

Oct. 3, 1933.

O. CAMMANN, JR

1,928,683

DISHWASHING MACHINE

Filed Dec. 12, 1927

2 Sheets-Sheet 1

Fig. 1

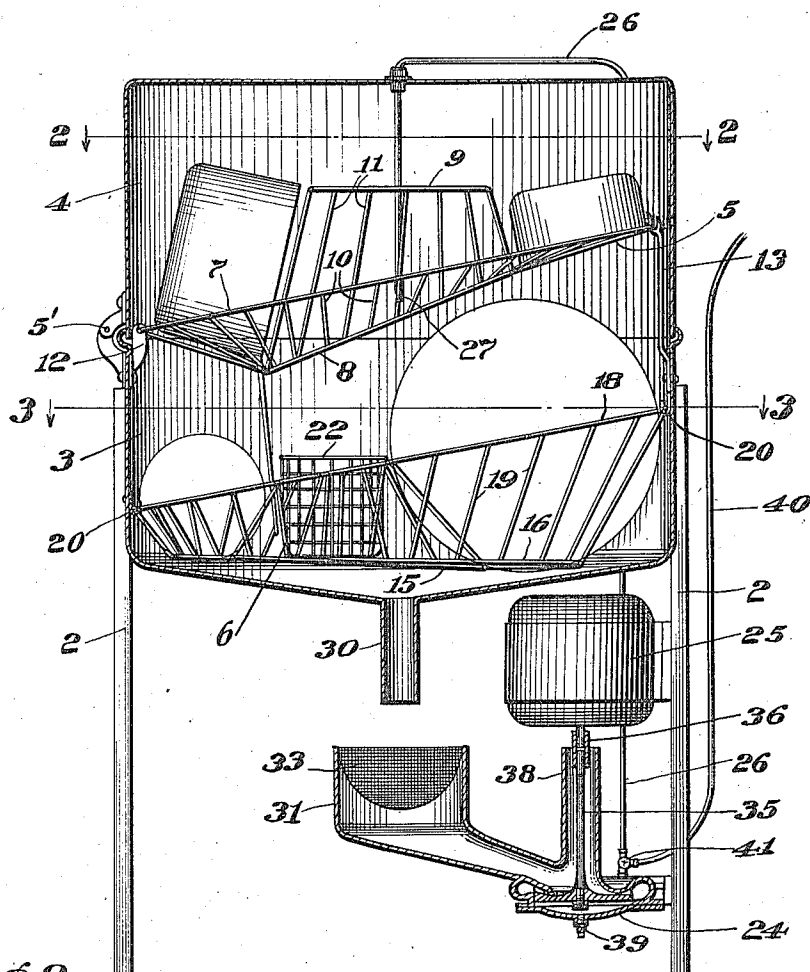


Fig. 9

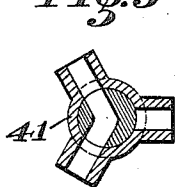
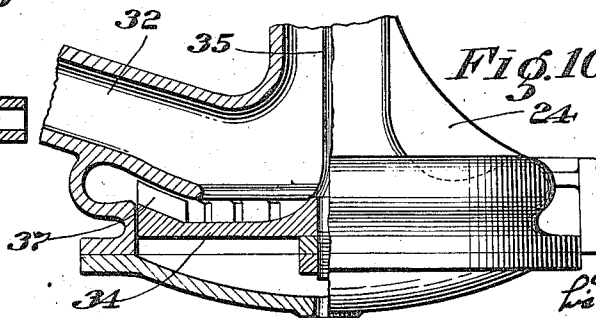


