Feb. 21, 1950

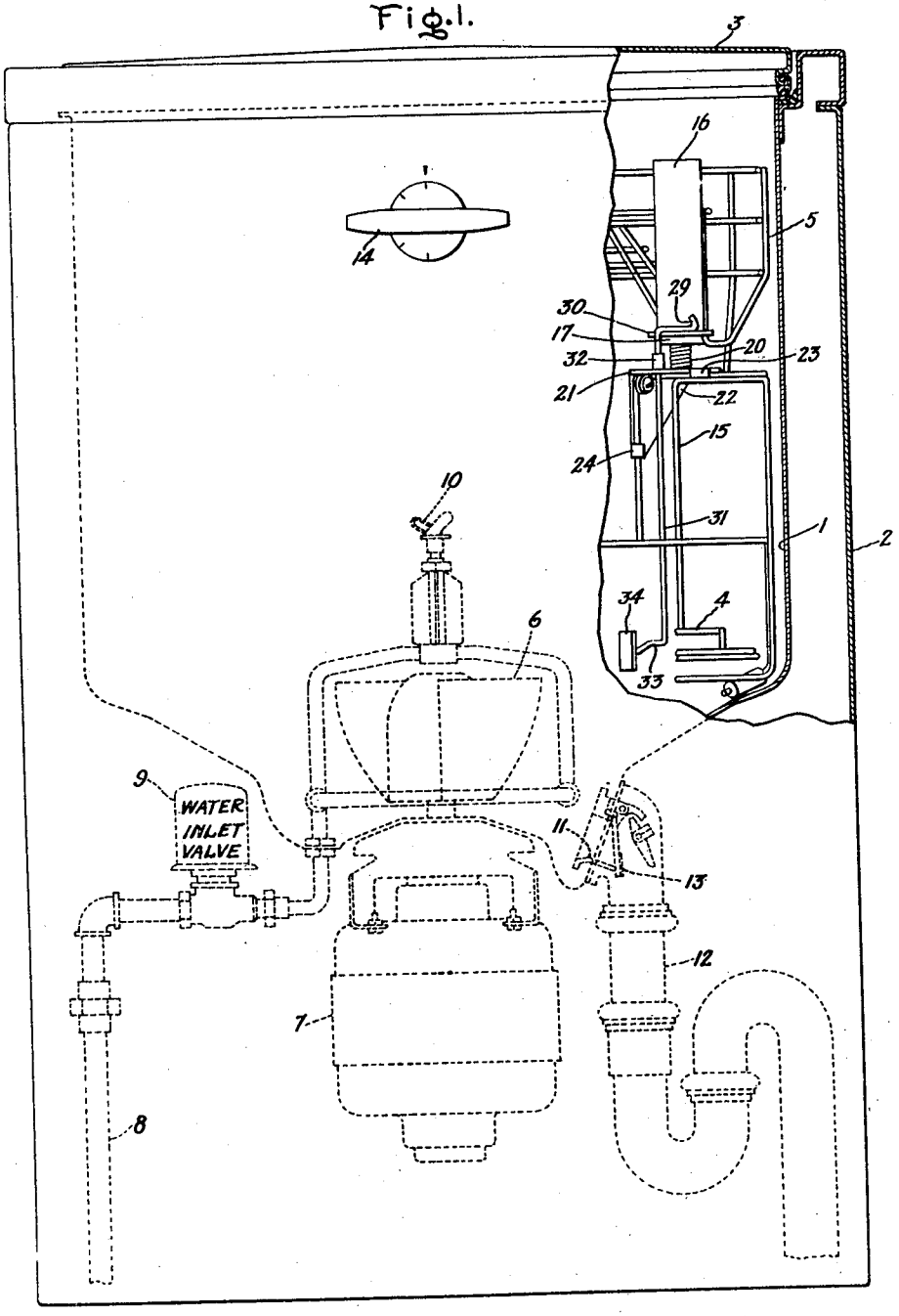
G. H. WOTRING
DETERGENT SUPPLYING MEANS FOR
DISHWASHING APPARATUS

2,498,517

Filed Feb. 23, 1945

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

Fig. 2.

