

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 630 309 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

01.03.2006 Bulletin 2006/09

(51) Int Cl.:

E03F 5/04 (2006.01)

(21) Application number: **05011971.8**

(22) Date of filing: **03.06.2005**

(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 MC NL PL PT RO SE SI SK TR**

Designated Extension States:

AL BA HR LV MK YU

(30) Priority: **17.06.2004 DK 200400938**

(71) Applicant: **Blücher Metal ApS
DK-7480 Vildbjerg (DK)**

(72) Inventor: **Lohmann, Hans
4180 Soro (DK)**

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

(54) **Drain unit**

(57) The present invention relates to a drain unit (1) comprising an elongated bottom gutter (2), a grate part (4) and at least one discharge (3), where the grate part (4) is positioned on top of the elongated bottom gutter (2) and the discharge (3) is connected to a lowermost area of the elongated bottom gutter (2), wherein the grate

part (4) comprises a grate (5) and a second gutter (6) with a second discharge (7), where the grate (5) is positioned on top of the second gutter (6) and the second discharge (7) is connected to a lowermost area of the second gutter (6) and positioned in the discharge (3) of the elongated bottom gutter (2).

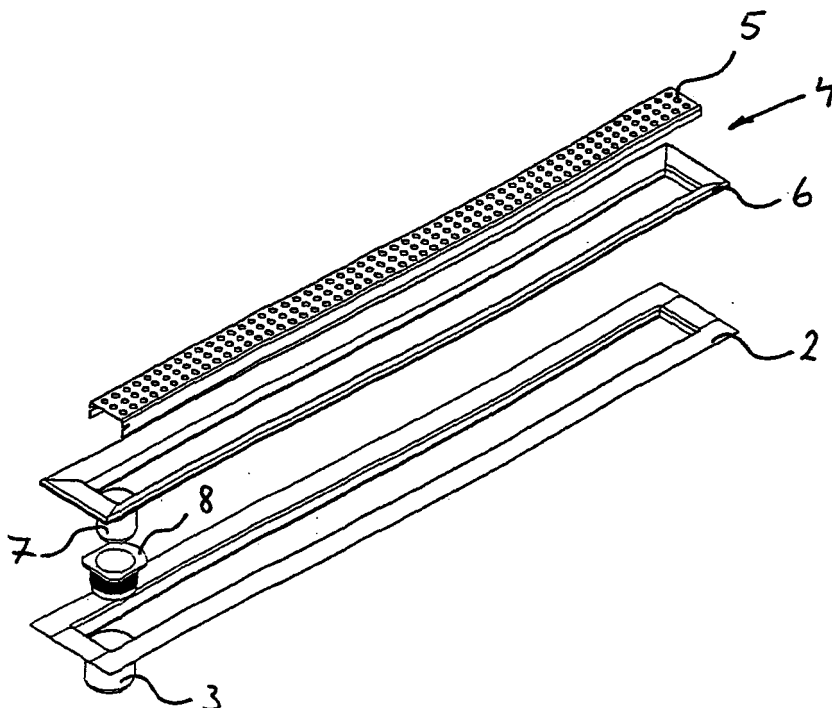


Fig. 2

EP 1 630 309 A1

Description

Field of the invention

[0001] The present invention relates to a drain unit comprising an elongated bottom gutter, a grate part and at least one discharge, where the grate part is positioned on top of the elongated bottom gutter and the discharge is connected to a lowermost area of the elongated bottom gutter.

Background of the invention

[0002] Due to increased demand for new designs and different drain options, manufactures of drains experience a demand for elongated drains for use in wet areas in building structures, e.g. in bathrooms or in shower cubicles where the drain extends along the walls.

[0003] Basically, there are two types of drain construction for wet areas:

- wet drain, which is formed with a sealing, hence a small amount of water can stay in the drain and must evaporate to disappear, or
- dry drain, which is formed without a sealing, hence all the water is drained off the drain.

[0004] Wet drains are preferred by some plumbers, and dry drains are preferred by other plumbers.

[0005] Known drains are typically of either the wet drain type or the dry drain type. E.g. GB-A-2 282 156 describes a floor drain of the dry drain type comprising an elongated bottom gutter with a discharge arranged in a lowermost area of the elongated bottom gutter, and a cover which can be positioned on top of the elongated bottom gutter. GB-A-2 282 156 does not indicate that this drain can be used as a wet drain.

