PORTABLE SELF-PRIMING FLOOR DRAINER PUMP ASSEMBLY

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The present invention relates to a portable self-priming floor dainer pump assembly and it consists in the combinations, constructions, and arrangements of parts herein-after described and claimed.

Generally there is provided as a compact light weight portable unit, an electric motor, a centrifugal pump driven by the motor, a flat base for the unit having radially disposed trough-shaped assembly supports longitudinally slotted to serve as intake ports for said pump, a specially designed recirculation tank mounted on said assembly for deaerating and holding a priming charge of water at all times, and a check valve for preventing loss of the priming charge during idle periods.

It is an object of this invention to provide a portable self-priming floor dainer pump assembly which is simple, rugged and inexpensive yet highly effective and efficient in use.

It is another object of the invention to provide such a device, the supporting base of which incorporates the advantages of applicant's prior patent, No. 2,816,664, granted December 17, 1957, for "Floor DRAINER," and improvements thereon.

It is a further object of the invention to provide a device of the character set forth having a deaerating tank connecting the pump to the discharge conduit and adapted to store and recirculate a priming charge to the pump chamber.

It is still another object of the invention to provide a unitary electric floor dainer, the motor of which is housed and sealed to permit complete immersing of the unit.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawings, in which:

FIGURE 1 is a perspective view of a preferred embodiment of the invention.
FIGURE 2 is a perspective view of the device of FIGURE 1 elevated to show the base structure.
FIGURE 3 is an enlarged elevational view partly in section, taken on line 3—3 of FIGURE 1.
FIGURE 4 is an elevational view similar to FIGURE 3 but taken on line 4—4 of FIGURE 2.
FIGURE 5 is an enlarged fragmental elevational view in section taken on line 5—5 of FIGURE 3, and
FIGURE 6 is a view similar to FIGURE 5, showing a modified form of the bottom disc.

With reference now to the drawings, the numeral 11 generally designates the floor dainer as a unit. Unit 11 comprises a conventional electric motor (not shown) having a watertight housing 12 provided with an integrally joined terminal housing 13 into which the power supply rubber covered cable 14 is led through a watertight sealing means 15. Terminal housing 13 is covered by a screw fastened plate 16. Cable 14 has a conventional connector at 17. Housing 12 is provided with a pair of diametrically disposed apertures adjacent its upper extremity to receive the inturnd ends of a carrying bail 18 which with its hand grip 19 provides a convenient carrying handle for the unit.

The housing 12 is either attached to or cast integrally with a horizontally disposed and coaxial centrifugal pump chamber 20. Housing 12 has a laterally disposed discharge chamber 21, apertured in its upper wall and threaded to receive the externally threaded integral nipple 22 of a recirculation tank 23, hereinafter more fully described. The recirculation tank 23 has a coupling nipple 24 at its upper end for connection to a flexible discharge hose or conduit 25.

A downwardly extending drive shaft 26 of the electric motor in housing 12 has rigidly fixed thereto a horizontally disposed disc portion 27 of an impeller, generally designated 28, of the centrifugal pump. Impeller 28 is a conventional cast element and has a plurality of straight or curved radial vanes 29.

The lower relatively flat wall of the pump chamber is defined by the upper surface of the cast recirculation chamber member generally designated 30. Member 30 has a plurality of vertically extending lug 31 equally spaced around the peripheral thereof and vertically bored to receive the screws 32 by which the member 30 is firmly attached to the pump chamber member 20, with a sealing gasket 33 clamped between the mating rings of the two members.

The recirculation chamber member 30 has a downward flange 34 and an internal vertical axis central sleeve portion 35, the space between which constitutes the recirculation chamber of the floor dainer. Said recirculation chamber 36 is closed by a flat metallic disc 37 provided with a plurality of relatively wide radially disposed slots 38.

The recirculation chamber member 30 has a downward flange 34 and an internal vertical axis central sleeve portion 35, the space between which constitutes the recirculation chamber of the floor dainer. Said recirculation chamber 36 is closed by a flat metallic disc 37 provided with a plurality of relatively wide radially disposed slots 38.

