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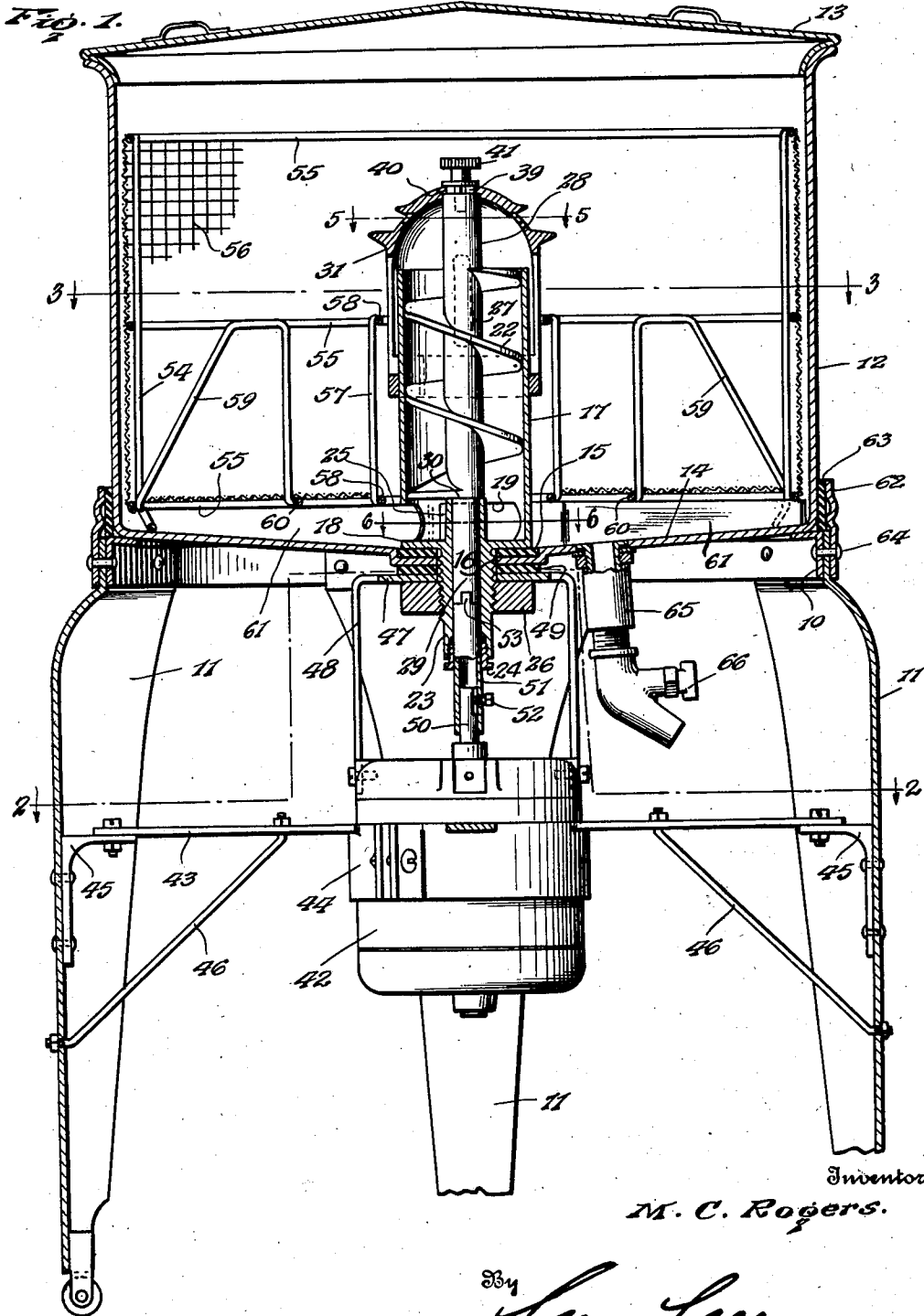
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1,942,452

