Title: FLOOR DRAIN WITH REMOVABLE STENCH-TRAP

Abstract: The invention relates to a drain or drainage channel for discharging a liquid, wherein the drain comprises a reservoir having a bottom wall (3), upright side walls (4, 5), and a discharge opening (10, 44) in the bottom wall or one of the side walls, and a stench-trap (12, 40) placed between the upright side walls (4, 5) in the reservoir and connecting to the discharge opening (10, 44) situated in the reservoir, wherein the stench-trap (12, 40) is removable from the reservoir and is provided with sealing means (126) for substantially air-tight sealing at least partially around the discharge opening (10, 44). The drain or drainage channel according to the invention is particularly suitable to be placed in for instance a finished floor of a wet area in a building, such as for instance a bathroom or a shower cubicle.
BACKGROUND OF THE INVENTION

The invention relates to a drain for discharging a liquid, and particularly to a drainage channel to be placed in for instance a finished floor of a wet area in a building, such as for instance a bathroom or a shower cubicle.

In particularly the invention relates to a drain having a limited build-in depth, which are highly suitable to be placed in a finished floor or to be used in a renovation of a wet area in a building, such as for instance a bathroom or a shower cubicle.

A drawback of the known drains with a limited build-in dept is that the flow-through openings, in particular the flow-through openings of a stench-trap, may become obstructed and are difficult to clean.

A further drawback is that the capacity for discharging the liquid via these flow-through openings is limited and may be insufficient in case of a flooding of the wet area in a building.
It is an object of the invention to improve on this.

SUMMARY OF THE INVENTION

To that end the invention provides a drain for discharging a liquid, wherein the drain comprises

- a reservoir having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls, and
- a stench-trap placed between the upright side walls in the reservoir and connecting to the discharge opening situated in the reservoir, wherein the stench-trap is removable from the reservoir and is provided with sealing means for substantially airtight sealing at least partially around the discharge opening.

The drain according to the invention comprises a stench-trap which is removable placed in the reservoir of the drain and the sealing means provide for an adequate sealing around the discharge opening, at least partially surrounding the discharge opening, for a proper functioning of the stench-trap. The sealing means may abut against the wall comprising the discharge opening and/or extend, at least partially, through the discharge opening. The stench-trap, in particular as a whole, can be removed out of the reservoir for cleaning purposes.

The stench-trap according to the invention can be used in combination with a very simple drain having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls. Special adaptations to the bottom wall and/or side walls for forming a stench-trap, in particular a water lock, are not required.
Furthermore, in case of a flooding of the wet area wherein a drain according to the invention is placed, the stench-trap may be removed, for example as a whole, out of the reservoir to increase the discharge capacity of the drain.

A further advantage of the drain according to the invention is that no stench-trap, such as for instance a siphon, needs to be placed outside the drain, for example between the reservoir and the discharge pipe. The stench-trap may be placed between the upright side walls and connects to the discharge opening. The discharge pipe can be connected directly to the discharge opening of the drain according to the invention.

In a simple embodiment the stench-trap comprises a base wall having a first edge raising away from the bottom wall, a lid, wherein the lid is placed above the first edge and is provided with a second edge substantially extending in a direction towards the bottom wall, wherein the second edge extends over the first edge at a side of the first edge facing away from the discharge opening, and flow-through openings for the liquid between the first edge and the lid, the first edge and the second edge, and the second edge and the bottom wall. In case of a drainage channel, the first edge and the second edge may be substantially transverse to the longitudinal side walls of the drainage channel, and the first edge may extend substantially over the full width of the bottom wall.

In an embodiment the stench-trap further comprises a connecting sleeve, which extends, at least partially, through the discharge opening. In use, this connecting sleeve may reach into the discharge pipe, which is connected to the discharge opening, for guiding the fluid into the discharge pipe.
For an easy handling of the stench-trap of the invention, an embodiment the stench-trap, in particular the base wall and the lid, can be placed in or removed out of the drain as a unity. The stench-trap, in particular the base wall and the lid, may be formed as one unity.

