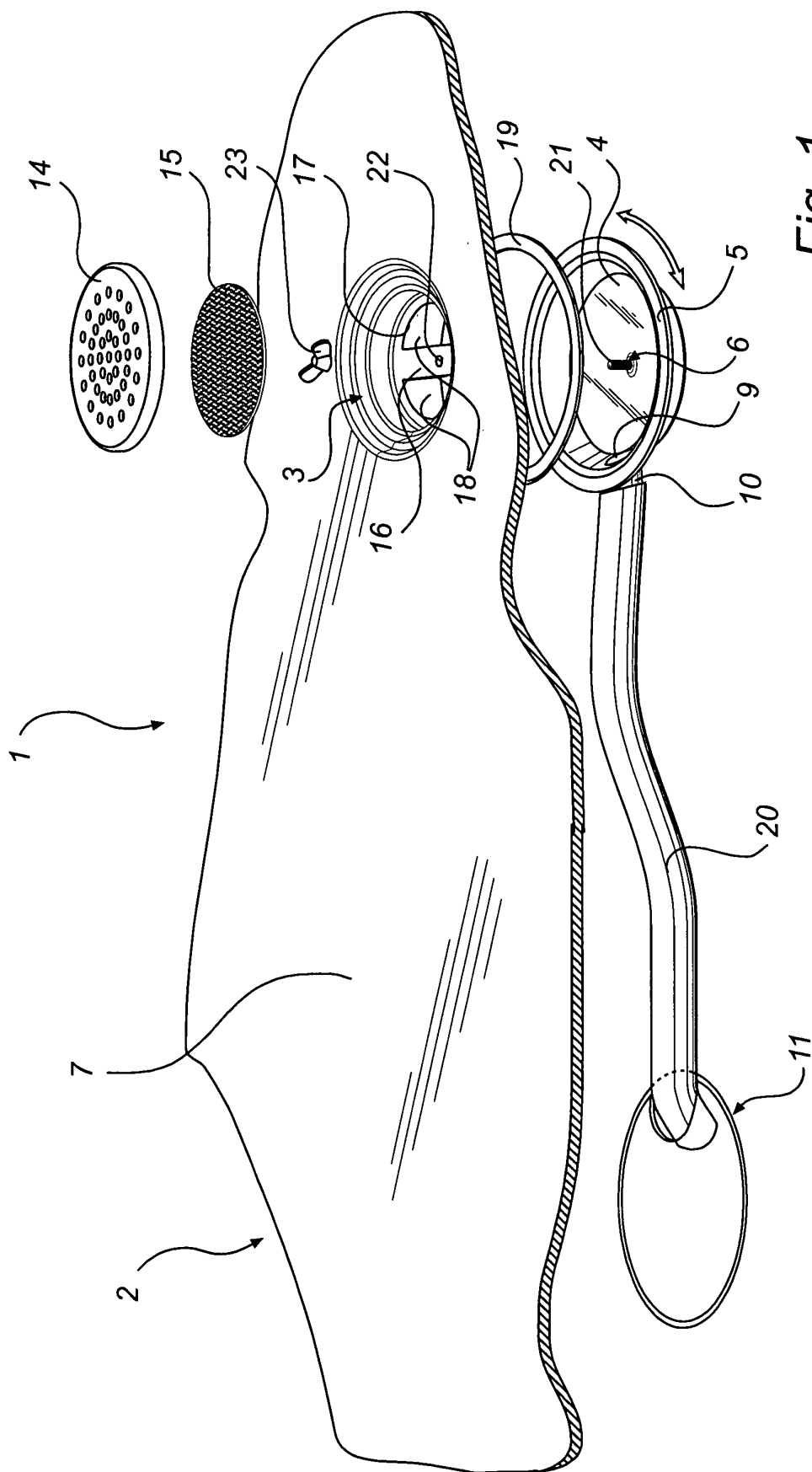
[0057] The drainage device according to the third embodiment can also be adjusted so that the pressing device also applies a force on the upper side of the floor, thereby obtaining the required tightness in the drainage device.