DISHWASHING MACHINE

Filed Aug. 25, 1931

3 Sheets-Sheet 1



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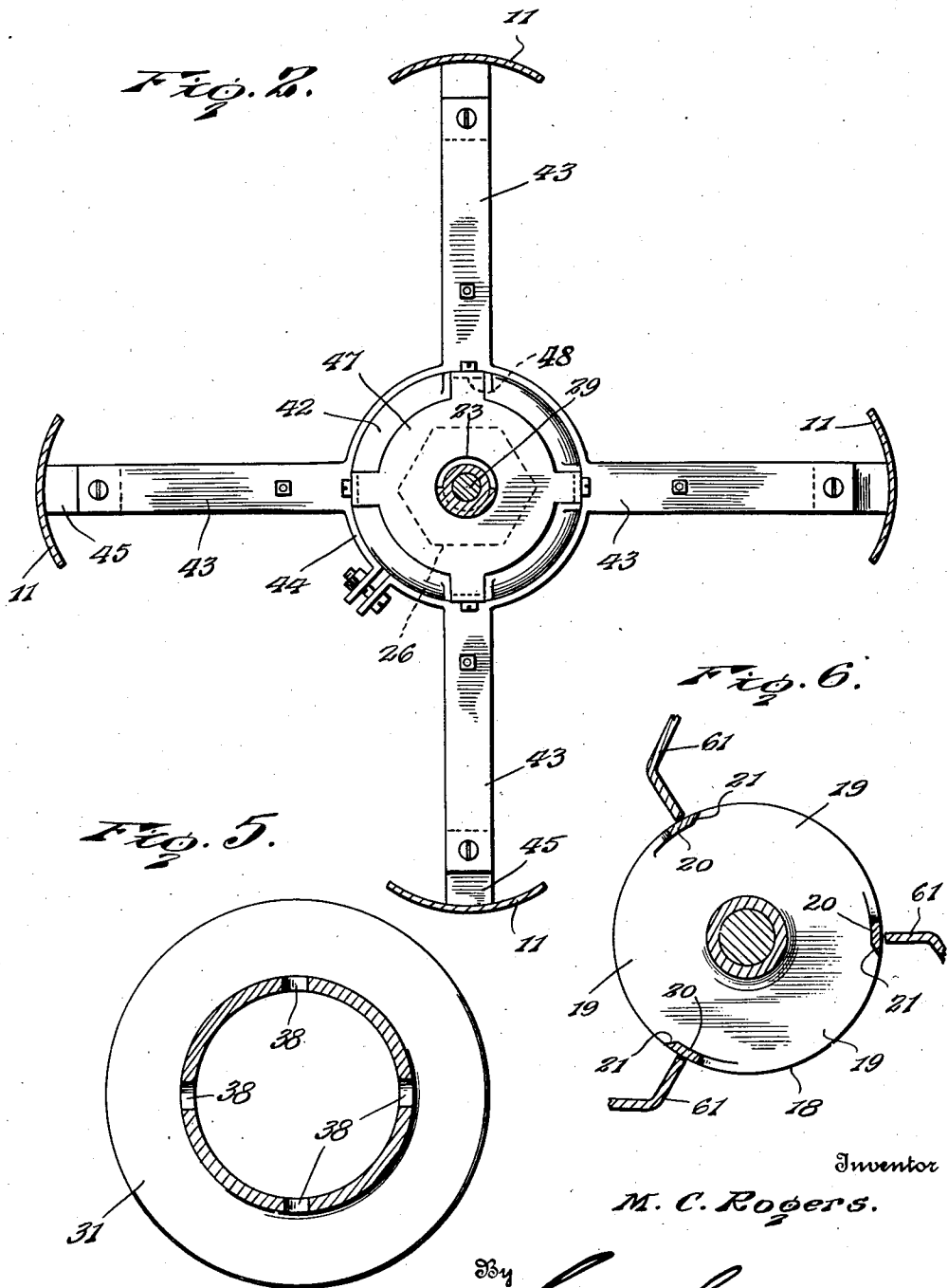
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Fig. 3.

