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Remarks:

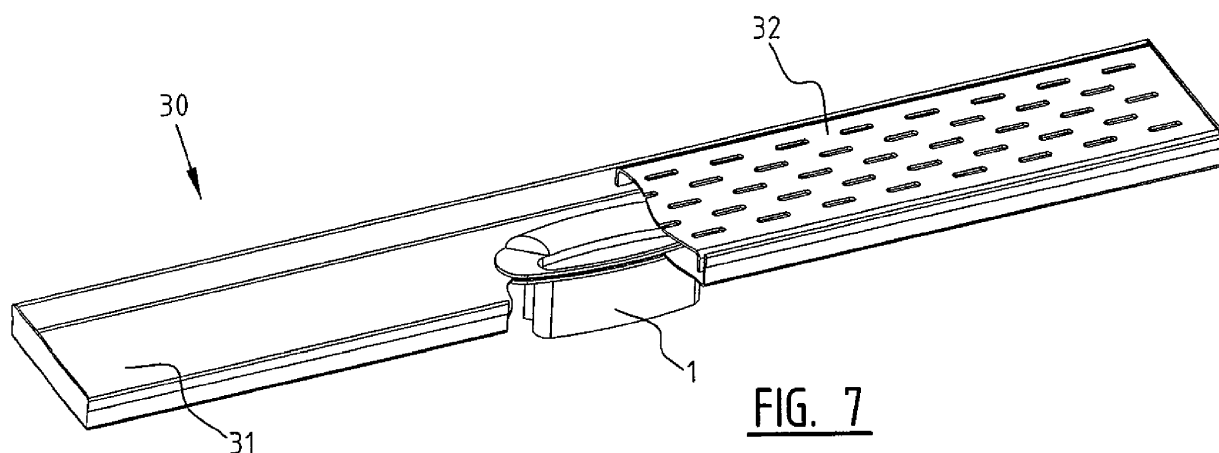
This application was filed on 24-04-2014 as a divisional application to the application mentioned under INID code 62.

(54) **Drain**

(57) The invention relates to a drain for discharge of a liquid, in particular water, to for instance an outlet pipe, which drain comprises an inflow opening, an outflow opening for connecting to an outlet pipe and an air trap arranged between the inflow opening and the outflow opening, which air trap comprises a reservoir open on the top side for collecting liquid flowing along the inflow opening and at least one overflow channel running over the top side out of the reservoir for discharging liquid from

the reservoir to the outflow opening, wherein a part of the overflow channel is at a higher position than the inflow opening of the drain.

The invention further relates to a gutter comprising an elongate receptacle of substantially U-shaped cross-section and a drain according to any of the foregoing claims arranged in the bottom of the U-shaped receptacle, wherein the inflow opening of the drain lies substantially flush with the bottom of the receptacle.



**FIG. 7**

## Description

**[0001]** The invention relates to a drain for discharge of a liquid, in particular water, to for instance an outlet pipe, which drain comprises an inflow opening, an outflow opening for connecting to an outlet pipe and an air trap arranged between the inflow opening and the outflow opening, which air trap comprises a reservoir open on the top side for collecting liquid flowing along the inflow opening and at least one overflow channel running over the top side out of the reservoir for discharging liquid from the reservoir to the outflow opening.

**[0002]** Such drains are for instance used for kitchen sinks, shower trays and baths.

**[0003]** The air trap of a drain has the purpose of airtight sealing of the connection to the sewer system, in particular the outlet pipe, while a liquid flow can nevertheless flow from the drain to the outlet pipe. This prevents unpleasant smells from the sewage system entering a living area via the drain.

**[0004]** Known drains take up considerable space under for instance the shower tray, this space not always being available. This space is defined particularly by the air trap. In this air trap there is a quantity of water which provides for sealing. In terms of legislation the height of this quantity of water is important since this water must be able to seal for a fixed period despite the fact that the water will evaporate. A minimum height of 5 cm applies for instance in the Netherlands.

**[0005]** Given such a height, the height of the drain will easily be about 7 cm. In particular cases this is still too much, and it is therefore the object of the present invention to provide a drain which can be made still flatter or at least has a smaller overall depth.

**[0006]** This object is achieved with a drain according to the invention which is characterized in that a part of the overflow channel is at a higher position than the inflow opening of the drain.

