May 29, 1934. M. J. KEHOE 1,960,816

DISHWASHING MACHINE

Original Filed May 26, 1931 4 Sheets-Sheet 1

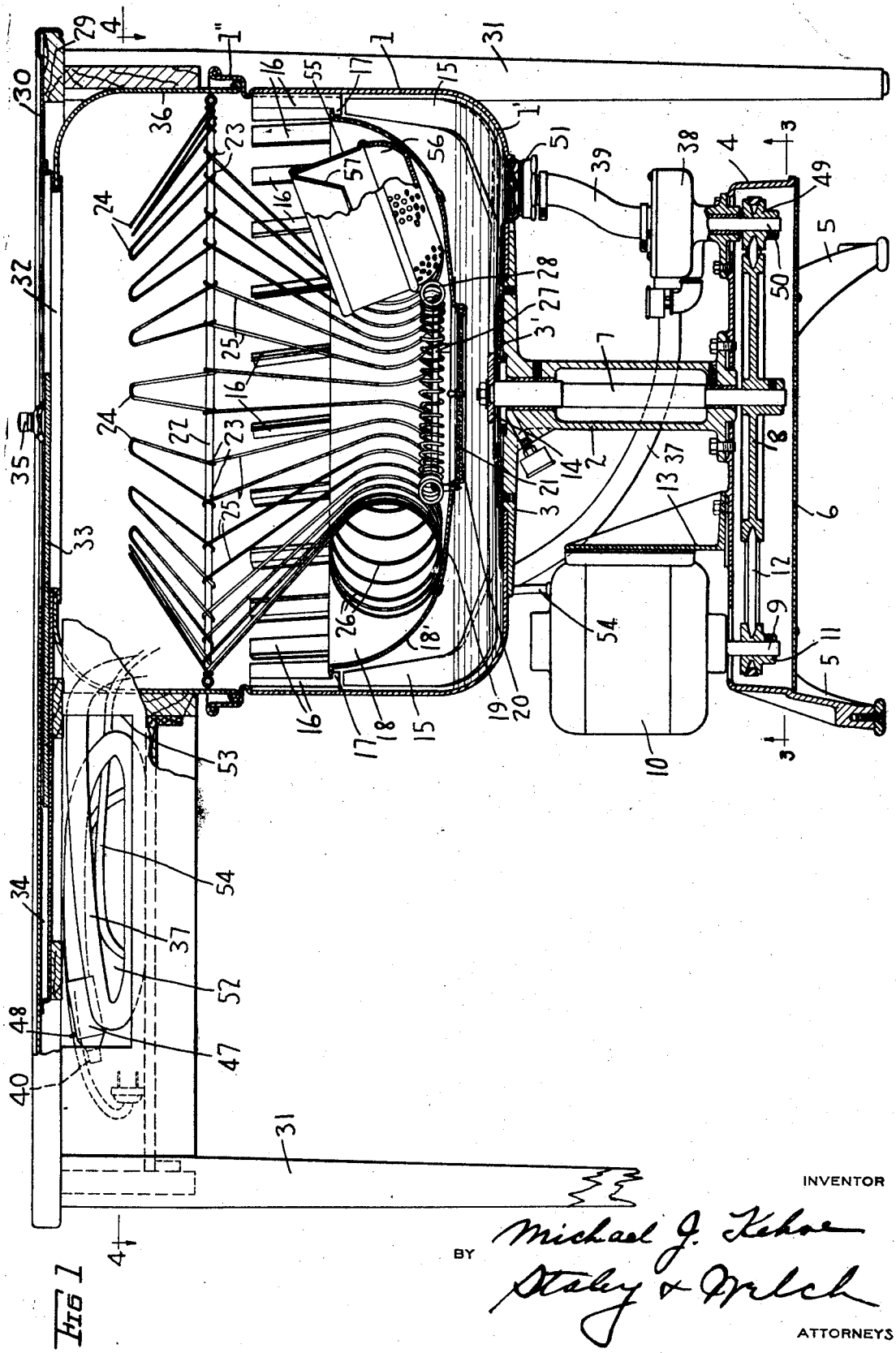


