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(54) Sealing means

(57) A sealing means at the lower end of a mechanical filter for removing particles carried by a stream of water in a channel (10). The filter comprises a screen consisting of respectively fixed (12) and movable (13) lamellar bars that form an inclined plane down into the water stream. The edges of the bars facing the water flow direction are stair-shaped. The movable lamellar bars (13) are interconnected in parallel to form at least one bar screen, which is operated by means of a driving mechanism placed at the upper end of the removing

device. It produces a closed circuit motion in the plane of the bars, with a motion component in an upward direction that exceeds the stair height of the bars. Each respective movable bar (13) is at its lower end equipped with a flexibly connected fingertip (14), which is pivoting in a vertical plane and displaceable, with its outermost end (16) in a sliding bearing, forward and backward along the channel bottom (10), during the motion of the screen.

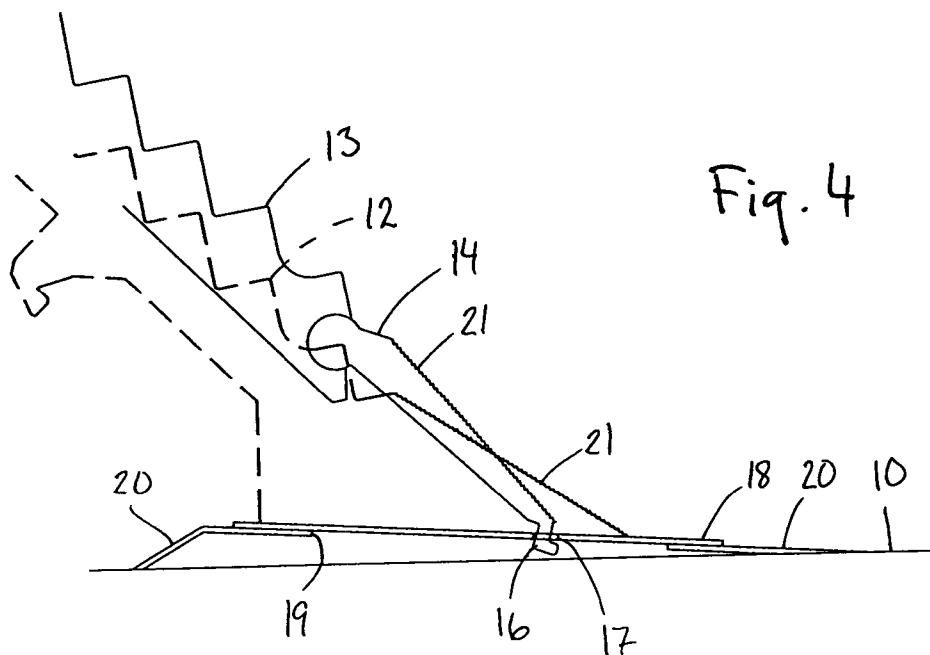


Fig. 4

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Description

TECHNICAL FIELD

The present invention deals with a sealing means at the lower end of a mechanical filter for removing particles carried by a stream of water in a channel, said filter comprising a screen consisting of respectively fixed and movable lamellar bars that form an inclined plane down into the water stream, with the edges of the bars facing the water flow direction being stair-shaped, wherein the movable lamellar bars are interconnected in parallel to form at least one bar screen, which is operated by means of a driving mechanism placed at the upper end of the removing device, to produce a closed circuit motion in the plane of the bars, with a motion component in an upward direction that exceeds the stair height of the bars.

BACKGROUND OF THE INVENTION

Devices for removing screenings according to above are used for example by a water-purifying plants to separate particles from sewage and are known among other through SE 448106.

A gap distance is maintained between the fixed and the movable bars, which makes it possible for the water to pass through the filter screen. When the movable bars move upward, an opening is normally formed at each movable bar, said opening corresponding to twice the gap distance plus the width of the movable bar. These openings form passages for bigger objects, which the filter screen is normally intended to capture.

SE 448106 shows in Fig. 4 a solution to the problem, where the fixed bars are made at their lower part with a bigger material thickness, corresponding approximately to the gap width. In this way, the width of the passages is somewhat reduced. A drawback arises however, as the gaps are substantially closed when the movable bars are in their lower position. This implies that the flow through the filter is temporarily reduced, and that the flow becomes pulsating in step with the bar motion.