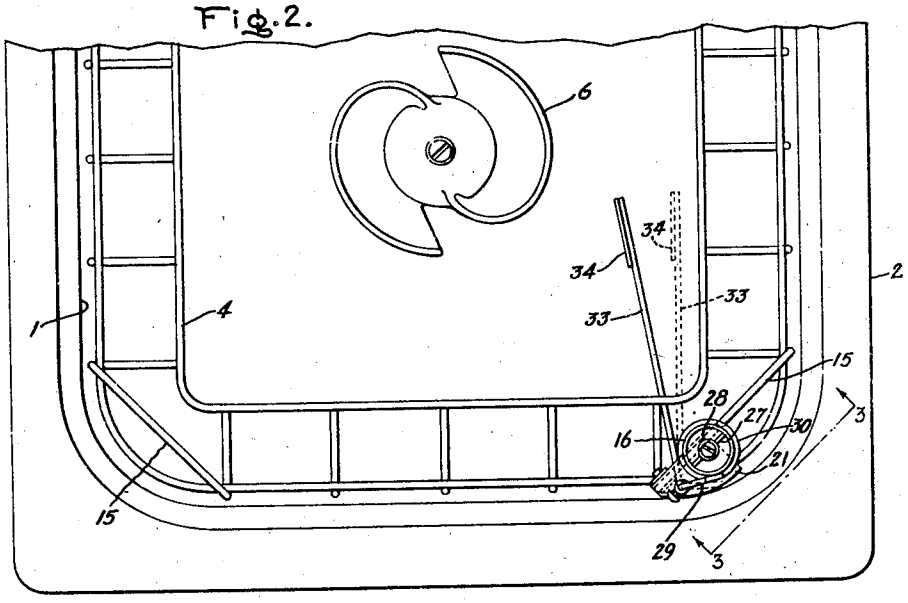


Fig. 3.

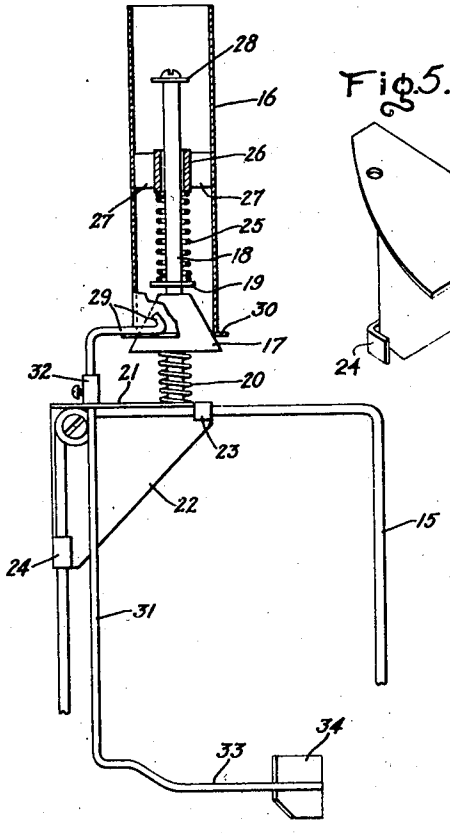
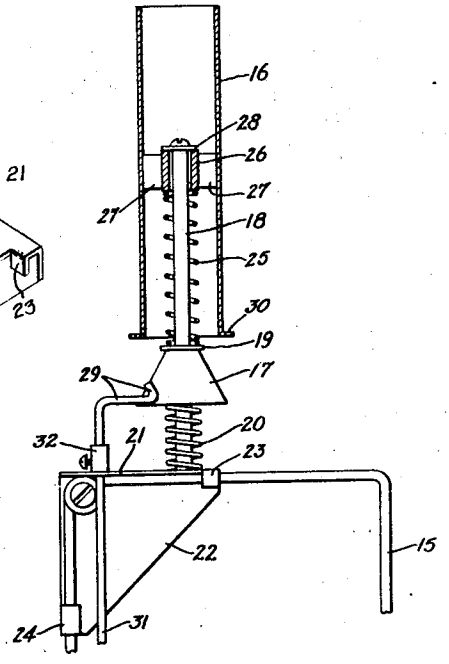


Fig. 5.

Fig. 4.



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DETERGENT SUPPLYING MEANS FOR DISHWASHING APPARATUS

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Application February 23, 1945, Serial No. 579,418

3 Claims. (Cl. 134—56)

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This invention relates to washing apparatus, more particularly to dishwashing apparatus, and it has for its object the provision of improved apparatus of this character having means for automatically supplying a suitable detergent into the washing vat.

More particularly, this invention contemplates the provision of improved washing apparatus having means for holding a detergent and for discharging it into the vat at the proper time. And it has a further object the provision in washing apparatus of detergent supply means for supplying detergent to the vat without the necessity of bringing any operable member outside of the vat.

In accordance with this invention in one form thereof, there is provided a container for the detergent constructed and arranged to be supported within the vat itself. Means are provided within the vat for controlling the release of the detergent from the container, the release means being operated in response to the flow of the washing liquid in the vat as it is circulated to effect a washing action on the dishes.

