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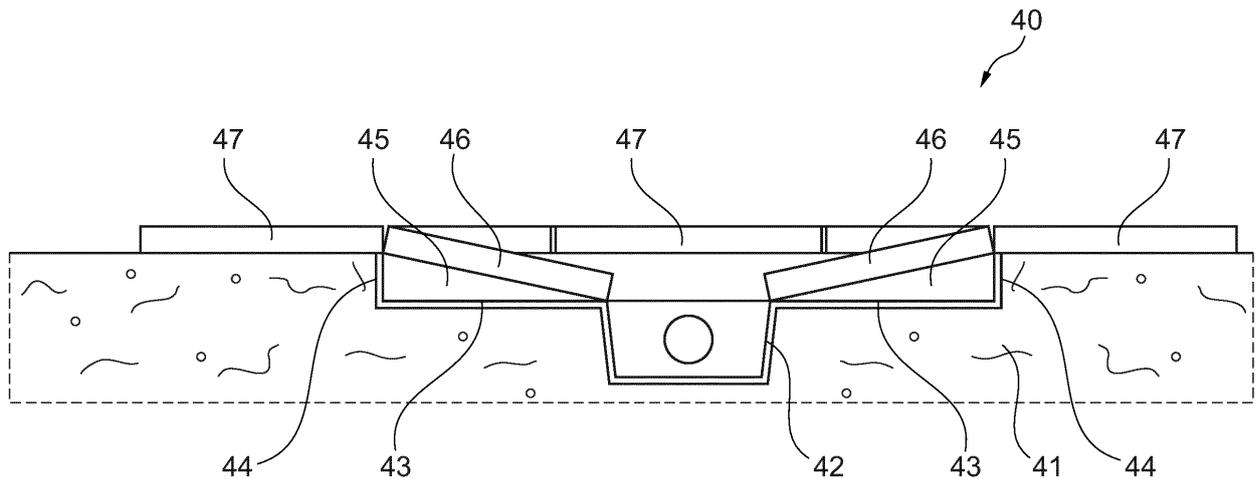
(54) **LINED DRAIN**

(57) The invention relates to a lined drain channel (4), which drain channel comprises:

- a collecting tray with a bottom (5) and upright walls (6), wherein the upper edges (7) of the upright walls (6) define an inflow opening (8) and wherein the collecting tray has an outlet opening (9);
- at least one discharge channel (10, 11, 12) with an elongate bottom surface and upright walls arranged in longitudinal direction and on either side of the elongate bottom surface, wherein at a first end side of the discharge channel the elongate bottom surface is arranged on an upper edge of the collecting tray and wherein the second end side of the discharge channel forms an open side of the discharge channel;
- at least one plate-like lining element (15), arranged on the elongate bottom surface of the discharge channel.

tudinal direction and on either side of the elongate bottom surface, wherein at a first end side of the discharge channel the elongate bottom surface is arranged on an upper edge of the collecting tray and wherein the second end side of the discharge channel forms an open side of the discharge channel;

- at least one plate-like lining element (15), arranged on the elongate bottom surface of the discharge channel.



**Fig. 3**

## Description

**[0001]** The invention relates to a lined drain channel, which drain channel comprises:

- a collecting tray with a bottom and upright walls, wherein the upper edges of the upright walls define an inflow opening and wherein the collecting tray has an outlet opening.

**[0002]** In for instance a shower space or a bathroom it is usual to tile the floor with tiles. A collecting tray is here arranged in the floor so that water falling on the floor, for instance from a shower head, can be discharged in an outlet pipe.

**[0003]** It is known to use an elongate shower drain as collecting tray. The advantage of an elongate shower drain is that an inclining surface, which is flat and can be lined with large tiles in simple manner, can be arranged adjacently. Often placed in the elongate shower drain is a stainless steel grating, through which the shower drain is clearly visible. In such an elongate shower drain hairs and dirt will stick to the underside of the grating, particularly to the adjusting feet of the grating. This is difficult to clean, and thereby less hygienic.