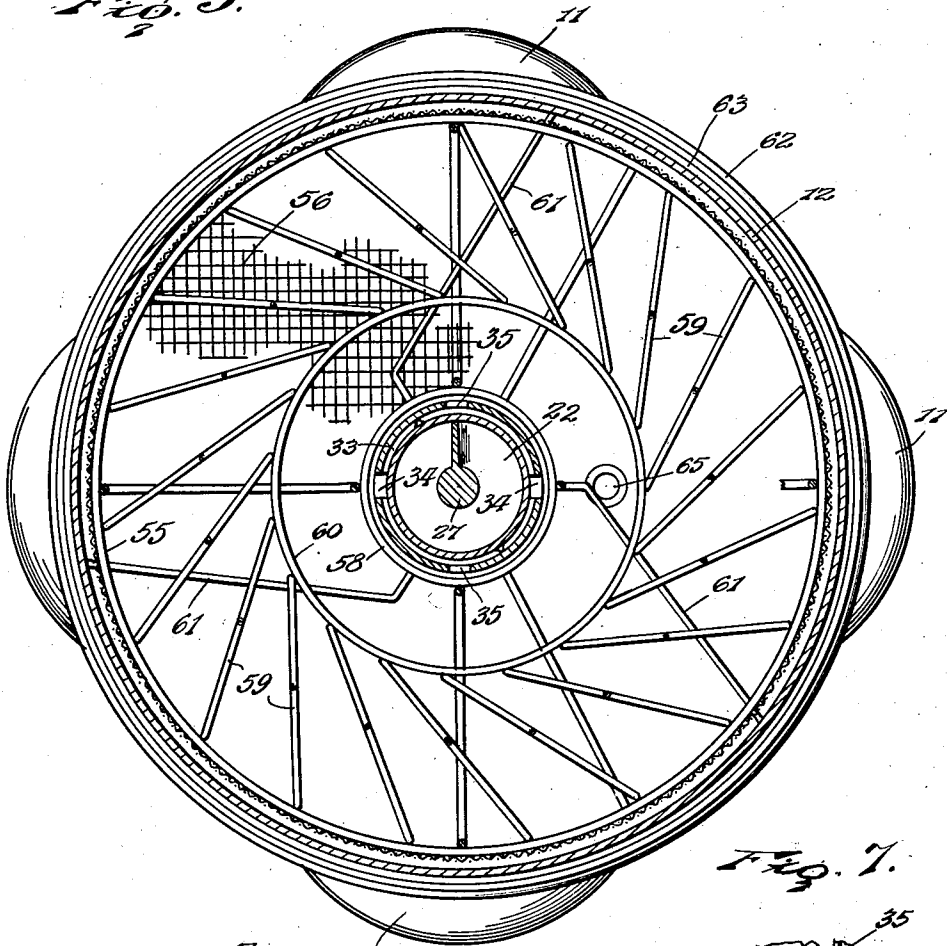


Fig. 4.

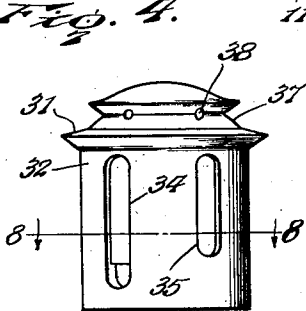


Fig. 8.

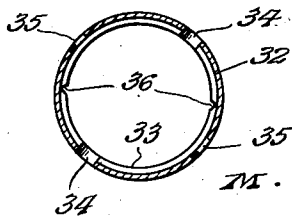
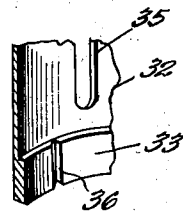


Fig. 7.



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# UNITED STATES PATENT OFFICE

1,942,452

## DISHWASHING MACHINE

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3 Claims. (Cl. 141-9)

This invention relates to dish washing machines and has for an object to provide a machine of this type which will be devoid of screens or other filters that might clog up, will be devoid of exposed rotating worms, and will be of such accessible construction as to be cleansed and kept in a sanitary condition with minimum effort.

A further object is to provide a dish washing machine in which the pump housing and spiral pump therein may be detached from the motor and removed as a unit from the container for cleansing by simply unscrewing a single nut.

A further object is to provide a distributor cap which forms a closure for the top of the pump housing and which is attached to the pump and is positively rotated by the pump, the cap being adapted to throw a large volume of water over the dishes so that the dishes are quickly and effectively washed.

A still further object is to provide a basket for the dishes having dish racks on the bottom and having baffles below the bottom, the baffles forming supports for the basket and also preventing swirling of the water being drawn by the pump into the pump housing, so that the effectiveness of the spiral pump will be greatly enhanced.

A further object is to provide a spiral pump which is elevated above the bottom of the pump housing, while the pump housing itself is provided with lateral openings below the water level and below the spiral pump, this construction, in practice, preventing sediment being drawn into the pump, and also preventing the rotating pump being exposed through the openings so that no injury will result should the fingers of the operator or children be thrust into the openings.

