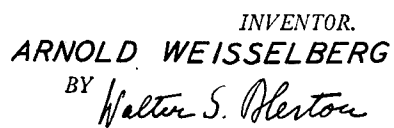


A. WEISSELBERG
DISHWASHING MACHINE WITH IMPELLER COAXIAL
WITH JET ACTUATED ROTARY BASKET

2 Sheets-Sheet 1

2 Sheets-Sheet 1



ATTORNEY.

July 24, 1951

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2,562,076

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2 Sheets-Sheet 2

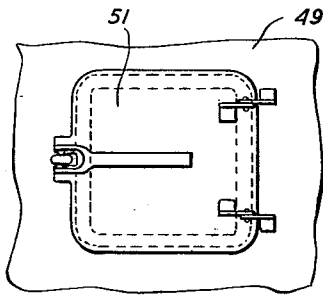


FIG. 4.

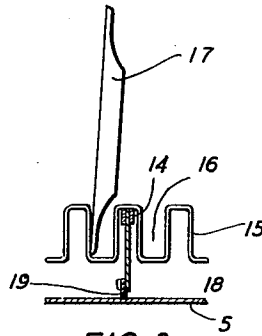
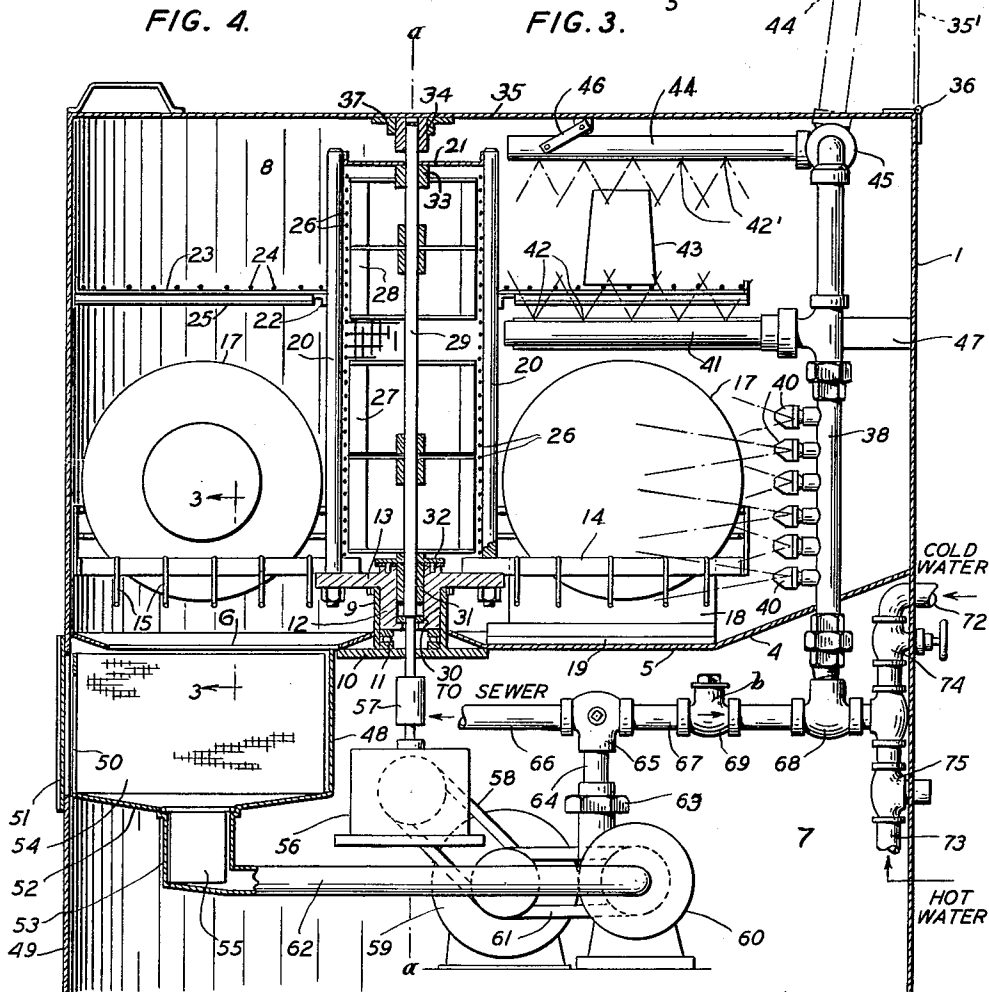


FIG. 3.