FIG 1

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FIG 2

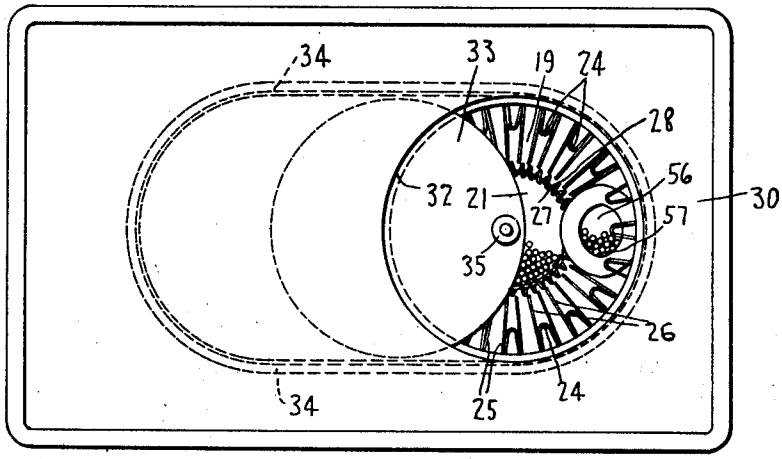
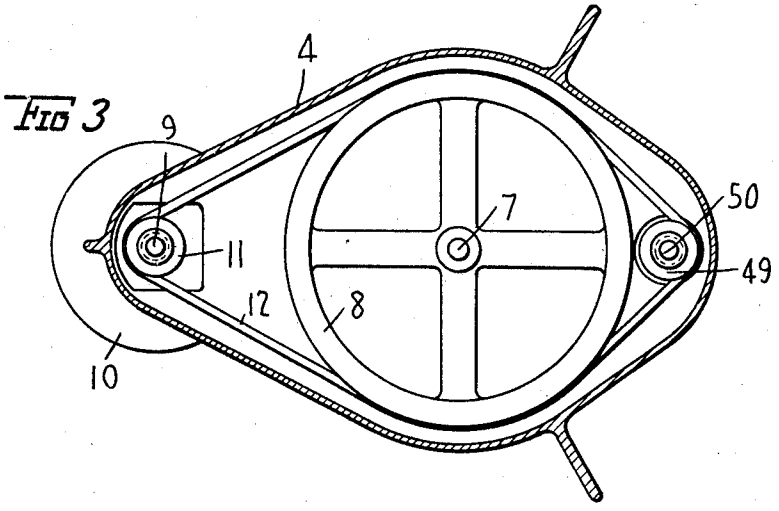