Other solutions are shown in EP 0346311, which, like in the preceding example, imply that a reduced flow is created at the lower part of the screen, and that the flow becomes pulsating in time with the bar motion.

TECHNICAL PROBLEM

An object of the present invention is to produce a sealing means at the lower part of the screen, which gives a substantially equally great flow over the whole surface of the screen, without a flow limiting threshold at the channel bottom, and without pulsations in the flow.

SOLUTION

This is achieved according to the invention by having each respective movable bar at its lower end equipped with a flexibly connected fingertip, which is pivoting in a

vertical plane and displaceable, with its outermost end in a sliding bearing, forward and backward along the channel bottom, during the motion of the screen.

Advantageous embodiments of the invention appear from the following claims.

DESCRIPTION OF THE DRAWINGS

The invention will be described below with reference to the embodiment that is shown on the accompanying drawings, in which

- Fig. 1 is a top view of a fragment of the lower part of a screen according to the prior art, with the movable bars in their foremost position,
- Fig. 2 shows the same screen as Fig. 1, with the movable bars in their rearmost position,
- Fig. 3-5 is a side view schematically showing the lower part of a screen according to the present invention in three different motion positions,
- Fig. 6 shows the screen according to the invention with the fingertip, in a corresponding manner to Fig. 1 and 2, and
- Fig. 7 is a perspective view of a fingertip and a gliding plate.

DESCRIPTION OF THE EMBODIMENT

The device for removing screenings according to the invention is mounted according to the art as an inclined plane in a not shown flume or channel, in such a manner that it reaches down with its lower end in a stream of water that is to be filtered. The lower end of the device rests on the channel bottom.

In accordance with the art, the device comprises a screen placed in the space between two side girders 11, which screen in a known manner comprises alternately fixed and movable lamellar bars 12, 13 that form an inclined plane down into the water stream, with the edges of the bars 12, 13 that face the direction of the water stream being stair-shaped. In this manner, the set of lamellar bars 12, 13 forms a fixed screen part and a movable screen part, the latter of which produces a closed circuit motion with a motion component in an upward direction that exceeds the stair height of the bars. The stair ledges are sited substantially horizontally or lean somewhat backwards as seen from the stair front side, when the device is mounted in an operational position in the channel.

During the movable screen part motion, caught objects and particles are moved up gradually step by step by the screen, until they can pass from the topmost stair over to a following transporter, not shown, for example a band conveyor.

Fig. 1 shows a fragment of the lower part of a screen according to the prior art, with the movable bars 13 in their lower position. From Fig. 2 it appears that openings are formed between the fixed bars 12, when the movable

ones move upwards. The width of these openings corresponds to twice the gap distance plus the width of the movable bar.

Fig. 3-5 shows the lower part of a screen, where the movable bars 13 are in three different positions. Each of the movable bars is at its lower end provided with a flexibly connected fingertip 14, which is pivoting in a plane which is parallel to the longitudinal axis of the bar, i.e. vertical. The end 15 of the lower tip of each fingertip 14 engages with a notch organ 16 in a matching opening 17 in a gliding plate 18. The gliding plate 18 covers an opening 19 in a support plate 20 that rests on the bottom of the channel 10.

As appears from Fig. 3-5, which illustrate the motion course during the movable bar motion in three stages, the lower ends of the fingertips follow the channel bottom 10 forward and backward, mainly in parallel with said bottom. The fingertips 14 hereby rest via the plate 18 against the upper side of the support plate 20. Fig. 3 shows a position where the movable bars 13 are in a straight line with the fixed ones 12. Fig. 4 shows a position where the movable bars 13 are above the fixed ones 12. Fig. 5 finally, shows a position where the movable bars 13 are below the fixed ones 12.

The upstream facing edges of the lower end of the fixed bars and the corresponding edges on the fingertips 14 are provided with sawtooth 21. The upper end of the fingertip is shaped with a segment of a circle 22 that is fitted in a corresponding recess in the lower end of the movable bar 13. This bearing means enables the fingertip to pendulate up and down in an angle sector of approximately 30° in relation to the movable bar 13. The fingertip is mounted by shifting it in from the side, which takes place before the pack with movable bars is put in between the fixed ones. Then, the fingertips can not be removed from their bearing points, due to the fact that they are broader than half the gap width between the fixed bars.