In an alternative embodiment the stench-trap comprises a first member comprising the base wall and the first edge, and a second member comprising the lid and the second edge, wherein the first member is detachable from the second member. By separating the first and second member, the stench-trap according to this embodiment, and particularly the flow-through openings, can easily be cleaned and/or unblocked.

In an embodiment, the first member further comprises the connecting sleeve. In this case, the second member can be detached from the first member and removed out of the drain without the need to remove the connecting sleeve out of the discharge opening. Thus the stench-trap according to this embodiment can be cleaned and/or unblocked with the first member still in place inside the drain.

In a further embodiment, the stench-trap comprises a container for a cleansing agent, detergent and/or deodorising agent. The container may be arranged for releasing cleansing agent, detergent and/or deodorising agent into the drain, and preferably into a liquid which at least partially fills the drain. The cleansing agent, detergent and/or deodorising agent may provide a substantial continuous cleansing or deodorising action in the drain, as long as the container is not empty.

The container for a cleansing agent, detergent and/or deodorising agent in or on a removable stench-trap is especially advantageous, because when the cleansing agent, detergent and/or deodorising agent is used
up, the stench-trap can be replaced by a new stench-trap with a full container.

In case the stench-trap, when operative, comprises a water seal, the container may also advantageously be filled with a substance for forming a layer or film on top of the fluid in the drain, which layer or film at least hampers the evaporation of the fluid. Since the fluid in the drain will evaporate at least more slowly, the water seal may stay operative for a longer period of time.

Although a water seal may form a simple and effective stench-trap, the inventor acknowledged that using such a water seal in a drain, such as a drainage channel or drain, placed in a floor with floor heating, may within a relative short period of time no longer provide an adequate sealing. The floor heating warming up the floor may namely result in a quicker evaporation of the water of the water seal.

For at least partially solving this further drawback the drain according to a further embodiment of the invention comprises insulation means place at the bottom wall and/or the upright side walls of the reservoir, at least near the stench-trap. Preferably the reservoir, at least near the stench-trap, comprises a double-walled bottom wall and/or double-walled upright side walls, comprising spaced double walls for forming an insulation layer in between them. Said insulation layer may comprise an air layer, but may also comprise known insulation materials, such as for instance rock wool, glass wool, or synthetic materials and synthetic resins (for instance foamed).

Since the insulation means placed near the stench-trap at least partially thermally insulate the stench-trap from its surroundings, the heating of the stench-trap, and particularly the evaporation of the fluid in the
water seal, can at least be slowed down, for forming an adequate stench sealing during a longer period of time.

In an embodiment the connecting sleeve comprises a non-return valve and/or dirt collection filter. Such a non-return valve may at least partially prevent sewage water from flowing back as well as/or prevent a sewage stench in the drainage channel in case of an overpressure in the sewage pipe. Such a dirt collection filter may catch dirt particles in the water to be discharged and thus reduce the risk of blockage of the sewage pipe.

The invention further provides a stench-trap for placing in a drain or drainage channel as described above. In particular said stench-trap for a drainage channel may be substantially box-shaped, wherein the lid and the base wall of the stench-trap are placed at a distance from each other and substantially parallel to each other. When placed inside the drainage channel, the base wall may rest on the bottom wall of the drainage channel. An advantage of this is, that a supporting structure for the stench-trap in the drainage channel is not required.

The invention further provides a stench-trap for removable placement in a drain for discharging a liquid, wherein the drain comprises a reservoir having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls, wherein the stench-trap is provided with sealing means arranged for substantially airtight sealing at least partially around the discharge opening. In an embodiment said stench-trap comprises a base wall, a lid and discharge means for alignment with the discharge opening between the base wall and the lid, the base wall having a first edge raising towards the lid, wherein the lid provided with a second edge substantially extending in a direction towards the base wall, wherein the second edge extends over
the first edge at a side of the first edge facing away from the discharge means, and flow-through openings for the liquid between the first edge and the lid, the first edge and the second edge, and the second edge and the bottom wall. The discharge means may comprise a connecting sleeve for extending, at least partially, through the discharge opening.