[0006] Therefore it is necessary to develop drains that comply with both types of drain without having major differences in the drain construction.

[0007] In vermin-infested areas there is a high risk of vermin entering a wet room through the sewer system, and the use of siphon traps to reduce the odour from the sewer system is not enough to prevent especially rats from entering through the drain system.

[0008] The known drains typically have complicated safeguard units built into them, hence complicating the manufacturing and assembly of the drain. Furthermore a safeguard unit requires much space meaning that the drain cannot be a compact unit.

Object of the invention

[0009] It is the object of the present invention to provide a drain, which easily can be installed as either a wet or dry drain and which has an uncomplicated vermin safeguard built into it.

[0010] This is obtained with a drain as described in the

preamble of claim 1, wherein the grate part comprises a grate and a second gutter with a second discharge, where the grate is positioned on top of the second gutter and the second discharge is connected to a lowermost area of the second gutter and positioned in the discharge of the elongated bottom gutter.

Description of the invention

[0011] By designing the drain unit with an elongated bottom gutter wherein a second gutter is placed, it is possible to provide a drain unit which easily can be installed as either a wet or dry drain because it is possible to install the elongated bottom gutter in the floor and either seal off the connection between the elongated bottom gutter and the second gutter, or to leave the connection between the elongated bottom gutter and the second gutter open.

[0012] As is the case for any other drain unit, a discharge from the drain unit is required to lead collected water to the sewage system, and the discharge is connected to a lowermost area of the elongated bottom gutter, where the lowermost area is the area wherefrom it is possible to empty the entire content of the elongated bottom gutter.

[0013] The grate part comprises a grate and a second gutter with a second discharge, where the grate is positioned on top of the second gutter and the second discharge is connected to a lowermost area of the second gutter and positioned in the discharge of the elongated bottom gutter.

[0014] It is important to manufacture the elongated bottom gutter and the second gutter in such a manner that, when assembled, they have the discharges positioned in alignment, hence making it easy to engage the discharges and making it possible to seal the connection between the discharges, and furthermore the second gutter will be positioned securely and firmly in the elongated bottom gutter.

[0015] The construction of the drain unit makes it very easy to disassemble a mounted drain unit for the purpose of cleaning or repair. The grate is removed from the second gutter and it is then possible, for example, to clean the second gutter.

[0016] If the drain according to the present invention is used as a wet drain, a sealing will be arranged between the discharges of the gutters, thereby preventing water collected in the lower gutter to drain off through the discharges.

[0017] If the drain according to the present invention is used as a dry drain, no sealing will be arranged between the discharges of the gutters, hence allowing water collected in the lower gutter to drain off through the discharges.

[0018] To ensure that all water collected in the drain unit is lead away into the sewage system, the elongated bottom gutter is provided with a sloping bottom towards the discharge and the second gutter is provided with a

sloping bottom towards the second discharge.

[0019] In a preferred embodiment of the invention the discharges are positioned at one end of or near the end of the gutters, thereby having only a long sloping bottom from the other end towards the discharges.

[0020] Alternatively the discharges can be positioned at any place along the length of the gutters, thereby having sloping bottom parts from both ends towards the discharges, which, however, causes a slightly more complicated manufacturing of the drain unit.

[0021] The built-in safeguard against intrusive vermin, especially rats, in the present invention is obtained by the grate being provided with a number of slots and the second gutter being provided with a number of protruding members, where the protruding members are adapted to engage with the slots.

[0022] The engaging of the protruding members and the slots causes the grate to be hinged onto the second gutter, thereby allowing the grate to be lifted during cleaning or maintenance of the drain unit while at the same time preventing the vermin from pushing the grate aside and entering the room.

[0023] The hinge arrangement of the protruding members and the slots is preferably positioned at the same end or near the position of the second discharge, hence the safeguard against vermin will be more efficient because vermin cannot push the grate in such a manner that the protruding members will disengage from the slots.

[0024] Furthermore the weight of the grate, due to gravity, will provide a substantial obstacle to vermin because the lever principle means that they must lift the entire or part of the weight of the grate.

[0025] Because of this construction of the safeguard, it is not required that the discharges are placed at an end area of the gutters, but they can be placed anywhere in the gutters, thereby allowing flexible and numerous options for the design of the wet room or mounting of the drain unit.