From Fig. 6, it appears that the fingertips 14 leave remaining gaps between them and the fixed bars 12. Besides, it appears how the notch organ 16 is insertable in an opening 17 in the gliding plate 18. The support plate 20 is designed to give the smallest possible resistance to the water stream on the channel bottom 10.

The invention is not limited to the embodiment described above, but more variants are conceivable within the scope of the following claims. For example, the bearing of the lower ends of the fingertips can be designed differently.

Claims

1. A sealing means at the lower end of a mechanical filter for removing particles carried by a stream of water in a channel (10), said filter comprising a screen consisting of respectively fixed (12) and movable (13) lamellar bars that form an inclined plane down into the water stream, with the edges of the bars facing the water flow direction being stair-

shaped, wherein the movable lamellar bars (13) are interconnected in parallel to form at least one bar screen, which is operated by means of a driving mechanism placed at the upper end of the removing device, to produce a closed circuit motion in the plane of the bars, with a motion component in an upward direction that exceeds the stair height of the bars,

characterized in, that each respective movable bar (13) is at its lower end equipped with a flexibly connected fingertip (14), which is pivoting in a vertical plane and displaceable, with its outermost end (16) in a sliding bearing, forward and backward along the channel bottom (10), during the motion of the screen.

2. A sealing means according to claim 1, **characterized** in, that said sliding bearing comprises a gliding plate (18) with a hole (17) that cooperates with a notch means (16) at the outermost end of the fingertip (14), said gliding plate being displaceable supported on a support plate (20) which follows the channel bottom (10).
3. A sealing means according to claim 1 or 2, **characterized** in, that an upstream positioned edge on each fingertip (14) is provided with sawtooth (21).
4. A sealing means according to any of claims 1-3, **characterized** in, that each fingertip (14) has a width that corresponds to at least half the gap width between two adjacently fixed bars (12).

FIG.1

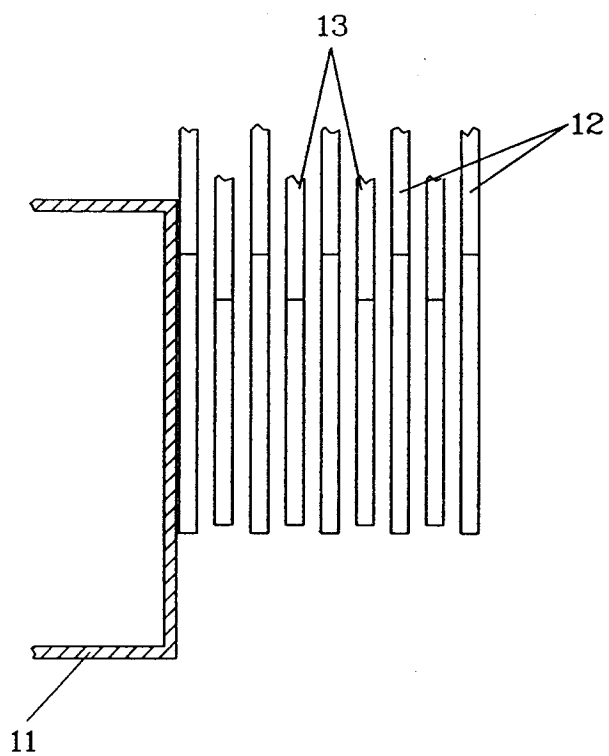
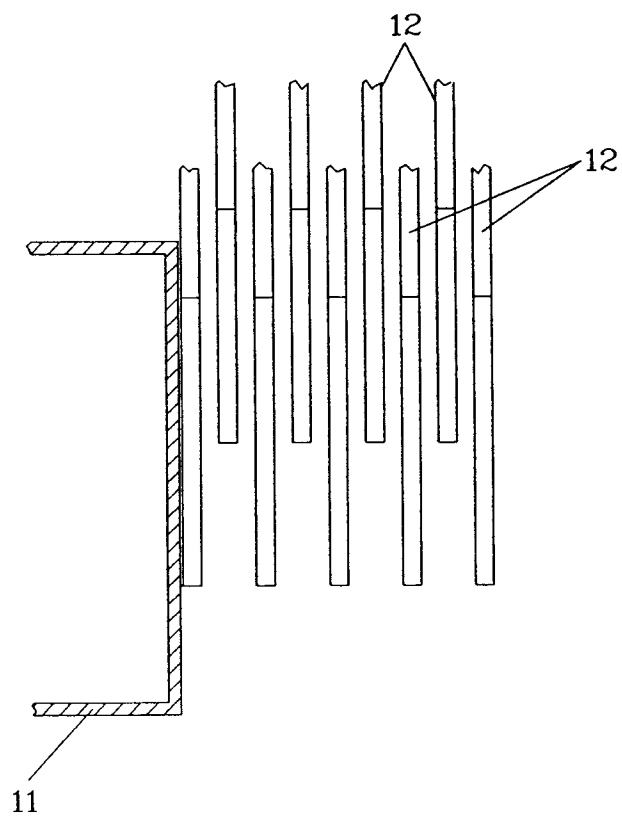