The invention further provides stench-trap for removable placement in a drain for discharging a liquid, wherein the drain comprises a reservoir having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls, wherein the stench-trap comprises a container for a cleansing agent, detergent and/or deodorising agent. The container may be arranged for releasing cleansing agent, detergent and/or deodorising agent into the reservoir of the drain, and in particular into a liquid which at least partially fills the reservoir.

In an advantageous embodiment the stench-trap is made entirely or partially of a rustproof material. Preferably the rustproof material comprises synthetic material.

The various aspects and measured as disclosed in herein may also be individually applied, or in any combination. Said aspects and measures, such as a stench-trap comprising a cleansing agent, detergent and/or deodorising agent for example, may be subject matter for a divisional application.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be further elucidated on the basis of the exemplary embodiment shown in the attached drawings, in which:
Figure 1 shows a view in perspective of a part of a first exemplary embodiment of a drainage channel according to the invention;

Figure 2 shows a view in cross-section in longitudinal direction of a drainage channel of figure 1 near the discharge opening, wherein the bottom wall comprises the discharge opening;

Figures 3 shows a view in cross-section in longitudinal direction of a drainage channel of figure 1 near the discharge opening, wherein a side wall comprises the discharge opening;

Figures 4A and 4B show a view in perspective and in cross-section respectively of a first exemplary embodiment of a stench-trap according to the invention;

Figures 5A and 5B show a view in perspective and in cross-section respectively of a second exemplary embodiment of a stench-trap according to the invention;

Figures 6A and 6B show a third exemplary embodiment of a stench-trap according to the invention, composed of a first and second member, wherein the first member is detachable from the second member.

Figures 7A, 7B and 7C show several views of the first member of the stench-trap of figure 6;

Figures 8A, 8B and 8C show several views of the second member of the stench-trap of figure 6; and
Figures 9A and 9B show a side view and a top view of a fourth exemplary embodiment of a stench-trap according to the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

An exemplary embodiment of a drainage channel 1 according to the invention is provided with a duct 2 that is built up from a bottom wall 3 and longitudinal side walls 4, 5. A discharge opening 10 may be provided in the bottom wall 3, as shown in the cross-section of figure 2, or in a longitudinal side wall 4, as shown in the cross-section of figure 3. The discharge opening 10 is furthermore provided with a connecting socket 6 for connecting the drainage channel 1 to a discharge pipe (not shown).

In this exemplary embodiment, one of the longitudinal side walls 4 is provided with a projecting retaining wall 7 placed offset which projects above the duct 2. The other longitudinal side wall 5 is provided with an edge 8 projecting substantially parallel to the bottom wall 3 and facing away from the longitudinal side wall 4, which edge 8 is for connecting the drainage channel 1 to the surface of a finished floor (not shown). Said projecting edge 8 can be incorporated into the floor; the projecting edge 8 is then for instance placed between the finished floor and the tiled floor 20 as shown for instance in the figure 3.

As shown in figures 1 and 2, the projecting retaining wall 7 and the projecting edge 8 may be provided with through openings 72, 82 for attaching the drainage channel 1 in the finished floor or against the wall. In addition the covering, such as floor tiles 20 or wall tiles, provided on the finished floor or the walls, can be connected to the finished floor or wall via said through openings 72, 82. For instance when gluing the floor tiles 20, a glue connection between the floor tiles
20 and the finished floor can be formed in the through openings 82. As a result a firm anchoring of the drainage channel 1 into the floor is achieved.

In stead of the projecting retaining wall 7, the drainage channel 1 may be provided with an edge 71 projecting substantially parallel to the bottom wall 3 and facing away from the longitudinal side wall 5, as shown in figure 3. This type of drainage channel 1 is suitable for placing in a floor away from a wall, for example in the opening of a door from a floor away from a wall, such as a bathroom or shower-cubicle.

