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WATERCRAFT WITH SCOOP

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A watercraft having a generally rectangular shape and a scoop situated beyond the bow for lifting frogs or other debris from the surface of navigable waters. Supporting the scoop for movement between raised and lowered positions is a boom structure extending over the top surface of the hull and pivoted rearwardly of the boom to a support on the hull. In the stern, a pair of stabilizing fins project rearwardly from the bottom surface of the craft in underlying and spaced relationship from an upper stern portion of the craft. Extending in horizontal planes, the fins each have a generally right-triangular shape including first side portions which merge with the opposite sides of the craft respectively and second side portions extending normal to the former transversely of the craft. The fins are spaced inwardly towards the bow from the rearmost surface of the upper stern portion. Between the fins and the upper stern portion, is an intermediate stern portion including two surfaces projecting upwardly in vertical planes from the hypotenuse sides of the fins respectively. These intermediate stern portions extend rearwardly and inwardly from the sides of the boat in converging fashion. A mounting bracket for the bottom of the rudder pin projects rearwardly from between the fins to a point generally below the rearmost surface of the upper stern portion.

FIG. 2 is a diagrammatic detail of the stern of the cleansing device of FIG. 1.

FIG. 3 shows, diagrammatically, the hydraulic system of a cleansing device according to the invention, superimposed on a plan of the cleansing device of FIG. 1, and Fig. 4 shows the lifting gear of a craft according to the present invention.

Referring to FIG. 1 a cleansing device according to the present invention comprises a craft having a hull 2 with novel stabilizing fins 3 at its stern. The craft has a diesel motor 4 and a gearbox 6 through which the motor 4 drives a propeller shaft 8 and hence a propeller 10. The craft is steered by a rudder 12 which is actuated by hydraulic rams 14.

A lifting device is positioned at the front of the craft according to the present invention. Such a device has a framework 16 mounted on the hull 2, a boom 18 pivotting on pins 20, from the position in which it is shown, by the extension of the rams 22. A wire-reel 24 is mounted on the boom 18 and is caused to pivot about pins 26 by the extension of rams 28. The details of the operation of the lifting device and the structure thereof is dealt with below.

The hydraulic system to operate the lifting device is operated by a power take-off from the motor 4. Such a take-off utilizes a shaft 30 which drives a pump 32. The hydraulic fluid is driven through a filter 34 to a reservoir 36 (see FIG. 3)—this reservoir 36 also serves as a part of the framework 16—and thence round the circuit of the lifting device.

A belt 38 on a pulley 40 on the shaft 30 is used to drive a pump 42 via a pulley 44. The pump 42 drives hydraulic fluid through a combined filter and reservoir 46 and thence into the pipes of the rudder control hydraulic system.

The hull 2 has an overall length L and a beam B—see FIG. 3.

In accordance with the present invention a pair of stabilizing fins 3 are provided at the stern of the craft. In the preferred embodiment shown in the drawings, these fins extend rearwardly from the bottom of the craft in a horizontal plane and have an identical shape which is a right-triangle. The fin sides, designated X in the drawings, extend rearwardly from the opposite sides of the craft while the fin sides which are designated Y in the drawings, extend at right angles to sides X and transversely of the craft. Fins 3 are spaced below the upper stern portion 22 of the craft by means of an intermediate stern portion 25 including planar surface portions of the hull projecting upwardly from the hypotenuse-sides Z of the fins and extending inwardly and rearwardly from the opposite sides of the craft in converging fashion. At their rearmost ends, intermediate stern portions 25 are interconnected by a vertical surface 2c projecting upwardly from the plane of the fins to the lower surface of upper stern portion 2a.

Projecting rearwardly from stabilizing fins 3 at the location of the surface 2c is a bracket 5 having an aperture in its extremity for receiving the rudder pin. The rearmost sides Y of the fins are spaced inwardly or forwardly from the rear of the craft by a distance A and this bracket 5 is accordingly dimensioned.

Fins 3 may be formed in any suitable manner, however, in one preferred construction they have a hollow construction filled with cement or other suitable substance which will give additional weight to the lower stern.

As illustrated in the table below the size of the fins and their distance A from the upper stern portion 2a may vary depending upon the hull length L and the beam dimension B. However, it should be understood that the linear proportions of the hull length L, beam B and dis-
The hydraulic system of the device, according to the present invention, may be dealt with in two parts. First, the hydraulic fluid supply to the lifting device and, secondly, the hydraulic fluid supply to the rudder. Dealing with the lifting device supply this, again, may conveniently be described in two parts. First, the supply to the boom operating rams and, secondly, the supply to the scoop-lifting rams. The supply to, and from, the rams is in the following manner.