[0026] To be able to adjust the height of the second gutter in relation to the elongated bottom gutter it is possible to use mortar and fill it into the elongated bottom gutter and then place the second gutter thereupon. The disadvantage of this method is that the mortar must be allowed a specific period of time for drying before it is possible to position the surrounding tiles or other type of floor surface.

[0027] To avoid this time-consuming method, the drain unit furthermore comprises a number of support members adapted to be positioned between the elongated bottom gutter and the second gutter where the support members are either blocks or strips of different sizes and thickness.

[0028] In the preferred embodiment of the present invention the support members are strips covering the entire or most of the length of the elongated bottom gutter apart from the discharge opening.

[0029] These strips have different thicknesses where-

by it is almost always possible to find a combination of strips having the wanted thickness for placing the second gutter in the right height above the elongated bottom gutter.

[0030] To ease the assembly of the drain gutter the strips have the same width as the width of the elongated bottom gutter whereby the person assembling the drain unit must only combine the strips to the wanted thickness in order to place the second gutter in the right height above the elongated bottom gutter

[0031] The support members are provided in an elastic and liquid-resistant material, e.g. rubber or plastic. Furthermore the material of the support members must be resistant against any kind of cleaning chemical typically used in wet rooms like bathrooms, utility rooms, kitchens or the like.

[0032] To seal off the space between the elongated bottom gutter and the second gutter and thereby prevent water from flowing into the second discharge comprises the drain unit and furthermore at least one sealing collar adapted to be positioned in the discharge and to engage with the second discharge.

[0033] In a preferred embodiment of the present invention the sealing collar is provided with a smooth inside and on the outside provided with a number of protruding bulbs, where the second discharge is engaged in the sealing collar, thereby pressing the protruding bulbs outwards against the sidewall of the discharge, thereby efficiently sealing the connection between the discharge and the second discharge.

[0034] The sealing collar is provided in an elastic and liquid-resistant material, e.g. rubber or plastic. Furthermore the material of the sealing collar must be resistant against any kind of cleaning chemical typically used in wet rooms like bathrooms, utility rooms, kitchens or the like.

[0035] In a preferred embodiment of the present invention the grate is constituted by an elongated plate member adapted to provide a stepping surface of the second gutter, and to allow water to penetrate, the plate member is provided with a number of openings positioned either in rows or in a pattern.

[0036] In an alternative embodiment of the present invention the grate is constituted by an elongated plate member adapted to provide a stepping surface of the second gutter with a surrounding narrow opening between the elongated plate member and the respective sides of the second gutter where the surrounding narrow opening allows the water to penetrate into the drain unit.

Short description of the drawing

[0037] The invention is explained in more detail below with reference to the accompanying drawing, where

Fig. 1 shows a drain unit according to the invention,

Fig. 2 shows an exploded view of the drain unit in

- Fig. 1, shows a side view of the drain unit in Fig. 1,
 Fig. 3 shows a detail view of the discharges and
 Fig. 4 shows a detail view of the discharges and
 Fig. 5 shows a detail view of a safeguard and seal-
 Figs. 6-7 show how to remove the grate according to
 the invention.

[0038] The reference numbers on the figures refer to the following:

1. Drain unit
2. Elongated bottom gutter
3. Discharge
4. Grate part
5. Grate
6. Second gutter
7. Second discharge
8. Sealing collar
9. Slot
10. Protruding member
11. Protruding bulb
12. Openings

Detailed description of the invention

[0039] Fig. 1 shows an assembled drain unit 1 comprising an elongated bottom gutter 2 with a discharge 3 positioned near one end of the elongated bottom gutter 2. A grate part 4 is positioned on top of the elongated bottom gutter 2 and comprises a grate 5 positioned on top of a second gutter 6. The grate 5 is a plate member with a number of openings 12 arranged in rows allowing water to penetrate into the drain unit 1.

[0040] Fig. 2 shows an exploded view of the drain unit 1 and it can be seen that the grate part 4 comprises a grate 5 and a second gutter 6 with a second discharge 7 where the grate 5 is positioned on top of the second gutter 6 and the second discharge 7 is positioned opposite the discharge 3 of the elongated bottom gutter 2.

[0041] Furthermore it is shown that the drain unit 1 comprises a sealing collar 8 adapted to be positioned in the discharge 3 and to engage with the second discharge 7.

[0042] Fig. 3 shows a side view of the drain unit 1 and it is possible to see that the elongated bottom gutter 2 is provided with a sloping bottom towards the discharge 3 and the second gutter 6 is provided with a sloping bottom towards the second discharge 7.

