Aug. 1, 1950 C. HOLLERITH 2,517,109

COMBINED IMPELLER AND DRAIN VALVE
FOR DISH WASHING MACHINES
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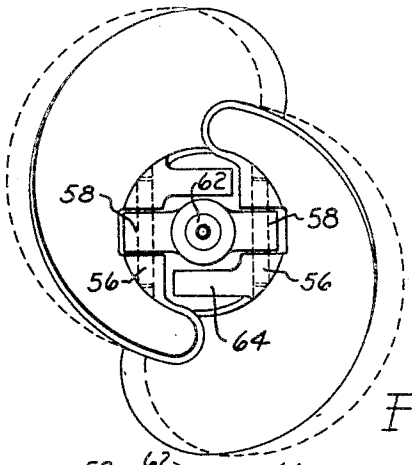


FIG. II.

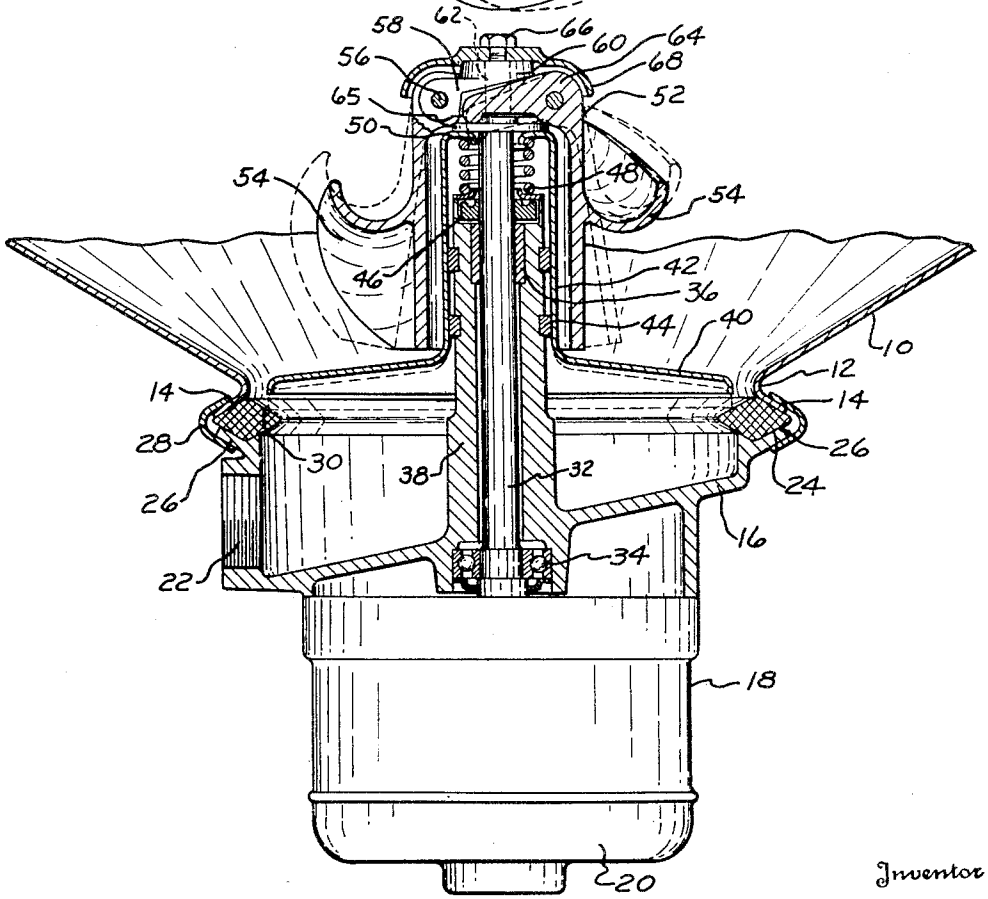


FIG. I.

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COMBINED IMPELLER AND DRAIN VALVE FOR DISHWASHING MACHINES

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Application December 29, 1945, Serial No. 638,315

1 Claim. (Cl. 134—56)

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The present invention relates to improvements in drain valves and impeller assembly structure for dishwashers and similar equipment. Reference may be had to the disclosure of co-pending application Serial No. 638,273, filed December 25, 1945, as one type of construction to which the present invention is particularly adapted.

