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(54) Drain with lighting

(57) The invention relates to a drain, comprising:
- a collecting tray (13) with an outflow opening (14) for connection to an outlet pipe;
- a light source (6) arranged outside the collecting tray (13); and
- at least one optical fibre (7), wherein the one end is connected to the light source (6) and wherein the other end extends into the collecting tray. Owing to the use of an optical fibre the electricity required for the light source is separated from the collecting tray in which water is collected.

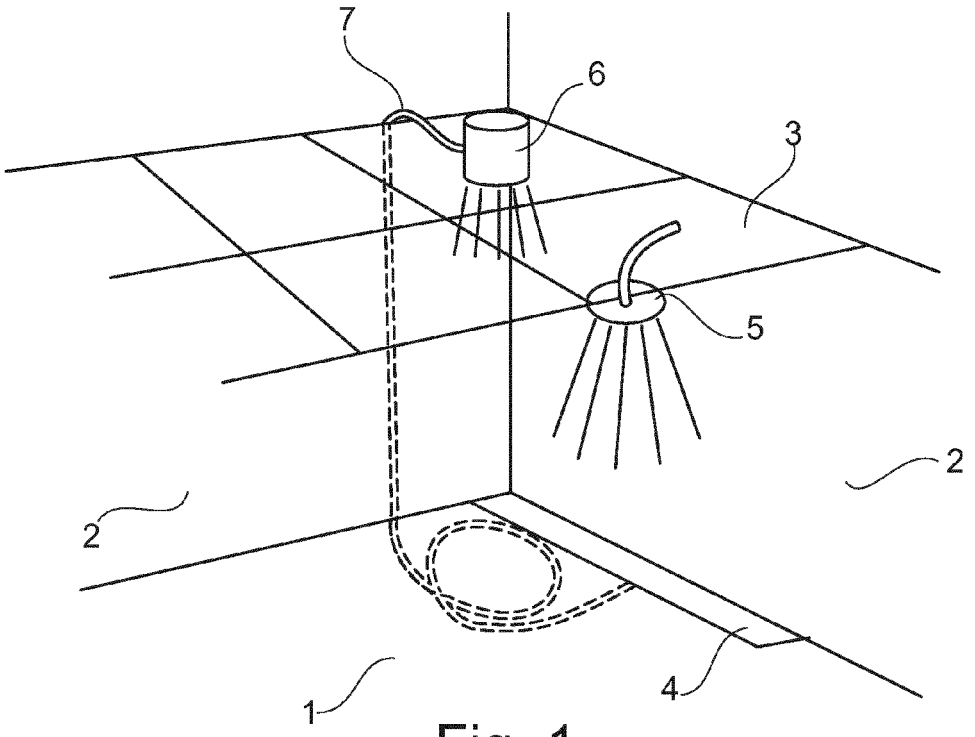

Fig. 1

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Description

[0001] The invention relates to a drain, such as a shower drain.

[0002] Drains are for instance used in a sanitary space, such as for instance a shower space. The drain is incorporated in the floor so that falling water can flow over the floor into the drain and then be carried to the sewer.

[0003] A sanitary space is further provided with lighting. This lighting is usually arranged in the ceiling so that contact with moisture is prevented as far as possible.

[0004] It is nevertheless desired to also arrange lighting in the floor, and to even arrange lighting in the drain.

[0005] A drain is thus known from for instance DE 20201105131 wherein contact points are arranged in the collecting tray. A grating in which lighting is arranged is further provided in the collecting tray. The lighting is supplied with current via the contact points. The drawback of this embodiment is the presence of current in the collecting tray. Although it is a weak current, it is often undesired by users. In addition, the contacts may corrode in the course of time, whereby the lighting may not function properly.

[0006] DE 102008006749 describes an elongate shower drain with an elongate grating. Lighting modules are arranged on the end surfaces of the grating. These lighting modules comprise batteries and LED lighting. The shower drain can hereby be illuminated for a certain period of time. The drawback however is that the batteries have to be replaced regularly. The usual fouling of the shower drain makes this is an unpleasant task. The lighting modules moreover take up space in the shower drain, which may affect the drainage capacity of the shower drain.

[0007] In addition, LEDs are sensitive to the fluctuations in temperature which typically occur in a drain for a shower. This can considerably limit the lifespan of the LEDs.

[0008] The LEDs moreover provide for local heating of the shower drain, which may enhance formation of limescale from the water.