**[0004]** It is however a trend to conversely make the drain element less visible in the covered floor, such as a tiled floor. It is known for this purpose to place a so-called tile grating in an elongate shower drain. This is an element which is lined with a tile, and largely covers the inflow opening of the shower drain and leaves only small inflow gaps. A drawback of such a tile grating is that it is difficult to remove when the shower drain has to be inspected and cleaned.

**[0005]** The use of a smaller collecting tray in combination with relatively large tiles is difficult, since the large tiles have to be cut into many pieces for the purpose of providing a good downward incline toward the collecting tray. This is because it is necessary in the case of a smaller collecting tray to provide various inclining surfaces, each having a downward inclining direction toward the smaller collecting tray.

**[0006]** In addition, it is known in for instance sports facilities to provide a recess, which forms a discharge channel, in the cement floor. Arranged in the bottom of this recess is a drain which protrudes with the upper edges above the bottom surface of the cement floor so that, when the bottom surface is tiled, the upper surface of the tiles connects to the upper edges of the drain. In such a construction the drain is in fact arranged in the same way as in a normal tiled floor.

**[0007]** The drawback of this construction is that the discharge channel must be formed in the floor during the work, while the drain is manufactured in the factory. A good seal between the discharge channel and drain is hereby difficult, and it is difficult to provide a correct incline in the discharge channel so that collected water is discharged to the drain properly.

**[0008]** In addition, the drawback of such a construction is that the width of the discharge channel is relatively great because a drain with standard dimensions must be arranged in the recess and a good seal must also be provided.

**[0009]** Further known are shaped metal drain strips which are provided in a central part with an opening which connects to an outlet pipe. It is essential precisely in the case of such metal drain strips that, from a design viewpoint, the metal drain strips remain visible. It is therefore usual when installing these drain strips to make the upper edges of the strips flush with the upper surface of the surrounding floor. In these drain strips the roughness of the metal surface, the so-called R-value, is low compared to the roughness of tiles. This can cause a user to slip when he or she steps from the surrounding floor onto the metal drain strip.

**[0010]** It is now an object of the invention to reduce or even obviate the above stated drawbacks.

**[0011]** This object is achieved with a lined drain channel according to the preamble, which drain channel is characterized by:

- at least one discharge channel with an elongate bottom surface and upright walls arranged in longitudinal direction and on either side of the elongate bottom surface, wherein at a first end side of the discharge channel the elongate bottom surface is arranged on an upper edge of the collecting tray and wherein the second end side of the discharge channel forms an open side of the discharge channel;
- at least one plate-like lining element, such as a tile, arranged on the elongate bottom surface of the discharge channel.

**[0012]** Because the elongate bottom surface is at a first end side arranged on an upper edge of the collecting tray, one whole is obtained, this forming the drain channel. Since the drain channel is manufactured in the factory, the discharge channel and the collecting tray can be adapted to each other in simple manner, whereby a good seal, a correct incline in the discharge channel and a good discharge of water can be ensured.

**[0013]** Now that the drain channel itself is provided with a discharge channel at least one plate-like lining element, such as a tile, can be arranged herein on the bottom surface. The at least one plate-like lining element will hereby simply lie at the correct incline, without special attention having to be paid thereto during the work.

**[0014]** The chance of leakage will further decrease owing to the discharge channel. Even when the at least one plate-like lining element has not been arranged water-tightly on the bottom surface and leakage water may come to lie under the lining element, the leakage water will still flow to the collecting tray and over an upper edge into the collecting tray owing to the bottom surface of the discharge channel.

**[0015]** Because the lined drain channel further has on

the second end side of the discharge channel an open side of the discharge channel, a surrounding floor can easily continue into the at least one plate-like lining element in the discharge channel. The lined drain channel and the surrounding floor can hereby simply form one whole to the eye.

