

impeller shaft 72 is connected to flexible shaft 74 by means of a coupling 79. The impeller shaft seal bears the reference numeral 80 while the eyebolts 75 anchor the lift rope 82.

FIG. 6 discloses a pump embodiment having a strainer 88 at the inlet of the impeller in order to limit the intake of solids into the pipe. The pump housing 85 has a lower diffuser 86 in the pump intake which is secured to the housing 85 by means of bolts 87. The device is provided with ball bearings 93 having a bearing cover 91. The bearings are also provided with seals 92. A discharge hose 95 evacuates the liquid from the pump as described hereinbefore.

FIG. 7 discloses a pump construction wherein the pump bearings and seals have been eliminated from the pump. Thus, the impeller unit in housing 100 is attached directly to the flexible shaft unit. The pump impeller 71 is seen attached to the fitting 103 by means of a nut 102. Additionally, the flexible shaft terminal 104 is secured to the pump by means of the cover 105 secured by screws 99 and sealed by a gasket 98. A strainer 118, the function of which is explained above, is secured to the bottom of the housing 100.

The special flexible shaft terminal of FIG. 7 is shown in greater detail in FIG. 8. This terminal is so constructed to form a mechanical seal unit to protect the bearings and the flexible core of the shaft. Thus, the outer conical surface of the casing terminal mates precisely with the flexible shaft terminal cover 105 and makes rigid the connection with the pump. Accordingly, the fitting 103 for securing the impeller 71 is provided with a woodruff key 109. The unit further has a mechanical seal unit 110 and spaced ball bearings 111. A pair of retaining rings 114 are provided for the ball bearings. The seal unit 110 has a cover 115, and the flexible casing 112 is shown cut away to reveal the interior flexible core 113. Bearing lubrication of the device may be achieved through opening 117 which is closed by screw 119.

FIGS. 9 and 10 illustrate another embodiment of the present invention in which an axial flow or propeller pump type is used. This construction is particularly desirable for low to moderate lifts at large capacities. In

this structure, a pump housing 120 is shown having a flexible shaft terminal holder 121 and a bracket 122. The latter by means of screws 123 secures the flexible shaft terminal 126 in the pump. The impeller 124 is secured to the flexible shaft terminal 135 by means of nut 125. The pump discharge 133 is connected to the pump housing 120 and is in turn connected to the flexible hose discharge 132. A flexible shaft unit 127 is shown having a flexible shaft entry unit 130 which is sealed by means of an elastic grommet and cover 128. The shaft 127 is further provided with a reinforcement section 131 which is sealed around the flexible casing in order to avoid the compression of the rotating flexible core in that sealed area.

I claim:

1. A portable submersible pump comprising an impeller provided with a pump housing, the latter having a liquid inlet therein, an impeller mounted in said pump housing and adapted to be operative in a liquid environment, a separate motor unit spaced from said pump and adapted to be located in a dry environment, a flexible power shaft having a rotatable core and having one end connected to said motor unit, a casing for said flexible shaft provided with a terminal secured to said pump housing, said rotatable core having a fitting at the end of the rotatable core which is connected to the impeller whereby the motor operates said impeller, a bearing and a mechanical seal in said flexible shaft casing terminal and said seal surrounding said fitting and being placed between said fitting and said bearing, and a discharge connection connected to said pump housing for discharging said liquid.

2. A portable submersible pump as claimed in claim 1 further comprising a woodruff key for securing said fitting to said impeller.

3. A portable submersible pump as claimed in claim 1 wherein said casing terminal is provided with an external conical surface, and a cover secured to said pump housing having an internal conical surface which mates precisely with said external conical surface of said casing terminal.

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