[0009] It is now an object of the invention to provide a drain with lighting, wherein the above stated drawbacks are reduced or even obviated.

[0010] This object is achieved with a drain comprising:

- a collecting tray with an outflow opening for connection to an outlet pipe;
- a light source arranged outside the collecting tray; and
- at least one optical fibre, wherein the one end is connected to the light source and wherein the other end extends into the collecting tray.

[0011] The use of the at least one optical fibre, such as for instance a glass fibre cable, makes it possible to place the light source outside the collecting tray, for instance at a dry location. The light from the light source is carried by the optical fibre to the collecting tray, where it illuminates the drain. This ensures that the electricity and the water can be separated from each other at all times.

[0012] Because of the placing outside the collecting tray, the dimensions of the light source are no longer determined by the collecting tray. The light source can further be easily replaced, or a colour-changing light source can be arranged.

[0013] Another advantage is that the optical fibre is thin, whereby possible excess length can be easily worked into for instance the adhesive layer of the tile floor. In addition, a possible break in the optical fibre will not immediately result in problems. The light will usually pass through the break in the fibre. If a break were to occur in an electric wire, short-circuiting could occur and it is often necessary to break open the shower floor. This will not be the case with the invention.

[0014] In an embodiment of the drain according to the invention an interruption where the glass fibre cable enters the collecting tray is arranged in the at least one optical fibre.

[0015] Providing an interruption makes it possible to wholly remove the part of the glass fibre in the collecting tray, for instance for the purpose of cleaning the collecting tray.

[0016] The interruption in the optical fibre is preferably provided with at least one lens to allow the light from the light source to bridge the interruption.

[0017] The use of a lens enables the light to be bundled. The light exiting at the interruption can hereby be focussed on the remaining part of the glass fibre and/or the light exiting at the interruption can be collected again by the lens and fed back into the remaining part of the glass fibre.

[0018] A preferred embodiment of the drain according to the invention further comprises a grating which covers the collecting tray, and wherein the other end is arranged on the grating. In this embodiment the grating is illuminated and the grating can be removed without problem, together with the remaining part of the optical fibre.

[0019] The light source preferably comprises at least one LED. LEDs have a long lifespan and are in addition energy-saving.

[0020] In another embodiment of the drain according to the invention a lens is provided on the other end of the optical fibre for the purpose of diffusing the light. The light from the light source is concentrated in the optical fibre. The use of the lens at the other end of the optical fibre enables the concentrated light to be diffused again in the collecting tray.

[0021] In yet another embodiment of the drain according to the invention the light source is a build-in spotlight provided with at least one connection for an optical fibre.

[0022] With this embodiment the ceiling of a sanitary space can be provided in a usual manner with build-in spotlights. The optical fibre can then be connected to the connection on the build-in spotlight. The advantage of

this embodiment is that it is possible by means of the build-in spotlight to check whether the lighting in the shower drain is functioning. This is because the optical fibre only carries the light from the build-in spotlight to the shower drain.

[0023] The invention relates specifically to shower drains and is also elucidated on the basis thereof. A drain is nevertheless also understood to mean a bath tub. The optical fibre then debouches into the wall of the bathtub, which can be seen as collecting tray.

[0024] In addition, the inventive concept can also be applied in situations where it is not possible to replace a normal lamp. Lighting can thus also be provided for instance in tiles by embedding the optical fibre in the adhesive layer of the tile and allowing the optical fibre to debouch into the surface of a tile or into the surface of a joint. In such applications of the inventive concept the collecting tray is omitted, or a more abstract definition of a collecting tray is at least applied.

[0025] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 is a perspective view of an embodiment of the drain according to the invention.
Figure 2 is a cross-sectional view of the light source according to figure 1.
Figure 3 is a cross-sectional view of the collecting tray according to figure 1.
Figure 1 is a perspective view of a sanitary space with a floor 1, upright walls 2 and a ceiling 3. Arranged in floor 1 is a shower drain 4 for the purpose of collecting and discharging water coming from shower head 5.

[0026] A build-in spotlight 6 is arranged in ceiling 3. Provided on this build-in spotlight 6 is a connection for an optical fibre 7 which runs to shower drain 4 for illumination thereof.

[0027] Figure 2 shows build-in spotlight 6 in cross-sectional view. Build-in spotlight 6 has a housing 8 with a flange 9 and clamps 10. Clamps 10 ensure that housing 8 can be snapped fixedly into ceiling 3.

