HENRY VAUDE VERE PUTMAN.

DISHWASHING MACHINE.

APPLICATION FILED DEC. 10, 1919.

1,409,571. Patented Mar. 14, 1922.

3 SHEETS—SHEET 1.

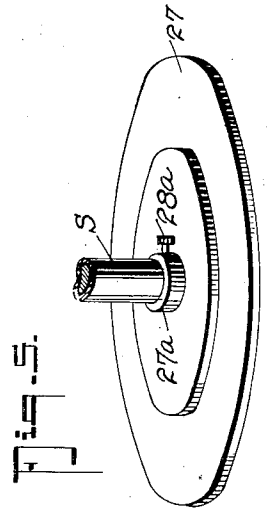



Fig. 5.

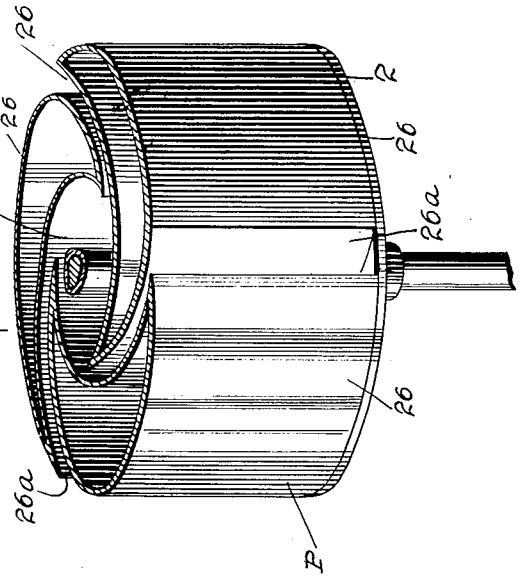



Fig. 4.

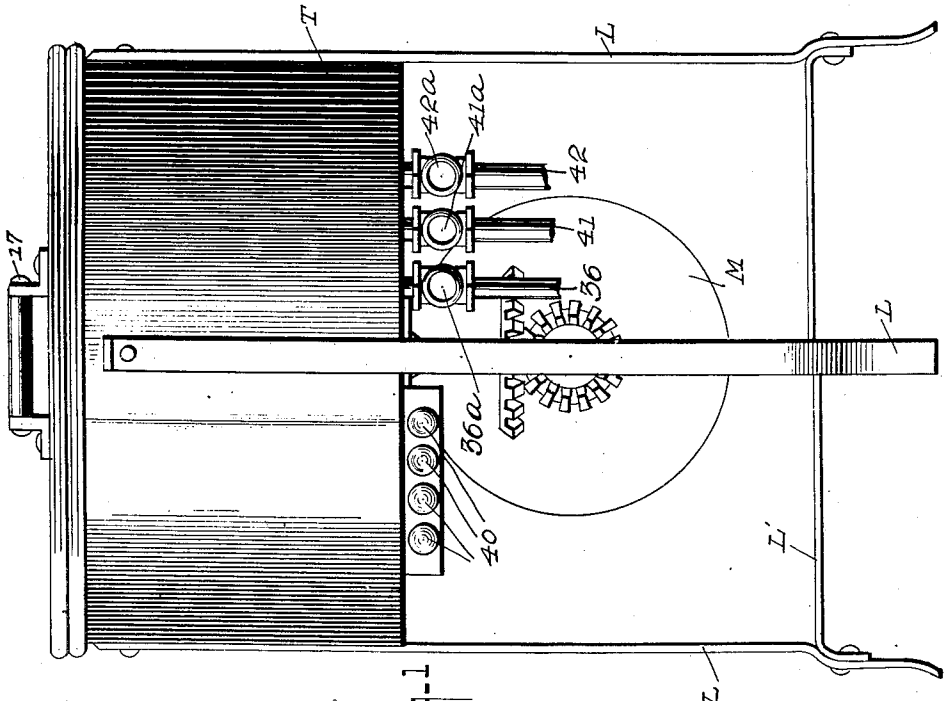



Fig. 1.

WITNESSES

Geo. V. Hall

INVENTOR

H. Vaude Vere Putman.

BY Munn & Co.