**[0016]** The at least one plate-like lining element can for instance be a wooden board, glass plate or Corian plate.

**[0017]** In an embodiment of the lined drain channel according to the invention the elongate bottom surface rises from the upper edge, and the height of the upright walls arranged on either side decreases correspondingly.

**[0018]** Owing to the rising elongate bottom surface a suitable incline in the discharge channel to the collecting tray is obtained, while the upright walls decreasing in height can form a horizontal upper edge of the drain channel and thus provide for a finish of the sides of the discharge channel and at the same time a finish of the cement floor, which lies against the discharge channel.

**[0019]** In another embodiment of the lined drain channel according to the invention the height of the upright walls arranged on either side is zero on the open side of the discharge channel.

**[0020]** In this embodiment the at least one plate-like lining element, such as a tile, will lie in the discharge channel with its side on the second end side flush with the covering elements, such as tiles, of a surrounding floor, whereby a simple connection is obtained.

**[0021]** In a preferred embodiment of the lined drain channel according to the invention a longitudinally extending horizontal flange is arranged on at least one of the upright walls of the discharge channel.

**[0022]** This horizontal flange can be useful in the levelling of the surrounding cement floor, so that covering elements which are adhered onto this cement floor come to lie at the same height as the tiles at the outer end of the discharge channel.

**[0023]** In addition, a sealing tile membrane can be arranged on this horizontal flange in simple manner. Since the lined drain channel itself is already a whole, attachment of the tile membrane to the horizontal flange can provide a wholly sealing layer under the lining elements. If a crack were to result in one of the joints, leakage water will be collected by this sealing layer, and the leakage water can flow to the collecting tray of the drain channel at all times.

**[0024]** In a preferred embodiment of the lined discharge channel according to the invention two discharge channels, each with an elongate bottom surface and upright walls arranged in longitudinal direction and on either side of the respective elongate bottom surface, are arranged on either side of the collecting tray, and the upright walls lying mutually in line connect to each other.

**[0025]** This embodiment of the lined discharge channel corresponds in respect of shape and position of the outlet opening to a known stainless steel drain channel, in which a grating is usually placed. The difference is however

that, in the case of the invention, the discharge channels have an open end, this in contrast to the known stainless steel drain channel, which has closed discharge channels. This embodiment according to the invention can be placed at the position of such a known drain channel in simple manner.

**[0026]** In another embodiment of the lined discharge channel according to the invention at least one of the upright walls of the at least one discharge channel extends over at least a part of an upper edge of an upright wall of the collecting tray, and connects thereto.

**[0027]** With this embodiment the upright walls of the discharge channel and the collecting tray form one whole, so that the drain channel itself has a common upper edge in at least the longitudinal direction, whereby a surrounding floor can connect neatly to the lined drain channel according to the invention.

**[0028]** In another preferred embodiment of the lined drain channel according to the invention the elongate bottom surface has on the second end side an upright wall and a wedge-shaped element is arranged on the elongate bottom surface, in contact with the upright wall on the second end side, wherein the height of the wedge-shaped element is equal to the height of this upright wall and wherein the at least one tile is arranged via this wedge-shaped element on the bottom surface.

**[0029]** By arranging a wedge-shaped element the bottom surface of the discharge channel is still provided at an incline, and because the height of the wedge is equal to the height of the upright wall on the second end side, the discharge channel maintains an open side on the second end side.

**[0030]** This embodiment is particularly suitable when an already built-in lower tray of a prior art drain channel is available. By arranging wedge-shaped elements a drain channel according to the invention is formed, which can be tiled in simple manner.

**[0031]** It is highly preferred for the collecting tray and the discharge channel to be made of a metal, preferably stainless steel.

**[0032]** It is further preferred for the at least one plate-like lining element to be adhered to the bottom surface, for instance with tile adhesive or a mastic. The bottom surface of the discharge channel can for this purpose be provided with a roughened layer, for instance an adhesive layer with embedded granules, whereby the adhesion of the tile adhesive and thereby the lining element is improved.