[0028] A halogen lamp 11 is provided in housing 8 for lighting the sanitary space. A lens 12 to which optical fibre 7 is coupled is also provided under halogen lamp 11. Lens 12 concentrates a part of the light from halogen lamp 11 and feeds it to optical fibre 7. Optical fibre 7 then runs through wall 2 and floor 1 to shower drain 4.

[0029] Figure 3 shows shower drain 4 in cross-section. Shower drain 4 has a collecting tray 13 with an outflow opening 14. Optical fibre 7 runs to a connection 15 on the side wall of collecting tray 13. Together with connection 16 this connection 15 forms an interruption in optical fibre 7. This interruption 15, 16 makes it possible to remove grating 17 from the collecting tray without optical fibre 7 having to be disconnected.

[0030] The remaining part of optical fibre 7 is connected to connection 16 and arranged under grating 17. In this embodiment the optical fibre 7 ends at an end point 18 which comprises a lens with which the light from optical fibre 7 can be diffused.

[0031] The distance between connections 15 and 16 is preferably kept as short as possible and preferably shielded from the water so that the least possible disruption of the light occurs at transition 15, 16.

Claims

1. Drain, comprising:
   - a collecting tray with an outflow opening for connection to an outlet pipe;
   - a light source arranged outside the collecting tray; and
   - at least one optical fibre, wherein the one end is connected to the light source and wherein the other end extends into the collecting tray.

2. Drain as claimed in claim 1, wherein an interruption where the glass fibre cable enters the collecting tray is arranged in the at least one optical fibre.

3. Drain as claimed in claim 2, wherein the interruption in the optical fibre is provided with at least one lens to allow the light from the light source to bridge the interruption.

4. Drain as claimed in any of the foregoing claims, further comprising a grating which covers the collecting tray, and wherein the other end is arranged on the grating.

5. Drain as claimed in any of the foregoing claims, wherein the light source comprises at least one LED.

6. Drain as claimed in any of the foregoing claims, wherein a lens is provided on the other end of the optical fibre for the purpose of diffusing the light.

7. Drain as claimed in any of the foregoing claims, wherein the light source is a build-in spotlight provided with at least one connection for an optical fibre.