**[0007]** In a usual drain with a normal air trap of for instance 5 cm, space is required on both the top side and underside of the air trap to allow passage of the liquid. Assuming that about 1 cm is necessary for this purpose, a conventional drain will then easily reach a height of 7 cm. In the drain according to the invention a part of the overflow channel is now at a higher position than the inflow opening of the drain. The space on the top side is hereby placed above the inflow opening, whereby the drain still has per se a height of, in this example, 7 cm but in this case, with the value in the example, the drain only protrudes 6 cm on the underside. A drain of smaller overall depth is hereby thus obtained.

**[0008]** In an embodiment of the invention the overflow channel comprises an inlet opening arranged in the reservoir and an outlet opening debouching in vertical direction under the top side of the reservoir. The distance between the inlet opening and the top side of the reservoir determines the height of the air trap in the invention.

**[0009]** In another embodiment of the invention the res-

ervoir comprises an upper edge and the higher-lying part of the overflow channel is arranged in the upper edge. With such an upper edge the drain can be easily installed in for instance a shower tray, and the overflow channel is moreover partially integrated into this upper edge.

**[0010]** The upper edge preferably comprises an elevation for accommodating the higher-lying part of the channel.

**[0011]** In yet another embodiment of the drain according to the invention the inlet opening lies below the centre of the reservoir in vertical direction. The overall depth of the drain is hereby kept as small as possible.

**[0012]** The invention further comprises a gutter comprising an elongate receptacle of substantially U-shaped cross-section and a drain according to the invention arranged in the bottom of the U-shaped receptacle, wherein the inflow opening lies substantially flush with the bottom of the receptacle. A drain according to the invention is particularly advantageous in the case of such an elongate gutter. Such an elongate gutter can for instance be placed in a tiled floor. The gutter itself already has a determined overall depth and, because the drain is arranged under the U-shaped receptacle, the overall depth, at least at the position of the drain, is hereby further increased. It is therefore advantageous for the drain according to the invention to have a small overall depth.

**[0013]** In yet another embodiment of the invention the inflow opening is elongate, for instance oval. This embodiment of the drain is greatly preferred, particularly in the case of an elongate gutter. The elongate inflow opening results in a long overflow edge, whereby a large amount of water can be discharged in a limited height. Owing to the elongate form the overflow channel also extends along the length of the drain. The overflow channel is hereby a flat channel which is likewise able to discharge a large quantity. The highest point in the overflow channel is moreover a long edge, whereby the overflow height can remain limited. The overflow height is the space required above the long edge to carry a determined amount of liquid per fixed unit of time over the highest point. Owing to the long edge the overflow height can thus remain limited, and thereby also the overall height of the drain. It is hereby even possible for the height of the overflow channel to be only a few millimetres, whereby the overflow channel no longer even need lie above the inflow opening of the drain.

**[0014]** In a preferred embodiment of the gutter the elongate receptacle is covered with a grating. The drain according to the invention is hereby also concealed from view.

**[0015]** These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figures 1 and 2 show a perspective view of a first embodiment of a drain according to the invention. Figure 3 shows a cross-section of the drain according to figure 1.

Figures 4 and 5 show a perspective view of a second embodiment of a drain according to the invention. Figure 6 shows a cross-section of the drain according to figure 4.

Figure 7 shows a perspective view of an embodiment of a gutter according to the invention with a drain as according to figures 1-3.

Figures 1-3 show a first embodiment of a drain 1 according to the invention. Drain 1 has a reservoir 2 with an upper edge 3. Provided in this upper edge 3 is an inflow opening 4 along which liquid can enter reservoir 2. Edge 3 is provided with a groove 5 in which an O-ring 6 can be placed for the purpose of sealing drain 1 relative to an outlet pipe 7.

[0016] Drain 1 further has an overflow channel 8, the inlet opening 9 of which is arranged on the underside of reservoir 2 and wherein outlet opening 10 is at the same height as edge 11 of reservoir 2. Provided in upper edge 3 is an elevation 12 so that the higher-lying part of channel 8 is accommodated herein. The height H of the air trap is determined by the distance between inlet opening 9 of channel 8 and the upper edge 11 of the reservoir.

[0017] Figures 4-6 show a second embodiment 20 of a drain according to the invention. This drain 20 is in fact a dual embodiment of the drain according to figures 1-3. The same parts are therefore designated with the same reference numerals.

[0018] Water W which must be discharged flows via upper edge 3 into inflow opening 4. The water W here enters reservoir 2. As soon as reservoir 2 is full of water W, the water will flow via channel 8 over edge 11 of the reservoir and thus enter outlet pipe 21.