**[0033]** Yet another embodiment of the lined drain channel according to the invention comprises a grating arranged in the inflow opening of the collecting tray, wherein the grating is preferably height-adjustable.

**[0034]** The invention further relates to a combination of a lined drain channel according to the invention and a floor, wherein the lined drain channel is arranged in the floor and wherein the floor is covered at least on one side adjacently of a longitudinal side of the drain channel with plate-like covering elements, such as tiles.

**[0035]** The floor has an underlayer on which tiles are arranged. This underlayer is usually a sand cement floor, but can optionally also be a wooden floor. The drain channel according to the invention is arranged in this floor and tiles are further arranged on this floor.

**[0036]** In a preferred embodiment of the combination according to the invention the floor part covered with plate-like covering elements has a unidirectional incline perpendicularly of the longitudinal side of the discharge channel. It is particularly when relatively large plate-like covering elements are used for covering the floor that a unidirectional incline is preferred.

**[0037]** In a further embodiment of the combination according to the invention a recess is arranged in the floor in line with the at least one discharge channel, adjacently of the open side of the discharge channel, so that plate-like lining elements arranged on the bottom surface can extend up to the surface of the recess.

**[0038]** When it is desirable for the discharge channel to be longer than the length of the drain channel, a recess can be arranged in the floor, in which recess plate-like lining elements can be arranged, which connect to the at least one plate-like lining element on the bottom surface of the discharge channel.

**[0039]** A further preferred embodiment of the combination according to the invention comprises a tile membrane arranged over at least a part of the floor and under the lining elements, and wherein the tile membrane is arranged sealingly on the lined drain channel.

**[0040]** In each of the above stated embodiments the at least one plate-like lining element can be a ceramic tile, a wooden plate or a glass plate.

**[0041]** These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 is a perspective view of a first embodiment of a combination according to the invention with partially cut-away parts.

Figure 2 is a perspective view of a second embodiment of a combination according to the invention with partially cut-away parts.

Figure 3 is a cross-sectional view of a third embodiment of a combination according to the invention.

**[0042]** Figure 1 shows a perspective view of a first embodiment 1 of a combination according to the invention with partially cut-away parts. Combination 1 has a floor 2 which is tiled with tiles 3.

**[0043]** A drain channel 4 is arranged in floor 2. This drain channel 4 has a collecting tray with a bottom 5 and upright walls 6. The upper edges 7 of upright walls 6 form an inflow opening 8. Arranged on one of the upright walls 6 is an outlet opening 9.

**[0044]** Arranged on either side of collecting tray 5, 6, 7 are two discharge channels, each with an elongate bottom surface 10 which connects with a first end side to an upper edge 7. Upright walls 11, 12, which are connected

to the horizontal flange 13 running all around, rise from the elongate bottom surface 10. A sealing tile membrane 14 (only partially shown) is arranged on horizontal flange 13.

**[0045]** A tile 15 is arranged on the elongate bottom surface 10 of the two discharge channels 10, 11, 12. Due to the incline of the elongate bottom surface 10, tile 15 is also inclined, so that water flowing in over the surrounding floor 3 is collected in discharge channels 10, 11, 12 on tiles 15 and can then flow into inflow opening 8 to collecting tray 5, 6, 7 and outlet opening 9.

**[0046]** Figure 2 shows a second embodiment of a combination 20 according to the invention. Combination 20 has a floor 21 on which tiles 22 are arranged, and a drain channel 23.

**[0047]** Drain channel 23 has a collecting tray with a bottom 24 and upright walls 25, the upper edges of which define an inflow opening 26. The collecting tray further has an outlet opening 27.

**[0048]** Arranged on either side of collecting tray 24, 25 are two discharge channels with an elongate bottom surface 28 with upright walls 29. The second end side 30 of the two discharge channels are open and connect to a recess 31 in floor 21.