Fig. 10



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2 Sheets-Sheet 2

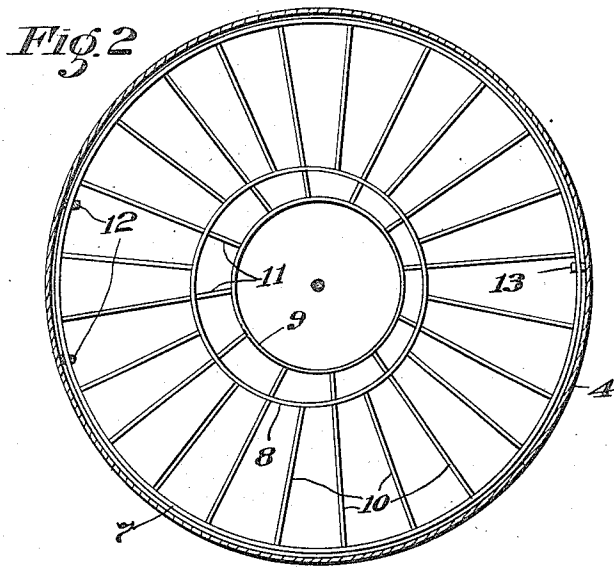


Fig. 4

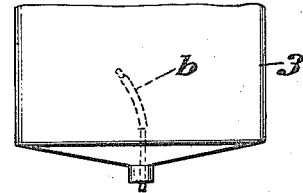


Fig. 5

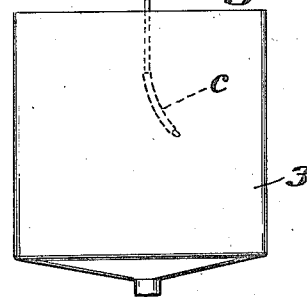


Fig. 6

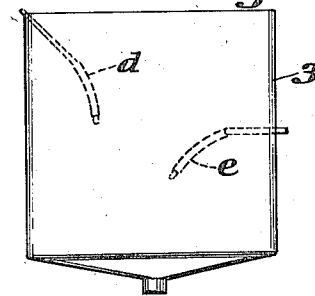


Fig. 7

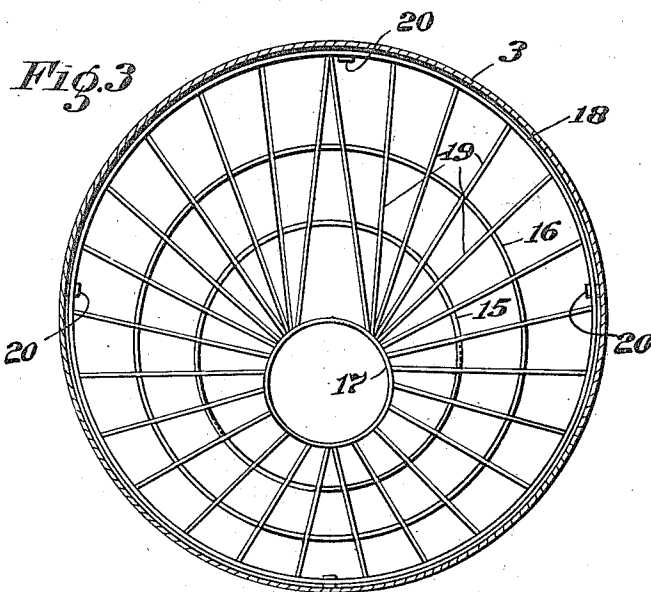
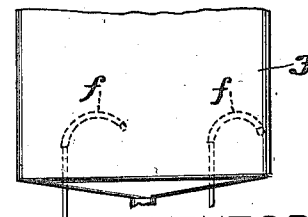
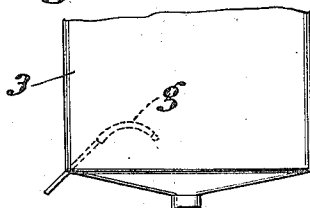


Fig. 8



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UNITED STATES PATENT OFFICE

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DISHWASHING MACHINE

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Serial No. 239,364

8 Claims. (Cl. 141-9)

This invention relates to dish washing machines of the domestic type.

