Overflow device for a vessel

Background

The present invention relates to a passive overflow device for draining away head water standing above settled sand in a loading space of a hopper.

The present invention further relates to a vessel comprising such a passive overflow device.

An overflow device is known from EP0000075 which relates to a dredging vessel comprising a loading space for receiving spoil, for example sand, and at least two effluent devices for conducting away the head water standing above the settled sand, said effluent devices comprising a conduit having a level-adjustable inlet and an outlet opening out in the outboard water, the inlet of the conduit being adjustable between an inactive position and an active siphon position, whilst the conduits of at least two effluent devices are coupled on board with a coupling conduit opening out in a common outlet conduit.

Summary of the invention

~~The invention aims~~Embodiments seek to provide a passive overflow device for draining away head water standing above settled sand in a loading space of a hopper, wherein environmental impact of dredging is reduces and risk of damage to the vessel or overflow device is minimized.

~~Another object~~Embodiments of the invention ~~is~~ seek to improve an known overflow device.

~~Yet another object~~ embodiments of the invention ~~is~~seek to provide an alternative overflow device.

According to a first aspect of the invention, ~~this is realized with~~there is provided a passive overflow device for draining away head water standing above settled sand in a loading space of a hopper, wherein the passive overflow device extends along a longitudinal axis and comprises;

- an inlet for taking in the head water,

accidently abuts the sea bottom. The tear of means even more prevents possible serious damage to the overflow device and the vessel comprising such an overflow device and thus promotes safe operations at sea.

In an embodiment of the passive overflow device, the tear of means comprise a region of the flexible portion, which region has a reduced tear strength. This provides an integrated tear of means to the passive overflow device.

In an embodiment of the passive overflow device, the inlet and the outlet are directly fluid coupled.

In an embodiment of the passive overflow device, both the inlet and outlet are centred at the longitudinal axis of the passive overflow device. This enables a simple and direct coupling with a loading space of a hopper such that head water flows directly downwards into the sea.

In an embodiment of the passive overflow device, the conduit comprise a number of conduit sections which are telescopically arranged for level adjusting the outlet into its active position.

In an embodiment of the passive overflow device, in a retracted inactive position the number of conduit sections overlap.

~~The invention further relates to~~According to a second aspect, there is provided a vessel comprising a passive overflow device according to the ~~invention~~above, wherein the passive overflow device is coupled with a loading space of the vessel for draining away head water standing above settled sand in the loading space. The passive overflow device is directly coupled with the loading space without any intermediate conduits or pumping means. The passive overflow is arranged with respect to the vessel in such a manner that the longitudinal axis of the passive overflow extends in the loading space of the vessel.

In an embodiment of the vessel, the passive overflow device is vertically arranged.

Claims

1. Passive overflow device ~~(1)~~ for draining away head water standing above settled sand in a loading space of a hopper, wherein the passive overflow device extends along a longitudinal axis ~~(2)~~ and comprises;
   - an inlet ~~(3)~~ for taking in the head water,
   - an outlet section ~~(4)~~ having an outlet ~~(5)~~ for opening out in the outboard water and which outlet is level adjustable into an active position wherein in use, the head water is delivered at considerable depth below the water surface,
   - a conduit ~~(6)~~ which extends along the longitudinal axis of the passive overflow device and which conduit fluidly couples the inlet and the outlet,
   - a supporting structure ~~(7)~~ for coupling the overflow device with the loading space of a hopper,

   wherein, the outlet section comprises an flexible portion ~~(8)~~ proximate the outlet for preventing mechanical overload to the supporting structure when the outlet, in use, in its active position accidently abuts the sea bottom.

2. Passive overflow device according to claim 1, wherein the flexible portion of the outlet section comprises means ~~(9)~~ for reinforcing the flexible portion and maintaining the outlet.

3. Passive overflow device according to claim 2, wherein the means for reinforcing the flexible portion comprises a ring portion ~~(9)~~.

4. Passive overflow device according to claim 2, wherein the ring portions comprises steel.

5. Passive overflow device according to claim 2, wherein the ring portions extends around the longitudinal axis of the passive overflow device.

6. Passive overflow device according to a preceding claim 2-5, wherein the means for reinforcing the flexible portion comprise a closed ring ~~(9)~~.

7. Passive overflow device according to claim 6, wherein the means for reinforcing the flexible portion comprises a number of steel closed rings ~~(9)~~.

8. Passive overflow device according to a preceding claim, wherein the outlet section comprises a tear of means for allowing at least a part of the outlet section to be torn off in case of excessive mechanical load to the outlet when, in use in its active position, the outlet accidently abuts the sea bottom.

9. Passive overflow device according to claim 8, wherein the tear of means comprise a region of the flexible portion, which region has a reduced tear strength.

10. Passive overflow device according to a preceding claim, wherein the inlet and the outlet are directly fluid coupled.

11. Passive overflow device according to a preceding claim, where both the inlet and outlet are centred at the longitudinal axis of the passive overflow device.

12. Passive overflow device according to a preceding claim, wherein the conduit comprise a number of conduit sections ~~(10, 11, 12)~~ which are telescopically arranged for level adjusting the outlet into its active position.

13. Passive overflow device according to claim 12, wherein in a retracted inactive position the number of conduit sections overlap.

14. Vessel comprising a passive overflow device according to a preceding claim, wherein the passive overflow device is coupled with a loading space of the vessel for draining away head water standing above settled sand in the loading space.

15. Vessel according to claim 14, wherein the passive overflow device is vertically arranged.