ATTORNEYS

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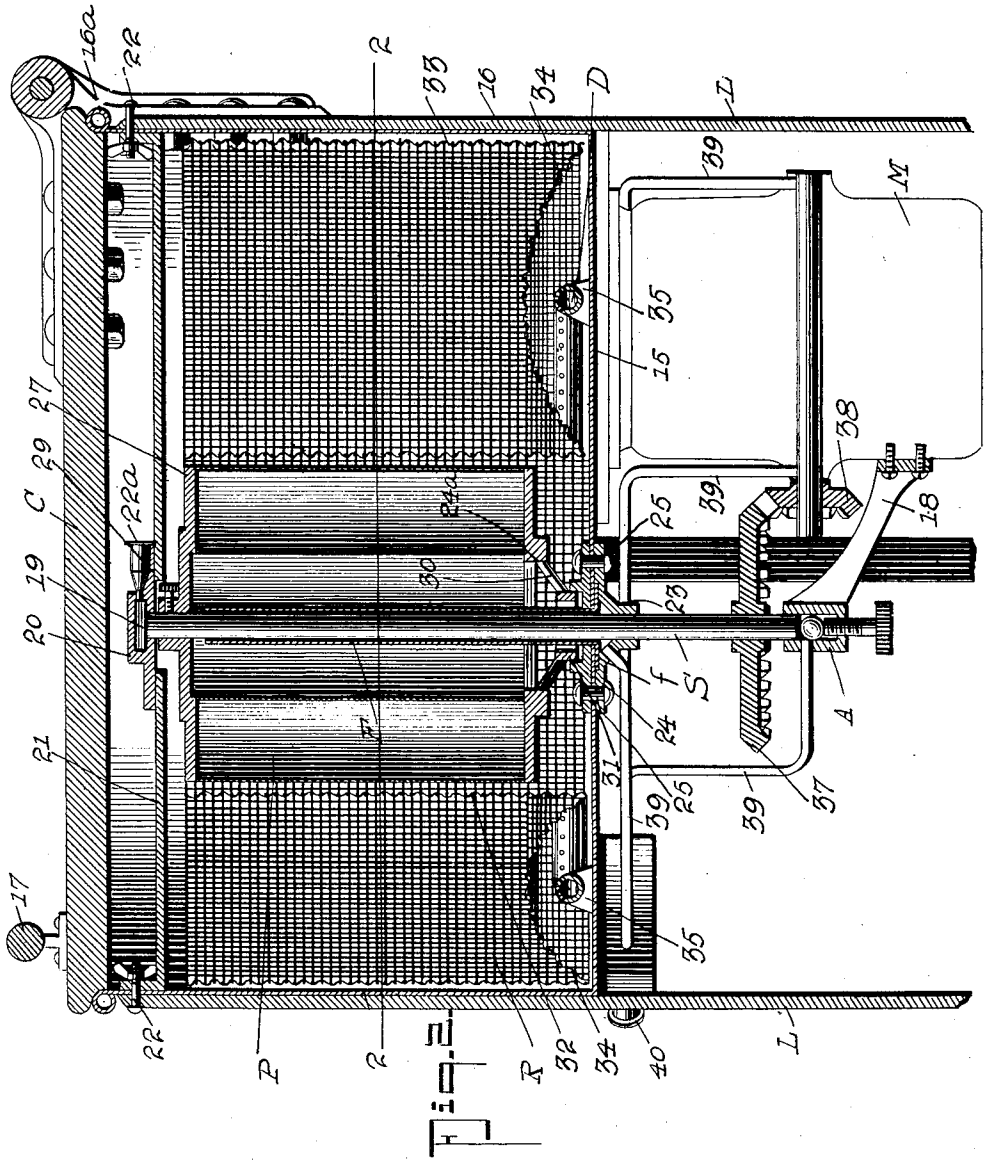



Fig. 2.

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BY Munn & Co.

ATTORNEYS

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3 SHEETS—SHEET 3.

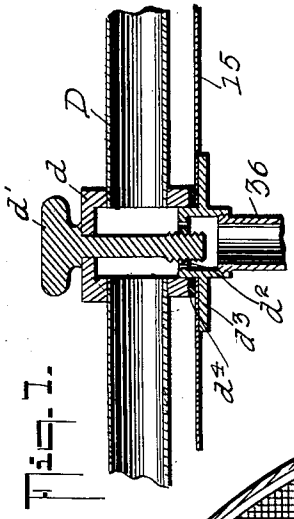



Fig. 7.

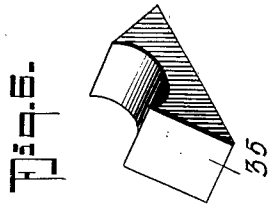



Fig. 6.