FIG.2



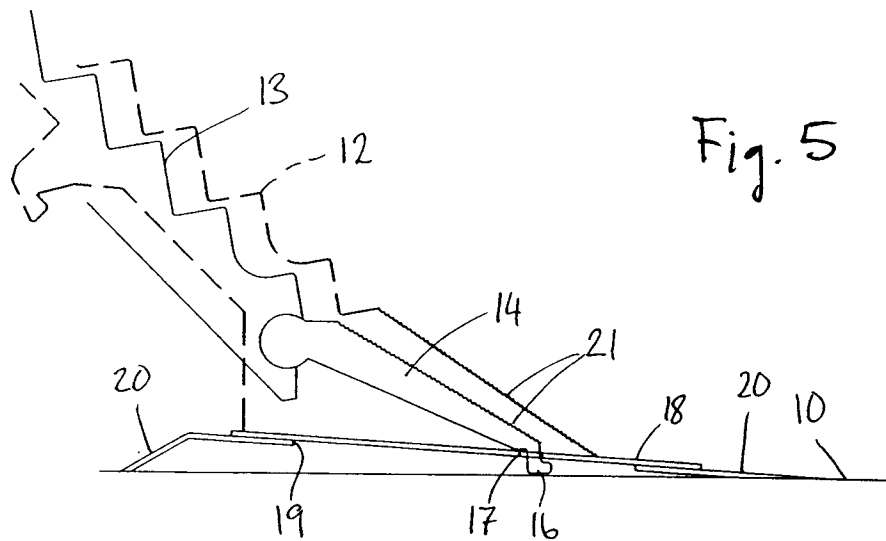
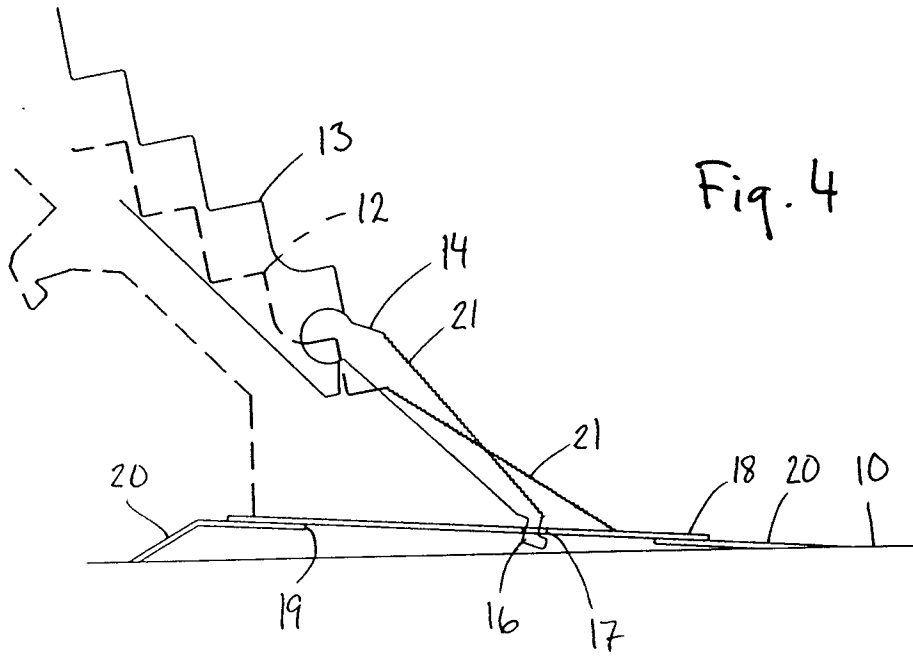
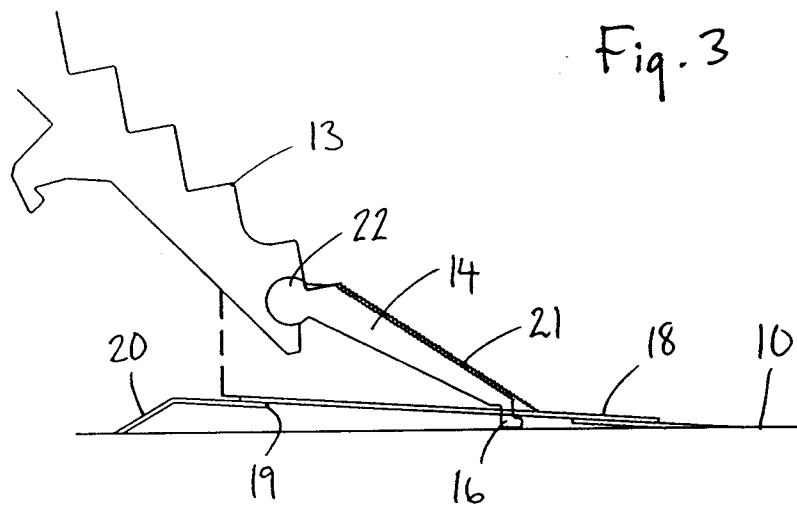