It is the chief object of the invention to improve machines of this character with a view to reducing the expense of manufacture, providing a machine which will be convenient to use, and devising a machine which will be substantially trouble proof.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a view, partly in side elevation and partly in cross-section, showing a machine embodying the invention;

Figs. 2 and 3 are horizontal cross-sectional views on the lines 2-2 and 3-3, respectively, Fig. 1;

Figs. 4 to 8, inclusive, are diagrammatic views showing various arrangements and locations of spray nozzles;

Fig. 9 is a cross-sectional view of the three-way valve which is included in the machine shown in Fig. 1; and

Fig. 10 is a view, partly in side elevation and partly in vertical cross-section, showing on a larger scale certain details of the pump construction.

Referring first to Figs. 1, 2 and 3, the machine there shown comprises a receptacle supported on legs 2 and divided at about midway of its height to provide a lower stationary tank section 3 and a cover 4 for said lower section or tank. The cover is hinged to the tank at 5, Fig. 1, so that it can swing into an open or closed position. The tank may be made of relatively heavy sheet metal which, if desired, may have a coating of vitreous enamel.

Mounted inside the receptacle are two racks 5 and 6, respectively, arranged one above the other, and designed to support the dishes to be washed. These racks may be of any suitable character but those shown have certain unique features. Preferably these racks are made of relatively heavy wire, and the upper rack 5 includes two circular wires or rings 7 and 8, connected by inclined wires 10, and an inner wire ring 9 located at a considerably higher level than the rings 7 and 8 and connected directly to the inner ring 8 by a series of inclined wires 11. This rack is located chiefly within the cover and is pivotally mounted on ears 12-12 secured to the inner wall of the tank 3 so that when the cover 4 is in its

open position the rack can be swung outwardly into the cover. It is supported in its operative position by an arm 13 secured to the wall of the tank 3 and forked at its upper end to receive the marginal ring or wire 7 of the rack, as clearly shown in Fig. 1. This rack is particularly designed to receive dishes of the larger sizes, such as large plates, kitchen utensils, and the like, the plates being adapted to rest at their edges on the wires 7 and 8 and being supported in this edge-wise position by the inclined wires 10 or 11. It is also adapted to support cups, glasses, etc.

The lower rack 6 includes two circular wires or rings 15 and 16 arranged one within the other and both located at substantially the same level, and two additional rings 17 and 18 located at a higher level and connected with the rings 15 and 16 by inclined wires. This rack is designed especially to support plates of various sizes and similar dishes, and the circular wires above mentioned preferably are arranged eccentrically so that larger plates can be accommodated at one side of the rack than at the other, as will be evident from an inspection of Figs. 1 and 3. The edges of the plates rest on the two lower wires 15 and 16 and they are supported in this position by the inclined wires 19.

In order to support this rack removably in the tank 3 a series of U-shaped hooks or hangers 20 are secured to the inner wall of the tank 3 where they releasably support the rack 6, the outer marginal ring 18 of the rack being entered in these hooks or hangers. A wire basket 22 for table silver may be removably supported in the small ring 17 of the rack, as shown in Fig. 1.

It is contemplated that the ears 12 which support the upper rack 5 could be forked or slotted at their upper edges as shown in Fig. 2, so that the rack could be swung either out into the open cover, or could be removed entirely from the machine, the ability to remove the racks being desirable at times for the purpose of loading the dishes into them or unloading them from the racks.

The operation of washing the dishes preferably is performed by directing a stream of water against them and moving this spray or stream of water so that practically all surfaces of the dishes are subjected to its action. It is desirable that this spray or stream of water have considerable force, and for this purpose, and in order to create the desired circulation of the water, an upright rotary pump 24 is mounted below the receptacle and is arranged to be driven by an electric motor 25. Connected to the outlet of

this pump is a hose 26 which, as shown in Fig. 1, extends centrally through the top of the cover 4, and is provided at its lower end with a nozzle 27. It will be observed that a free portion of the hose of substantial length extends downwardly from the cover into the receptacle and into the central aperture provided in the upper rack 5. When a stream of water under considerable pressure is forced through this hose, the nozzle 27 and the depending part of the hose immediately above it take on an oscillating or rotary motion due to the flow of water through the nozzle, and this motion preferably is utilized to direct the water discharged from the nozzle over the entire series of dishes supported in the racks. The motion of the hose is limited by the central ring 9 of the upper rack. In addition to the cleaning action produced by the direct striking of the stream of water on the dishes, a very substantial cleaning action also is produced by the spray which rebounds from one dish to another, or from the walls of the receptacle to the dishes.