[0019] Figure 7 shows a gutter 30 with a receptacle 31 having a U-shaped cross-section. A drain 1 as according to figures 1-3 is arranged in the bottom of this receptacle 31. Further arranged in the receptacle is a grating 32 which in this case conceals drain 1 from view.

the overflow channel comprises an inlet opening arranged in the reservoir and an outlet opening debouching in vertical direction under the top side of the reservoir.

3. Drain as claimed in claim 1 or 2, **characterized in that** the reservoir comprises an upper edge and wherein the higher-lying part of the overflow channel is arranged in the upper edge.
4. Drain as claimed in claim 3, wherein the upper edge comprises an elevation for accommodating the higher-lying part of the channel.
5. Drain as claimed in any of the foregoing claims 2-4, **characterized in that** the inlet opening lies below the centre of the reservoir in vertical direction.
6. Drain as claimed in any of the foregoing claims, wherein the inflow opening is elongate, for instance oval.
7. Drain as claimed in claim 6, wherein the overflow channel has a width in the order of the length of the drain.
8. Gutter comprising an elongate receptacle of substantially V-shaped cross-section and a drain as claimed in any of the foregoing claims arranged in the bottom of the U-shaped receptacle, wherein the inflow opening of the drain lies substantially flush with the bottom of the receptacle.
9. Gutter as claimed in claim 8, wherein the elongate receptacle is covered with a grating.

## Claims

1. Drain for discharge of a liquid, in particular water, to for instance an outlet pipe, which drain comprises an inflow opening, an outflow opening for connecting to an outlet pipe and an air trap arranged between the inflow opening and the outflow opening, which air trap comprises a reservoir open on the top side for collecting liquid flowing along the inflow opening and at least one overflow channel running over the top side out of the reservoir for discharging liquid from the reservoir to the outflow opening, **characterized in that** a part of the overflow channel is at a higher position than the inflow opening of the drain.
2. Drain as claimed in claim 1, **characterized in that**

