

March 19, 1940.

F. A. WALKER

2,194,342

DISHWASHING APPARATUS

Original Filed June 22, 1934 2 Sheets-Sheet 1

Fig. 1.

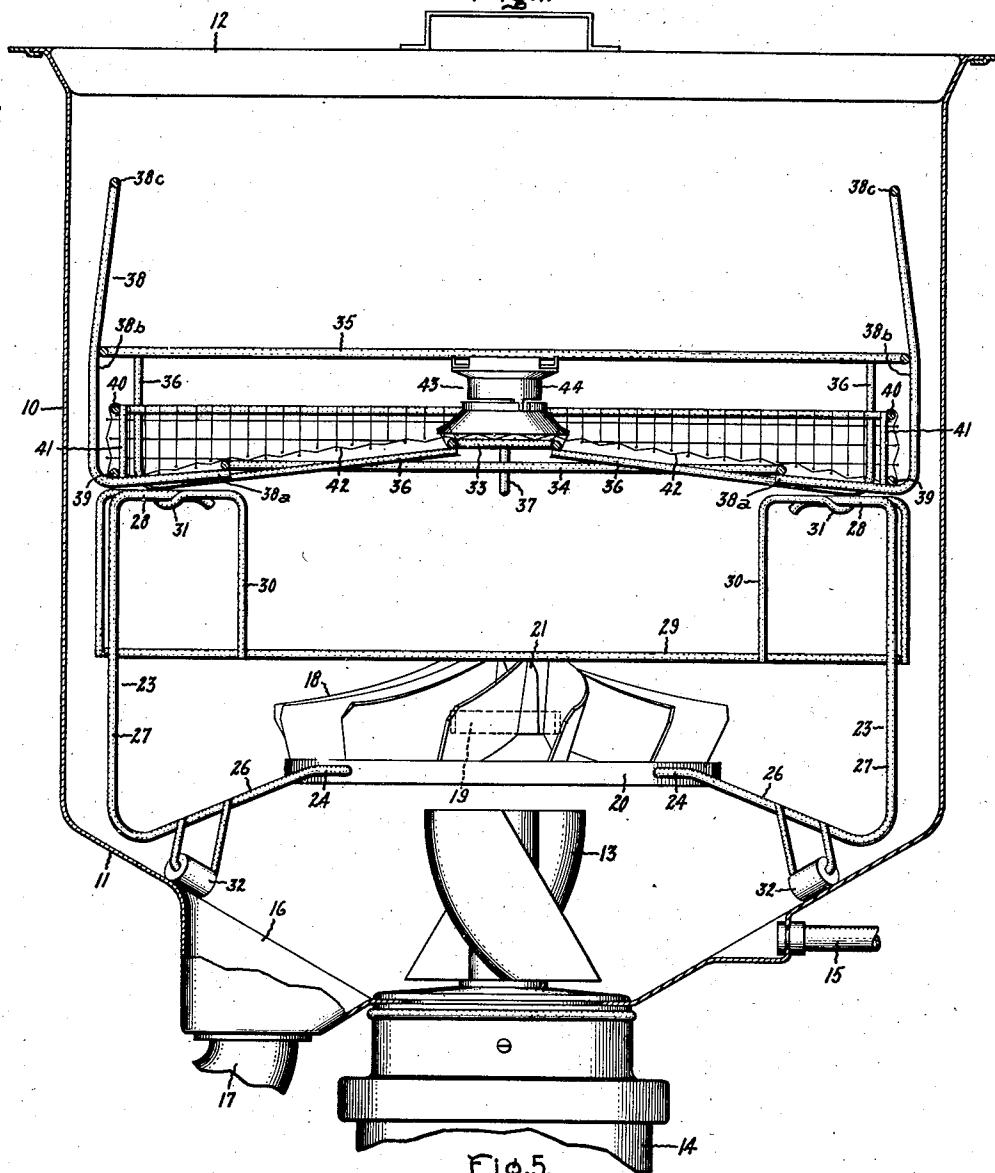
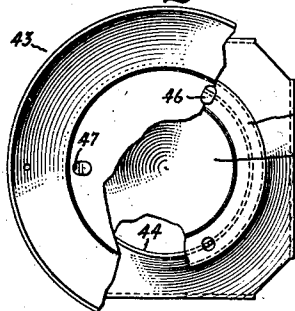
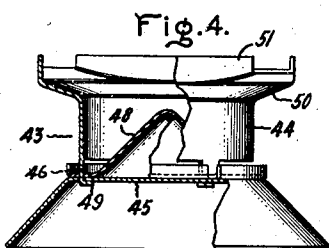