FIG.6

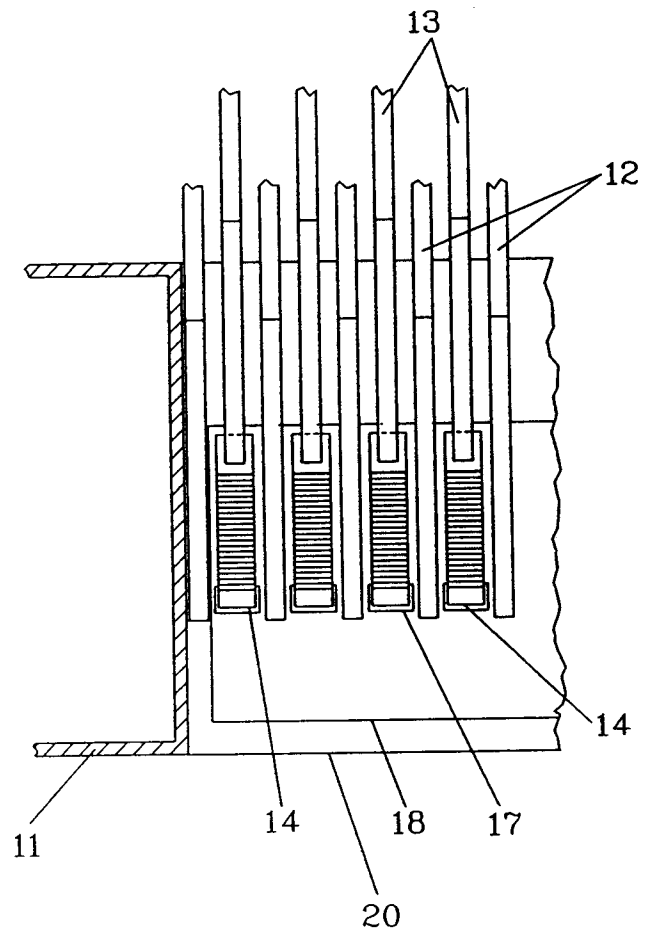


Fig. 7

