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3,396,941

UNDERWATER MOTOR

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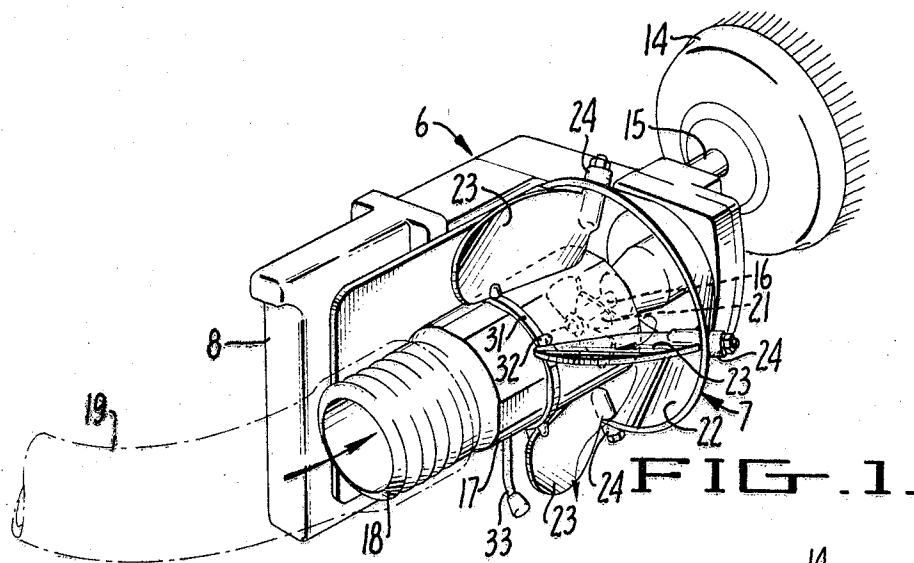
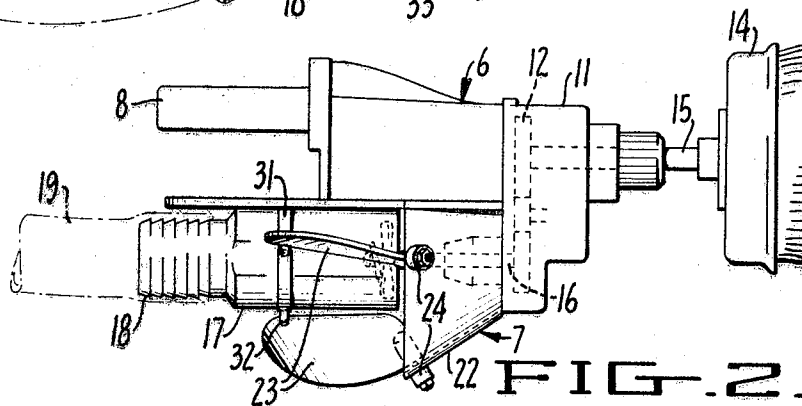
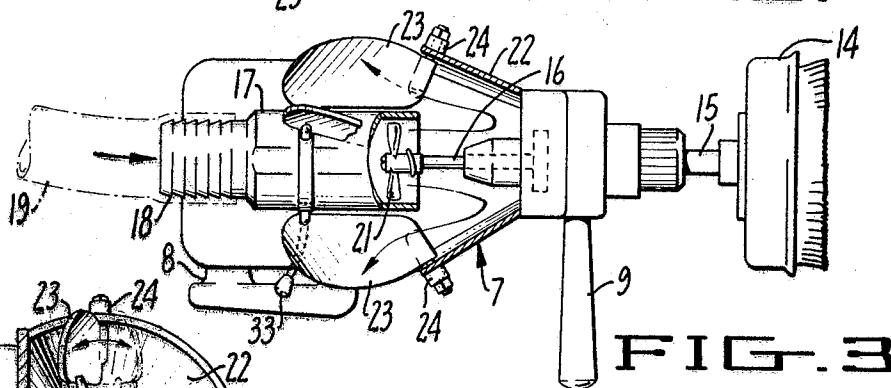
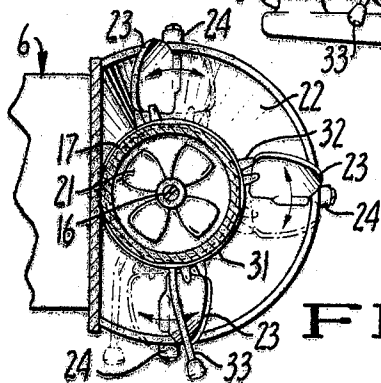


FIG. 4

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UNDERWATER MOTOR

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2 Claims. (Cl. 253—1)

ABSTRACT OF THE DISCLOSURE

A motor is provided for underwater use. Power is supplied by a stream of water suitably directed against an impeller carried on a drive shaft. Rotation of the drive shaft is effective to drive a spindle carrying a tool of any suitable design such as a drill, a grinding disc or a brush. Water discharged past the impeller is suitably directed away from the device in such fashion as to provide a reverse torque. Thus, an operator holding the device in position under water merely has to support the device against gravity and does not have to offset the torque applied to the tool spindle.