Fig. 5.



Inventor:
Forrest A. Walker,
by *Hany E. Dunham*
His Attorney.

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2 Sheets-Sheet 2

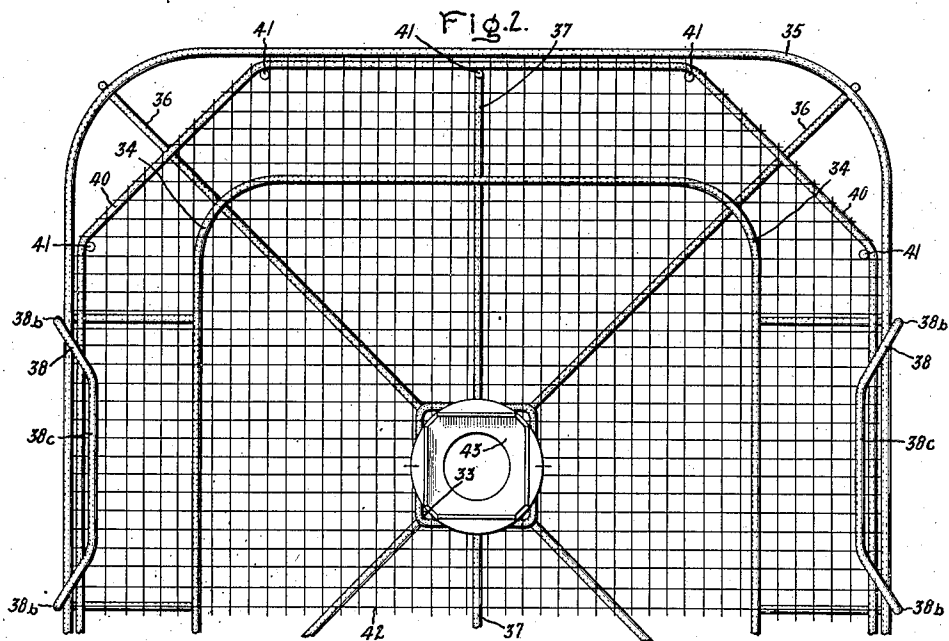
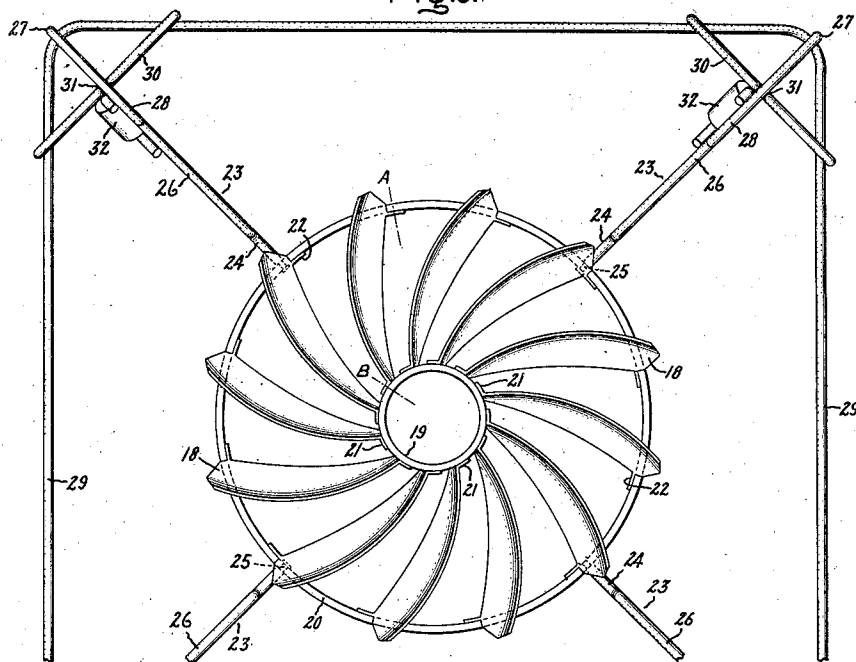