Hydraulic fluid is pumped from the pump 32 along a conduit 48 to the filter 34, along a conduit 50 to the reservoir 36, into a control panel tank 52, out of the tank 52 along a conduit 54 to the bottom of the rams 22. A branch conduit 55 takes the fluid to the left hand ram 22. The fluid is returned from the rams 22 to the reservoir 52 along conduits 58 and 60. Hydraulic fluid is pumped to the rams 28 by similar means, the hydraulic fluid going to the rams 28 from the reservoir 52 along conduits 62 and 64 and being returned to the reservoir 52 along conduits 66 and 68.

To complete the above circuits, the hydraulic fluid is returned from the reservoir 52 to the pump 32 via a conduit 70.

Turning to the control of the rudder 12, pump 42 drives the fluid along a conduit 72 to a combined filter and reservoir 46, along a conduit 74 to a control panel tank 76 hence to the rudder operating rams 14 via conduits 78 and 80. A by-pass 75 is provided on tank 76. The circuit is completed by a conduit 82 which returns the fluid to the pump 42 from the tank 76.

FIG. 4 gives an accurate picture of the layout of the conduits shown diagrammatically in FIG. 3 and further shows levers 84 and 86 which control valves (not shown) in the tank 52 and hence the supply of fluid to and from rams 22 and 28, lever 84 controlling valves which, in turn, control the flow to and from rams 28 and lever 86 controlling valves which, in turn, control the flow to and from rams 22. A cabinet 88 is also shown.

The rudder controls, the lifting device controls and the motor controls, for example the starter switch and the throttle, are preferably located in the cabinet 88, which provides weather protection for the operator.

The cleaning device illustrated in the above FIGS. 1 to 4 operates in the following way. The engine 4 is started, the gear is engaged and the vessel moved into the dock by the use of a throttle (not shown) and the rudder 12. The lever to control the rudder is not shown, being conventional. Conveniently the rams 22 are partially extended so that these proportions are very significant in the achievement of improved stabilization in accordance with the present invention.

Length of Beam (B) Safe lifting load Pint measure Distance A

<table>
<thead>
<tr>
<th>Length</th>
<th>Beam (B)</th>
<th>Safe lifting load</th>
<th>Pint measure</th>
<th>Distance A</th>
</tr>
</thead>
<tbody>
<tr>
<td>17'</td>
<td>8'</td>
<td>1,120</td>
<td>y=35/4</td>
<td>2'</td>
</tr>
<tr>
<td>20'</td>
<td>9'</td>
<td>1,700</td>
<td>y=5/4</td>
<td>2'</td>
</tr>
<tr>
<td>29'</td>
<td>12'</td>
<td>3,300</td>
<td>y=5/4</td>
<td>4'</td>
</tr>
</tbody>
</table>

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To complete the above circuits, the hydraulic fluid is returned from the reservoir 52 to the pump 32 via a conduit 70.

Turning to the control of the rudder 12, pump 42 drives the fluid along a conduit 72 to a combined filter and reservoir 46, along a conduit 74 to a control panel tank 76 hence to the rudder operating rams 14 via conduits 78 and 80. A by-pass 75 is provided on tank 76. The circuit is completed by a conduit 82 which returns the fluid to the pump 42 from the tank 76.

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The rudder controls, the lifting device controls and the motor controls, for example the starter switch and the throttle, are preferably located in the cabinet 88, which provides weather protection for the operator.

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fins extending generally at right angles with respect to said first side portions of the fins, said fins each having an identical shape of a right triangle further including third side portions forming the hypotenuse of the right triangle, an intermediate stern portion including vertical surfaces projecting upwardly from said third hypotenuse sides of the fins to said upper stern portion, said craft having a generally rectangular external shape, the upper stern portion having a rear face of rectangular shape, and the surfaces of said intermediate stern portion having a rectangular shape.

10. In a watercraft having a scoop situated beyond its bow and support means on its hull for raising and lowering the scoop; an improved stern construction including fin means projecting rearwardly from the bottom of the craft in a generally horizontal plane, said fin means having a sufficient area and projecting rearwardly and transversely with respect to the craft sufficient distances to provide stabilization of the craft when moving through water.

11. In a watercraft as defined in claim 10 wherein the stern further includes an upper portion and the fin means are spaced below and forwardly of said upper portion.

12. In a watercraft as defined in claim 11 wherein said second side portions of said fin means are positioned forwardly of the plane of said upper stern portion by a distance equal to one third to one length of said second side portions and one to two lengths of said first side portions, said distance being measured along the longitudinal center line of the craft.

13. In a watercraft as defined in claim 11 wherein the stern further includes an intermediate portion projecting upwardly from the fin means to said upper portion.

14. In a watercraft as defined in claim 13 wherein said intermediate portion includes two surfaces extending from the sides of the craft rearwardly in converging relationship.

15. The watercraft defined in claim 1 further including a propeller for propelling the craft, said propeller being situated rearwardly of the craft beyond said stabilizing fins.

16. The watercraft defined in claim 10 further including a propeller means for propelling the craft, said propeller means being situated rearwardly of the craft beyond said fin means.

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