Aug. 27, 1940. P. R. POWELL ET AL 2,212,649

DISHWASHING MACHINE

Filed May 6, 1939

Fig. 1.

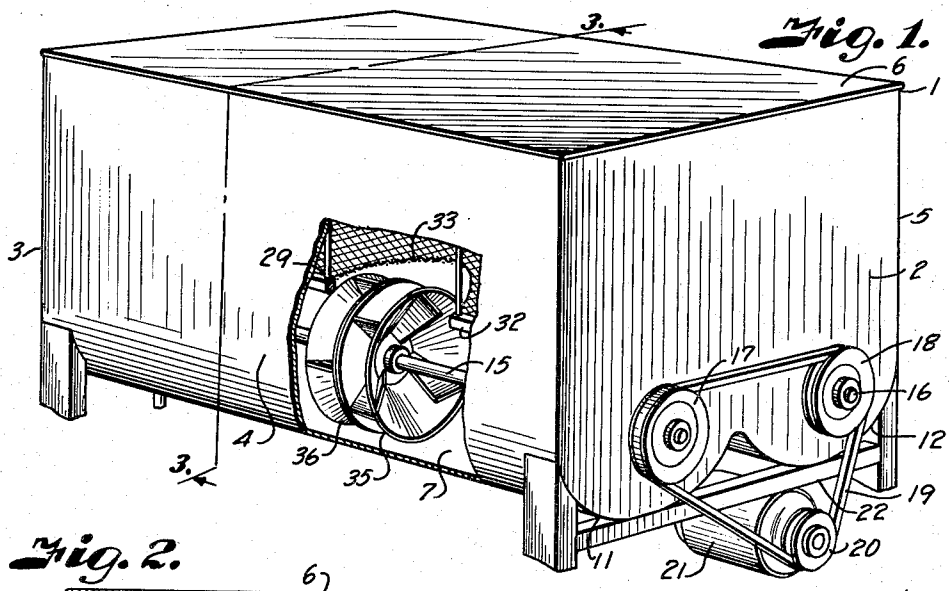


Fig. 2.

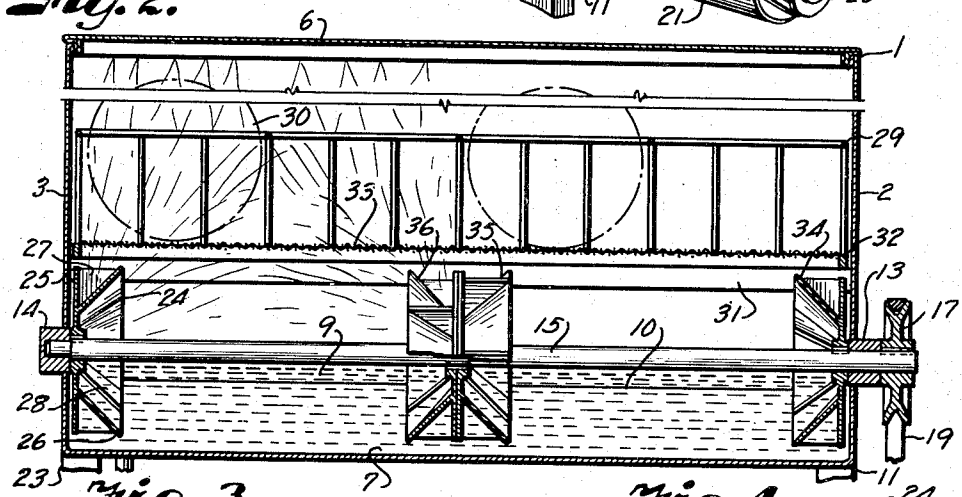


Fig. 3.

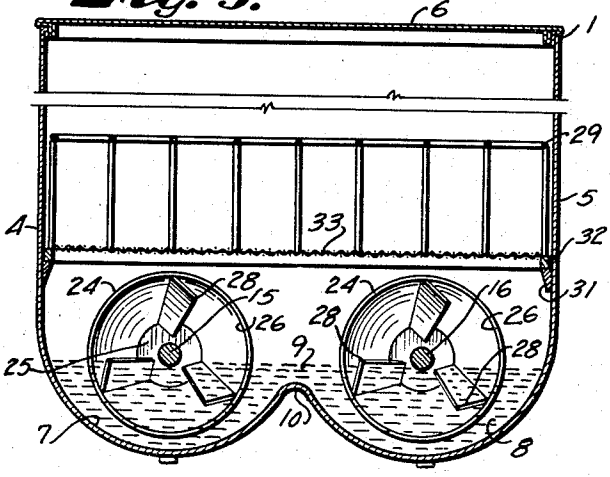
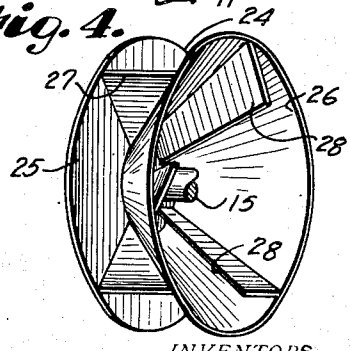


Fig. 4.