Fig. 3.



Inventor:
Forrest A. Walker,
by *Harry E. Dunham*
His Attorney.

UNITED STATES PATENT OFFICE

2,194,342

DISHWASHING APPARATUS

Forrest A. Walker, Oak Park, Ill., assignor, by
mesne assignments, to Edison General Electric
Appliance Company, Inc., a corporation of
New York

Original application June 22, 1934, Serial No.
731,901. Divided and this application March
4, 1938, Serial No. 193,909

4 Claims. (Cl. 141-9)

This invention relates to dishwashing apparatus, more particularly to apparatus for supporting glassware and the like in mechanical dishwashing machines, and it has for its object the provision of improved apparatus of this character.

This invention is particularly applicable to mechanical dishwashing apparatus wherein a cleansing liquid, such as water, is circulated or hurled through the washing vat by suitable power-driven means, such as a motor-driven impeller, so as to effect a washing action on the utensils supported in an open-work tray in the vat.

It is an object of this invention to provide water distributing members in the vat arranged to deflect or distribute the water that is hurled upwardly by the impeller into the tray so that the glassware, etc., placed within the tray will be properly washed.

In accordance with this invention, in one form thereof, there is provided a suitable supporting framework for baffles arranged to be fitted in the lower portion of the vat. The baffles function as deflectors for directing water hurled upwardly by the impeller into the articles placed within the rack.

The framework preferably will be arranged to support the tray in proper position within the vat.

This application is a division of my pending application Serial No. 731,901, filed June 22, 1934, which has matured into United States Patent No. 2,136,259, granted November 8, 1938.

For a more complete understanding of this invention, reference should be had to the accompanying drawings in which Fig. 1 is a fragmentary elevation in section of dishwashing apparatus embodying this invention; Fig. 2 is a fragmentary plan view of the dish-supporting rack used in the washing apparatus of Fig. 1; Fig. 3 is a fragmentary plan view of a part of the apparatus used in the washing apparatus of Fig. 1; and Figs. 4 and 5 are elevation and bottom views of a detergent container used in the rack.

Referring to the drawings, this invention has been shown in one form as applied to mechanical dishwashing apparatus comprising a vat and a motor-driven impeller in the lower portion of the vat arranged to circulate cleansing liquid upwardly and outwardly in the vat. As shown, the dishwashing apparatus comprises an upright vat 10. The vat 10 has a square cross-section, but it is to be understood that this invention is not limited to vats of this shape. The vat 10 is pro-

vided with an inverted frustro-conical bottom wall 11, and a suitable removable cover 12.

Mounted within the conical wall 11 is an impeller 13 arranged when rotated to engage and hurl a cleansing liquid, such as hot water, upwardly and outwardly in the vat with a more or less whirling circumferential motion. The impeller may have any suitable construction, the important feature being that the impeller be given a shape such that the cleansing liquid in the lower portion of the vat will be thrown upwardly and outwardly in an efficient manner by the rotary motion of the impeller. The impeller will be formed of any suitable material, such as cast-aluminum or pressed steel. The impeller 13 is driven by a suitable electric motor 14.

