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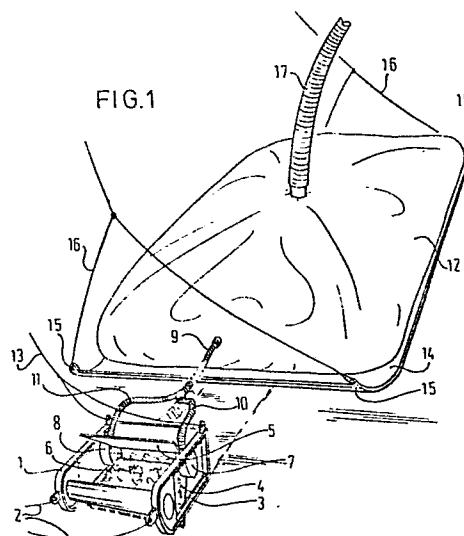
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54 Container for ground material removed by a ground working device from the bottom of a watercourse.

57 A container in the form of a flexible bag (12) is connected to a ground working device (1), such as a sludge plough. The bag may comprise an inflatable compartment (19) for controlling the floatability of the bag. A slide plate (14) may also be provided.



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Short title: Container for ground material removed by a
ground working device from the bottom of a
watercourse.

The invention relates to a container for the ground material removed by a ground working device, for example, a mud plough or a suction device from the bottom of a watercourse.

5 Such a container is known in the form of a compartment through moved by the tugboat of the mud plough or the hopper barge. A disadvantage of such a container is that it is heavy and hence transportable only with difficulty, whilst it is expensive and cannot be emptied by simple means.

10 The invention has for its object to obviate these disadvantages and provides to this end a container of the kind set forth in the preamble constructed in the form of a flexible bag that can be connected with the ground working device.

15 The bag is preferably provided with floating means having, for example, an inflatable compartment which can be inflated until, for example, at a given degree of filling,

the bag freely floats suspended in the water. Thus friction along the bottom is avoided.

It will be obvious that the bag according to the invention can be connected with the free space of a sludge
5 plough, where the scraped up ground material is collected, or with the pump means forming part of a hopper dredger.

In order to avoid excessive collection of water the bag may be pervious to water.

At the rear end of the bag there may be provided
10 an opening that can be closed. This opening may serve to conduct away excess water during operation and/or for emptying the filled bag at the place of destination.

The opening can be closed with the aid of an inflatable balloon.

15 In order for the dimensions of the bag to automatically match the degree of filling, the bag according to the invention may be provided with a tensile spring covering substantially the entire length of the bag and being connected at least by its front and rear ends with the
20 bag. This spring may be formed by a helical spring connected with the bag substantially over its whole length.

The bag according to the invention may furthermore be provided with a slide for gliding along the bottom of a watercourse. The invention furthermore relates to a
25 ground working device, for example, a sludge plough provided with a flexible bag serving as a container for the ground material removed from the bottom.

The invention will now be described more fully with reference to a drawing in which the corresponding
30 elements are invariably designated by the same reference numerals.

The drawing shows in

Fig. 1 a perspective view of a first embodiment of a container connected with a sludge plough in accordance
35 with the invention,

Fig. 2 partly a side elevation and partly a cross-sectional view of a second embodiment of the container in accordance with the invention,

Fig. 3 a perspective view, partly broken away,
of a third embodiment of the invention,

Fig. 4 a side elevation of a fourth embodiment
of the container in accordance with the invention and

5 Fig. 5 a sludge plough provided with a container
in a fifth embodiment of the invention.

Fig. 1 shows a sludge plough which can be dragged
by means of tow lines 2 along the bottom of a watercourse
by a vessel (not shown). The sludge plough 1 comprises a
10 frame 3, to which two plough knives 4, 5 are fastened.
The plough knives 4, 5 enclose a space in which ground
material 6 loosened from the bottom of the watercourse can
accumulate. In this embodiment the ground material 6 is
conducted away by means of two pumps 7, 8 fastened to the
15 frame 3 and passing the ground material 6 through hoses 10,
11 merging in one hose 9 to a flexible bag 12.

It is furthermore noted that a further line 13
is fastened to the sludge plough 1, which line when drawn
brings about a sloping position of the plough so that the
20 ploughing action can be temporarily stopped.