An obeject of the invention is to provide a drain valve which is closed by the rotational forces acting upon the impeller for the washing liquid.

Another object is to provide an improved drain valve and impeller assembly for dishwashers and the like, in which the impeller is in the form of a fly-ball governor type of construction with the rotational forces developed therein holding the valve closed.

A further object is to provide an improved, motor-driven impeller for the washing liquid, having the blade elements thereof mounted in such a manner as to respond to centrifugal forces and having an operative connection with the drain valve to regulate the movement thereof.

These objects and advantages and others residing in the general arrangement and construction of parts will manifest themselves more clearly from a consideration of the following specification and the attached claim.

In the drawings,

Fig. 1 is a fragmentary, vertical cross-sectional view, showing the impeller and valve structures in section in the motor in side elevation, and

Fig. 2 is a plan view of the impeller with the attachment screw and cap shown removed.

Referring to the drawings, the vat 10 has a central opening 12, defined by an outwardly turned flange 14. The sump 16 is shown in the form of a casting integral with the housing 18 of the motor 20. An outlet for connection to a suitable drain pipe is indicated as 22. A sealing ring 24 of suitable non-metallic material is located between the flange 14 and the flange 26 of the sump 16. An adjustable band 28 is tightly drawn to clamp the flanges 14 and 26 together with a ring 24 compressed between them. The conical surface 30 constitutes a seat for the drain valve as will be hereinafter described.

The shaft 32 is driven directly by the motor 20 with a ball bearing being provided at 34 and a sleeve bearing at 36 in the support 38. A sheet metal drain valve 40 has a tubular portion 42 which is guided for axial and rotational movement on spaced bearing rings 44. A seal of suitable construction is shown at 46 for the shaft 32. A spring 48 located between the top of the column 38 and the end 50 of the tubular portion 42 supports the valve 40 in the position shown in full line in the drawing.

The impeller 52 for circulating liquid in the vat 10 has the additional function of opening

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and closing the drain valve 40 upon starting and stopping of the motor 20. This is accomplished by hinging the impeller blades 54 upon pins 56, supported on the bosses 58 of the collar 60, fixed against relative rotation on the reduced upper end 62 of the shaft 32. Integral with each blade 54 is an arm 64 which is brought to bear on a thrust and wear plate 65. This plate is supported on the end 50 of the tubular portion 42 and it is provided with a central aperture to permit free axial movement along the shaft 32. A cap screw 66 holds cover 68 in position and the collar 60 against the shoulder 68.

The manner in which the impeller 52 controls the valve 40 should now be obvious: When the motor 20 is started, the forces of rotation cause the blade 54 to move toward the dotted line position shown in Figs. 1 and 2. This action results in the arms 64 forcing the plate 65 and the column 42 downwardly to bring the valve 40 into sealing engagement with its seat 30. The slight friction between the valve 40 and its seat 30 will overcome any tendency for the valve 40 to be rotated by the slight driving action of either the plate 65 or the travel of the arm 64 around plate 65. As in the case of my co-pending application, Serial No. 638,314, filed December 29, 1945, this tendency for the valve 40 to rotate at least partially during opening and closing assures more uniform wear and gives improved sealing action between the engaging surfaces by wiping all foreign matter therefrom.

Having thus described my invention, what I claim to be new and patentable and desire to cover by Letters Patent is:

A combination of a dishwasher or the like, having a vat with a central drain opening therein, a vertical shaft extending through said opening, an impeller mounted on the upper end of said shaft and driven thereby, a drain valve for controlling said opening and surrounding said shaft, pivoted impeller blades upon said impeller adapted to be moved from one position to another by centrifugal forces upon rotation of said shaft, and an operative connection between said pivoted blades and said drain valve.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,123,876	Hiddleson	Jan. 5, 1915
1,919,541	Davis	July 25, 1933

FOREIGN PATENTS

Number	Country	Date
491,624	Germany	Feb. 12, 1930