[0058] Moreover, the drainage device can with relatively simple means be adjusted for other applications,

such as bathtubs, whirlpools, liquid containers and other tub-like containers having a hollow bottom portion.

Claims

1. A drainage device (1) for a shower tray (2; 2") having an outlet depression (3; 3'; 3") with an open bottom, **characterised in that** the drainage device (1) further comprises
 - a cup-shaped collecting means (4; 4') which surrounds the outlet depression (3; 3'; 3") and has, at its top, an edge portion (5) for sealing engagement with the underside of the shower tray, and
 - a pressing device (6) for pressing the collecting means against the underside of the floor (7; 7") of the shower tray for sealing along said edge portion (5),
 - at least one peripheral collection space (8) forming between the outlet depression (3; 3'; 3") and the collecting means (4; 4') and
 - the collecting means (4; 4') having, in its side, an outlet (9; 9') leading to a duct (10) which extends essentially along the underside of the shower floor (7; 7") and is connectible to a drain (11), the outlet (9; 9') communicating directly with said peripheral collection space (8).
2. A drainage device (1) as claimed in claim 1, **characterised in that** the pressing device (6) is operable from the upper side of the floor (7; 7") of the shower tray.
3. A drainage device (1) as claimed in claims 1 and 2, **characterised in that** the cup-shaped collecting means (4; 4') is turnable relative to the shower tray (2; 2") for orienting said outlet (9; 9').
4. A drainage device (1) as claimed in claims 1-3, **characterised in that** the outlet depression (3; 3') is formed in one piece with the floor (7) of the shower tray.
5. A drainage device (1) as claimed in claims 1-4, **characterised in that** the outlet depression (3'; 3") has a highest liquid passage (12') extending a distance under a lowest liquid passage (13') of said outlet (9') in order to establish, in the collection space (8), a water trap function in the drainage device.
6. A drainage device (1) as claimed in claims 1-5, **characterised in that** the outlet depression (3; 3'; 3") is funnel-shaped.
7. A drainage device (1) as claimed in claims 1-6, **characterised in that** said outlet depression (3; 3'; 3") is covered with at least one removable strainer means (14, 15).
8. A drainage device (1) as claimed in claims 1-7, **characterised in that** said outlet depression (3; 3'; 3") is stepped with associated steps intended for at least one strainer means (14, 15).
9. A drainage device as claimed in claims 1-8, **characterised in that** the outlet depression (3; 3'; 3") has a portion (16) which bridges the same and which serves as abutment for the pressing device (6).
10. A drainage device as claimed in claims 1-9, **characterised in that** the pressing device (6) consists of a screw joint.