In the duct part 2 a cover means 9 is placed, which projects above the duct part 2 over a distance d that is substantially equal to the thickness of a floor covering, such as a tiled floor 20 (see figures 2 and 3), surrounding the drainage channel 1. The cover means 9 is constructed such that its upper side 91 sits substantially in the same plane as the tiled floor 20.

The cover means 9 is formed like a profile having a substantially U-shaped cross-section and comprises a cover wall 91 and side walls 92 connecting to the longitudinal sides of the cover wall 91, wherein the side walls 92 are placed substantially perpendicular to the cover wall 91. The side walls 92 of the cover means 9 support at least partially on the bottom wall 3.

At least the cover wall 91 of the cover means 9 is formed out of a mesh or grid provided with openings for allowing a liquid to flow therethrough into the duct 2. In a simple exemplary embodiment the entire cover means 9 is formed out of a mesh or grid bent into a U-shaped profile. Thus the connecting side walls 92 may also be provided
with openings for allowing a liquid to flow therethrough into the duct 2 of the drainage channel 1.

Placed inside the duct 2, near the discharge opening 10, a removable stench-trap 11, 12 is placed. The stench-trap 11, 12 comprises a base wall 111, 121 having a first edge 112, 122 raising away from the bottom wall 3, and a lid 113, 123, wherein the lid is placed above the first edge 112, 122 and is provided with a second edge 114, 124 substantially extending in a direction towards the bottom wall 3. As will be described below and shown in more detail in the figures 4 - 9, the second edge 114, 124 extends over the first edge 112, 122 at a side of the first edge 112, 122 facing away from the discharge opening 10. The stench-trap 11, 12 further comprises a connecting sleeve 115, 125, which extends, at least partially, through the discharge opening 10. In one embodiment the connecting sleeve 115 is placed in the base wall 111 of the stench-trap 11, as shown in figure 2. In an other embodiment this connecting sleeve 125 is placed in a side wall of the stench-trap 12, as shown in figure 3.

The stench-trap 11, 12 is provided with a sealing ring 116, 126 for substantially airtight sealing around the discharge opening 10, which the sealing ring 116, 126 abuts against the wall 3, 4 wherein the discharge opening 10 is placed.

In a variant of the stench-trap 11, 12 as shown in figures 2 and 3, the connecting sleeve 115, 125 may be the sealing means for substantially airtight sealing around the discharge opening 10, by substantially airtight sealing against the inner wall of the connecting socket 6. The connecting sleeve 115, 125 may be made from a resilient material, such as a rubber material, which abuts against the inner wall of the connecting socket 6 when the stench-trap 11, 12 is placed in the
drainage channel 1. In this case, the sealing ring 116, 126 is not necessary and can be omitted.

In particular for a drainage channel 1 where the discharge opening 10 is placed in a side wall 4, as shown in figure 3, the use of a resilient connecting sleeve 115 is advantageous, because such a resilient connecting sleeve 115 is deformable for more easily placing the stench-trap 12 inside or removed from the drainage channel 1.

A simple exemplary embodiment of a box-shaped stench-trap 40 according to the invention is shown in figure 4A, and in cross-section in figure 4B. The stench-trap 40 comprises a base wall 41 and a lid 42. The base wall 41 having first edges 411, 412 substantially extending perpendicular to the base wall 41 in the direction of a lid 44. The lid 42 is placed at a distance above the first edges 411, 412 and is provided with second edges 421, 422 substantially extending perpendicular to the lid 42. The second edges 421, 422 extend over the first edges 411, 412 at a side of said first edges 411, 412 facing away from the discharge opening 10. The stench-trap 40 further comprises side walls 43. One of the side walls 43 comprises the discharge opening 44 and a connecting sleeve 45 for connecting to the discharge opening 10 of a drainage channel 1.