Field of the invention

An underwater motor hydraulically operated in such fashion that the torque provided to a drive shaft is offset by escape of the water utilized to drive the motor.

Description of the prior art

In Patent No. 2,932,836, the fluid discharge is utilized to propel the tool forward while in Patent No. 2,591,488 the driving fluid is discharged in opposite directions but the torque is not offset.

Summary

In general, it is the broad object of this invention to provide a water-driven motor which can be utilized under water to drive a selected tool and in which the torque applied to the drive shaft is offset by release of water from the motor so that the operator does not have to resist the torque applied to the tool spindle.

The invention includes other objects and features of advantage, some of which, together with the foregoing, will appear hereinafter wherein the present preferred embodiment of the invention is disclosed.

Brief description of the drawings

In the drawings accompanying and forming a part hereof:

FIGURE 1 is a perspective view showing the tool in position for use.

FIGURE 2 is a plan view of the tool.

FIGURE 3 is a side elevational view of the tool with a portion broken away to show details of the construction.

FIGURE 4 is a fragmentary view taken through the drive mechanism and showing the means for changing the angle of the vanes to vary the degree of off-set of the torque.

Description of the preferred embodiment

The tool of the present invention includes a driven tool supporting section, generally indicated at 6, and a drive motor, generally indicated at 7. The tool is provided with a hand grip element 8 and a handle 9 whereby

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the tool can be held in both hands of an operator. The driven tool portion includes a suitable casing 11 containing gearing, generally indicated at 12, and having a tool 14 on a spindle 15 which is removably supported in the drive portion in a well-known manner. The tool includes an input shaft 16 through which power is transmitted through the gearing 12 to rotate the spindle 15 and the tool 14. The unit so far described as one available on the market and as such forms no part of the present invention; it is shown in the Amundsen et al. Patents No. 2,990,187, No. 3,022,769 and No. 3,097,858.

In accordance with this invention, the shaft 16 projects into an annular casing 17, the later having a groove portion 18 at the end opposite to shaft 16 to which a flexible hose 19 is suitably attached. Water under pressure is supplied through the hose to the casing 17. Mounted upon an end of the shaft 16 is a multi-bladed impeller 21 which is rotated by the water forced through the hose 19 and the tubular casing 17 to drive the shaft 16.

In accordance with this invention, a tubular casing in the form of a truncated cone 22 is suitably attached to the housing for the driven portion 6. The tubular casing 22 flares outwardly to direct the water passing the impeller rearwardly away from the tool.

Further, and in accordance with this invention, several vanes 23 are rotatably mounted in supports 24 about the conical casing 22. The vanes are movable simultaneously by an operator to change readily their position relative to the axis of shaft 16 and direct the discharge of fluid to provide a force in a direction which offsets the torque applied to spindle 15 to a desired extent. Thus, the vanes can be turned into such a position that the torque applied to the spindle is completely offset and the device is torque free. Additionally, the vanes can be so turned that such a force is applied to the tool as will move the tool and the operator holding it through the water so that the operator can readily change position without any effort on his part. The means provided for turning the vanes simultaneously so that the desired degree of torque offset can be attained include a ring 31 rotatable about the tubular casing 17. The ring has pairs of spaced ears 32, each pair of ears being engaged with a vane 23, the ring being turned by handle 33.

I claim:

1. A torque-free underwater motor for driving a tool, the motor comprising

- a drive shaft connected to drive the tool and having an impeller thereon,
- a casing about the impeller for directing water discharged into the casing onto the impeller,
- a truncated conical casing about the end of the casing for receiving water issuing from the casing past the impeller and discharging water rearwardly of the motor,
- and a plurality of movable vanes mounted on the casing for directing the water discharge at a selected angle to the drive shaft.

2. A motor as in claim 1 wherein means are provided for moving the vanes simultaneously.

No references cited.

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