In this first embodiment the bag 12 is supported
by a slide plate 14, which may serve for causing the bag to
glide along the bottom. For drawing on and, if necessary,
lifting the bag 12 the slide plate 14 is provided at the
25 four corners with ears 15, to which lines 16 are fastened.

In this first embodiment the bag 12 comprises
a compartment (not shown) that can be inflated through a
compression conduit 17. The supply of compressed air through
the conduit 17 can be controlled in a manner such that the
30 bag 12 with the slide plate 14 invariably remains in a
completely or substantially completely floating position
so that friction at the bottom and hence an impermissibly
heavy draught in the tow members concerned are avoided.

Fig. 2 shows a second embodiment of a bag
35 according to the invention. The bag 18 of Fig. 2, like the
first embodiment of Fig. 1, comprises an inflatable
compartment 19, which can be more or less pressurized through
the compression conduit 17. The bag 18 has at its rear end

an outlet opening 20 for conducting away accumulated ground material 6 and/or for a more or less regular evacuation of excess water. For this purpose the outlet opening 20 is provided with a closing member formed by a balloon 22
5 inflatable by means of a compression conduit 21. It will be obvious that by controlling the pressure the dimensions of the balloon 22 and hence the extent of closure of the opening 20 can be controlled. For example, by slightly reducing the pressure it can be ensured that coarse material
10 is retained in the bag 18, whereas finer ground material or excess water is removed from the bag.

Fig. 3 shows a further embodiment of the invention. The bag 23 of this embodiment is provided with a helical spring 24 covering substantially the whole length
15 of the bag and being connected herewith substantially throughout its length. This helical spring ensures that the length of the bag 23 will match the degree of filling.

For completeness' sake the direction of tow is indicated in Fig. 3 by an arrow 25.

20 Like the bag 18 in Fig. 2, the bag 23 is shown suspended in the water with respect to the bottom 26 in Fig. 3. It should be noted that the bag 23 of Fig. 3 is not provided with one or more slides for the gliding propagation of the bag; the bag 23 has, therefore, to be maintained in the
25 suspended position. For this reason the bag 23 is provided with an inflatable compartment 27.

The embodiment shown in Fig. 4 substantially corresponds with the third embodiment of Fig. 3. It is, however, noted that slide elements 31 are provided by which
30 the bag 23 can also be moved in a more or less gliding state. This variant has the advantage that the bag 23 will not be damaged by friction on the bottom 26 due to lack of floating power and the tow elements concerned will not be overloaded.

In the construction shown in Fig. 5 a flexible
35 bag 28 is directly connected with the sludge plough 1 and is communicating through a slot-like opening 29 with the space bounded by the plough knives 4, 5. To the top side of the bag 28 are fastened two floats 30.

The invention is not limited to the embodiments

described above. For example, the inflatable compartment need not be separated from the space collecting ground material. These two functions may be performed in a single, water- and air-tight space. The advantage of the embodiments
5 described above is, however, that there is no risk of losing floating power due to an excessive degree of filling of the bag. In general the bag embodying the invention serves to collect ground material loosened by a ground working device from the bottom of a watercourse. In the foregoing
10 reference is made to a mud plough, but other devices such as a hopper dredger are also quite suitable for applying the invention.

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Claims

1. A container for ground materail removed by a ground working device from the bottom of a watercourse characterized in that the container is formed by a flexible bag that can be connected with the ground working device.

5 2. A container as claimed in Claim 1 characterized by floating means.

3. A container as claimed in Claim 2 characterized in that the floating means comprise an inflatable compartment.

10 4. A container as claimed in anyone of the preceding Claims characterized in that the bag is pervious to water.

5. A container as claimed in anyone of the preceding Claims characterized by an opening at the rear end of the bag that can be closed.

15 6. A container as claimed in Claim 5 characterized in that said opening can be closed by an inflatable balloon.

7. A container as claimed in anyone of the preceding Claims characterized by a tensile spring covering substantially the whole length of the bag and being
20 connected with the bag at least by its front and rear ends.

8. A container as claimed in Claim 7 characterized in that the tensile spring is a helical spring connected with the bag substantially throughout its length.

9. A container as claimed in anyone of the preceding Claims characterized by a slide for moving the bag glidingly.

10. A ground working device comprising a container as claimed in anyone of the preceding Claims.