A further exemplary embodiment, as shown in figure 5A and in cross-section in figure 5B, has essentially the same construction as the embodiment of figure 4 in combination with some additional features:

Firstly, the base wall 51 comprises the discharge opening 54 and the connecting sleeve 55 of the stench-trap 50.
Secondly, the second edges 521, 522 are provided with containers 56, 57 for a cleansing agent, detergent and/or deodorising agent.

A first container 56 is for example provided with a cleansing agent or a detergent 561 which is soluble in the liquid, such as waste water, in the drainage channel 1. For releasing the cleansing agent or detergent 561, into the liquid in the drainage channel, through-openings 562 are provided in the bottom wall of the container 56. Alternatively, these through-openings may be provided in a side wall of the container 56 (not shown), in particular near the bottom wall, such that, in use, said openings are submerged into the liquid in the drainage channel 1.

A second container 57 is for example provided with a deodorising agent 571 for releasing a fresh smell to a surrounding atmosphere. For releasing the deodorising agent 571, through-openings 572 are provided in a top wall of the container 57. Alternatively or in addition through-openings 573 may be provided in a side wall of the container 57, in particular near the top wall, such that, in use, said openings are above the level of the liquid in the drainage channel 1. The level of the liquid in the drainage channel 1 is defined by the height of the first edges 511, 512.

Although the exemplary embodiment as disclosed in figures 5A and 5B, comprises two different containers 56, 57, an alternative stench-trap may comprise two or more similar containers.

In a third embodiment as shown in figures 6A, 6B and 6C, the stench-trap comprises a first member 60 comprising the base wall 601 and the first edges 602, 603, and a second member 61 comprising the lid 611 and the second edges 612, 613, wherein the first member 60 is detachable from the second member 61.
As shown in figure 7A, 7B and 7C, the first edges 602, 603 of the first member is formed by a fold of the base wall 601. The part of the folded first edges 602, 603 at the side towards the discharge opening 64 is provided with wall sections 604, 605 of the base wall 601 that slope towards the discharge opening 64. The base wall 601 and the first edges 602, 603 are confined between the side walls 606, 607. In use the side walls 606, 607 may sealingly abut against the longitudinal side walls 4, 5 of a drainage channel 1, such that a liquid in the drainage channel 1 can only flow over the first edges 602, 603 to the discharge opening 10.

In the exemplary embodiment as shown in figure 7, the discharge opening 64 and the connecting sleeve 608 are placed in one of these side walls 606. In an alternative exemplary embodiment, said discharge opening and connecting sleeve may also be provided in the base wall 601.

As shown in figure 8A, 8B, and 8C, the lid 611 and the second edges 612, 613 are confined between the side walls 614, 615. These side walls 614, 615 are provided with a raised face 617, 618 which in use may sealingly abut against the longitudinal side walls 4, 5 of a drainage channel 1. In use, when a water seal is present in the drainage channel 1, the second edges 612, 613 will be at least partially submerged into the water in the channel 1. Thus in use, the substantially airtight sealing of the discharge 10 of the drainage channel 1 is, along the side walls 4, 5 of the drainage channel 1, provided by the raised faces 617, 618, and between the side wall 4, 5 of the drainage channel 1 by the submerged second edges 612, 613. In stead of the raised faces 617, 618, also other sealing means may be provided, such as a sealing strip or a sealing ring 126 as shown in figure 3.
The side walls 6 1 4, 6 1 5 of the second member 6 1 are provided with an opening or recess 6 1 9 for at least partially positioning the first member 6 0 herein as shown in figure 6A.

In a fourth embodiment as shown in figures 9A and 9B, the stench-trap comprises two first members 30 comprising the base wall 30 1 and the first edges 30 2, 30 3, and a second member 3 1 comprising the lid 3 1 1 and the second edges 3 1 2, 3 1 3, wherein the second member 3 1 is detachable from the first members 30, which are detachably placed on both sides of the discharge opening 1 0 between the longitudinal side walls of a drainage channel.