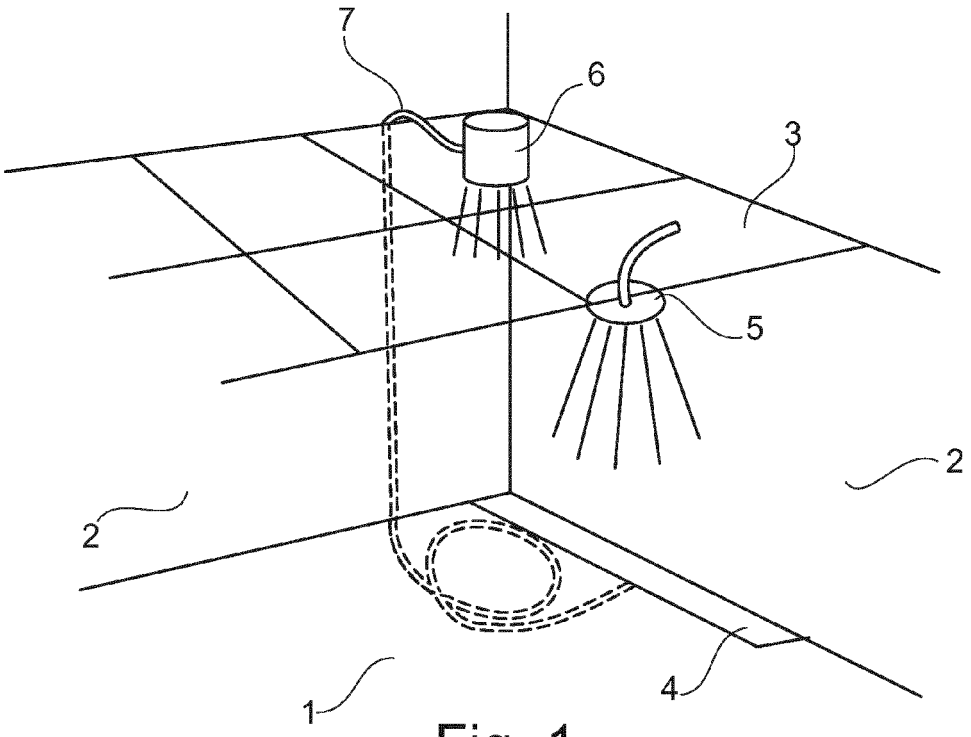

Fig. 1

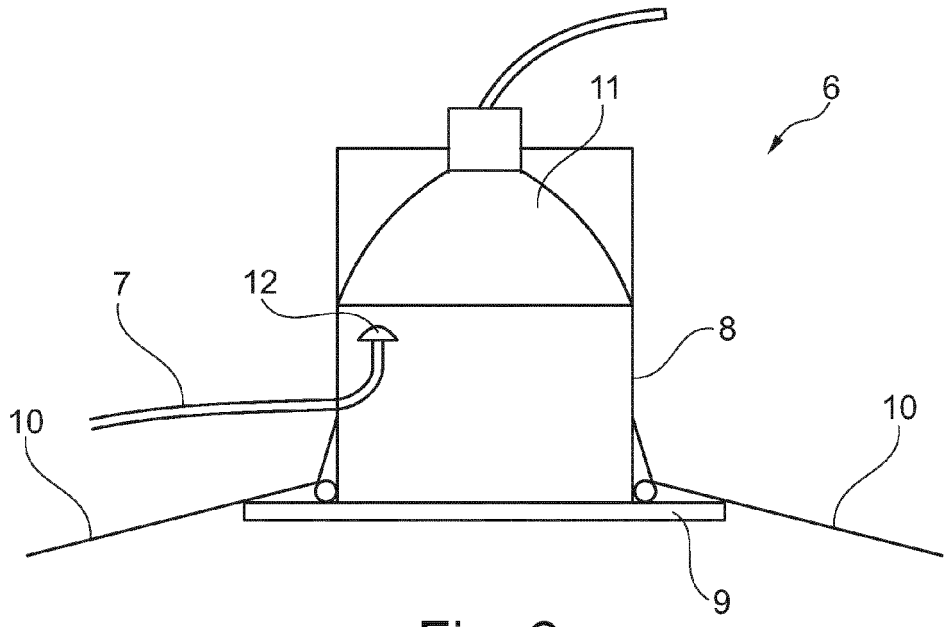

Fig. 2

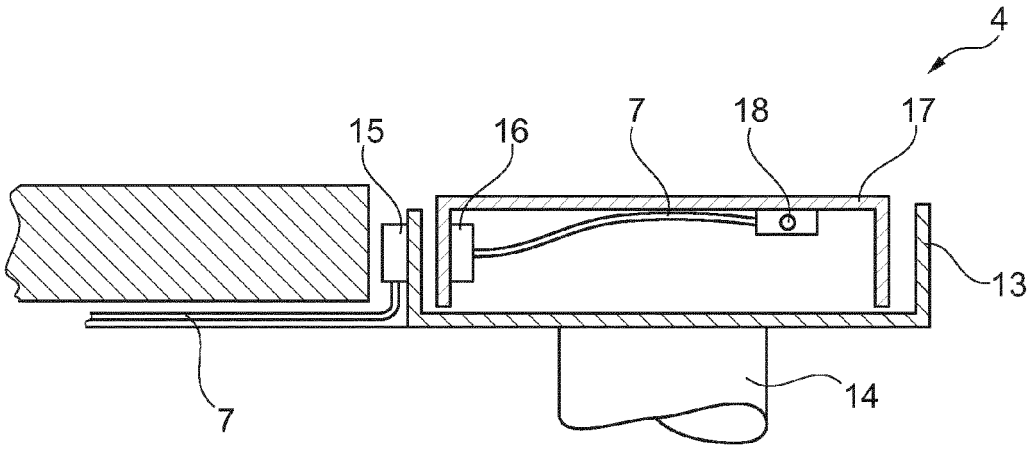

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 0825

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2007 057214 A1 (BIRCO BAUSTOFFWERK GMBH [DE]) 4 June 2009 (2009-06-04) * paragraph [0013] *	1,2	INV. E03F5/04 F21V33/00
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A	DE 20 2011 100112 U1 (KESSEL AG [DE]) 22 November 2011 (2011-11-22) * figure 1 *	1	
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TECHNICAL FIELDS SEARCHED (IPC)

E03F
F21V
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 September 2013	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 17 0825

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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19-09-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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