A suitable cleansing liquid, such as hot water, is supplied to the vat by any suitable means, such as by means of a conduit 15 communicating with a liquid supply source and with the vat.

The vat is provided with a suitable drainage outlet 16 which is arranged in the bottom wall 11 as close to the bottom of the vat as is practical. This port communicates with a drainage conduit 17. It will be understood that this conduit communicates with a suitable drain valve housing (not shown) in which a suitable drain valve will be provided for controlling the drainage of liquid from the vat. This drain valve housing and valve form no part of this invention and it is believed to be unnecessary, therefore, to describe them in detail.

In the vat 10, there are a number of baffles 18. These baffles are supported in concentrically arranged inner and outer rings 19 and 20. The baffles, as shown in Figs. 1 and 3, have a curved shape and are secured at their inner and outer ends to the rings 19 and 20, respectively, at substantially uniform intervals circumferentially of the rings. The baffles are supported at an angle to the vertical. The angle at the inner ends of the members may be approximately 5°, the angle increasing to approximately 25° at the outer ends of the members. The ring 19 is in a plane elevated somewhat with respect to the plane of the ring 20, as shown in Fig. 1. The inner and outer ends of the baffles are provided with circumferentially arranged extensions 21 and 22 respectively bearing on the outer and inner surfaces of the rings 19 and 20 as shown in Figs. 1 and 3, and secured to these members in any suitable manner, as by welding.

The rings are supported by four wire members 23 spaced apart approximately 90° about the outer ring 20 and provided with portions 24 ar-

ranged substantially normal to tangents to the ring at the points of engagement of the wires with the ring. The inner ends of the wires have reduced extensions 25 received in apertures provided for them in the ring, and are secured to the ring in any suitable manner, as by butt welds.

The normal portions 24 of the wires 23 merge into portions 26 that extend downwardly at an angle to the normal portions, as shown in Fig. 1, and these portions, in turn, curve into upright portions 27 that extend above the planes of the rings 19 and 20. These portions 27 at their upper ends are turned inwardly to form horizontal portions 28 lying in the vertical planes of the portions 24 and 26, as shown in Fig. 3, and in a horizontal plane above the rings 19 and 20.

Substantially half-way up the vertical portions 27 is a closed square wire ring 29 secured to the inner surface of the portions 27 in any suitable manner, as by welding. And arranged at the corners of this square ring are wire reinforcing members 30. These members have an inverted U-shape and are arranged to straddle the corners of the wire 29, as shown in Fig. 3. The lower ends of these members are welded or otherwise suitably secured to the ring 29. The horizontal portions 28 of the wires 23 are supported by these members 30, the latter members having depressed curved portions 31 in the bases of the U for receiving the wires 27. The wires 27 and 30 preferably will be welded together.

The framework supporting the baffles 18 is completed by feet 32 secured to the wires 23 and arranged to support the framework in an elevated position in the vat, as shown in Fig. 1.

The framework just described is quite rigid and mechanically strong, and is utilized to support an upper tray, as well as the baffles 18.

The upper tray or rack has a square contour, as has the lower framework. This rack comprises a relatively small square ring 33 at the center of the rack and a considerably larger square ring 34 arranged symmetrically about the ring 33, as shown in Fig. 2, and in a plane somewhat below it, as shown in Fig. 1.

A larger square ring 35 is arranged symmetrically with and about the inner square rings 33 and 34, but in a plane somewhat above the planes of these rings, as shown in Fig. 1. The rings 33, 34 and 35 are secured together by means of wire corner stays 36 and cross stays 37 arranged at the corners of the tray, and in one central axis of the tray, respectively, as shown in Fig. 2. The wire stays have approximately an L-shape, as shown in Fig. 1, the long legs of the stays bearing under the rings 33 and 34 and extending outwardly to the short legs which extend vertically upwardly tangentially to the wire 35, as shown. The stays where they connect the wires 33, 34 and 35 will be secured to the wires in any suitable manner, as by welding.