[0043] In the shown embodiment of the drain unit 1 the degree of sloping of the bottoms of the elongated bottom gutter 2 and the second gutter 6 is the same. This causes the water to enter the drain unit 1 and flow towards the discharges 3, 7, thereby emptying the drain unit 1.

[0044] The same degree of sloping of the bottoms of the elongated bottom gutter 2 and the second gutter 6 means that it is only necessary to provide support mem-

bers (not shown) each having uniform thickness. This makes it easy to adjust the height of the second gutter 6 in relation to the elongated bottom gutter 2.

[0045] Alternatively, the degree of sloping of the bottoms of the elongated bottom gutter 2 and the second gutter 6 may be different, making it necessary to provide support members (not shown) with different thicknesses.

[0046] The grate 5 is provided with slots 9 and the second gutter 6 is provided with a protruding member 10, which is adapted to engage with the slots 9, thereby hinging the grate 5 to the second gutter 6, allowing the grate 5 to revolve around the protruding member 10.

[0047] Fig. 4 shows that the discharge 3 of the elongated bottom gutter 2 is positioned beneath the second discharge 7 of the second gutter 6 and the sealing collar 8 is adapted to be positioned in the discharge 3 and to engage with the second discharge 7.

[0048] The protruding member 10 is shown as a round bar positioned near the end of the second gutter 6 and across the second gutter 6. The slots 9 are positioned inside flanges of the grate 5 and shown as approximately straight slots adapted to receive the protruding member 10.

[0049] Alternatively the slots 9 can be positioned optionally along the grate 5 whereby the protruding member 10 will be positioned in the second gutter 6 in such a position that the protruding member 10 can engage with the slots 9, which can be formed as bended slots to prevent unwanted lifting of grate 5.

[0050] Fig. 5 shows a detail view of the safeguard against intruding vermin especially rats comprising the protruding member 10 engaging with the slots 9, which prevents the rats from pushing the grate 5 aside and entering the wet room (not shown) through the discharge 3 of the drain unit 1.

[0051] To evade this safeguard, rats must either disengage the protruding member 10 from the slots 9 or lift the whole weight of the part of the grate revolving around the protruding member 10.

[0052] To avoid the disengaging of the protruding member 10 from the slots 9, for example a plate member, a hook member or the like (not shown) can be used, which is connected to the grate 5 and which is either bended around or bended down past the protruding member 10, thereby preventing the protruding member 10 from sliding out of the slots 4.

[0053] To prevent a rat from lifting the grate 5, it is provided in a heavy material, e.g. rustproof steel which in combination with the lever principle and gravity causes the grate 5 to be too heavy to lift for any kind of vermin.

[0054] Figs. 4-5 show a detail view of the sealing collar 8 which has a smooth inside and is provided with protruding bulbs 11 on the outside. The assembling of the drain unit 1 with the sealing collar 8 is performed in the following manner:

- positioning the elongated bottom gutter 2 in a floor (not shown) and fitting the discharge 3 to a pipe to

- the subsequent sewage system (not shown),
- positioning the sealing collar 8 into the discharge 3,
- positioning the support members (not shown) so as to adjust the height of the second gutter 6 above the elongated bottom gutter 2,
- positioning the second gutter 6 upon the support members (not shown) and pressing the second discharge into the sealing collar 8, thereby pressing the protruding bulbs 11 against the wall of the discharge 3, thereby providing a sealed connection between the discharges 3,7 of the gutters 2,6.

[0055] Figs. 6-7 show how to remove the grate 5 from the second gutter 6. By sliding the grate 5 in direction A, the protruding member 10 is disengaged from the slots 9 and it is then possible to remove grate 5 from the second gutter 6 by lifting it in direction B.