**[0049]** The incline of elongate bottom surface 28 connects to the incline of the bottom of recess 31, so that an elongate tile 32 can be arranged on bottom surface 28 in a manner overlapping with the bottom of recess 31.

**[0050]** Arranged on the upright walls 29 of the two discharge channels is a horizontal flange 33 on which a sealing tile membrane 34 is arranged. The edge of tile membrane 34 is indicated in the figure with a broken line 35. This tile membrane 34 provides for a seal relative to floor 21 and the recess 31 arranged therein.

**[0051]** Figure 3 shows a cross-sectional view of a third embodiment 40 of a combination according to the invention. A collecting tray 42 with two discharge channels 43, 44 is arranged in floor 41. Collecting tray 42 and discharge channels 43, 44 form a prior art lower tray, wherein the second end side 44 is closed by an upright wall.

**[0052]** According to the invention, a wedge-shaped element 45 is however placed herein, whereby the thus formed discharge channel 43, 44, 45 has a bottom surface rising from collecting tray 42, with an open second end side. A tile 46 can hereby be arranged on the rising bottom surface, whereby tile 46 connects to the tiles 47 with which floor 41 is covered.

**[0053]** In this way existing shower drains can be converted into a lined drain channel according to the invention.

## Claims

1. Lined drain channel, which drain channel comprises:
  - a collecting tray with a bottom and upright walls, wherein the upper edges of the upright walls de-

fine an inflow opening and wherein the collecting tray has an outlet opening;

**characterized by**

- at least one discharge channel with an elongate bottom surface and upright walls arranged in longitudinal direction and on either side of the elongate bottom surface, wherein at a first end side of the discharge channel the elongate bottom surface is arranged on an upper edge of the collecting tray and wherein the second end side of the discharge channel forms an open side of the discharge channel; 5
  - at least one plate-like lining element, such as a tile, arranged on the elongate bottom surface of the discharge channel. 10
2. Lined drain channel according to claim 1, wherein the elongate bottom surface rises from the upper edge and wherein the height of the upright walls arranged on either side decreases correspondingly. 20
  3. Lined drain channel according to claim 2, wherein the height of the upright walls arranged on either side is zero on the open side of the discharge channel. 25
  4. Lined drain channel according to any one of the foregoing claims, wherein a longitudinally extending horizontal flange is arranged on at least one of the upright walls of the discharge channel. 30
  5. Lined drain channel according to any one of the foregoing claims, wherein two discharge channels, each with an elongate bottom surface and upright walls arranged in longitudinal direction and on either side of the respective elongate bottom surface, are arranged on either side of the collecting tray, and wherein the upright walls lying mutually in line connect to each other. 35
  6. Lined drain channel according to any one of the foregoing claims, wherein at least one of the upright walls of the at least one discharge channel extends over at least a part of an upper edge of an upright wall of the collecting tray, and connects thereto. 40
  7. Lined drain channel according to any one of the foregoing claims, wherein the elongate bottom surface has on the second end side an upright wall and wherein a wedge-shaped element is arranged on the elongate bottom surface, in contact with the upright wall on the second end side, wherein the height of the wedge-shaped element is equal to the height of this upright wall and wherein the at least one tile is arranged via this wedge-shaped element on the bottom surface. 45
  8. Lined drain channel according to any one of the foregoing claims, wherein the collecting tray and the discharge channel are made of a metal, preferably stainless steel. 50
  9. Lined drain channel according to any one of the foregoing claims, wherein the at least one tile is adhered to the bottom surface, for instance with tile adhesive or a mastic. 55
  10. Lined drain channel according to any one of the foregoing claims, further comprising a grating arranged in the inflow opening of the collecting tray, wherein the grating is preferably height-adjustable.
  11. Combination of a lined drain channel according to any one of the foregoing claims and a floor, wherein the lined drain channel is arranged in the floor and wherein the floor is covered at least on one side adjacently of a longitudinal side of the drain channel with tiles.
  12. Combination according to claim 11, wherein the floor part covered with tiles has a unidirectional incline perpendicularly of the longitudinal side of the drain channel.
  13. Combination according to claim 11 or 12, wherein a recess is arranged in the floor in line with the at least one discharge channel, adjacently of the open side of the discharge channel, so that tiles arranged on the bottom surface can extend up to the surface of the recess.
  14. Combination according to any one of the claims 11-13, further comprising a tile membrane arranged over at least a part of the floor and under the tiles, and wherein the tile membrane is arranged sealingly on the lined drain channel.