The side walls of the first and second members 30, 3 1 are provided with a rubber sealing strip 30 4, 3 1 4 which in use may sealingly abut against the longitudinal side walls of a drainage channel. Moreover, the base wall 30 1 of both first members 30 may also be provided with such or other sealing means which in use may sealingly abut against the bottom wall of a drainage channel.

In use, when water is flowing into the drainage channel 1, the water will flow over the first edges 30 3 which are not covered by the lid 3 1 1, into the first member 30. The water level between the first edges 30 2, 30 3 of the first members 30 will rise until the water flows over the first edges 30 2 which are covered by the lid 3 1 1, into the discharge 1 0 of the drainage channel. The second edges 3 1 2, 3 1 3 will be at least partially submerged into the water between the first edges 30 2, 30 3 of the first member 30, yielding a substantially airtight sealing of the discharge 1 0 between the side walls of the drainage channel. Thus the water seal is formed by the liquid in the first members 30 and the
second edges 312, 313 of the second member 31 at least partially submerged herein.

It is observed here that the embodiments of the invention described above are intended as an illustration of the invention and not as a limitation of the invention. An expert will certainly be capable of designing alternative embodiments that fall within the scope of protection of the attached claims.

For instance, the second members 31, 61 and/or the first members 30, 60 of the third and fourth exemplary embodiment may also be provided with containers for a cleansing agent, detergent and/or deodorising agent. Such a cleansing agent, detergent and/or deodorising agent may also be provided between the first edges 302, 303 of the first members 30 of the fourth exemplary embodiment.

For instance, in case the cleansing agent, detergent and/or deodorising agent are in a solid form, a container for holding the cleansing agent, detergent and/or deodorising agent may be at least partially omitted.
Claims

1. Drain for discharging a liquid, wherein the drain comprises
   a reservoir having a bottom wall, upright side walls, and a
discharge opening in the bottom wall or one of the side walls, and
   a stench-trap placed between the upright side walls in the
reservoir and connecting to the discharge opening situated in the
reservoir, wherein the stench-trap is removable from the reservoir and
is provided with sealing means for substantially airtight sealing at least
partially around the discharge opening.

2. Drain according to claim 1, wherein the sealing means abut against
   the wall comprising the discharge opening and/or extend, at least
partially, through the discharge opening.

3. Drain according to claims 1 or 2, wherein the stench-trap comprises
   a base wall having a first edge raising away from the bottom
wall,
   a lid, wherein the lid is placed above the first edge and is
provided with a second edge substantially extending in a direction
towards the bottom wall, wherein the second edge extends over the
first edge at a side of the first edge facing away from the discharge
opening, and
   flow-through openings for the liquid between the first edge and
the lid, the first edge and the second edge, and the second edge and
the bottom wall.

4. Drain according to claim 3, wherein the stench-trap further
   comprises a connecting sleeve, which extends, at least partially,
through the discharge opening.
5. Drain according to claim 3 or 4, wherein the stench-trap, in particular the base wall and the lid, are formed as one unity.

6. Drain according to claim 3 or 4, wherein the stench-trap comprises a first member comprising the base wall and the first edge, and a second member comprising the lid and the second edge, wherein the first member is detachable from the second member.

7. Drain according to claim 6 in dependence of claim 4, wherein the first member further comprises the connecting sleeve.

8. Drain according to any one of the preceding claims, wherein the stench-trap further comprises a container for a cleansing agent, detergent and/or deodorising agent.

9. Drain according to claim 8, wherein the container is arranged for releasing cleansing agent, detergent and/or deodorising agent into the drain, in particular into a liquid which at least partially fills the drain.

10. Drain according to any one of the preceding claims, wherein the first edge and the second edge of the stench-trap are substantially transverse to a side wall.