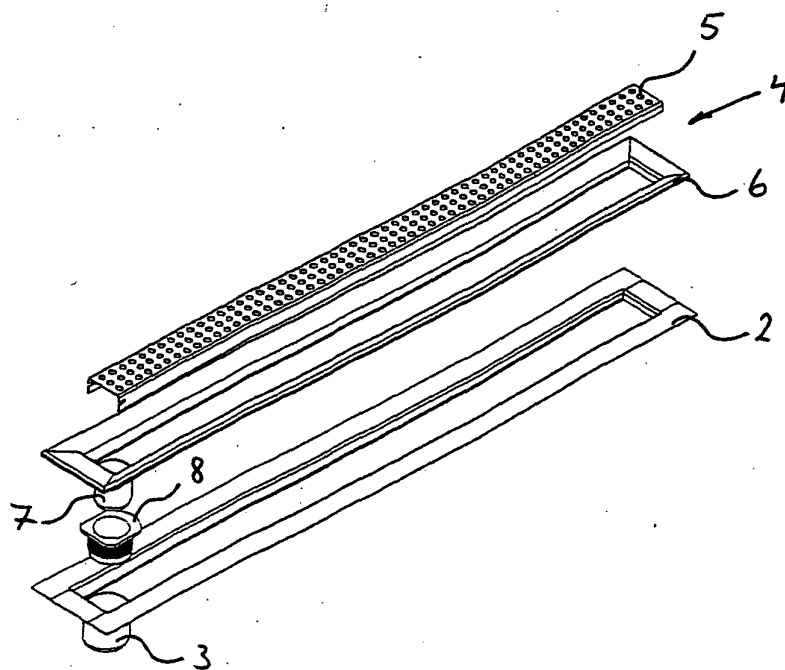
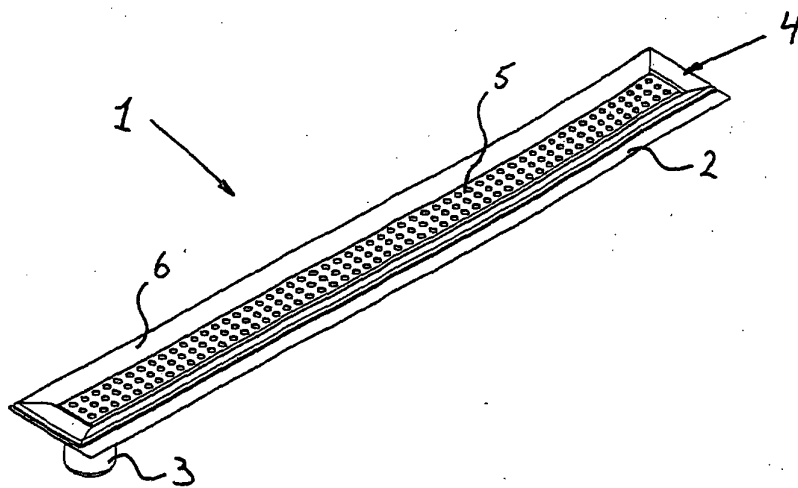
[0056] Oppositely, motion is required for positioning the grate 5 in the second gutter 6, where the grate 5 is positioned down into the second gutter 6 and then slid along the longitudinal direction of the second gutter 6 until the protruding member 10 engages with the slots 9.