Disc 37 has its bottom surface substantially covered by a coextensive disc 39 of tough and somewhat resilient material, such as vulcanized rubber or plastic material. Disc 39 has a plurality of radially extending trough-shaped depressions 40 molded therein and underlying the radial slots 38 in the metallic disc 37. The molding of troughs 40 in disc 39 also produces a series of radially disposed semicylindrical coplanar supporting elements 41 for the unit 11. Supporting elements 41 are longitudinally slit at 42 (where they engage the floor) to provide water intake apertures for the troughs 40. The slits are desirably provided with feathered edges 43 (FIGURE 5) for increased resiliency for closer and better shape conformation with the floor F. This construction insures more complete removal of the water W by preventing entrance of air into the troughs 48 as the water level drops to a thin floor-covering film. Integral spacing ribs 44 prevents the slits 42 in the radial ribs 41 from being sealed off by too firm pressing thereof against the floor F by the weight of the unit 11 and water held therein. The concentric spacing ribs are herein disclosed as being slightly shallower than the radial intake ribs 41, but could be of the same or even slightly greater, vertical dimension if preferred.

To prevent loss of priming in chamber 21 and/or flow back of water pumped into discharge hose 25, a check valve is inserted between pump chamber 20c and recirculation chamber 36 and its collection troughs 40. Said check valve comprises a ball 45 formed of a material having a specific gravity somewhat greater than 1.0 and retained by a cross bar 46 within the bore 47 of part 35. Ball 48 seats on the beveled lip of circular aperture 48 in disc 37 (FIGS. 3 and 4). An O-ring gasket 49 prevents leakage from bore 47 to the chamber 36. The recirculation tank 23 (FIG. 3) comprises a perforated tube 50 pressed or otherwise fixed in the inlet bore of nipple 22. Tube 59 directs water, or a mixture of air and water, toward the outlet bore in nipple 24 to which discharge hose 25 is fastened by any suitable means.
or expedient (such as a hose clamp, not shown). The perforations in tube 50 allow water to flow relatively slowly into the outer part of the chamber where air is separated from the water, which then flows or recirculates through the hose section 51 back to the ball valve passage 47 and thus to the pump chamber 20c through the interconnecting radial bore 52 formed in a thickened rib-like part 53 of member 38. This recirculation of deaerated water to the pump chamber both improves the efficiency of the pump and also insures a priming charge in the pump chamber at all times (being retained therein by the check valve 45-48).

In use, the floor drainer is carried by the handle 18-19 and rested on ribs 41 on the floor to be drained. When plug 17 is connected to an electrical outlet and discharge hose 25 has been directed to a discharge point, the pumping action will begin regardless of the depth of the water to be drained, since ball valve 45-48 has retained a priming charge in pump chamber. However, if for any reason, such as initial use, the priming charge is lacking, the device can be easily primed by immersing in a tub of water and tilting to one side to cause ball 45 to roll off of seat 48.

The lips 43 of intake slits 42 will hug the floor F (FIG. 5) so that complete drainage will be effected.

FIGURE 6 discloses a modified construction in which a unitary rubber disc 37' is substituted for the metallic disc 37 and the vulcanized or cemented-on rubber disc 39 of the first-described species. The other primed numerals and letters in FIGURE 6 designate parts substantially identical to those designated by unprimed characters in FIGURES 1 through 5.

While but two forms of the invention have been shown and described herein, it will be readily apparent to those skilled in the art that many minor modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In a portable self-priming floor drainer pump assembly including a pump chamber having a fluid inlet, and a collecting chamber beneath said pump chamber in communication with said inlet, the provision of a base plate of resilient material covering the bottom of said collecting chamber and having a plurality of circumferentially spaced radially extending protuberances each having a longitudinal slit therein communicating with said collecting chamber, the marginal portions of said protuberances forming said slits being flanged toward each other for upward flexing of said marginal portions slightly away from a floor surface by suction in said pump chamber for substantially complete drainage of water from said floor surface, and support members carried by said plate and having their bottoms in substantially the same plane as the bottoms of said protuberances.

2. A device as defined in claim 1 wherein there is provided a vertically extending priming tank having a lower nipple in its lower end communicating with and mounted atop said pump chamber, a discharge nipple at the upper end of said tank, and a vertically extending perforated tube fitted into said lower nipple and extending to a point adjacent said upper nipple.

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