For a more complete understanding of this invention, reference should be had to the accompanying drawings in which Fig. 1 is a front elevation view of dishwashing apparatus embodying this invention, parts being broken away so as to illustrate certain details of construction; Fig. 2 is a fragmentary plan view of the apparatus shown in Fig. 1, parts being removed so as to illustrate certain details of construction; Fig. 3 is an enlarged vertical elevation view taken from the line 3—3 of Fig. 2, parts being shown in section; Fig. 4 is a view similar to Fig. 3 but illustrating certain of the elements in different operative positions than they occupy in Fig. 3; and Fig. 5 is a perspective view of an element of the apparatus.

Referring to the drawings, this invention has been shown in one form as applied to dishwashing apparatus comprising a vertically positioned square vat 1 mounted within a suitable supporting casing 2. The vat opens at the top, and is provided with a cover 3. Positioned within the vat is a lower open-work utensil-supporting square tray 4 and above this is a utensil-supporting tray 5. While the trays 4 and 5 may have any suitable construction, I prefer to use the trays as described and claimed in the United States patent to Forrest A. Walker, No. 2,035,625, dated March 31, 1936. Positioned below the lower tray 4 is a water circulating impeller 6 which is driven by means of a suitable electric motor 7

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located below the bottom wall of the vat. This impeller is used to circulate the washing liquid by hurling it outwardly and upwardly in the vat through the trays 4 and 5.

A cleaning liquid, such as hot water, is supplied to the vat through a suitable conduit 8 controlled by means of an inlet valve 9. The water passed into the vat is fed through a reaction spray device 10 which when it operates sprays the water upwardly and outwardly through the racks so as to spray the dishes. The vat is further provided with a drain opening 11 in its bottom wall and with a drain pipe 12 communicating with the opening. The drainage of liquid from the vat is controlled by means of a drain valve 13.

The movement of the inlet and drain valves 9 and 13 to and from their closed and open positions, and the energization of the impeller motor 7, all preferably will be controlled by means of suitable automatic control means, such as described and claimed in the copending application of Leslie A. Kempton, Serial No. 421,788, filed December 5, 1941, which issued on August 12, 1947, as Patent No. 2,425,620, and assigned to the Hotpoint Inc. For sake of simplicity, however, they are shown as controlled by a manually operable control knob 14 which when turned to various controlling positions effects the operation of these elements in a predetermined cycle to effect spraying and washing operations. Since the connection means between the control knob and the elements which it controls forms no part of this invention, it is believed to be unnecessary to describe them. However, it will be understood that when the control knob is moved to the "spray" position both the inlet valve 9 and the drain valve 13 are open so that water may enter the vat through the reaction spray device 10, the water issuing therefrom spraying the dishes and then gravitating to the lower part of the vat and draining therefrom into the drain pipe 12. When the control member 14 is moved to a "wash" position the drain valve is closed so that the water supplied can collect in the lower part of the vat. At this time, the impeller 6 will violently throw the water outwardly toward the side walls of the vat and upwardly through it so as to violently hurl the water against the dishes and utensils supported in the open-work trays 4 and 5.

It is to be understood that it is preferable to provide the washing apparatus with suitable means (not shown) for automatically shutting off the inlet valve 9 when the proper quantity of water has been supplied. Preferably, such means

will be arranged as described and claimed in the United States patent to Wilbur L. Merrill, No. 1,995,318, dated March 26, 1935.

As described in the aforementioned Walker patent, the lower tray 4 is provided with upright inverted U-shaped supporting bracket 15, one at each corner, and arranged to support the upper tray 5, as shown in Fig. 1.

One of these upright brackets 15, the lower right-hand one, as viewed in Fig. 2, is used to support the detergent supplying means which is constructed and arranged in accordance with this invention. This detergent supplying means comprises a container 16 of tube-like form which is provided with a bottom wall 17 shaped in the form of a frustrum of a cone with the small end uppermost. The tube 16 and its lower wall 17 are arranged to be moved to a first relative position wherein the lower end of the tube is closed, as shown in Fig. 3, and to a second relative position wherein the lower end of the tube is open so as to discharge its contents, as shown in Fig. 4. When the wall 17 is in its closed position of Fig. 3, it projects for a considerable distance up into the tube. When the tube is in its open position the contents of the tube will readily slide off of the tapered bottom wall 17.

The lower wall 17 is mounted upon an upright supporting rod 18, and its upper end bears against an abutment 19 fixed to the rod and against which the wall 17 is forced by means of a compression spring 20 located on the lower end of the rod. The upper end of this spring, as shown, bears against the lower surface of the bottom wall 17 while the other end of the spring bears against a plate 21 which functions both as an abutment for the spring and as a support for the rod 18, the lower wall 17 and the tube 16, as clearly shown. The plate 21 is formed integrally with a plate 22 formed at right angles with reference to it. The two plates 21 and 22 function to secure the detergent supply means to the upright bracket 15. For this purpose, the integral plate structure formed by the two plates is provided with a pair of fingers 23 and 24 which are bent around the transverse leg of the U-shaped bracket 15 and one of the upright legs thereof, as more clearly shown in Figs. 3 and 4.