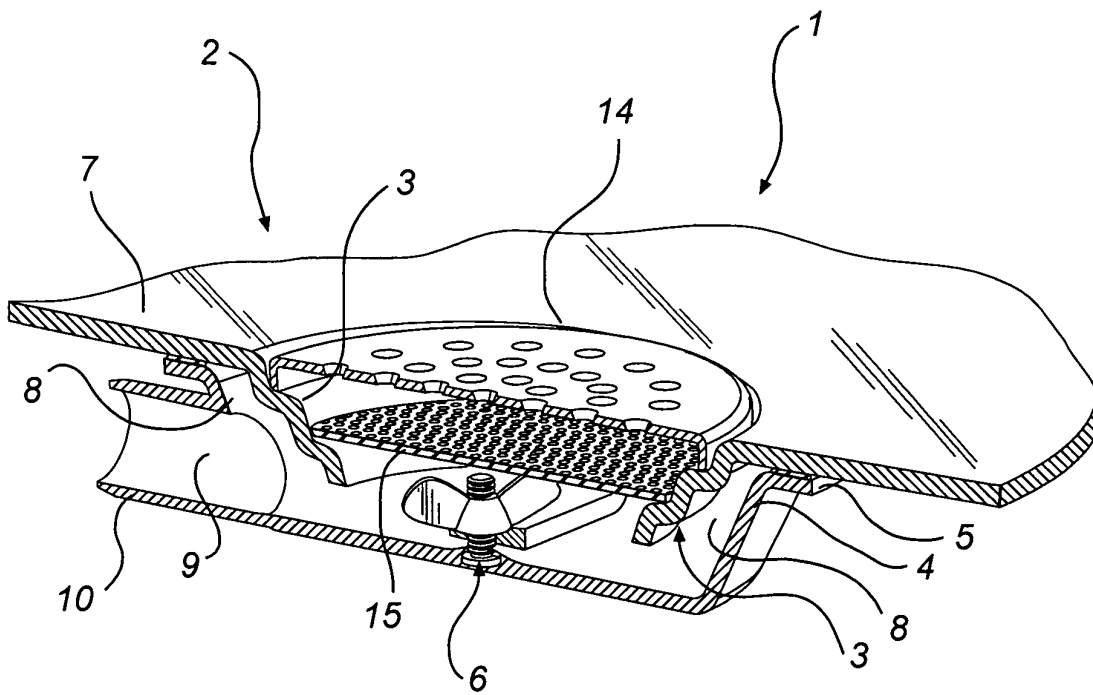


Fig. 2

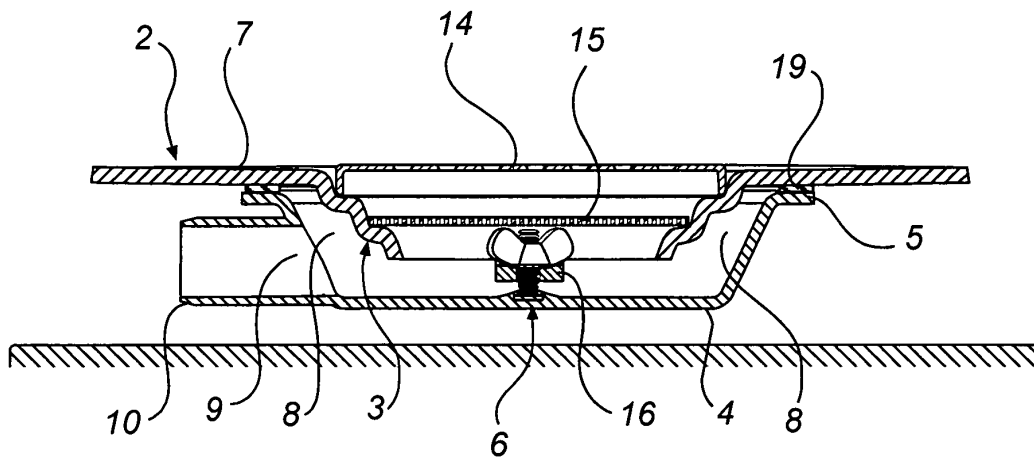


Fig. 3

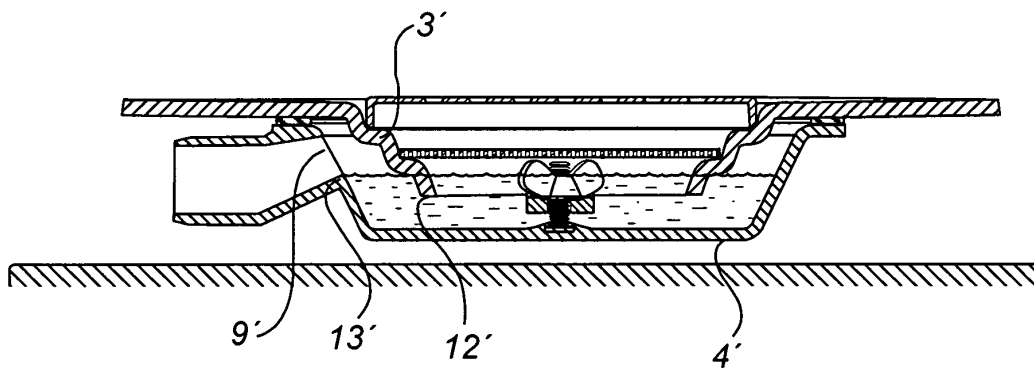


Fig. 4

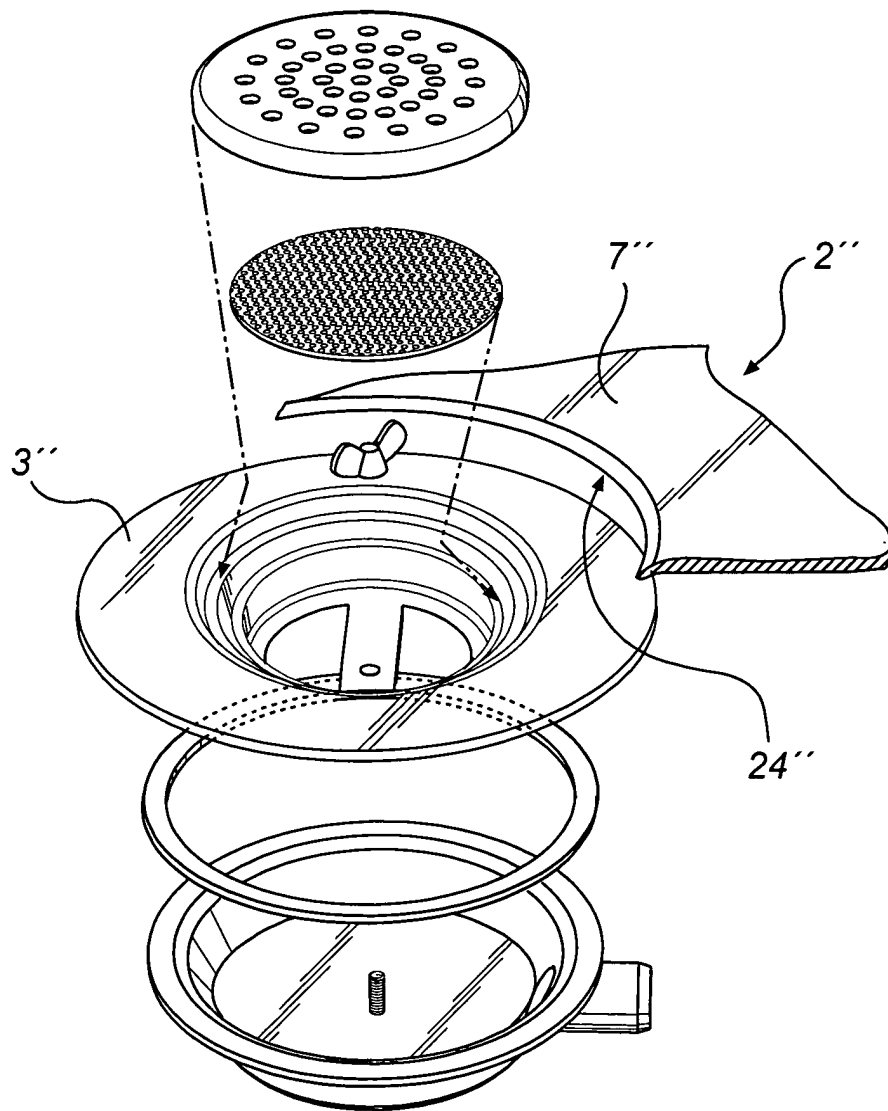


Fig. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 8468

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 3 287 742 A (GADDIS RAY R) 29 November 1966 (1966-11-29) * column 2, line 42 - line 45 *	1-10	E03C1/22 E03C1/29 E03F5/04
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			E03C E03F
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 20 April 2004	Examiner Isailovski, M
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 02 8468

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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