

OIL COLLECTOR FOR USE IN WATERS
CONTAMINATED BY OIL

(13)

The invention relates to an oil collector comprising a watercraft provided in the vicinity of the level of the water line with a collecting device which takes up the oil and other contaminants floating on the surface.

A sea-going oil collecting ship is already known which is divided in the longitudinal plane. The two ship halves are connected at the stern so as to be swung open in the manner of a hinge. At the bow or at other suitable places the ship halves are detachably coupled to one another. During operation the two ship halves are swung open such that they form an open angle with respect to the direction of travel and thus take up the oil.

A device operating in a similar manner is also known which consists of a fire-extinguishing craft of catamaran construction.

An oil collecting ship with a collecting device arranged at the lateral side of the ship in the vicinity of the level of the water line is also known which can execute a lateral movement directed obliquely forwards and thus takes up the oil. The collecting device is supported in this case by a flap which can be swung out (German Auslegeschrift 28 43 952).

An oil collecting arrangement is known in which oil collecting booms converge towards an oil collecting barge to which they are attached, the booms being towed by respective tugs.

What is required is an oil collector which requires small capital investment and which is simple. The operational and maintenance costs should be low and the collector should have high operational safety. With

respect to cost it should in particular be taken into account that the collector is only used relatively infrequently or at least not continuously. The unused capital should therefore be kept as low as possible.

5 The present invention provides a collector for collecting oil and/or other contaminant material floating on the surface of water, comprising a barge train which comprises a collecting barge or group of barges which is provided in the vicinity of the level of
10 the water line with a collecting device for taking up the contaminant material, and two tugs or two groups of tugs, each group of tugs comprising tugs connected in longitudinal alignment, the two tugs or the rearmost tugs of the two groups of tugs being connected to
15 opposite sides of the barge or group of barges without obstructing the collecting device, the two tugs or two groups of tugs extending ahead of the barge or group of barges and forming a funnel open in the direction of travel of the barge train so as to funnel the
20 contaminant material towards the collecting device during operation, one end of each of the two tugs or of the rearmost tugs being adjacent the barge or group of barges, the gap between the said end and the barge or barge group being small compared with the length of the
25 tug.

The tugs can be of usual construction, i.e. they can be equipped with fixed pitch propellers and flat rudders. The thrust acts in the direction of travel of the tugs. Since the tugs are angularly associated with
30 one another there is a resulting direction of travel in the direction of the longitudinal axis of the oil collecting barge(s).

However, such a barge train is difficult to manoeuvre. Therefore, preferably the tugs are provided
35 with at least one drive device, acting upon the water, which imparts to the tug a transverse thrust in the

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direction of travel of the barge train. The drive device preferably comprises at least one pair of rudder propellers which are controllable relative to one another such that their resultant thrusts impart to the
5 tug a transverse thrust in the direction of travel of the barge train. Tugs which provide a lateral thrust are known (German Offenlegungsschrift 27 18 831).

The invention has considerable advantages with respect to the known prior art. The initial costs are
10 then particularly low if tugs are already available, since the oil collecting barges are to be obtained. The unused capital is very low - this refers only to barges, whereas the tugs can be used normally. Efficiency is great at high operational speed; above all
15 the invention offers many possible combinations. The maintenance costs are low since the oil collecting barge is practically maintenance-free. The degree of readiness is high, since the tugs are constantly busy or available. Operational safety is great since all
20 sensitive parts and the drivers are in any case constantly associated with the maintained _____

tugs. No additional expenditure on staff is required.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which

5 Figures 1 and 1a show the component vessels of a barge train during the journey to the place of use;

Figure 2 shows the barge train during use; and

Figure 3 shows a further barge train during use.

10 An oil collecting barge 1 is provided in the vicinity of the level of the water line with an opening 2 which takes the oil or the contaminant material. The opening 2 leads to an inner collecting container (not shown). Such openings and collecting containers and
15 other devices for taking up and collecting oil are known and therefore need not be described in further detail. During the journey to the place of use, the barge 1 is drawn by a first tug 3 while a second tug 4 travels independently to the place of use. The tugs are each
20 equipped with a pair of rudder propellers 5, 6 which are arranged in front of the centre of gravity 7. In the example illustrated both of the rudder propellers are aligned parallel during the journey to the place of use and are swung out of this position in the same direction so that the tug carries out rotations during
25 manoeuvring.