The framework of the upper tray is completed by a pair of handles 38 secured at the opposite sides of the tray. The handles in side elevation have approximately an L-shape, as shown in Fig. 1, and in front elevation have a substantially U-shape. The lower ends 38a of the U-shaped handles are turned inwardly and slightly inclined upwardly where they are secured to the intermediate ring 34 in any suitable manner, as by welding.

The two vertical portions 38b, of these handles, as shown, extend upwardly in the vertical planes of the associated sides of the wire 35 until they reach the wire and then incline inwardly some-

what toward the center of the rack, as shown in Fig. 1, and toward each other, as shown in Fig. 2. These vertical portions 38b are joined by means of horizontal portions 38c.

Supported within the framework just described is a suitable tray frame assembly which comprises a pair of octagonal shaped wire rings 39 and 40, arranged one above the other and having a size just slightly smaller than the outer square ring 35, as shown in Fig. 1. The sides of the octagonal rings 39 and 40 at the corners of the tray are somewhat shorter than the remaining four sides, as clearly shown in Fig. 2. The two rings 39 and 40 are secured together in vertically spaced relation, as shown in Fig. 1, by means of vertical wires 41 arranged at each corner of the octagon and in the middle of the longer side members of the octagon, as clearly shown in Fig. 2. These wires are secured at their upper and lower ends to the wires 39 and 40 in any suitable manner, as by welding.

A wire screening member 42 is placed over the entire bottom of the upper tray. This member 42, as shown, rests upon the upper surfaces of the rings 33 and 34 and extends under the lower octagonal ring 39 and thence upwardly in the vertical planes of the rings 39 and 40 to the upper ring 40, where the edges of the screen are bent over and around the upper ring 40, as shown in Fig. 1. It will be observed that this arrangement of the screening member 42 provides a bottom wall for the upper tray tapering downwardly from the center of the tray to its eight vertical side walls.

Arranged substantially in the central portion of the tray is a suitable soap or detergent container 43. This container comprises a cylindrical body portion 44 over the mouth or lower end of which is positioned a closure member 45. This closure member, as shown, is secured in spaced relation with the lower edge of the cylinder 44 by means of legs 46 attached to the lower edge of the container 44 and directed through apertures 47 provided for them in the closure member. The legs are turned inwardly, as shown, and are secured to the closure member. Arranged above the closure member is a conical member 48 arranged in an inverted position, as shown in Fig. 5, and secured to the closure member by means of a flange 49 attached to the cone. This flange is provided with apertures receiving the legs 46. The upper end 50 of the cylinder is flared outwardly and terminates in upright walls 51 which form a square, open at the corners. It will be understood that a suitable detergent will be placed within the cylinder 44 on the conical wall 48 and that when the impeller 13 is operated some of the water hurled upwardly through the vat will gravitate into the cylinder 44 through its upper open end and will wash detergent from the cylinder through the space between its bottom and the closure member 45.

While the baffles 18 of the lower open framework may have any suitable shape, it is important that they be given a shape such that the water which is hurled circumferentially and upwardly by the impeller 13 be engaged by the baffles so as to be directed upwardly and outwardly and distributed substantially uniformly over the bottom of the wire screening 42 upon which the vessels in the upper tray are placed. In the particular form shown, there are twelve baffles spaced substantially 30° apart. Preferably, the outer ends of the baffles will be advanced with respect to the inner ends of the baffles in a clockwise

direction by an angle of approximately 52°. In other words, the outer end of each baffle indicated by the letter A (Fig. 3) will be in advance of the inner end of the baffles indicated by the letter B, by an angle of 52°. Preferably, the blades also will be inclined upwardly from their lower edges so that their faces incline forwardly in a counter clockwise direction, as viewed in Figs. 1 and 3. The inclination of the blades and the curvature, of course, depends upon the direction of rotation of the impeller 13, which is in the counter-clockwise direction when looking down on it in Fig. 1. If the impeller were arranged to rotate in the reverse direction, the arrangement of the blades 18 would be reversed.