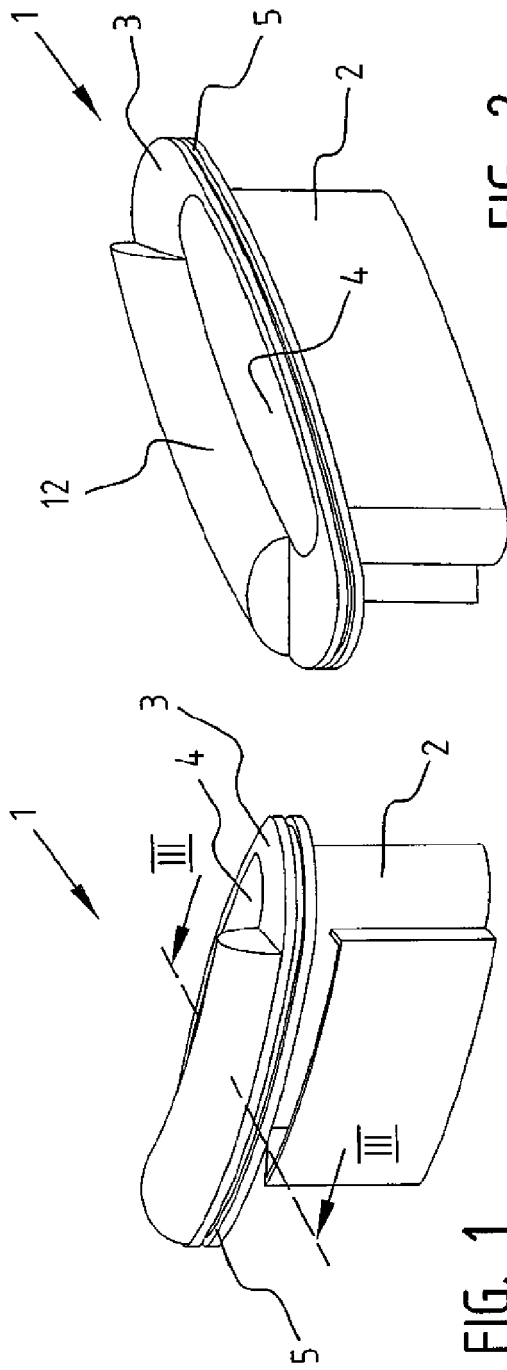


FIG. 2

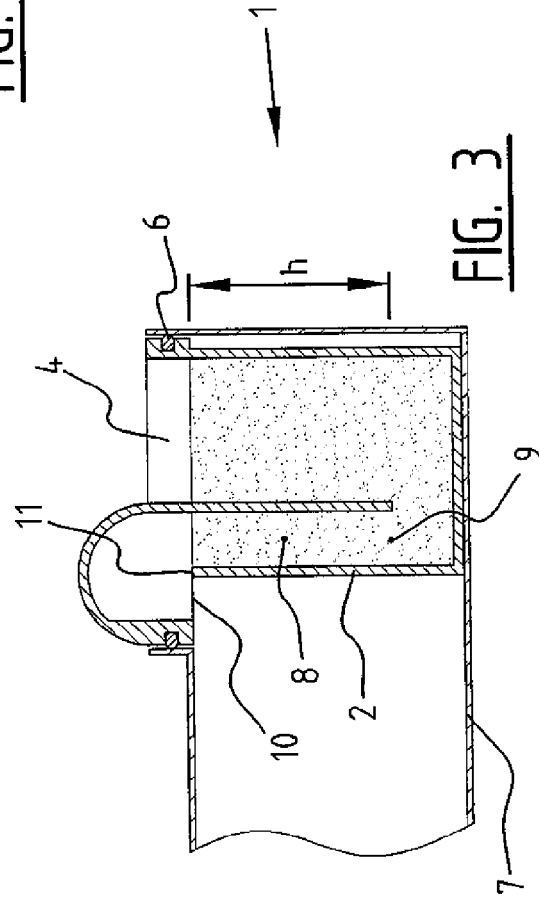


FIG. 3

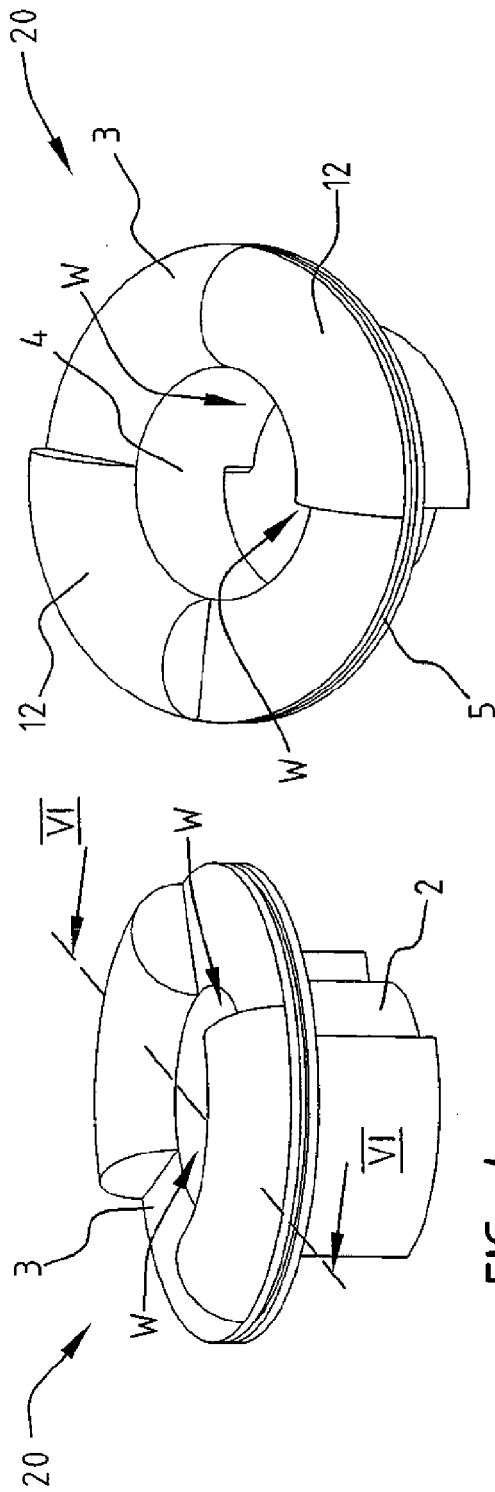


FIG. 4

FIG. 5

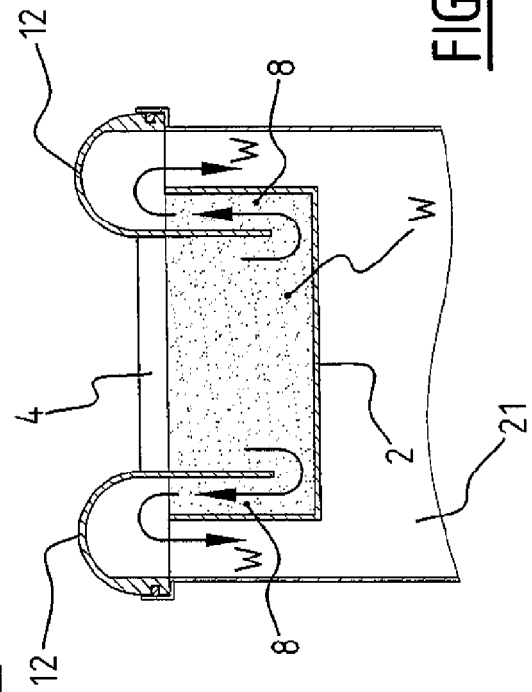
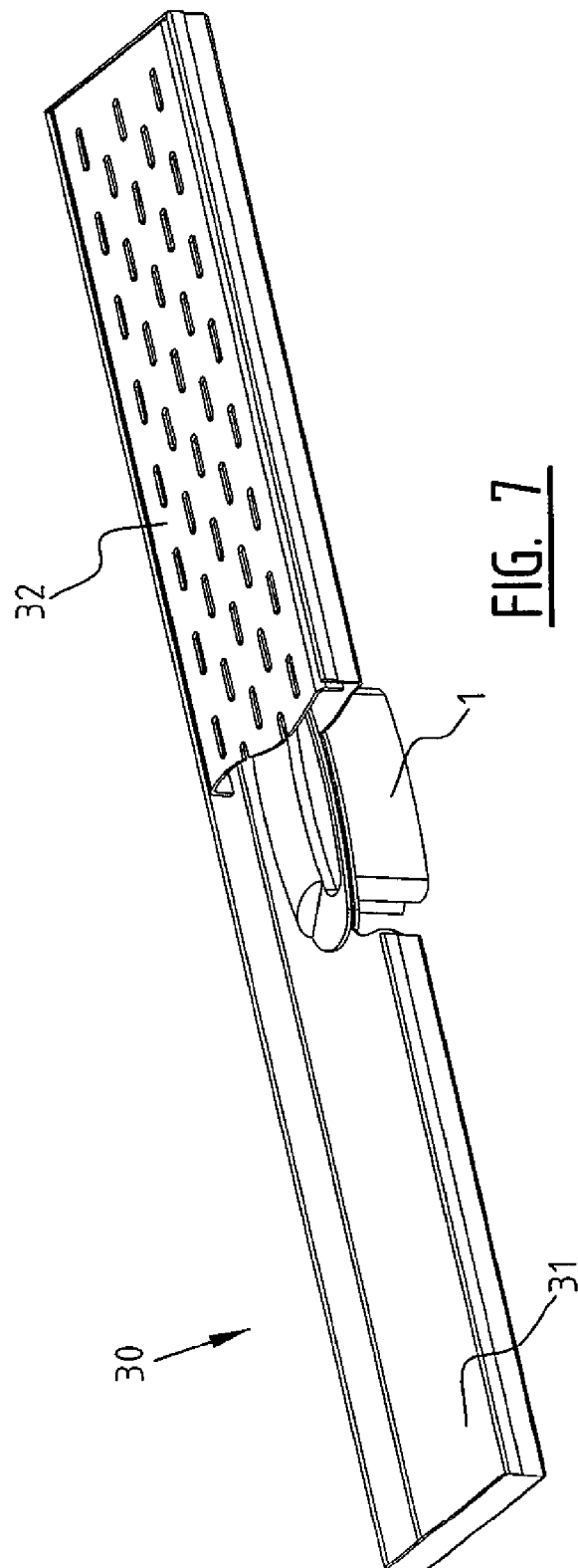


FIG. 6





## EUROPEAN SEARCH REPORT

 Application Number  
 EP 14 16 5822

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 627 968 A2 (NAUR BENNY PETER HANSEN [DK]) 22 February 2006 (2006-02-22)	1-4	INV. E03F5/04
Y	* paragraph [0030] - paragraph [0037]; figures 1-6 *	6-9	
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X	AT 335 369 B (HUTTERER & LECHNER KG [AT]) 10 March 1977 (1977-03-10) * page 2, line 25 - line 56; figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 May 2014	Examiner De Coene, Petrus
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			

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

EP 14 16 5822

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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  
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