The water drains rapidly out of the receptacle through the pipe 30 and into the spout 31 leading to the intake opening 32 of the pump which recirculates the water, no great body of water remaining in the receptacle at any time. Preferably a strainer 33 is removably supported in the mouth of the spout 31 where it strains out solid particles of material carried by the circulating water.

In order to simplify the pump construction, the pump is mounted in an upright position and the rotor 34 of the pump is supported in its operative position in the pump casing by an extension 35 of the motor shaft. This shaft section 35 may either be integral with the motor shaft or connected to it by a coupling 36, Fig. 1. In any event, it is to all intents and purposes a part of the motor shaft. The rotor has no bearing in the pump casing but is free, having small clearances with the cooperating surfaces of the casing. It is provided with blades 37 which exert a centrifugal action on the water and produces the pressure desired for the operation of the machine. Any necessity for stuffing boxes is eliminated by providing the casing 24 with an upright housing 38 which surrounds the shaft 35 but is entirely free from it. This housing is provided with an overflow just below the motor 25, or terminates at this point. It thus provides a frictionless means for controlling the water and protects the motor from water. As shown, the upper edge of the housing is substantially level with the upper edge of the inlet spout 31 so that it is impossible for water to reach the motor. A drain cock 39 at the lowest point in the pump casing provides for draining the casing when desired.

It is contemplated that in using the machine the dishes will be arranged in the two racks, the pump started up, and a quantity of hot water will be poured into the tank 3, or else into the inlet spout 33. The pump will circulate this water, and the stream issuing from the nozzle 27 will be rotated in the manner above described, thus washing the dishes. This operation may be continued as long as desired. In order to discharge the water from the machine, a drain hose 40 is connected to the pump casing through a three-way cock 41. While the dish washing operation is being performed this cock is adjusted, as shown in Fig. 9, so that all the water discharged from the pump is delivered to the hose or pipe 26. When this operation has been completed the cock

is moved manually to connect the pump casing with the drain hose 40 so that the water then will be pumped through this hose into a sink or the like. Nearly all of the water can be discharged from the machine in this manner.

It will now be appreciated that this invention provides a machine of simple organization, which can be manufactured economically, is convenient to use, which requires a minimum of attention, and in which the danger of any of the parts getting out of order is substantially eliminated. The fact that the pump requires no lubrication and does not depend upon stuffing boxes for control of the water are important practical advantages in a machine of this character. Preferably the upper edges of the blades 37 and the surface of the pump casing immediately above them lie in sections of concentric spheres each having a center lying approximately in the coupling 36 so that if the pump as it rotates moves away from the position shown in Fig. 10 such movement will not affect the clearance between the blades and this part of the casing.

While I have herein shown and described a preferred embodiment of my invention, it will be understood that the invention may be embodied in other forms without departing from the spirit or scope thereof. For example, the flexible portion of the hose which is utilized to direct the stream of water over the dishes may be arranged in a number of other ways.

Fig. 4 shows the hose *b* located in the lower part of the tank 3. Fig. 5 shows such a hose *c* mounted as shown in Fig. 1 but at a lower point in the receptacle. In Fig. 6 two of these flexible sections *d* and *e* are provided, one leading laterally through the side of the receptacle and the other located in a more or less depending position. Two such sections may be used in the same receptacle in other relationships, as for example, that shown in Fig. 7 at *f, f*. In some cases, also, it may be desirable to arrange one of the nozzles as shown in Fig. 8 at *g*. In fact, considerable variation may be made in the organization of the apparatus within the spirit and scope of the invention.