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2,562,076

DISHWASHING MACHINE WITH IMPELLER
COAXIAL WITH JET ACTUATED ROTARY
BASKET

Arnold Weisselberg, Leonia, N. J.

Application February 5, 1946, Serial No. 645,549

3 Claims. (Cl. 134-139)

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The invention relates to a dish washing machine. Its main object is to provide means for amplifying the washing action of water sprays or jets by impellers so that the dishes are sprayed all over, and also means for causing a fan action of the impellers sufficient for drying the cleaned dishes even if the rinse water is not hot enough or insufficient.

Further objects and details of the invention will be apparent from the description given hereinafter and the accompanying drawing illustrating an embodiment thereof by way of example. In the drawing,

Fig. 1 is a top plan view, part of the cover being open and part of the top shelf being broken away, of a dish-washing machine according to the invention;

Fig. 2 is a longitudinal section thereof along line 2-2 of Fig. 1;

Fig. 3 is a partial cross-section along line 3-3 of Fig. 2; and

Fig. 4 is a side elevation of a portion of the machine.

Referring now to the drawing, the washing machine comprises a housing 1, the cross-section of which, constituted of a semi-circular portion 2 and a rectangular portion 3 as bases, is clearly shown in Fig. 1. An axis of rotation $a-a$ coincides with the center of the semicircle. At a distance from the bottom the housing is provided with a partition 4, which is depressed in a ring-shaped zone 5 with its center located on the axis $a-a$. Whereas the major part of the partition consists of sheet metal, a substantially rectangular portion 6 of the depressed ring is open for a purpose to be explained hereinafter. The partition divides the housing in a lower chamber 7 and a larger upper chamber 8 and carries in its central portion a sleeve 9 with a bottom plate 10. The sleeve forms a collar bearing and a thrust ball bearing 11 is positioned on the bottom plate. A hollow hub 12 with a flange 13 is rotatable in the sleeve and supported by the bearing 11. Carried by and secured to flange 13, there are a number, e. g. eight, of substantially tangentially directed bars or spokes 14. The bars support several concentric wire rings 15 which are waved so as to constitute trough-like receptacles 16 for the dishes 17 to be washed (see Fig. 3). Hub 12, flange 13, bars 14 and rings 15 constitute a rotatable platform to carry substantially shallow dishes, positioned on edge during the washing operation.

Preferably four of the bars 14 are provided with downwardly directed extensions 18 to which

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wiper blades 19 are attached. These blades extend across the ring zone 5 and will scrape that zone and wipe over the aperture 6 when the platform rotates. The aforementioned hub flange 13 also carries four upright struts 20 which are braced at their top ends by a disc 21, and an angle ring 22 is secured to the outside of the struts at a distance from their tops. A flat shelf 23 consisting of a wire net or rings 24 with reinforcing bars 25 rests removably on ring 22. A cylindrical wire netting 26 is positioned between the struts 20, flange 13 and disc 21. Interiorly of the netting 26, two sets of impeller blades 27 and 28 are rotatable, the one set 27 extending from a short distance above the bars 14 substantially as high as the dishes 17, and the other one 28 extending from the level of the ring 22 to the neighborhood of disc 21. The impellers serve the purpose of reflecting water impinging on the blades, back against the dishes. For this purpose, they are secured to a central shaft 29 which passes with its lower end through plate 10 into the housing chamber 7. The shaft is supported by a thrust bearing 30 and a collar bearing 31, both arranged interiorly of the hub 12. A flange 32 secured to the shaft and in engagement with the top face of a gasket inserted in the hub prevents water from entering into the latter. A second collar bearing 33 for the shaft is provided in the disc 21 and a third collar bearing 34 may be provided on the lower side of the housing cover 35. As this cover is hinged to the housing at 36 so as to be swung open into the position 35' indicated in dashed lines in Fig. 2, bearing 34 consists of a yielding rubber sleeve held only in its upper portion by a ring 37 of angular cross-section which is secured to the cover 35. It will be noticed, that owing to the arrangement described, hub 12 with all parts secured thereto and shaft 29 with impellers 27 and 28 can rotate in the upper housing chamber 8 independently of each other.

