

SPECIFICATION

A water jet drive in a water craft

- Water jet drives which are operated by propeller or centrifugal pumps or the like and driven by internal combustion engines or electric motors, are known, and serve either as thwart-jet rudders, especially bow jet rudders, or for driving and all-round steering of water craft which have to negotiate shallow and winding waters, or flat-running working craft.

The components of known water jet drive, e.g. the pump, its housing, the water jet guide means, conduits, the motor the base of the motor, and the remaining conventional ancillary devices, have hitherto been mounted singly in the water craft, and have usually been individually welded to the body of the craft. This presents disadvantages in respect of storage, mounting and replacement.

- The present invention provides a water jet drive in a water craft, comprising a drivable pump for sucking up a stream of water from the bottom of the craft and expelling it from a housing of the pump as a jet in a direction selected from a plurality of desired directions, a motor for driving the pump, and a conduit for expelling the water jet from the craft in one selected direction, the conduit being substantially within the craft, in which the pump, its housing, the motor, and the said conduit together form a transportable unit including a base supporting the motor, the conduit forming at least a part of the said base.

Preferably, the said conduit is so placed in the unit as to form at least a part of a base supporting the motor. More than one conduit may be provided as part of the transportable unit. Each conduit may lead directly to the outside of the water craft or via a further conduit not forming part of the unit.

In a water jet drive for thwart jet steering, the housing of the pump preferably has outlet openings at opposite sides through which the stream of water is selectively guided by adjustable guide means such as clack valves or a slewable baffle, the first-mentioned conduit communicating with one of the outlet openings and leading, directly or via a further conduit, to one side of the craft, another conduit communicating with the other opening and leading to the other side of the craft.

In a water jet drive for all-round steering, the housing has at least three outlets (preferably four, in the principal directions) one of which communicates with the first-mentioned conduit, which is preferably a conduit leading in the ahead direction.

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

Figure 1 shows a thwart-jet steering drive in vertical section; and

Figure 2 shows a steering drive in vertical section.

- A propeller pump 1 (Figure 1) is rotatably mounted about its vertical axis in a housing 2 so that it sucks up water from the bottom of the craft 5 in a known way (see German patent 22 15 344 and US patent 3 903 833). Conduits 3, 4, which lead to the starboard and port sides of the craft 5, communicate with

openings at opposite sides of the housing 2. The current of water sucked up by the propeller pump 1 is directed as desired into one of the conduits by a baffle 6. For this purpose the baffle 6 is mounted in the housing to slew about a horizontal shaft 7, and is driven for slewing by an hydraulic motor 8 or some other suitable driving means. The propeller pump 1 is driven by a motor 11 via an angle drive 9, e.g. bevel gearing or worm gearing, and a universal-joint shaft 10. In this example the motor 11 is an internal combustion engine, but it may equally well be an electric motor, for example a constant-speed motor. The transverse thrust of the water can be controlled by only partly slewing the baffle 6. One of the conduits, namely the conduit 4, is solidly united with the housing 2 and, together the supports 12, forms the base for the motor. In this way the pump 1, the housing 2, the conduit 4, the guide means for the water flow (baffle 6), the drive 8, the motor 11, and the torque transmitting elements 10, 9 constitute a structural unit, which can be stored, transported, and mounted as such. A light construction is obtained including the conduit 4 in the base for the motor 11.

Figure 2 shows a drive unit for all-round steering.

- A propeller pump 21, which may be a centrifugal pump, with a vertical axis of revolution, is placed in an elbow duct 22, which is slewable about the pump axis in a housing 23. The elbow duct is formed L-shaped, so that the water sucked in through its vertical part can be expelled in desired directions from its horizontal part. The slewing movement is obtained from a motor 24. For rotating the propeller pump 21 there is a motor 25 which transmits its torque through a universal joint shaft 26 and an angle drive 27 to the propeller pump. The expelled water can be guided by the elbow duct 22 in four directions: through one of two apertures 28 and 29 which either lead into the open or can be connected to conduits; or through a further aperture (not visible), which faces the aperture 29; or through a conduit 30 which leads in the ahead direction of the craft and which together with supports 31 forms a base for the motor. All the parts that have been described above form a single transportable structural unit that can be mounted as a unit.

The parts for connecting the conduits and apertures to the water craft, e.g. to the extension of the conduits and apertures, may be of any type and accordingly have not been illustrated. Ancillary means, such as couplings, battery and switch and steering board, have not been illustrated and may likewise belong to the structural unit according to the invention.

120 CLAIMS

1. A water jet drive in a water craft, comprising a drivable pump for sucking up a stream of water from the bottom of the craft and expelling it from a housing of the pump as a jet in a direction selected from a plurality of desired directions, a motor for driving the pump, and a conduit for expelling the water jet from the craft in one selected direction, the conduit being substantially within the craft, in which the pump, its housing, the motor, and the said



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- 20 Preferably, the said conduit is so placed in the unit as to form at least a part of a base supporting the motor. More than one conduit may be provided as part of the transportable unit. Each conduit may lead directly to the outside of the water craft or via a further conduit not forming part of the unit.

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conduit together form a transportable unit including a base supporting the motor, the conduit forming at least a part of the said base.

2. A water jet drive as claimed in claim 1 for thwart jet steering, in which the housing has outlet openings at opposite sides through which the stream of water is selectively guided by adjustable guide means, the said conduit communicating with one of the outlet openings.
3. A water jet drive as claimed in claim 2, in which the other opening communicates with a conduit which leads to one side of the craft and the first-mentioned conduit leads, directly or via a further conduit to the other side.
4. A water jet drive as claimed in claim 1 for all-round steering, in which the housing has at least three outlets, one of which communicates with the said conduit.
5. A water jet drive as claimed in claim 4, in which the said conduit leads in the ahead direction of the craft.
6. A water jet drive in a water craft, substantially as described herein with reference to, and as shown in, Figure 1 or Figure 2 of the accompanying drawings.

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