In the operation of the washing apparatus, it will be understood that the lower frame will be placed in the lower portion of the vat and the upper tray will be placed upon the lower frame so that it rests upon and is supported by the U-shaped members 30, and the horizontal portions 28 of the wire members 23. Then the upper tray will be loaded with the glassware, cups and the like with their basins facing downwardly in the vat. When the impeller 13 is operated it will circulate the water upwardly and outwardly circumferentially through the vat, the whirling mass of water striking the vanes or baffles 18 so that the water is deflected upwardly and outwardly and distributed substantially uniformly over the screening 42, and hence, over the utensils supported by it.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto since many modifications may be made, and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In washing apparatus having a vat and a liquid circulating impeller in said vat arranged to circulate liquid upwardly and outwardly circumferentially in said vat, a plurality of rings arranged in substantially concentric relation, the inner smaller ring lying in a plane elevated with respect to the plane of the outer large ring, a plurality of baffles secured at their inner and outer ends to said inner and outer rings respectively arranged to engage the whirling mass of liquid projected upwardly by said impeller so as to direct the liquid substantially vertically upwardly and distribute it substantially uniformly over a horizontal plane through said vat, a plurality of wires attached to said rings for supporting them in said vat, each having a portion extending upwardly above the planes of said rings and defining a seat in a plane above said rings for supporting an upper rack, and an open-work upper rack resting upon said seats.

2. In combination with a vat and a liquid circulating impeller in said vat arranged to cir-

culate liquid upwardly and outwardly circumferentially in said vat, a plurality of rings arranged in substantially concentric relation, the inner smaller ring lying in a plane elevated with respect to the plane of the outer larger ring, a plurality of baffles secured at their inner and outer ends to said inner and outer rings respectively, arranged at an angle to the vertical and generally substantially tangential to said inner ring so as to engage the whirling mass of liquid projected upwardly by said impeller to direct the liquid substantially vertically upwardly and distribute it substantially uniformly over a horizontal plane through said vat, a plurality of wire members spaced circumferentially of said outer ring and arranged normally thereto, said wire members having portions arranged to support said ring on the bottom wall of said vat and portions extending vertically upwardly therefrom above said rings and baffles and terminating in horizontal portions extending inwardly toward the axes of said rings, a reinforcing square wire secured to said vertical portions, a plurality of brackets secured to said reinforcing wire at the corners thereof and to said horizontal portions defining seats for receiving an upper rack and an upper open-work rack provided with portions adapted to rest upon said seats.

3. In dishwashing apparatus having a vat and means in the lower portion of said vat for projecting a cleansing liquid upwardly in said vat, a plurality of water distributing baffles, means for supporting said baffles in predetermined positions over said liquid projecting means, wire members attached to said supporting means having portions directed outwardly and downwardly from said baffles and constituting supporting legs for said supporting means, and the outer ends of said wires merging in portions directed upwardly from said downwardly extending portions, seats on said upwardly directed portions for supporting a tray, and a closed wire member attached to each of said upwardly extending portions at points intermediate their lengths to reinforce them.

4. In dishwashing apparatus having a vat and means in the lower portion of said vat for projecting a cleansing liquid upwardly in said vat, a plurality of water distributing baffles above said liquid projecting means, inner and outer closed members supporting the inner and outer ends of said baffles, spaced wire members having portions substantially normal to the outer member extending outwardly and downwardly therefrom to constitute supports for said closed members and said baffles, the said portions terminating in upwardly extending portions which in turn terminate in transverse portions, a closed wire member uniting said upwardly extending portions at points intermediate their lengths, and reinforcing brackets for said transverse portions secured thereto and to said closed wire member.

FORREST A. WALKER.