A still further object is to provide a horizontal spider and clamp ring for attaching the motor to the legs of the machine, which spider prevents lateral vibration and coacts with a vertical spider which is removably attached to the container and to the motor, and prevents vertical vibration of the motor, the result being that the assembled device is quiet-running and devoid of vibration which might tend to break the dishes.

With the above and other objects in view the invention consists in certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sac-

rificing any of the advantages of the invention. In the accompanying drawings forming part of this specification,

Figure 1 is a longitudinal sectional view through a dish washing machine constructed in accordance with my invention,

Fig. 2 is a cross sectional view taken on the line 2-2 of Fig. 1, showing the motor-attaching spiders in plan,

Fig. 3 is a cross sectional view taken on the line 3-3 of Fig. 1, showing the dish racks and the baffles carried by the basket,

Fig. 4 is a side elevation of the rotary distributor cap,

Fig. 5 is an enlarged sectional view of the cap taken on the line 5-5 of Fig. 1,

Fig. 6 is an enlarged cross sectional view taken on the line 6-6 of Fig. 1, showing the leading edges of the openings in the pump housing sharpened,

Fig. 7 is a fragmentary perspective view showing the bearing of the distributor cap, and

Fig. 8 is a cross sectional view on the line 8-8 of Fig. 4.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, the washing machine is shown to comprise a frame including an angle iron ring 10 to which are preferably riveted four casted legs 11. The flange of the angle iron ring forms a supporting ledge for a container 12 which preferably is formed of metal and is closed by a cover 13. The bottom 14 of the container is depressed from the outer edge toward the center and, at the center, is further depressed to receive a rubber packing washer 15, and at the center is provided with an opening 16.

The pump housing 17 is preferably formed of a cylinder of uniform diameter, the cylinder being open at the top and being closed at the bottom by a flat disk 18 which bears upon the rubber washer 15. Above the bottom disk there are formed a plurality of elongated openings 19 in the wall of the housing, preferably three of such openings being provided, as best shown in Fig. 6. The webs 20 of the housing between the openings preferably are sharpened, as shown at 21, on the leading edges to promote easy access of the water into the pump housing in a counter-clockwise direction to correspond to the direction of rotation of the hereinafter described spiral pump 22.

Formed integral with the bottom disk 18 of the housing there is a nipple 23 which is threaded exteriorly and is of sufficient size to loosely fit in the opening 16 in the bottom of the con-

tainer. A packing nut 24 closes the lower end of the nipple. The bottom disk 18 is also provided on the top surface thereof with an upstanding boss 25 which extends in prolongation of the nipple 23. A nut 26 is threaded onto the nipple 23 and forms means for securing the pump housing to the bottom of the container. Obviously, by simply backing off the nut 26 the pump housing may be removed bodily from the container for cleansing when necessary.

The above-mentioned spiral pump 22 is vertically disposed in the pump housing to rotate in a counter-clockwise direction, the axial shaft 27 of the pump projecting at the upper end beyond the spiral worm of the pump, as shown at 28, and also projecting below the lower end of the spiral worm, as shown at 29. The bottom extension 29 of the pump shaft is journaled for rotation in the above described boss 25 and nipple 23 of the pump housing.

A shoulder 30 is formed on the pump shaft to seat on the top edge of the boss, as best shown in Fig. 1, and limit insertion of the pump in the housing. It will thus be observed that the spiral worm of the pump terminates at the upper end flush with the top of the housing and terminates at the lower end flush with the top of the boss 25 which, as will be observed, extends above the tops of the lateral openings 19 in the housing.

Thus, the spiral worm is elevated above the intake openings 19 so that whatever sediment may accumulate in the bottom of the container will not be touched by the worm and carried up in the housing as would be the case were the worm extended to the bottom wall of the housing to cut into the accumulated sediment, as will be obvious. Furthermore, by the spiral worm being elevated above the intake openings 19, should the fingers of the operator or children be inserted in the openings, they will not encounter the worm as the worm is completely housed by the housing and is not exposed through the openings, so that no injury will result.

In further carrying out the invention, I provide a distributor cap 31, best shown in Figs. 1, 4, and 5, which forms a closure for the top of the housing 17, and is provided with a cylindrical side wall 32 which fits loosely down over the outer face of the top of the housing so that the cap may rotate freely thereon. The wall is thickened at the bottom to provide an annular bearing 33, as shown in Fig. 7. The bearing engages the housing 17 and is lubricated by water passing downward through hereinafter described grooves 36 in the bearing so that oiling of the bearing is unnecessary.

