

UNLOADING EQUIPMENT FOR A FLAT TOP BARGE AND A METHOD FOR  
UNLOADING SAME.

There is provided unloading equipment for a flat top barge.  
More precisely there is provided unloading equipment for a  
5 flat top barge having a deck. The invention also includes a  
method for unloading of the barge.

A "flat top barge" is in this context defined to be a barge  
that has its loading deck close to or above the sea line. The  
flat top barge may be a conventional non-propelled or a self-  
10 propelled barge.

So called "flat top barges" having a generally flat deck  
acting as a load space, are widely used and readily  
available. It is known to equip such barges with a retaining  
wall that extends upwardly from the deck. The retaining wall  
15 is normally positioned close to the edge of the deck.

When used for transport of sand, for instance for recouping  
land from the sea, the barge may be loaded by pumping  
fluidized sand on to the deck while draining surplus water  
from the sand as the sand sets on the deck. The drainage may

typically be done through perforations typically in the form of slits or through geotextiles in the retaining wall, or through an agricultural type perforated pipes on or close to the deck.

5 According to prior art the sand is unloaded from the barge by use of earth moving equipment such as an excavator or a loading shovel. The unloading method has proved to be relatively time consuming and costly.

The purpose of the invention is to overcome or reduce at lest  
10 one of the disadvantages of the prior art.

The purpose is achieved according to the invention by the features as disclosed in the description below and in the following patent claims.

There is provided unloading equipment for a flat top barge  
15 having a deck, wherein at least one water supply outlet is provided at, in or above the deck for slurrification or flushing of sand that is present on the barge.

By position a water supply outlet at, in or above the deck, water supplied through the water supply outlet will flow into  
20 the sand on the deck and slurrify or flush the sand. If the water supply outlet is positioned close to the deck, the water will enter the sand at a relatively low position, and the water will tend to slurrify the sand rather than flush it. The water supply outlets may include flow regulating  
25 items such as orifices or valves.

The water supply outlets may communicate with a pipe that is positioned on, under or above the deck. In this way a pipe may have a plurality of water supply outlets that may be positioned on the deck, thus providing a low cost option of unloading equipment. More than one pipe may be advantageous, particularly on larger barges.

A water supply outlet may be supported by equipment separate from the barge. A fixed or floating gantry system or an excavator placed on the barge or on an adjacent barge, may for instance be useful for supporting the water supply outlet and a tubular.

It is understood that a water supply outlet, depending on its position relative to the barge, may require connections through the pipe and/or the tubular in order to be connectable to a water pump. The water pump may be positioned on or outside the barge. If positioned outside the barge, the water pump may be better suited for serving more than one barge as the water pump is only connected to the barge during the unloading operation.

The flat top barge may have a retaining wall for keeping the sand in position on the barge during loading and transport. At least part of the retaining wall may be tiltable or removable in order to facilitate unloading by fluidizing the sand.

The retaining wall or the deck may have an opening for discharge of fluidized or flushed sand leading to the outside of the barge. For loading purposes, particularly when fluidized loading is utilized, the opening should be

closable. The opening does not need to be closable for unloading purposes.

The closable opening may be equipped with a valve. Any type of valve suitable for the purpose may be used. The valve may  
5 be remotely controlled for instance by a hydraulic ram.

There is provided a method for unloading sand from a flat top barge having a deck, wherein the method includes:

- providing at least one water supply outlet at, in or above the deck;
- 10 - connecting the water supply outlet to a water pump;
- pumping water into the sand through the water supply outlet for slurrification or flushing of the sand; and
- letting the slurrified sand flow off the deck.

As stated above, the water supply outlet is normally  
15 connected to the water pump through at least a pipe or a tubular.

The barge may have a retaining wall and the method may include:

- providing an opening in the deck or the retaining wall; and
- 20 - letting the fluidized or flushed sand flow through the opening.

The unloading equipment and the method according to the invention, where the use of relatively simple equipment is proposed, provide a substantial reduction in time and cost  
25 for unloading sand from a flat top barge.

Below, an example of preferred equipment and method is explained under reference to the enclosed drawings, where:

Fig. 1 shows a perspective view of a flat top barge with equipment according to the invention;

Fig. 2 shows to a larger scale a pipe with water supply outlets;

5 Fig. 3 shows an opening in a retaining wall of the barge, where a valve is positioned at the opening;

Fig. 4 shows a perspective view of a self-propelled barge;

Fig. 5 shows schematically a front view of a barge that is positioned under a gantry carrying a water supply  
10 outlet; and

Fig. 6 shows schematically a front view of a barge that is positioned adjacent to another barge with an excavator carrying a water supply outlet.