Having thus described my invention, what I desire to claim as new is:

1. In a dish washing machine, the combination of a receptacle, means in said receptacle for supporting the dishes to be washed, a rotary pump mounted at a lower level than said receptacle, means for conducting water from the outlet of said pump into said receptacle, a motor mounted above said pump for driving the same, means for draining water from said receptacle and delivering it to the intake of the pump, an upright shaft connecting said motor with the rotor of said pump, and an upright housing extending upwardly from said pump and surrounding said shaft but free from contact with the shaft, said housing having an overflow between said motor and pump.

2. In a dish washing machine, the combination of a receptacle, means in said receptacle for supporting the dishes to be washed, a rotary pump mounted at a lower level than said receptacle, means for conducting water from the outlet of said pump into said receptacle, a motor mounted above said pump, means for conducting water from the receptacle to said pump, an upright shaft connecting said motor with the rotor of said pump and supporting said rotor in its operative position in the pump casing, and a housing extending upwardly from the pump cas-

ing and loosely surrounding said shaft, said housing having an overflow between said motor and pump.

3. In a dish washing machine, the combination of a receptacle, means in said receptacle for supporting the dishes to be washed, a rotary pump including a casing and a rotor, a motor above said pump having an upright shaft on which the rotor of said pump is supported in its operative position in said casing, said rotor being free in the casing, said casing having an upright housing surrounding said shaft but out of contact therewith and having an overflow below the motor, and connections between said pump casing and said receptacle for causing the pump to circulate water through the receptacle.

4. In a dish washing machine, the combination of a receptacle, means in said receptacle for supporting dishes to be washed, a hose extending into said receptacle, a nozzle on the end of said hose, a rotary pump the outlet of which is connected to said hose, means for delivering water from the receptacle to the intake of said pump, a motor for driving said pump, said hose having a portion thereof suspended in said receptacle and free to oscillate therein to cause the flow of water through the hose to swing the nozzle and thereby to direct a spray across the dishes supported in said receptacle, and means inside said receptacle for limiting the range of movement of said hose and nozzle.

5. In a dish washing machine, the combination of a receptacle including a cover, a rack in said receptacle for supporting dishes to be washed, said rack having a central aperture, a hose extending through said cover and depending therefrom into said aperture, means for supplying water to said hose, and a nozzle connected with said hose and adapted to be given an oscillating motion by the flow of the water through said hose and nozzle, the walls of said aperture in said rack serving to limit the range of movement of said nozzle.

6. In a dish washing machine, the combination of a tank, means in said tank for supporting the dishes to be washed, a hose extending into said tank, a nozzle on the end of said hose, and means for supporting said hose to leave a free portion thereof inside the tank through which the flow of water will cause the nozzle to oscillate and thereby direct a spray across the dishes in said tank, said means for supporting the dishes being positioned adjacent to said free portion and the nozzle to permit said nozzle to have a substantial range of movement but serving to limit said range of movement.

7. In a dish washing machine, the combination of a receptacle divided at an intermediate point in its height to provide a tank and a cover for the entire top of the tank, two dish supporting racks mounted in said tank, one above the other, means for releasably supporting said racks in the tank with a considerable portion of the upper rack in said cover, means including a nozzle suspended from said cover to swing freely under the action of the water flowing therethrough for directing water against the dishes supported in said racks, and means in said receptacle for limiting the range of movement of said nozzle.

8. In a dish washing machine, the combination of a receptacle divided at an intermediate point in its height to provide a tank and a cover for the entire top of the tank, two dish supporting racks mounted in said receptacle, one above the other, means for supporting said cover for swinging movement into an open or closed position, the upper of said racks being mounted in said tank but supported to swing out of the tank into said cover, means including a nozzle suspended from said cover to swing freely under the action of the water flowing therethrough for directing water against the dishes supported in said racks to wash them, and means inside said receptacle for limiting the range of movement of said nozzle.

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