 In operation (Fig. 2) both tugs 3, 4 are connected with the barge 1 via coupling elements 17 on opposite sides so that they form an angle open in the direction of travel 8 of the barge train. The longitudinal axis
30 of the barge 1 substantially bisects this angle. The angle formed by the tugs 3, 4 funnels the floating oil 18 towards the opening 2 as the barge train advances. During this operation, the rudder propellers 5, 6 of
35 tug are moved synchronously in the same direction with respect to a reference position in which the direction of their thrust in each case is perpendicular to the respective connecting line 9 or 10 between the centre of gravity 7 and the vertical swivel axis and such that in this

reference position - in the case of equal propeller thrusts - they exert the same opposed torques about the centre of gravity. If they are swung from this reference position synchronously in the same direction of rotation the tug carries out a traversing movement without slewing (in the German Offenlegungsschrift 27 18 831 this device is described in detail). If the rudder propellers are swung into a suitable position the shearing forces 11, 12 and 13, 14 of the rudder propellers produce respective resultants 15, 16 which lie parallel to the direction of travel 8. It is part of the helmsman's usual operating skill to find this suitable position. The tugs 3, 4 arranged in the manner disclosed with respect to the barge 1 conduct the oil to be collected compulsorily into the opening 2 of the barge 1. Possible gaps between the watercraft can be covered in addition.

The invention also offers the advantage of manifold possible combinations. In Fig. 3, for instance, two oil collecting barges 20, 21 are arranged side by side. They are drawn on either side by in each case two tugs 22, 23 and 24, 25. The tugs arranged behind one another are connected to one another such that the lateral thrust of both pairs is transferred to the barges 20, 21. The coupling members 27, 28 between the tugs 22, 23 or 24, 25 arranged in pairs do not allow any deviation of the tugs of each pair relative to one another, as is indicated diagrammatically. Fig. 3 only show one possible combination. If two barges and four tugs are available, for reasons of expediency, two units consisting in each case of a barge and two tugs are usually put together.

Instead of tugs carrying out lateral thrusts, tugs can also be used which can only carry out slewing movements, for instance tugs with fixed pitch propellers and flat rudders.

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In the arrangements according to the invention (Figs. 2 and 3) such tugs would also tow the barge(s) in the desired direction of travel 8, 26; however, manoeuvring of the barge train would not be so simple. If the
5 arrangement of the propellers of the tugs requires it, the tugs can also be coupled with the bow to the barge. They would then travel backwards, which does not alter the principle of the invention at all.



CLAIMS:

1. A collector for collecting oil and/or other
contaminant material floating on the surface of water,
comprising a barge train which comprises a collecting
5 barge or group of barges which is provided in the
vicinity of the level of the water line with a
collecting device for taking up the contaminant
material, and two tugs or two groups of tugs, each group
of tugs comprising tugs connected in longitudinal
10 alignment, the two tugs or the rearmost tugs of the two
groups of tugs being connected to opposite sides of the
barge or group of barges without obstructing the
collecting device, the two tugs or two groups of tugs
extending ahead of the barge or group of barges and
15 forming a funnel open in the direction of travel of the
barge train so as to funnel the contaminant material
towards the collecting device during operation, one end
of each of the two tugs or of the rearmost tugs being
adjacent the barge or group of barges, the gap between
20 the said end and the barge or barge group being small
compared with the length of the tug.

2. A collector as claimed in claim 1, in which each tug
is provided with at least one drive device, acting on
the water, which imparts to the tug a transverse thrust
25 in the direction of travel of the barge train.

3. A collector as claimed in claim 2, in which the
drive device comprises at least one pair of rudder
propellers which are controllable relative to each other
so that the resultant of their thrusts imparts to the
30 tug a thrust in the said direction of travel.

4. A collector substantially as described with
reference to, and as shown in, Figure 2 or Figure 3 of
the accompanying drawings.