FIG 3



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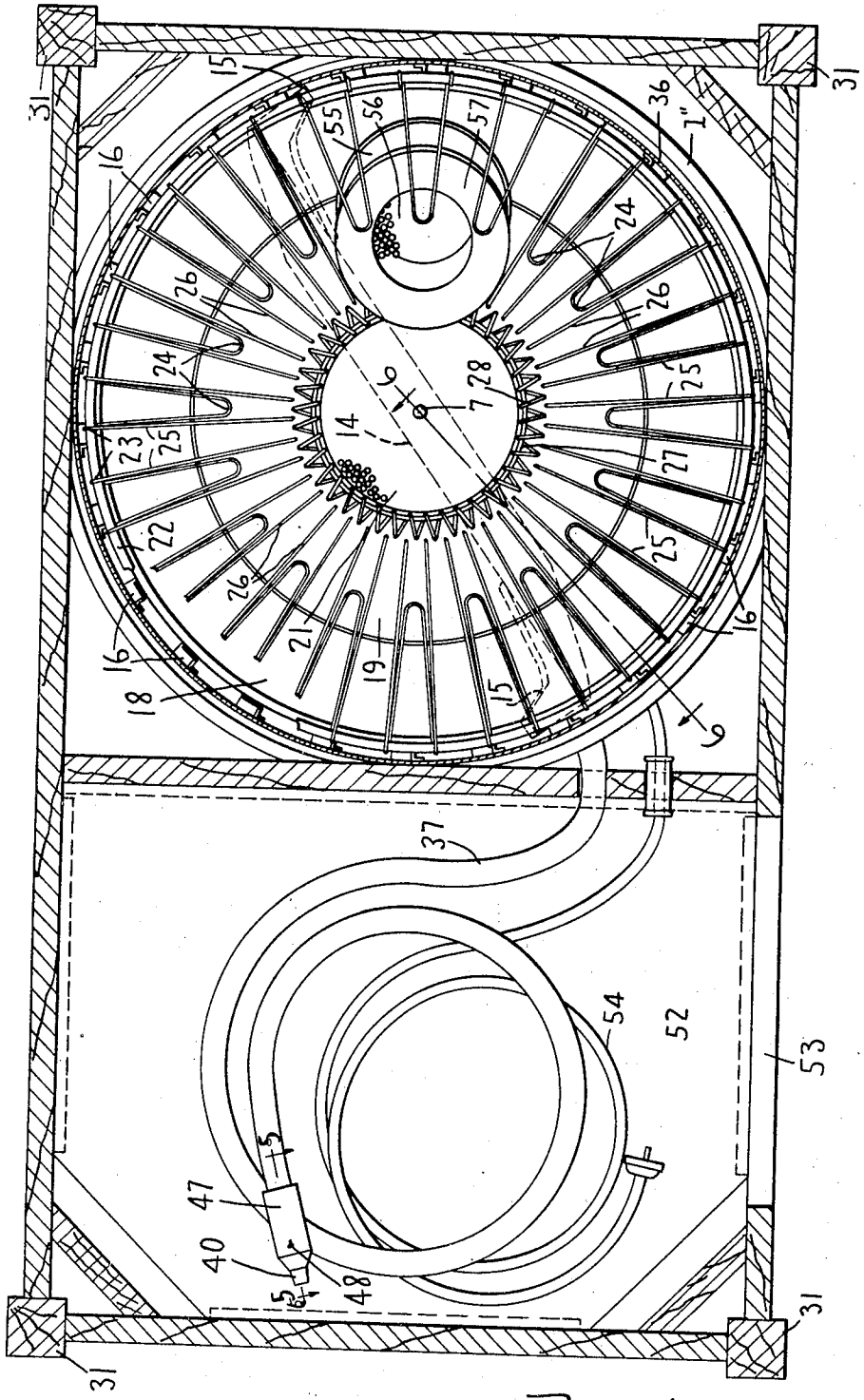