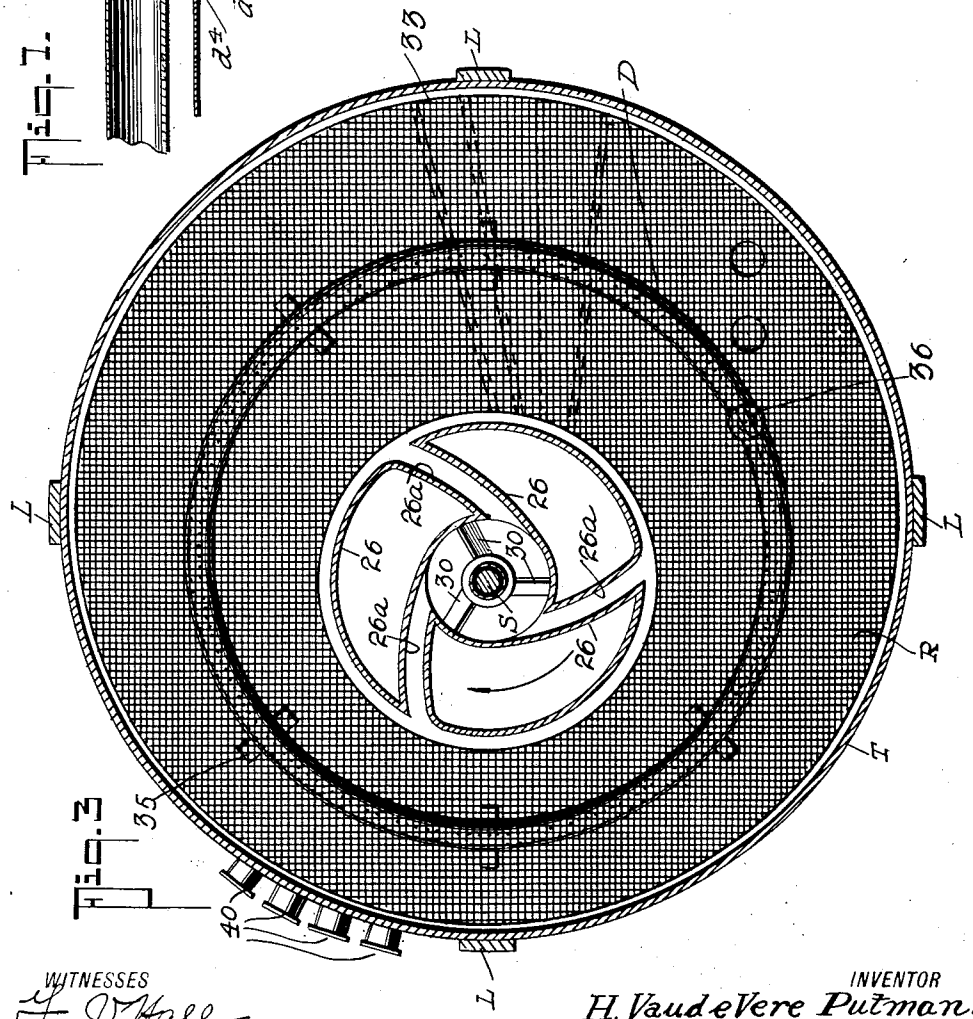



Fig. 5.

WITNESSES

Geo. V. Hall

INVENTOR

H. Vaude Vere Putman.

BY Munn & Co.

ATTORNEYS

# UNITED STATES PATENT OFFICE.

HENRY VAUDE VERE PUTMAN, OF SCHENECTADY, NEW YORK.

## DISHWASHING MACHINE.

1,409,571. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed December 10, 1919. Serial No. 343,838.

*To all whom it may concern:*

Be it known that I, HENRY VAUDE VERE PUTMAN, a citizen of the United States, and a resident of Schenectady, in county of Schenectady and State of New York, have invented certain new and useful Improvements in Dishwashing Machines, of which the following is a specification.

My invention relates to dish washing machines, and an object of my invention is the provision of a machine in which the dishes are constantly under water and wherein their cleaning is effected by creating a circulation of water so as to cause the latter to impinge upon the dishes at the most advantageous angle to secure a thorough cleaning of the dishes with a minimum expenditure of power.

It is also a purpose of my invention to provide a dish washing machine of simple and efficient construction having lubricating means including grease cups which are readily accessible to facilitate the lubrication of any particular part of the machine.

It is a further purpose of my invention to provide a machine in which the several parts thereof are removable to facilitate the cleaning of the machine, and furthermore, a dish washer which is constructed to accommodate large and small articles in proper position for cleaning.