The wall of the distributor cap is preferably provided with a pair of opposite elongated openings 34 which extend longitudinally of the wall. It is also preferably provided with a pair of opposite openings 35 of less length than the openings 34, as best shown in Fig. 4. It will be observed that both pairs of openings extend vertically and provide slits through which the water will be discharged with great force. To permit streams of water being thrown downwardly, vertical grooves 36 are formed in the bearing 33, as best shown in Fig. 8. Also, it will be observed that the top of the cap is substantially dome-shaped and is constructed at about a medial point to provide an annular V-shaped groove 37, the bottom of which is perforated, as shown at 38, to provide jet openings through which the water may escape horizontally.

The distributor cap is positively rotated by the pump, as will presently be described, so that all the streams of water will be revolved while being simultaneously ejected in large volume and with great force.

For rotating the cap, the upper end of the extension 28 of the spiral pump shaft 27 is reduced and squared, as shown at 39 in Fig. 1. A square opening 40 formed at the center of the cap receives said squared end of the shaft. A nut 41 is threaded onto the end of the shaft and secures the cap firmly on the shaft. The cap thus rotates as a unit with the worm pump in a counter-clockwise direction. By simply removing the nut 41, the cap may be quickly removed for cleansing when desired.

By referring now more particularly to Figs. 1 and 2, it will be seen that a motor 42 is mounted on the frame of the washing machine below the container and between the legs thereof. A spider, preferably having four arms 43 connected at the inner ends by a split clamp ring 44, is employed to secure the motor to the legs 11. Angle iron brackets 45 are preferably riveted to the legs and bolted to the outer ends of the spider arms. The clamp ring 44 surrounds the motor casing and is tightly secured thereto by means of a bolt which connects the terminals of the ring, as shown in Fig. 2. Inclined braces 46 are terminally connected to the legs 11 of the washing machine and to the arms 43 of the spider. The spider serves to removably support the motor as well as reinforce the motor against horizontal vibration.

To secure the motor against vertical vibration, a spider is employed, having a central disk 47 which is perforated at the center to receive the nipple 23. The spider is provided with preferably four arms 48, shown in Fig. 2, which extend downwardly at the ends, as best shown in Fig. 1, and are terminally secured by screws, or otherwise, to the motor casing. A rubber washer 49 is inserted on the nipple 23 between the disk 47 and bottom of the container 12. It will be observed that the nut 26 may be backed off from the nipple to permit removal of the pump, housing and distributor cap as a unit from the container 12 without disturbing the position of the spider 47.

To connect the motor shaft 50 with the bottom extension 29 of the spiral pump, I employ a tubular sleeve 51 which is secured to the motor shaft by means of a set screw 52 and which projects up into a nipple 23 through a stuffing box 24. The sleeve is coupled to the shaft of the spiral pump by means of a tongue and groove connection between these parts, designated in general by the numeral 53.

It will be observed that this tongue and groove connection 53 permits removal of the spiral pump 22 from the housing 17 by simply lifting the cap 31 and spiral pump vertically as a unit from the housing, and that to accomplish this result it is not necessary to remove any screws, nuts or similar connectors.

Within the container 12 there is disposed a basket preferably formed of wire mesh and comprising a wire frame including a plurality of stiff vertical wires 54 connected at the top and at the bottom and midway between the top and bottom by wire rings 55. Wire mesh 56 of suitable stiffness may be securely attached to the frame in any preferred manner, such as by spot-welding or otherwise, to form the wall and bottom of the basket. To facilitate centering the basket in the container, a skeleton frame is mounted centrally in the basket and comprises a plurality of verti-

cal wires 57 which are connected at the top and at the bottom by wire rings 58 of greater diameter than the outer diameter of the pump housing 17, as best shown in Fig. 1.