On the drawings the reference numeral 1 denotes a flat top  
15 barge having a deck 2. A retaining wall 4 that extends upwardly from the deck 2 encloses the deck 2 and serves to keep sand in position on the deck 2 during loading and transport.

In fig. 1 a pipe 6 is positioned centrally on the deck 2. The  
20 pipe 6 is equipped with a plurality of water supply outlets 8 along its length. In fig. 2 the water supply outlets 8 are shown in the form of flanged stud pipes 10.

The pipe 6 is during unloading connected by a tubular 12, preferably in the form of a tube, to a not shown water pump.

The retaining wall 4 is provided with a number of openings 14 for discharge of slurrified sand. In this preferred embodiment each opening 14 is provided with a valve 16 and are thus closable. The valve 16 is pivotable about a hinge 18  
5 and operated by a hydraulic ram 20. In fig. 3, the valve 16 is shown in an open position.

When unloading the barge, the pipe 6 is connected to the not shown water pump via the tubular 12. Water is pumped into the sand through the water supply outlets 8 fluidizing the sand.  
10 The valves 16 are opened, letting the fluidized sand flow out of the barge 1 via the openings 14.

In fig. 1 an end party of the retaining wall 4 is shown in a tilted position to provide an opening 14a for discharge of fluidized sand.

15 Fig. 4 shows a self-propelled barge 1 equipped with the same equipment as that shown on the barge 1 in fig. 1. The self-propelled barge 1 has a super structure 22. The self-propelled barge 1 is well suited to have a not shown inboard water pump for providing the water supply outlets 8 with  
20 water.

A gantry 24 on floats 26 is equipped with a relatively to the gantry 24 movable water supply outlet 8. The water supply outlet 8 is connected to a tubular 12, see fig. 5.

The water supply outlet 8 is in fig. 6 shown on an excavator  
25 28 that is carried by a separate barge 30. The gantry 24 and the excavator 28 are examples of support equipment 32.

When letting water flow through the water supply outlets 8

shown on of figs. 5 and 6, the water tends to flush the sand over board.

## C l a i m s

1. Unloading equipment for a flat top barge (1) having a deck (2), c h a r a c t e r i z e d b y that at least one water supply outlet (8) is provided at, in or above  
5 the deck (2) for slurrification or flushing of sand that is present on the barge (1).
2. Unloading equipment according to claim 1,  
c h a r a c t e r i z e d b y that a plurality of water supply outlets (8) for slurrification of sand that is  
10 present on the barge (1), are positioned in or near the deck (2).
3. Unloading equipment according to claim 2,  
c h a r a c t e r i z e d b y that the water supply outlets (8) communicates with a pipe (6) that is  
15 positioned on the barge (1).
4. Unloading equipment according to claim 1,  
c h a r a c t e r i z e d b y that the water supply outlets (8) that communicates with a tubular (12), are supported by support equipment (32) separate from the  
20 barge (1).
5. Unloading equipment according to claim 3 or 4,  
c h a r a c t e r i z e d b y that the pipe (6) or the tubular (12) is connectable to a water pump.
6. Unloading equipment according to claim 5,  
25 c h a r a c t e r i z e d b y that the water pump is positioned outside the barge (1).

7. Unloading equipment according to claim 1 where a retaining wall (4) extends upwardly from the deck (2), characterized by that at least a part of the retaining wall (4) is tiltable or removable.
- 5 8. Unloading equipment according to claim 1 where a retaining wall (4) extends upwardly from the deck (2), characterized by that at least the retaining wall (4) or the deck (2) has an opening (14, 14a) leading to the outside of the barge (1).
- 10 9. Unloading equipment according to claim 8, characterized by that the opening (14, 14a) is closable.
10. Unloading equipment according to claim 8, characterized by that closable opening  
15 (14) is equipped with a valve (16).
11. A method for unloading sand from a flat top barge (1) having a deck (2), characterized by that the method includes:
- providing at least one water supply outlet (8) at, in  
20 or above the deck (2);
  - connecting the water supply outlet (8) to a water pump;
  - pumping water into the sand through the water supply outlet (8) for slurrification or flushing of the sand; and
  - 25 - letting the slurrified sand flow off the deck (2).
12. A method according to claim 11 where a retaining wall (4) extends upwardly from the deck (2), characterized by that the method further

includes:

- providing an opening (14, 14a) in the retaining wall (4) or deck (2); and
- letting the slurrified or flushed sand flow through the opening (14, 14a) in the deck (2) or in the retaining wall (4).

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