I will describe one form of dish washer embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings:—

Figure 1 is a view, showing in side elevation one form of dish washing machine embodying my invention;

Figure 2 is a vertical sectional view of the machine shown in Figure 1;

Figure 3 is a horizontal sectional view, taken substantially on the line 2—2 of Figuge 2; and

Figures 4, 5, 6 and 7 are detail views of the machine shown in the preceding views.

Similar reference characters refer to similar parts in each of the several views.

Referring specifically to the drawings, T designates a tub formed of copper or galvanized iron and supported by channel steel legs L which are reinforced adjacent their lower ends by brace bars L'. The tub T comprises a bottom wall 15 and a side wall 16 which is formed at its upper edge with a bead 16ª against which a cover C is adapted to rest when in closed position. The cover C is hingedly supported upon the tub T, as clearly shown in Figure 2, and is provided with a handle 17 for moving the same to open or closed position.

Disposed vertically within the tub T is a shaft S which is supported for rotary movement by a thrust bearing designated generally at A and supported by a standard 18 secured to a motor M. The upper end of the shaft S is provided with a head 19 which is journaled in a bearing 20 supported by a bar 21 detachably secured at its ends to the tub by means of bolts 22. The bearing 20 is adapted to be lubricated by an oil cup 22ª which is associated with the bearing in the manner shown in Figure 2. Intermediate its ends, the shaft S is journaled in a pair of bearings 23 and 24, the latter being secured to the opposite sides of the bottom 15 by means of rivets 25. The shaft S carries an impeller designated generally at P and comprising in the present instance a series of spirally disposed vanes 26. As illustrated to advantage in Figure 4, each vane 26 is hollow and of substantially crescent shape formation. The vanes 26 are spaced apart at their confronting sides so as to provide arcuate channels 26ª through which the water is ejected axially from the impeller as will be more fully described hereinafter.

As shown in Figure 4, the upper ends of the vanes 26 are open but are adapted to be closed and hermetically sealed by a disk 27 through which the upper end of the shaft S extends, as clearly shown in Figure 5. At the point at which the shaft S extends through the disk 27, the latter is provided with a collar 27ª that carries a set screw 28ª which serves to secure the disk to the shaft so that the impeller as a unit will rotate with the shaft. The lower end of the vanes 26 are closed by a disk 29 which is formed with an axial opening that is spanned by a plurality of blades 30 and a collar 31. As shown in Figure 2, the blades are inclined to a common center with their upper ends secured to the wall of the opening of the disk while their lower ends are secured to and support the collar 31. The collar 31 is mounted for rotation within an annular flange 24ª formed on the upper side of the bearing 24, the latter serving to prevent lateral movement of the collar and to thereby prevent movement of the lower end of the impeller with respect to the shaft S. Around

the shaft S is arranged a tube F that extends substantially the entire length of the impeller, as clearly shown in Figure 2. The lower end of the tube F is provided with an annular flange *f* which is secured between the bearings 23 and 24 so as to support the two in definite relation with respect to the shaft S. The purpose of this tube is to prevent the water from leaking out through the bearings 23 and 24 and incidently avoiding the use of a packing box.

As shown in Figures 2 and 3, the impeller P is surrounded by a rack R formed of foraminous material and comprises an inner cylindrical portion 32 and an outer cylindrical portion 33, such portions being connected at their lower edges by a convex portion 34. This rack R is designed for the purpose of supporting dishes, table-ware or any other articles of this character, so that they will be subjected to the action of the cleaning liquid as it is circulated within the tub by the movement of the impeller P.

Disposed below the arcuate portion 34 of the rack R and supported at intervals by brackets 35 upon the bottom wall 15 of the tub is a circular spray pipe D to which water is adapted to be supplied through a pipe 36, as clearly shown in Figures 1 and 3. The formation of each of the brackets 35 is clearly shown in Figure 6 while the manner in which the supply pipe 36 is connected to the spray pipe D is clearly shown in Figure 7. As illustrated to advantage in Figure 7, the opposite ends of the pipe D are connected by a coupling member *d* that carries a screw *d'* which threadedly engages a head $d^2$ carried by a coupling member $d^3$. The upper end of the pipe 36 threadedly engages the coupling member $d^3$, and the latter is preferably secured to the bottom wall 15 of the tub. The head $d^2$ is provided with suitable openings to allow the passage of water from the pipe 36 to the pipe D.