The cleaning water is admitted to the chamber 8 through two vertical pipes 38 and 39 with a number of horizontal nozzles 40 which are so positioned as to discharge strong sprays or jets at angles to the plane of the dishes 17 when the latter are placed in the troughs 16. The angles of the nozzles of the two vertical pipes differ so that both sides of the plates are watered. In order to rotate the platform when there are only a few dishes outside of the path of the sprays, the lowest nozzle 40' of each upright pipe is located on the level of the wiper blade extensions 18 so as to emit jets impinging on the latter at

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the most favorable angle. Radial branches 41 extend from the pipes 38 and 39, respectively, underneath the shelf 23. They are provided with upward directed nozzles 42 from which sprays can enter into the interior of deep dishes or glasses 43 placed on the shelf in an upside down position. Other branches 44 of the pipes 38 and 39, respectively, are in a horizontal position closely underneath the cover 35 when the latter is lowered. They are provided with downward directed nozzles 42'. As the branch pipes 44, if fixed in such position would prevent removal of shelf 23, they are connected to the vertical pipes by means of swivel joints 45, and to the cover by means of a link member 46. Owing to this arrangement, the branch pipes 44 will be turned in an upright position 44' together with cover 35 when the latter is opened.

The afore-mentioned impellers 27 and 28 have a second purpose, viz., to circulate air through the housing for drying after the washing. In order to admit air for this purpose an airduct 47 may be provided which opens in the housing wall and ends, preferably, in the space between the impellers close to the circle described by the struts 20 when the hub rotates.

The lower housing chamber contains a receptacle for the scrapings, the major part of the water system and a drive for shaft 29. The scraping or refuse receptacle consists of a box 48 water-tightly secured to the housing wall 49 and the partition 4 underneath the aperture 6. The box is open on top and on one side which registers with an opening 50 in the housing wall. Opening 50 can be tightly closed by a door 51. The bottom 52 of the box 48 is slightly funnel-shaped and has a cylindrical extension 53. A wire basket 54 of coarse netting is inserted in box 48 and a more finely meshed strainer 55 is inserted in the extension 53. The basket 54 and the strainer 55 are removable through the opening 50, one after the other, and insertable in the reverse order.

In the center of the lower housing chamber 7 a speed reducing transmission 56 is connected by means of a flexible coupling 57 to shaft 29 and by a V-belt 58 to a motor 59 which, when energized, rotates the impellers 27 and 28, via said belt 58, transmission 56, coupling 57 and shaft 29. At the same time, the motor will drive a pump 60 by another V-belt 61. The inlet of the pump is connected by a pipe 62 to the lower end of the refuse box extension 53. The pump discharge 63 is connected by a short pipe 64 to a three-way valve 65, the second way of which leads through a pipe 66 to a sewer (not shown), whereas the third way leads through pipe 67 to a T-piece 68 to which both the vertical pipes 38 and 39 are connected. (Only the connection with pipe 38 is visible in Fig. 2.) Between three-way valve 65 and T-piece 68 a check-valve 69 is inserted which permits flow only in the direction indicated by the arrow b, that means from 65 to 68. T-piece 68 is further connected to pipes 72 and 73 with stop valves 74 and 75, respectively, which lead to sources (not shown) of cold and hot water supplies. The cold water valve 74 is hand-controlled, whereas valves 65 and 75 are, preferably, of a type which can be mechanically or electrically controlled.