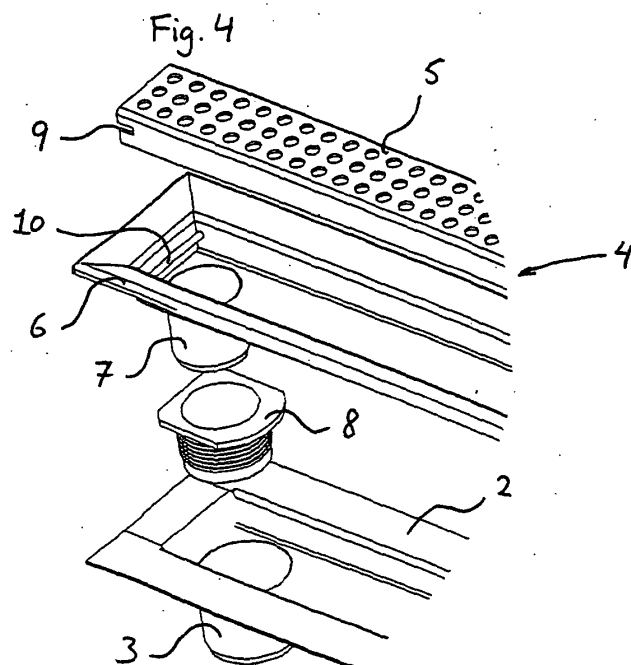
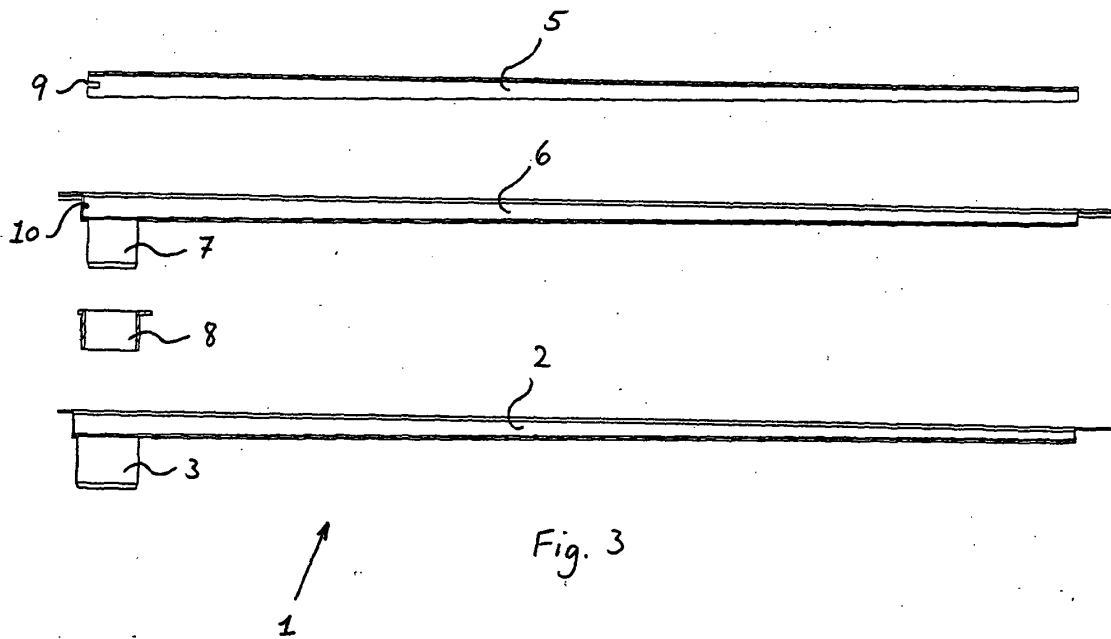
5. Drain unit (1) according to any of the preceding claims, **characterised in that** the drain unit (1) furthermore comprises at least one sealing collar (8) adapted to be positioned in the discharge (3) and to engage with the second discharge (7).

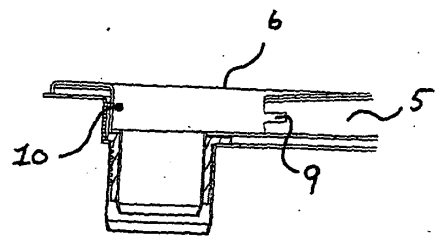
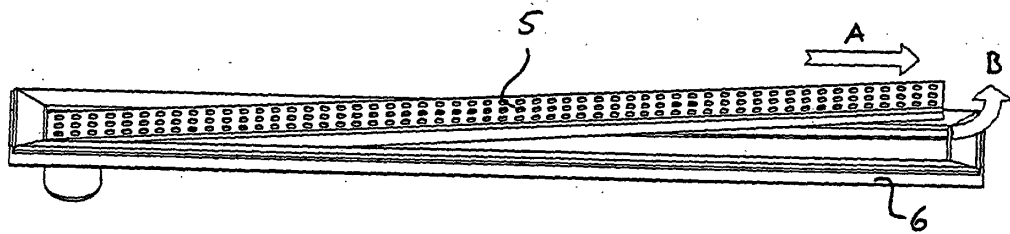
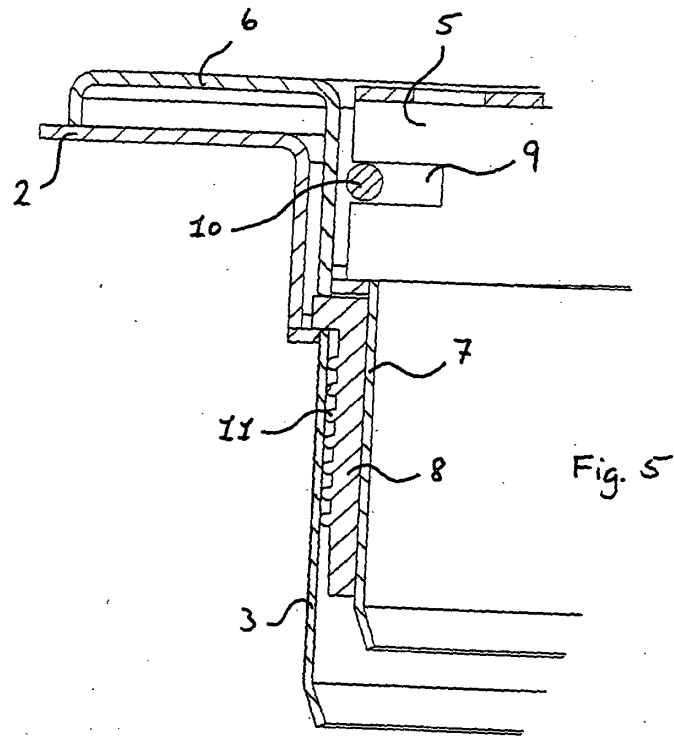
6. Drain unit (1) according to any of the preceding claims, **characterised in that** the grate (5) is constituted by an elongated plate member adapted to provide a surrounding narrow opening between the elongated plate member and the respective sides of the second gutter (6).