11. Drain according to claim 10, wherein the first edge extends substantially over the full width of the reservoir.

12. Drain according to any one of the preceding claims, comprising a cover means provided with inflow openings for the liquid for at least partially covering the reservoir.
13. Drain according to claim 12, wherein the cover means at least partially projects above the reservoir, in particular over a distance which substantially equals the thickness of a floor covering, such as for instance a tiled floor, surrounding the drain.

14. Drain according to claim 12 or 13, wherein the cover means is detachably placed in the drain.

15. Drain according to claim 12, 13 or 14, wherein the cover means comprises a cover wall having longitudinal sides and side walls connecting to the longitudinal sides, wherein the side walls extend substantially from the cover wall in the direction of the bottom wall, wherein the cover wall is provided with the inflow openings.

16. Drain according to claim 15, wherein the cover wall and the side walls of the cover means define a profile having a substantially U-shaped cross-section, wherein the side walls of the cover means preferably at least partially abut the upright side walls of the reservoir.

17. Drain according to claim 15 or 16, wherein the side walls are placed substantially perpendicular to the cover wall.

18. Drain according to claim 15, 16 or 17, wherein the side walls of the cover means at least partially rest on the bottom wall.

19. Drain according to any one of the preceding claims, wherein the bottom wall and/or the upright side walls of the reservoir, at least near the stench-trap, comprises insulation means.

20. Drain according to claim 19, wherein the reservoir, at least near the stench-trap, comprises a double-walled bottom wall and/or double-
walled upright side walls, comprising spaced double walls for forming an insulation layer in between them.

21. Drain according to one or more of the preceding claims, wherein a first of the side walls, at least at an end thereof facing away from the bottom wall, comprises an edge extending substantially parallel to the bottom wall and away from the reservoir.

22. Drain according to claim 21, wherein the edge comprises one or more through openings.

23. Drain according to one or more of the preceding claims, wherein a first of the side walls comprises a retaining wall projecting substantially perpendicular to the bottom wall and above the reservoir, wherein the retaining wall is placed shifted at the first side wall, at least at an end thereof that faces away from the bottom wall.

24. Drain according to claim 23, wherein the retaining wall comprises one or more through openings.

25. Drain according to any one of the preceding claims, wherein the bottom wall comprises a wall section sloping to the discharge opening.

26. Drain according to any one of the preceding claims, wherein the stench-trap, when operative, comprises a water seal.

27. Drain according to one or more of the preceding claims, wherein the reservoir comprises a duct part comprising a bottom wall and upright longitudinal side walls for forming a drainage channel.
28. Drain according to claim 27, wherein the duct part comprises upright transverse side walls situated at its ends.

29. Stench-trap for placing in a drainage channel according to one or more of the preceding claims.

30. Stench-trap for removable placement in a drain for discharging a liquid, wherein the drain comprises a reservoir having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls, wherein the stench-trap is provided with sealing means for substantially airtight sealing at least partially around the discharge opening.

31. Stench-trap according to claim 30, wherein the stench-trap comprises
   a base wall, a lid and discharge means for alignment with the discharge opening between the base wall and the lid,
   the base wall having a first edge raising towards the lid,
   wherein the lid provided with a second edge substantially extending in a direction towards the base wall, wherein the second edge extends over the first edge at a side of the first edge facing away from the discharge means, and
   flow-through openings for the liquid between the first edge and the lid, the first edge and the second edge, and the second edge and the bottom wall.

32. Stench trap according to claim 31, wherein the discharge means comprises a connecting sleeve for extending, at least partially, through the discharge opening.
33. Stench-trap for removable placement in a drain for discharging a liquid, wherein the drain comprises a reservoir having a bottom wall, upright side walls, and a discharge opening in the bottom wall or one of the side walls, wherein the stench-trap comprises a container for a cleansing agent, detergent and/or deodorising agent.