FIG 4

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FIG 5

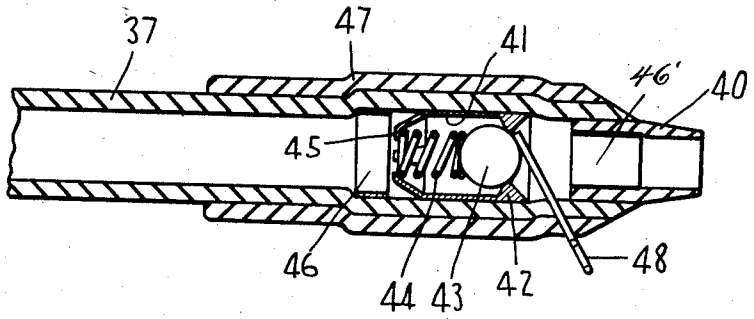


FIG 7

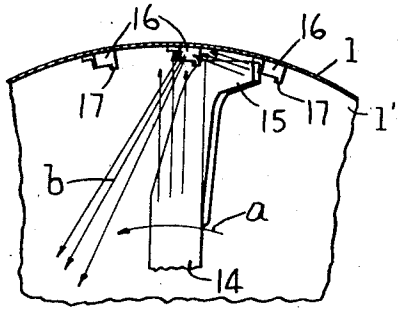


FIG 8

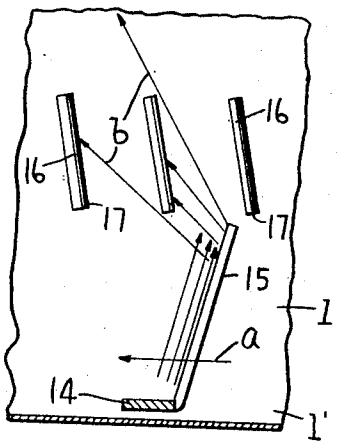
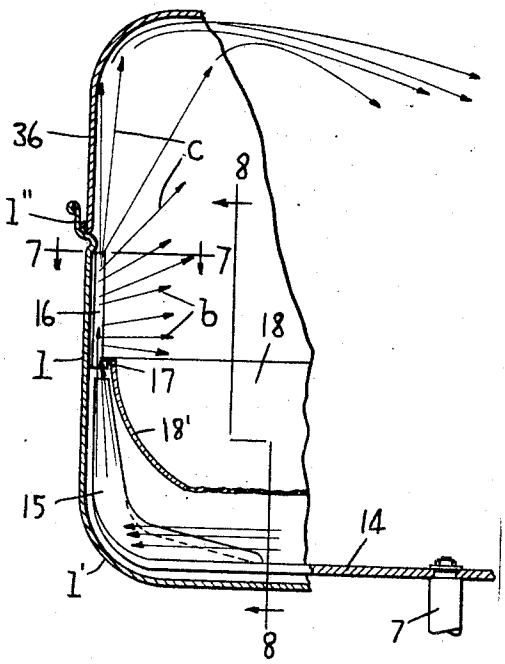


FIG 6



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UNITED STATES PATENT OFFICE

1,960,816

DISHWASHING MACHINE

Michael J. Kehoe, Springfield, Ohio

Application May 26, 1931, Serial No. 540,102
Renewed November 6, 1933

6 Claims. (Cl. 141—9)

This invention relates to dish washing machines, it more particularly relating to that type of machine in which there is employed a stationary tube and a rotary water impelling device.

One object of the invention is to provide improved means for projecting or dashing the water upon the dirty dishes or other utensils; a more specific object in this connection being to provide an improved arrangement of movable impellers and stationary baffles for directing the water in the proper direction.

A further object of the invention is to provide an improved arrangement for supplying the water to the tub and draining the water therefrom.

Another object of the invention is to provide improved devices for supporting the dishes or other utensils in the tub and for straining the water before recirculation over the dishes; a more specific object in this connection being to provide a pan so arranged that it will support said strainer and also act to direct the water into effective range of the impeller blades.

A further object of the invention is to provide a unitary structure in the nature of a washing machine and kitchen table so arranged that the table will form a main cover for the washing machine, act as a support for some of the parts and also answer for the purpose of an ordinary kitchen table.

Other objects of the invention will appear from the accompanying description, statement of advantages and claims.

In the accompanying drawings:

Fig. 1 is a view partly in side elevation and partly in vertical section showing the improvements.

Fig. 2 is a top plan view on a reduced scale.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged longitudinal section of that portion of the water supply and drainage hose which connects with the water faucet, the section being taken on the line 5—5 of Fig. 4.

Fig. 6 is a vertical section of a portion of the tub, the section being on the line 6—6 of Fig. 4, with the dish rack omitted.

Fig. 7 is a section on the line 7—7 of Fig. 6, with the pan omitted.

Fig. 8 is a section on the line 8—8 of Fig. 6 with the pan omitted; this figure, as well as Figs. 6 and 7, showing the direction taken by the water under the action of the various parts.