Claims

1. Drain unit (1) comprising an elongated bottom gutter (2), a grate part (4) and at least one discharge (3), where the grate part (4) is positioned on top of the elongated bottom gutter (2) and the discharge (3) is connected to a lowermost area of the elongated bottom gutter (2), **characterised in that** the grate part (4) comprises a grate (5) and a second gutter (6) with a second discharge (7), where the grate (5) is positioned on top of the second gutter (6) and the second discharge (7) is connected to a lowermost area of the second gutter (6) and positioned in the discharge (3) of the elongated bottom gutter (2).
2. Drain unit (1) according to claim 1, **characterised in that** the elongated bottom gutter (2) is provided with a sloping bottom towards the discharge (3) and the second gutter (6) is provided with a sloping bottom towards the second discharge (7).
3. Drain unit (1) according to any of the preceding claims, **characterised in that** the grate (5) is provided with a number of slots (9) and the second gutter (6) is provided with a number of protruding members (10), where the protruding members (10) are adapted to engage with the slots (9).
4. Drain unit (1) according to any of the preceding claims, **characterised in that** the drain unit (1) furthermore comprises a number of support members adapted to be positioned between the elongated bottom gutter (2) and the second gutter (6).









European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 1971

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,A	GB 2 282 156 A (* INVA-DEX LIMITED) 29 March 1995 (1995-03-29) * figures 1,2 *	1	E03F5/04
A	US 2003/115814 A1 (NIELSEN CLAUS DYRE) 26 June 2003 (2003-06-26) * figure 2 *	1	
A	US 4 275 760 A (KESSEL ET AL) 30 June 1981 (1981-06-30) * figure 1 *	1	
A	EP 0 239 534 A (POLYDRAIN, INC; POLY-BAUELEMENTE AG) 30 September 1987 (1987-09-30) * abstract * * figure 2 *		
			TECHNICAL FIELDS SEARCHED (IPC)
			E03F
The present search report has been drawn up for all claims			

2

EPO FORM 1503 03.92 (P04C01)

Place of search Munich	Date of completion of the search 22 December 2005	Examiner Flygare, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

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

EP 05 01 1971

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-12-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2282156	A	29-03-1995	NONE	

US 2003115814	A1	26-06-2003	AU 4231901 A	08-10-2001
			CN 1440482 A	03-09-2003
			CZ 20023188 A3	12-03-2003
			WO 0173231 A1	04-10-2001
			EP 1287213 A1	05-03-2003
			JP 2003529005 T	30-09-2003
			NO 20024555 A	19-11-2002
			PL 365880 A1	10-01-2005

US 4275760	A	30-06-1981	AT 372451 B	10-10-1983
			AT 833278 A	15-02-1983
			BE 872629 A1	30-03-1979
			BR 7808049 A	07-08-1979
			DE 2755174 A1	13-06-1979
			DK 526878 A	11-06-1979
			ES 475838 A1	16-04-1979
			FR 2411278 A1	06-07-1979
			GB 2009813 A	20-06-1979
			IE 47759 B1	13-06-1984
			IT 1100780 B	28-09-1985
			LU 80631 A1	09-04-1979
			NL 7812045 A	12-06-1979
			NO 784153 A	12-06-1979
			SE 438884 B	13-05-1985
			SE 7812676 A	11-06-1979

EP 0239534	A	30-09-1987	US 4751945 A	21-06-1988