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DISHWASHING MACHINE

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7 Claims. (Cl. 299—63)

This invention relates to washing machines and more particularly to a machine for washing dishes and the like.

Dishwashing machines usually comprise a closed housing arranged to support the articles to be washed above a washing medium and provision is ordinarily made for then applying the washing medium to the articles to cleanse the same.

The principal objects of the present invention are to provide an improved arrangement for applying a washing medium to the articles to be washed; to provide for distributing the washing medium throughout the housing; to move a large quantity of water over the dishes to be washed; to apply the medium in forceful sprays; to provide for using a minimum amount of washing medium; to provide for controlling direction and distribution of the spray; to provide improved housing and washing medium impelling devices of such a character as to make dishwashing with machines simple, economical and efficient; and to provide improved elements and arrangements of elements in a machine of this character.

In accomplishing these and other objects of the present invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a dishwashing machine constructed in accordance with the present invention, a part of the housing being broken away to show a fluid medium impeller and its relation to the housing.

Fig. 2 is a substantially central vertical longitudinal cross-section through one shaft of the machine particularly showing the relation of the impellers to the articles being washed and the action of the washing medium on the articles.

Fig. 3 is a transverse vertical section through the machine substantially on the line 3—3, Fig. 1, particularly illustrating the relation of the pairs of impellers to each other.

Fig. 4 is a detail perspective view of an impeller embodying the features of the present invention.

Referring more in detail to the drawing:

1 generally designates a dishwashing machine constructed in accordance with the present invention, which preferably consists of a housing comprising end walls 2 and 3 and side walls 4 and 5 having water-tight connection with each other at their edges, the housing being provided with a closure 6 of suitable type for confining spray and impelled washing medium in the housing.

The side and end walls of the housing are preferably curved at their lower edges to form separate wells 7 and 8 for washing medium 9, such as water, in which a suitable detergent may be placed. The wells 7 and 8 may be provided with suitable preferably valved outlets, not shown, for draining washing medium from the wells of the housing after it has served its purpose.

More particularly, the side walls 4 and 5 are curved downwardly and inwardly substantially on the arcs of duplicate circles, as shown in Fig. 3, and then upwardly adjacent the longitudinal center line of the housing to terminate in a common ridge 10, thus forming a bottom for the housing which constitutes or defines the washing medium wells 7 and 8. The end walls 2 and 3 are also provided at their lower ends with arcuate edges 11 and 12, Fig. 1, conforming to the arcs defining the bottom wall of the housing where they are joined to the bottom wall in a suitable manner to complete the housing.

Each of the end walls is provided with pairs of aligned apertures for seating and supporting bearings 13 and 14 for a pair of duplicate shafts 15 and 16 which are rotatably mounted in the bearings, the bearings being arranged in the end wall apertures in such a manner as to prevent seepage of washing medium out of the walls of the housing.

Keyed on the shafts at one end thereof exteriorly of the housing are pulleys 17 and 18 which are interconnected, as by a belt 19, the belt 19 passing over a pulley 20 on the drive shaft of a prime mover, such as an electric motor 21, secured to the undercarriage 22 on which the housing rests. Suitable standards 23 are also provided on the undercarriage in supporting contact with the housing for maintaining the housing above a floor a convenient distance.

24, Fig. 4, designates an impeller embodying important features of the present invention, which preferably consists of a substantially flat circular shaped plate 25 which constitutes a slinger ring.

A frusto-conically shaped bell-like extension 26 is engaged with the plate 25 on one side thereof, as by casting the impeller in single element, with the smaller end of the extension concentrically arranged relative to and adjacent the center of the plate 25, the outer peripheral edge of the extension 26 being substantially in alignment with and of the same diameter as the periphery of the plate 25, said peripheries being

in spaced relation to each other. Mounted between the adjacent surfaces of the plate 25 and extension 26 is a series of radial vanes 27 which are preferably perpendicular to the plane of the plate and aid in interconnecting and bracing the plate and extension relative to each other. The inner surface of the extension 26 is provided with fins 28 substantially radially arranged in a spaced series about the inner surface of the extension. As shown in Figs. 3 and 4, the fins 28, and particularly the inner edges thereof connecting the fins to the extension are preferably arranged at an angle to and extend outwardly from opposite sides of a radial plane passing from the longitudinal axis of the shaft on which the extension is mounted to the outer periphery of the extension. The fins 28 are also preferably angularly disposed relative to a chord connecting a pair of upper inner corners of the fins, as shown.

The fins are also preferably arranged to extend forwardly at an angle in the direction of rotation of the shaft in such a manner that the outer edges thereof bite into the washing medium and enhance the pick-up action of the impellers.

A rack 29 or other suitable support, for dishes 30 or the like to be cleaned, is mounted in the housing in upwardly spaced relation to the greatest height of the impellers 24, as clearly shown in Figs. 2 and 3, and preferably rests on a peripheral flange 31 suitably fixed to the interior surfaces of the housing walls and forming a ledge support for the frame 32 of the rack. A screen 33 or the like is also provided between the rack and the impellers, the screen if desired forming a bottom support for the dishes and the like, but of large enough mesh to allow passage of matter of which the dishes have been cleansed into the wells 7 and 8, thereby maintaining the washing medium in a relatively clear state over longer periods of time than would ordinarily be possible.