In the drawings, 1 represents a tub or bowl, preferably formed of metal, which is stationarily mounted upon a suitable support consisting of a standard 2 having its upper end formed with an integral disk 3 and its lower end fastened to a hollow base 4 which is supported from the floor by legs 5 and has a lower cover 6 to form a housing. The disk 3 has an annular depressed portion at its outer edge to receive the bottom proper of the tub, which is formed with a central opening with the walls of the opening abutting the shoulder formed by the depressed portion of the disk, and secured to the upper surface of the disk is an auxiliary bottom member or cover 3' which overlaps and is clamped tightly to the bottom of the bowl to form a water-tight joint.

Journalled in suitable bearings at the upper and lower ends of the standard 2 is a spindle 7, the lower reduced end of which extends into the housing and has fast thereto a large pulley 8 which derives motion from the shaft 9 of an electric motor 10 through the medium of a small pulley 11, fast to the motor shaft, and the belt 12; the motor being supported by a bracket 13 secured to the housing 4.

Fast to the upper end of the spindle 7 is a horizontal cross bar 14 having each of its ends upturned to form an impeller blade 15 which revolves in close proximity to the wall of the tub; the lower corners of the tub being rounded as indicated at 1' and the impeller blades being correspondingly formed adjacent thereto. As shown best in Figs. 7 and 8, each impeller blade projects upwardly at an angle in a direction reverse to the travel thereof for a purpose to be explained.

Arranged about the inner wall of the tub immediately above the upper ends of the impeller blades are baffle members 16, these baffle members being of angle form with one wing of each secured to the wall of the tub in any suitable manner and the other wing thereof projecting inwardly from the wall. These baffle members are in parallel relation but are each arranged at an angle so that they lean from bottom to top in the direction of the travel of the impeller blades so that the angular relation of the baffles and impeller will be as shown best in Fig. 8.

The lower end of each baffle member has an inturned lug 17 and hung on these lugs is a pan 18, the upper edge of the pan having an outturned flange for that purpose. The pan has a removable bottom 19 which is provided with a central opening having an inturned flange 20 upon which is removably seated a screen member 21. This pan member has two functions, one being to provide for straining the dirty water and the other being to coact with the wall of the tub to provide

a converged throat within which the impeller blades rotate so that all of the water will be brought into intimate association with the blades, the pan being rounded as indicated at 18' for that purpose.

Removably mounted upon the pan is a dish rack formed of a ring 22 which supports a number of wires so bent as to form supports for the dishes. Each wire is wrapped with a single turn at two points 23 about the ring 22 so as to provide an upwardly and inwardly projecting loop 24 and to also provide two downwardly and inwardly projecting flexible rods 25, the lower end of each of which is bent in the form of a ring 26. The rings 26 are spaced apart so that flat dishes may be inserted therebetween, while the loops 24 provide supports upon which are laid such dishes as cups and the like, and over which are inserted such dishes as drinking glasses and the like. Within the lower portions of the dish supporting members 25 is placed a ring 27, which is supported by the removable bottom 19 of the pan and which is surrounded by a garter spring 28, this ring and spring being for the purpose of keeping the dishes which are placed between the rings 26 in place therein, the edge of a dish entering between the coils of the garter spring for this purpose.

The upper end of the bowl or tub is closed by members which are carried by a table. The table has a top which is formed by outer wooden frame members 29 to which is secured a top proper 30 of any suitable material, the table top being connected to and supported by suitable legs 31. The portion 30 of the top is provided with a circular opening 32 which is designed to be closed by a transparent cover 33, this cover being slidably mounted in suitable ways 34 on the under side of the top 30 and provided with a suitable knob or handle 35 by which it can be conveniently slid to different positions. Carried by the under side of the top 30 in line with the opening therein is a metal cover 36, the lower edge of this cover having a slip connection with the upper portion of the tub 1 as shown in Fig. 1; the upper edge of the tub 1 being formed with an enlarged portion 1'' to form a shoulder which receives the lower edge of the cover 36 which is preferably rolled to form a bead as shown.