The tube 16 is biased upwardly from its position of Fig. 3 to its position of Fig. 4 by a compression spring 25 having its lower end bearing against the abutment 19 and its upper end bearing against a collar 26 attached to the tube by a pair of legs 27 about midway between the two ends of the tube. Mounted upon the upper end of the rod 18 is another abutment 28 which functions as a stop for the tube in its upper open position of Fig. 4.

The tube 16 is latched in its lower closed position of Fig. 3 by means of a latch 29 which engages an outwardly extending flange 30 provided on the lower end of the tube. This latch is mounted upon a vertically positioned rod 31 which is rotatably mounted in the plate 21, and held in position by a collar 32. The lower end of the rod 31 terminates in a transversely extending section 33 upon the end of which is a vane 34. When the latch member is in its position of Fig. 3 and its full line position of Fig. 2, the latch 29 engages the flange 30 to hold the tube down in its closed position. When the latch member is moved to its position of Fig. 4 and its dotted line position of Fig. 2, the cylinder 16 is released so that it is free to move upwardly to its open position under the influence of its compression spring 25.

In the operation of the washing apparatus, it will be understood that the dishes to be cleansed will be loaded into the lower and upper trays 4 and 5 through the open top of the vat. Also, the detergent, which is generally in granular or powdered form, will be loaded into the tube 16 which at this time will be in its closed position of Figs. 1 and 3. It will be understood that to place the tube in this position it is merely necessary to depress it and move the latch 29 over the flange 30. After the dishes and detergent have been loaded, the cover 3 is closed. Then the control knob 14 will be moved to the "spray" position in which position it will be remembered that both the inlet valve 9 and the drain valve 13 are open. Also, generally the impeller motor 7 will be energized at this time to drive the impeller 6, but the impeller really does not perform any function in the spray operation. The water which issues from the reaction spray device 10 sprays the dishes and gravitates to the bottom of the vat and drains from it. The spray water does not in any way influence the operation of the detergent supply means. After the initial spray the control knob is moved to the "wash" position, at which time the drain valve is closed so that water supplied to the vat may collect therein. This water that is supplied is engaged by the impeller 6 and it is violently hurled upwardly and outwardly through the racks 4 and 5 so as to effect the main cleansing action on the dishes. This water in being hurled outwardly engages the vane 34 and forces it from its full line position of Fig. 2 to its dotted line position thereof. This operation moves the latch 29 to release the tube 16 which thereupon moves to its open position of Fig. 4 and discharges the detergent into the vat where it is mixed with the water and makes the washing solution.

While I have shown and described a particular embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made without departing from my invention in its broader aspects and I therefore aim in the appended claims to cover all such changes and 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. Dishwashing apparatus comprising a vat, a liquid circulating impeller in said vat for circulating water therein, a container in said vat for a detergent, a wall of said container being movable relatively thereto so that when the container and wall are in a first relative position said detergent is held within the container and when moved to a second relative position detergent is discharged into said vat, means biasing said container and wall to said second relative position, locking means for holding said container and wall in said first relative position against the force of said biasing means, and means operated responsively to the circulation of liquid in said vat by said impeller for operating said locking means to release said container and wall to permit the biasing means to move them to said second relative position.

2. Dishwashing apparatus comprising a vat, a liquid circulating impeller for circulating water in said vat, a tubular container in said vat for receiving a detergent, the bottom wall of said container being movable relatively to the container so that when the two are in a first relative position

the bottom of the container is closed to retain the detergent and when they are moved to a second relative position the bottom of the container is open to discharge the detergent into the vat, a spring interposed between said bottom wall and container biasing them to said second relative position, a latch for holding said container and bottom wall in said first relative position, and means for moving said latch to release said container and bottom wall responsively to the circulation of liquid in the vat by said impeller so that they are moved to said second relative position by said spring.

3. Dishwashing apparatus comprising a vat, a liquid circulating impeller within said vat for circulating water therein, a tubular container in said vat for receiving a detergent, said container having a bottom wall, means supporting said bottom wall in a fixed position, said container being movable away from said bottom wall to open the bottom of said container, a spring biasing said container away from said bottom wall, said container

at its bottom wall end having an outwardly extending flange, a pivoted latch member arranged when in one position to engage said flange to lock said container in position with reference to said bottom wall to close the lower end of the container, and a vane carried by said latch positioned in said vat to be engaged and moved by the water which is circulated therein by said impeller so as to remove the latch from said flange and thereby permit said spring to move said container away from said bottom wall to open its lower end and discharge said detergent into the vat.

GAYLORD H. WOTRING.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,226,096	Halsey	Dec. 24, 1940
2,254,269	Clark et al.	Sept. 2, 1941