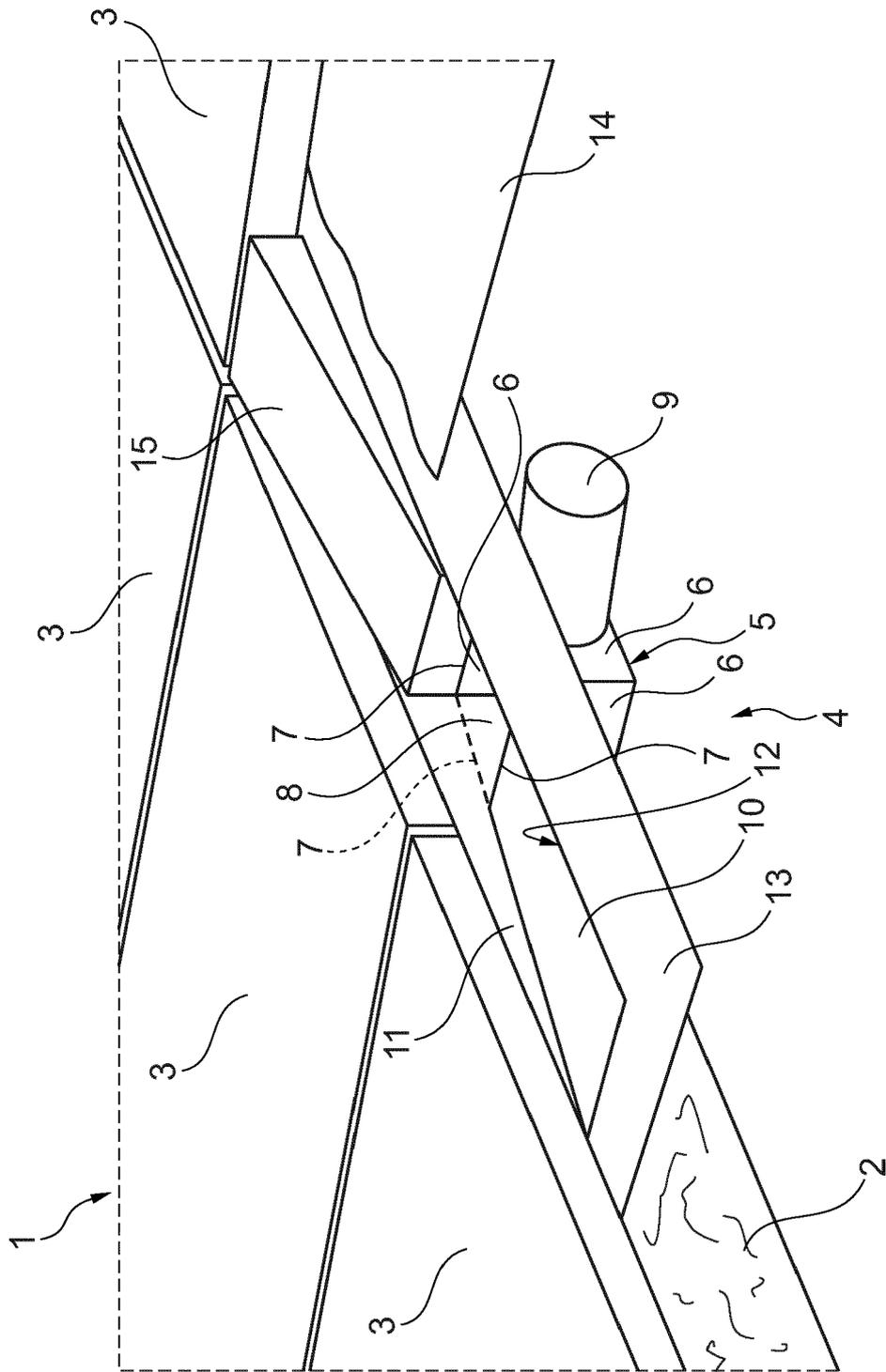


Fig. 1

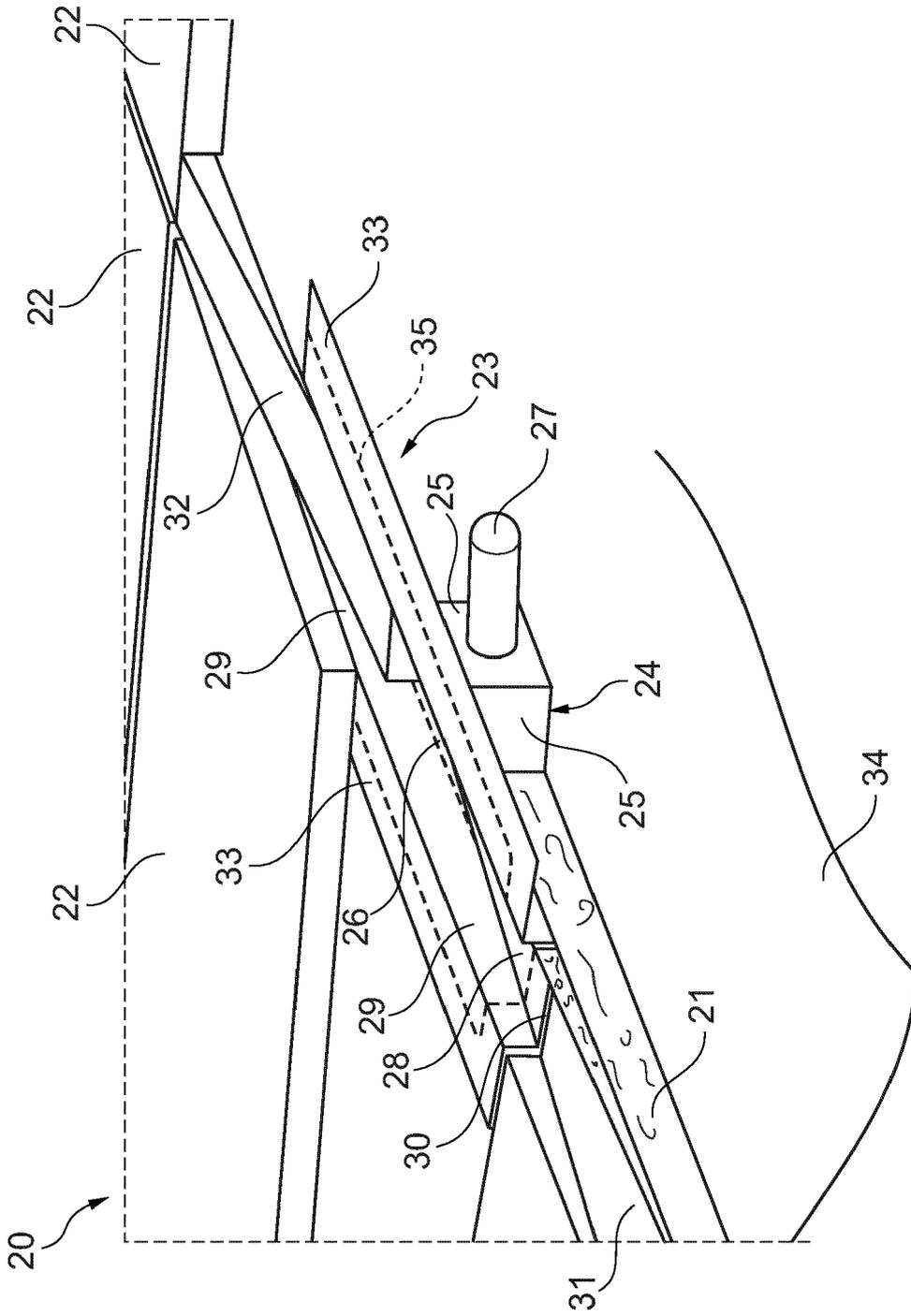


Fig. 2

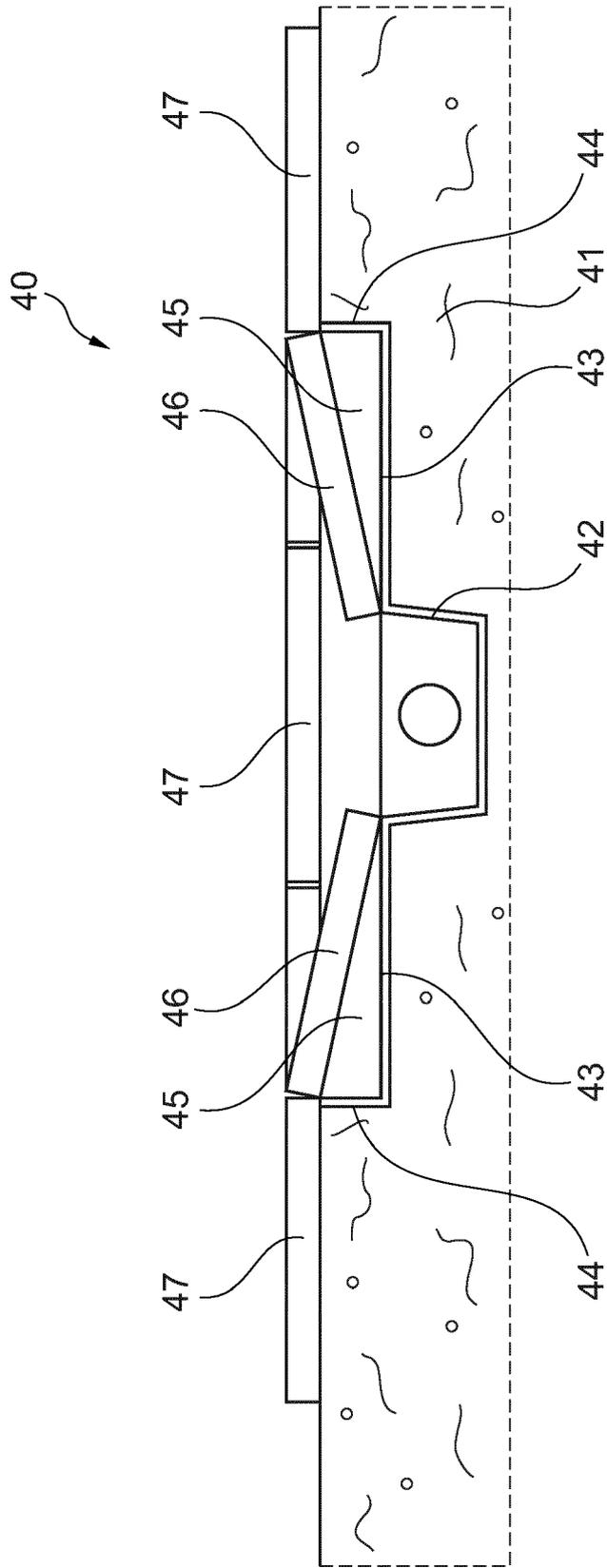


Fig. 3



EUROPEAN SEARCH REPORT

Application Number  
EP 20 15 3974

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC)
			E03F
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>22 June 2020</b>	Examiner <b>Flygare, Esa</b>
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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