For the purpose of filling the tub with water and draining the water therefrom there is provided a flexible hose 37, a pump 38 and a flexible connection 39. The flexible connection 39 extends between the lower portion of the tub and the pump casing, while the hose 37 has one end connected to the pump casing and the other end provided with a soft rubber nipple 40 (see Fig. 5) which may be slipped into an ordinary hot water kitchen faucet. Within the hose 37 adjacent this nipple is a metallic valve casing 41, the outer end of which is formed with a seat 42 for a ball valve 43 which is normally held to its seat by a coil spring 44 interposed therebetween and a flange 45 formed on the inwardly bent inner end of the casing 41. A ring 46 is preferably inserted in the hose adjacent the rear end of the valve casing to support the hose at this point, a second ring 46' inserted in the nipple for the same purpose, and the exterior of this portion of the hose is preferably provided with a soft rubber gripping member 47. Provision is made for manually unseating the ball valve 43 and to that end there is inserted through the hose and its gripping member on the soft side of the seat 42 a small trigger-like member 48 which is normally held in the position shown in Fig. 5 by the natural resiliency of the rubber of the hose and gripping member but which may be moved by pressing upon the outer end thereof so as to temporarily unseat the valve for the purpose to be explained.

The pump is of the ordinary centrifugal type which builds up appreciable pressure with the check valve closed, this pump being operated from the motor 10 by passing the belt 12 about a pulley 49 about the shaft 50 of the pump. The opening in the bottom of the tub 1 with which the house connection 39 communicates is preferably provided with a strainer 51.

For the purpose of accommodating the hose when not in use there is provided beneath the table top a compartment 52 having an opening 53 through which the hose may be withdrawn and replaced. This compartment also accommodates the current-carrying cord 54 for the motor.

In addition to the dish rack described, there is also provided a small receptacle for silverware as shown in Fig. 1 which may be placed in the pan 18, the legs 25 of the dish rack being discontinued at one point to accommodate this holder. The holder consists of a small metal bowl 55 having its lower portion 56 provided with a series of perforations for drainage purposes and its upper portion open. Suitably secured to the upper edge thereof is an annular member 57 which projects downwardly and inwardly into the bowl to act as a support for the knives, forks and spoons placed therein, such utensils being preferably inserted with their handles downwardly.

In operation, when it is desired to use the machine, the glass lid 33 is slid back and the rack filled with dishes in the manner described and the bowl 55 with knives, forks and spoons, and a small amount of suitable cleansing agent placed in the machine. The lid is then closed and the motor started to revolve the water impelling blades 15 and operate the pump 38. The hose 37 is then removed from its compartment and the nipple inserted in the hot water faucet, and the hot water turned on, the nipple being held in the faucet by hand until the tub has been supplied with a suitable amount of water. As the water rises in the tub it is thrown upwardly by the impellers so that by watching the water through the glass lid the sufficiency of water can be determined. When a sufficient amount of water has been placed in the machine the faucet is shut off and the hose disconnected therefrom. During the flow of the water to the tub the check valve 43 is forced from its seat by the water pressure, and the water pressure being greater than the pressure of the pump, the water is permitted to flow through the pump casing to the tub.

Referring to Figs. 6, 7 and 8, the action of the water is as follows: The water after entering the tub is directed to the converged annular throat within which the impellers move, this throat being formed by the wall of the tub and the wall of the pan 18. The water is thrown by the impeller upwardly and forwardly, considering the direction of travel of the impeller blades as indicated by the arrows *a* in Figs. 7 and 8, the water striking against the baffles 16. Some of the water is directed inwardly by the baffles as shown by the arrows *b* in Figs. 6 and 7, while some of the water continues up the walls of the tub, or rather the walls of the cover 36 thereof, where it is directed inwardly and downwardly by the rounded corners thereof, as indicated by the arrows *c*. Thus, all of the water is directed or dashed forcibly in all

directions against the dishes in the racks and the silverware in the small bowl, thoroughly cleansing the same. During the washing operation the pump has continued to operate, tending to force water through the hose 37 which is prevented, however, by the automatic closing of the check valve 43.