From this arrangement, it will be seen that by properly adjusting the screw *d'*, the coupling member *d* is held in snug engagement with the bottom wall of the tub and the coupling member $d^3$, a rubber washer $d^4$ being interposed between the tub and coupling member to effect a water seal between the two. Should it be desired to remove the spray pipe D for cleaning purposes, it is obvious that by withdrawing the screw *d'* from the head $d^2$, the coupling member *d* and consequently the spray pipe D can be readily disconnected from the pipe 36 and thus removed from the tub. The pipe 36 is provided with a valve $36^a$ for controlling the passage of water through the spray pipe D and when opened water is projected onto the dishes carried in the rack to effect a rinsing of the same subsequent to the washing operation. The shaft S in the present instance is driven by the motor M which is suitably supported at the under side of the tub, as clearly shown in Figure 2. The shaft of the motor M is operatively connected to the shaft S through a pair of beveled gears 37 and 38 fixed to the shaft S and the motor shaft, respectively.

For lubricating the motor shaft and the impeller shaft, I provide pipes 39, two for the motor shaft and two for the impeller shaft. Each of these pipes extends to the outer side of the tub and terminate in grease cups 40 of the ordinary construction by means of which the grease is fed to the bearings through the pipes 39. By virtue of this arrangement, it will be obvious that the grease cups are readily accessible and hence lubrication of the several bearings is easily accomplished.

In the operation of the washing machine, hot water is supplied to the tub through a pipe 41 controlled by a valve $41^a$. When the water in the tub has reached a level sufficient to submerge the dishes within the tub, the valve $41^a$ is closed thus discontinuing the supply. Soap is now added and the dishes are placed within the rack R in the manner indicated in dash lines in Figure 3 wherein it will be noted that they assume a vertical position. The motor M is now started causing rotation of the impeller P in the direction of the arrow in Figure 3. This causes the water in the channels $26^a$ of the impeller to be forced outwardly on a line substantially tangential to the periphery of the impeller. As the water is projected in this manner, a vacuum is created within the impeller which draws the water up from the bottom of the tub so that a constant circulation of the water within the tub is effected. The drawing of the water into the impeller is materially assisted by the blades 30, it being noted that the disposition of the same are such as to elevate the water when the impeller is rotated in the direction of the arrow in Figure 3.

As previously stated, the water is drawn from the impeller substantially at a tangent to the periphery of the same so that with the dishes arranged in the manner shown in Figure 3, it is manifest that the water impinges upon the surface of the dishes so as to effect a thorough cleaning of the same. Because of the peculiar construction of the impeller P, the circulation of the water within the tub is not continuous but intermittent, this of course being due to the spacing of the channels $26^a$. During one rotation of the impeller, three separate and distinct impulses are transmitted to the water in the direction of the dishes so that with the impeller rotating at a high speed a vibratory motion of the water is effected with the result that a cleaning of the dishes may be accomplished in a very few minutes. This vibratory motion of the water greatly aids

in the dissolution of the grease on the dishes thereby preventing concentration of the grease so that the efficient operation of the machine is insured at all times.

After the dishes have been thoroughly cleaned, the water, together with the grease and particles of food, are drained from the tub through a pipe 42 by opening a valve 42ª, whereupon the dishes are rinsed with fresh water by opening the valve 36ª.

As clearly shown in Figures 2 and 3, the impeller P is mounted eccentrically within the tub T and the rack R is constructed accordingly. The purpose of this arrangement is to provide a large space at one side of the propeller for the reception of dishes, and a smaller space at the opposite side for the reception of smaller articles, such as glasses, cups and silverware. This arrangement also permits the motor M to be housed beneath the tub T and provides ample space for the driving gears.

Although I have herein shown and described only one form of dish washing machine embodying my invention, it is to be understood that various changes and modifications may be made herein without departing from the spirit of the invention or the spirit and scope of the appended claims.

Having thus described my invention, I claim:—

1. A dish washing machine comprising, a tub, and an impeller rotatable within the tub and comprising a plurality of crescent-shaped vanes spaced apart to provide arcuate channels of uniform width which extend tangentially from the axis of the impeller.

2. A dish washing machine comprising a tub, an impeller rotatably mounted within the tub and comprising blades for elevating water and vanes for projecting the water tangentially of the impeller, a rack for supporting dishes in vertical position and radially of said impeller, and spraying means disposed below said rack and encircling said impeller.

HENRY VAUDE VERE PUTMAN.