34. Stench-trap according to claim 33, wherein the container is arranged for releasing cleansing agent, detergent and/or deodorising agent into the reservoir of the drain, and preferably into a liquid which at least partially fills the reservoir.
INTERNATIONAL SEARCH REPORT

PCT/NL2005/000477

A. CLASSIFICATION OF SUBJECT MATTER

INV. E03F5/04 E03C1/126

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E03F E03C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and where practical search terms used)

EPO-Internal , PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
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<td>EP 1 566 497 A (J. DE BEER b.V) 24 August 2005 (2005-08-24) the whole document</td>
<td>1-3, 6, 7, 10, 11, 26</td>
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<td>X</td>
<td>EP 1 229 175 A (FRANZ VIEGENE II GMBH &amp; CO. KG; VIEGA GMBH &amp; CO. KG) 7 August 2002 (2002-08-07) the whole document</td>
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<td>DE 91 16 788 U1 (EDELSTAHL-TECHNIK-ULM GMBH, 89231 NEU-ULM, DE) 18 November 1993 (1993-11-18) figure 2</td>
<td>1-5, 10, 11, 26</td>
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<td>X</td>
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* Further documents are listed in the continuation of Box C

X See patent family annex

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  "P" document published prior to the international filing date but later than the priority date claimed

  "R" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

  "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

  "Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art

  "Z" document member of the same patent family

Date of the actual completion of the international search

29 May 2006

Date of mailing of the international search report

06/06/2006

Name and mailing address of the ISA/

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Fax (+31-70) 340-3016

Authorized officer

Geisenhofer, M
<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
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<td>EP 1 287 213 A (UNIDRAIN A/S) 5 March 2003 (2003-03-05) figure 3a</td>
<td>1-3,6,26</td>
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<td>X</td>
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<td>Y</td>
<td>DE 101 27 553 A1 (SIEKER FRIEDHELM) 21 November 2002 (2002-11-21) paragraph {0014}; figure 1</td>
<td>8,9</td>
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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **Claims Nos.**, because they relate to subject matter not required to be searched by this Authority, namely

2. **Claims Nos. 29 - 34**, because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically
   
   see FURTHER INFORMATION sheet PCT/ISA/210

3. **Claims Nos.**, because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 64(a)

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows.

see additional sheet

1. **As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.**

2. **As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee**

3. **As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid specifically claims Nos.**
   
   1-11, 26

4. **No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos**

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- **No protest accompanied the payment of additional search fees**
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7,10,11,26
   Details of the structure of the stench-trap: geometry, connection to the discharge opening of the reservoir

2. claims: 1,8,9
   Container suitable for releasing a cleansing agent, detergent and/or deodorising agent

3. claims: 1,12-18
   Details of the cover means covering the reservoir: geometry, certain dimensions

4. claims: 1,19,20
   Insulation of the reservoir

5. claims: 1,21,22
   Connecting the floor covering to the reservoir, first alternative

6. claims: 1,23,24
   Connecting the floor covering to the reservoir, second alternative

7. claims: 1,25
   Sloping bottom of the reservoir

8. claims: 1,27,28
   Drainage channel guiding fluid to the central discharge opening
Continuation of Box II.2

Claims Nos.: 29 - 34

Claims 29 -34 define a stench-trap. Nevertheless, the invention as presented by the applicant is a drain comprising a reservoir with a discharge opening and a removable stench-trap. As set out in the description, the prior art problem to be solved consists of a limited capacity of drains in case of a flooding and possible clogging of the drain. The trap is removable; this allows to increase the width of the drain opening in case of looding. Furthermore, the trap may be removed to clean it easily. Thus, a stench-trap as such, i.e. not in combination with a reservoir, cannot solve the problems defined. It is essential to the definition of the invention that a drain comprising both the stench-trap and the reservoir is present. Therefore, a meaningful full search can only be carried out for a drain comprising a reservoir and a removable stench-trap as defined in claims 1-28 since claims 29 - 34 do not comprise all essential features for a definition of the invention (Article 6 PCT).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.
## INTERNATIONAL SEARCH REPORT

### Patent document cited in search report

<table>
<thead>
<tr>
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Form PCT/ISA/210 (patent family annex) (April 2005)