In assembling the impellers on their shafts, it has been found desirable to mount impellers 34, Fig. 2, on the shafts 15 and 16 at one end of the housing with the slinger ring 25 adjacent the end wall 2 of the housing, with the fins thereon extending substantially in the direction of rotation of the shaft.

Pairs of impellers 35 and 36 are mounted on the shafts 15 and 16 with the slinger rings in back to back relation and the fins extending in substantially opposite directions to form a double impeller unit. Impellers 24 are then arranged on each of the shafts 15 and 16 with the slinger rings thereof adjacent the end wall 3 of the housing and the fins on the extensions reversed in relation to the fins on the impellers 34 in order that all the fins on the several extensions may extend in the direction of rotation of the shafts on which they are mounted.

The operation of a dish washing machine constructed as described is as follows:

Washing medium, such as water of suitable temperature and containing a suitable quantity of detergent may be suitably applied to the housing to fill the wells thereof and the housing approximately to the height of the shafts supporting the impellers. The rack may then be filled with dishes or the like to be washed and placed on its ledge support in the housing. The cover is then placed on the housing to confine spray and washing medium within the housing and aid in directing the washing medium back onto the dishes. The motor is then energized and the shafts are rotated in unison by means of the pulley and belt connection with the motor, rotation of the shafts rotating the impellers, the fins 28 of which form pockets or dippers which pick up substantial quantities of water and throw such water upwardly in response to centrifugal action due to rotation of the impellers. The impellers on the outer ends of the shafts throw the water upwardly and inwardly through the screen of the rack and upon the dishes to thoroughly wash the dishes.

The radial vanes 27 also serve as pockets to pick up water and throw the same substantially upwardly to form a complete spray throughout the interior of the housing. Frictional contact of the slinger rings and the peripheries of the extensions with water in the wells also picks up water and "slings" it upwardly into forcible contact with the dishes. As shown in Fig. 2, the double impeller unit throws water upwardly and outwardly in opposite directions, the outwardly thrown water impinging against water thrown inwardly by the outer impellers, contact between the particles of water forming a spray and mist which further enhances washing action of the water on the dishes.

When the dishes have been thoroughly washed, the dirty water may be drained from the wells and hot fresh rinse water applied to the wells, whereupon the operation may be repeated to rinse the dishes. The dishes may then be left to dry in the rack and removed in dry condition without the necessity of wiping the dishes.

It is apparent, therefore, that an easily operated dish washing machine has been provided by the present invention, which is efficient in operation and which makes dish washing by machines economical.

What we claim and desire to secure by Letters Patent is:

1. An impeller for a washing machine of the character described including a plate, an extension on the plate, means on the extension forming pockets in cooperation with a wall of the extension, and means mounted on the impeller between the plate and extension forming pockets therebetween.

2. In an impeller for a washing machine of the character described, a bell-like member, means on the inner surface of the member forming pockets in cooperation with the inner face of the wall of the member, and a slinger plate on the smaller end of the bell-like member.

3. In an impeller for a washing machine of the character described, a bell-like member, means on the inner surface of the member forming pockets in cooperation with the inner face of the wall of the member, a slinger plate on the smaller end of the bell-like member, and vanes mounted between the slinger plate and bell-like member forming pockets arranged to pick up washing medium in contact therewith upon rotation of the impeller.

4. In a washing machine of the character described, a housing, a shaft rotatably mounted in the housing, a plurality of impellers mounted on said shaft each including a slinger plate having an extension thereon and means on the slinger plate and extension forming pockets arranged to pick up water in the housing and disperse the same in the housing, one of said impellers being mounted adjacent one end of said shaft and arranged with the slinger plate adjacent a wall of said housing, a pair of said impellers being arranged as a unit with the slinger plates thereof

in back to back relation, and another of said impellers being mounted on the shaft with the slinger plate thereof arranged adjacent a wall of said housing opposite said first-named wall.

5. An impeller for a washing machine of the character described including a plate, an outwardly directed extension on the plate, and means arranged between the plate and the extension forming a washing medium pick-up.

6. In a washing machine of the character described, a housing, a shaft rotatably mounted in the housing, a plurality of impellers mounted on said shaft each including a slinger plate having an extension thereon and means on the slinger plate and extension forming pockets arranged to pick up water in the housing and disperse the same in the housing, one of said impellers being mounted adjacent one end of said shaft and arranged with the slinger plate adjacent a wall of said housing, and another of said impellers being mounted on the shaft with the slinger plate thereof arranged adjacent a wall of said housing opposite said first-named wall.

7. An impeller for a washing machine of the character described including a plate, an outwardly directed extension on the plate, means arranged between the plate and the extension forming a washing medium pick-up, and a substantially duplicate oppositely disposed impeller arranged adjacent said first-named impeller and cooperative therewith to form a double impeller unit.

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