The washing machine connected as stated, to hot and cold water sources, the sewer and the electric net, may be operated in the following manner: The cover 35 is opened, and shelf 23 lifted out so that the dishes to be washed may be

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placed in the troughs 16, loose food remnants falling down upon the partition 5. Shelf 23 may now be returned to its position on the ring 22, and glasses and deep dishes placed thereon whereupon cover 35 will be closed. The dishes may first be flushed with cold water, by opening valve 74 and starting motor 59 by hand so that flush water will drain to sewer. After shutting off valve and motor, door 51 will be opened and basket 54 removed. Soap flakes or other cleaning substances are put into the strainer 55 whereupon the basket is restored to the box and the door closed. Now, hot water valve 75 will be opened and motor 59 started to operate the pump and rotate shaft 29. The hot water, under the pressure of its source, impinges on the extensions 18 through nozzles 40' and on the dishes 17 through the nozzles 40 and, thus, starts to rotate the hub 12 with all associated parts and to clean the dishes 17 from all coarse food remnants. Simultaneously, the glasses and deep dishes 43 on shelf 23 which participates in the rotation, are sprayed from the nozzles 42 and 42'.

When the machine is filled with hot water to a desired level, the fresh hot water will be shut off and only circulated water will be passed through the nozzles. During rotation of the shaft 29, the jets deflected by the rotating dishes impinge on the differently rotating impellers which will redirect the water towards the dishes. This second step continues a time sufficient to accomplish the actual dish washing. It will be noticed that during the circulation period all soiled and fibrous material carried along by the water will be deposited in the basket 54 or the strainer 55. No clogging of the pipes occurs on account of the relatively very large surfaces of both strainers, nor can any refuse reach and clog the nozzles 40, 40', 42 and 42'. For the third step of operation, connection between the pump and pipe 66 will be established while the passage through 67 is closed. In consequence, the water contents of the machine is drained into the sewer. Thereafter, valve 75 will be opened again while the connection of the pump with the sewer is maintained. The fresh hot water spray from the nozzles 40, 42 and 42' rinses the dishes. After the rinsing, valve 75 will be closed, so that all water is drained off. Still the motor continues to drive the pump and impeller blades, and the latter will agitate the air entering through duct 47, and throw it against the surfaces of the dishes to dry them. During this drying period the cover 35 is slightly opened so that wetted air may escape at the top of the housing. If the cover is closed, pump 60 will help to convey the moisture-laden air to the sewer. At the end of the drying period motor 59 will be switched off and the cover may now be opened for removal of the dry and clean dishes. After or before the removal of the dishes, door 51 may be opened for the removal of the basket 54 and strainer 55 which are to be emptied. It is noticeable that the contents of the basket and strainer have been subjected to at least some drying effect by the air conveyed to the sewer, so that the refuse may be readily dumped into a garbage container.

Although I have illustrated and described only one embodiment it will be apparent to those skilled in the art that many alterations and modifications are possible without departing from the essence and spirit of my invention which shall not be limited but by the scope of the appended claims,

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I claim:

1. A dish washing machine, comprising a housing, a lower platform rotatable therein about a vertical axis and adapted to receive dishes thereon, an upper removable net-shelf carried by said platform at a distance therefrom and adapted to carry other dishes, nozzles outside the platform periphery and arranged to eject water jets upon said first mentioned dishes to clean them, means to cause a turning moment to rotate said platform, other nozzles to eject water jets upon said other dishes, a vertical shaft coaxial with said platform and journaled therein for rotation independent of the platform rotation, first impeller blades secured to said shaft between the levels of said platform and said shelf, second impeller blades spaced from the first and being arranged in the space substantially above said shelf, said first and second blades being so arranged as to reflect water having passed the dishes back towards the latter and means to rotate said shaft.

2. A dish washing machine as claimed in claim 1, further comprising an air duct to admit air from the outside to both said sets of impeller blades, said duct being arranged on a level between said sets of blades.

3. A washing machine, comprising a housing, a platform rotatable in said housing about a vertical axis and adapted to receive thereon dishes to be washed, nozzles in said housing, said nozzles being adapted for connection to a water supply source and being so directed as to emit jets against said dishes, a vertical shaft coaxial with said platform and journaled therein for independent rotation, impeller blades secured to said shaft, said blades being so con-

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structed and arranged as to reflect water jets having passed the dishes on the platform, back towards said dishes, means to rotate said platform, means to rotate said shaft independently of the platform rotation, a cover hinged to said housing, and a bearing for said shaft attached to the lower side of said cover, said bearing including a bushing of yielding material to allow for engagement and disengagement of the shaft end, when the cover is turned in its hinges.

ARNOLD WEISSELBERG.

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