5 Disposed on the bottom of the basket there are a plurality of stiff wire frames 59 of the general shape shown in Fig. 1. The inner legs of the frames are connected together by a wire ring 60, as best shown in Fig. 3, while the outer legs of the frames are connected to the outer bottom wire ring 55 of the basket. The frames constitute racks between which the dishes may be placed, and it will be observed, by referring to Fig. 3, that these dish racks extend oblique to said bottom ring 60 to which the inner legs of the racks are connected. As a result of the angular inclination of the racks, the streams delivered centrifugally by the cap 31 during rotation of the cap will be delivered longitudinally of plates set on edge between the racks so that washing of the plates, cups and saucers will be quickly and effectively performed.

By referring now to Figs. 1, 3 and 6, it will be seen that a plurality of plates 61 are disposed on the bottom of the basket and may be rigidly connected thereto in any preferred manner. These plates gradually increase in depth from the outer to the inner ends, as best shown in Fig. 1, so as to support the bottom of the basket level on the sloping bottom 14 of the container. The plates thus form supports for the basket, and it will be observed that the plates extend from the wall of the container 12 to the pump housing 17 and thus also perform the function of baffles which positively prevent any swirling of the water being sucked into the housing by rotation of the pump. As best shown in Fig. 6, it is preferable that the basket be positioned in the container so that the baffle plates 61 coincide with the webs 20 which separate the openings 19 at the bottom of the pump housing.

By referring to Fig. 1, it will be seen that the container 12 is properly centered and supported on the angle iron ring 10 by means of a resilient flange 62 which is faced on the inner side with a rubber ring 63 adapted to bear against the wall of the container. The flange 62 may be riveted, as shown at 64, or otherwise rigidly secured to the angle iron ring 10.

50 A drain pipe 65 enters the bottom of the container and is controlled by a valve 66.

In operation, the container is partially filled with hot water containing soap powder or other desired cleansing agent. The dishes are then placed in position in the basket, or this may be done before the water is supplied, if desired, and then the cover 13 is placed on the container. The motor is then started, rotating the spiral pump 22, and causing a continuous and forceful ejection of the water upward in the housing 17 against the cap 31 and out through the openings thereof.

65 The streams ejected from the openings have a whirling motion due to the positive rotation of the cap by the spiral pump, and these streams pass outwardly and downwardly to all parts of the container, finding their way to all parts of the dishes in the basket, even to the insides of

cups and similar dishes, and thoroughly cleansing the same.

Since the baffles 61 prevent swirling of water in the bottom of the container, any sediment will not be stirred up but will be deposited on the bottom of the container. 80

It is thought that from the above description the construction and operation of my invention will be thoroughly understood without further explanation. 85

Having thus described the invention, I claim:

1. A dish washing machine comprising a support, a container thereon, a cylindrical pump housing in the container having a disk bottom bearing on the bottom of the container and having intake openings in the side wall contiguous with the bottom, a boss rising from said disk bottom, a spiral pump in the housing having an axial shaft provided with a shoulder seating on the top of said boss, said boss extending above the tops of said intake openings, the worm of said spiral pump terminating at the top of said boss whereby the worm is elevated above said openings, a nipple carried by said disk bottom and projecting downwardly in alignment with said boss, the shaft of the pump extending into sand nipple, an electric motor carried by the support below the container, a sleeve secured to the shaft of the motor and projecting into said nipple, said sleeve and the shaft of the pump being detachably connected together in said nipple, and a stuffing box carried by said nipple and surrounding said sleeve. 90 95 100 105

2. A dish washing machine comprising a support, a container thereon, an upright cylindrical pump housing in the container having a disk bottom provided with a downwardly extending integral nipple projecting through an opening in the bottom of the container, a nut threaded on the nipple and coacting with said disk bottom in securing the housing to the container, there being inlet openings in the wall of the housing contiguous to said disk bottom, a spiral pump in said housing, a boss on said disk bottom supporting the pump and maintaining the pump elevated above said openings, and a drive shaft journaled in said boss and in said nipple for rotating the pump. 110 115 120

3. A dish washing machine comprising a support, a container thereon, an electric motor carried by the support below the container, an upright housing in the container having an integral nipple extending downwardly through an opening in the bottom of the container, there being intake openings in the housing near the bottom thereof, a spiral pump in the housing, a shaft for the pump rotatably mounted in the nipple, a boss integral with the housing for supporting the pump elevated above said openings, a shaft for the electric motor projecting upwardly in axial alignment with the nipple, and a sleeve fixed to the motor shaft and having a tongue and groove connection with the pump shaft in said nipple permitting the pump being detached from the motor and removed vertically from the housing. 125 130 135 140

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