After the washing operation has been completed, the free end of the hose is placed in the sink, the check valve 43 forced from its seat by the trigger 48, whereby by the action of the pump the water in the tub is discharged into the sink. After the tub is emptied, if desired, another charge of hot water may be placed therein and again emptied in the manner before described for rinsing purposes. The operator can determine when the tub is emptied by observing the flow of water from the nozzle or nipple and when emptied the machine is stopped and the hose coiled up and returned to its compartment. The lid is then opened and if the water is sufficiently hot the dishes will dry in a few minutes.

It will be observed that during the entire operation of washing, emptying, refilling for rinsing purposes and again emptying, it is not necessary to stop the machine, but if desired the machine may be stopped at any time to add a forgotten dish. The machine is self cleansing, the water action being so violent that all parts within the machine are kept clean, but if desired the dish rack and pan may be readily removed by lifting the table sufficiently to disengage the slip connection between the tub and its cover 36 and then moving the table to one side, after which the removable part may be readily taken out. The dish rack, pan and the bottom 19 for the pan, ring 27 and its garter spring 28, drain 21 and bowl 55 are all readily separable so that they can be each individually thoroughly cleansed at any time desired.

Having thus described my invention, I claim:

1. In a machine of the character described, a stationary container, means for supporting dishes therein, a revoluble water impeller adjacent the wall of the container extending upwardly on an incline reverse to its direction of travel to direct the water upwardly, and a series of deflectors on the interior of the wall of the tub above said impeller each inclined from bottom to top in the direction of the travel of the impeller to direct the water inwardly.

2. In a machine of the character described, a stationary container, means for supporting dishes therein, a revoluble water impeller adjacent the wall of the container extending upwardly on an incline reverse to its direction of travel to direct the water upwardly, and a series of deflectors on the interior of the wall of the tub above said impeller each inclined fom bottom to top in the direction of the travel of the impeller to direct the water inwardly, the upper corner of said container being rounded to direct water passing said deflectors in an inward and downward direction.

3. In a machine of the character described, a stationary container, a member in the lower portion thereof and spaced from the walls thereof to form an annular throat, a revoluble water impeller operating in said throat to direct water upwardly, and a series of deflectors above the path of travel of said impeller to receive the water therefrom and direct it upwardly, said impeller extending upwardly at an incline reverse to its direction of travel and each of said deflectors extending upwardly at an incline in the direction of the travel of said impeller.

4. In a machine of the character described, a stationary container, a member in the lower portion thereof and spaced from the walls thereof to form an annular throat, a revoluble water impeller operating in said throat to direct water upwardly, and a series of deflectors above the path of travel of said impeller to receive the water therefrom and direct it upwardly, said impeller extending upwardly at an incline reverse to its direction of travel and each of said deflectors extending upwardly at an incline in the direction of the travel of said impeller, the upper corner of said container being rounded to direct the water which passes the deflectors in a downward and inward direction.

5. In a machine of the character described, a stationary container, a stationary pan in the lower portion of said container and spaced from the walls thereof to form an annular throat open at the top, said pan having a screened drain opening in its bottom, a revoluble water impeller operating in said throat to direct water upwardly, and a series of deflectors above the path of travel of said impeller to receive the water therefrom and direct it upwardly, and a dish rack supported by said pan and extending above the upper portion of said pan into said container.

6. In a machine of the character described, a stationary container, a pan in the lower portion of said container and spaced from the walls thereof to form an annular throat open at the top, said pan having a screened drain opening in its bottom, a revoluble water impeller operating in said throat and having blades inclined reversely to the direction of travel of said impeller to direct water upwardly, a series of deflectors above the path of travel of the blades of said impeller to receive water therefrom, said deflectors extending upwardly at an incline in the direction of travel of said impeller to direct the water upwardly, and a dish rack supported in said pan and projecting above the same.

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