MULTIPLE CLOSURE FOR DISHWASHING MACHINES

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This invention relates to dish washing machines and more particularly to the construction of a cabinet and tank for such devices, including the cover or closure structure for the tank, the present application being a continuation, in part, of my prior application, Serial No. 386,534, filed June 4, 1941.

As illustrated herein, the device is designed particularly for use as a household machine adapted to be supported from the floor. Machines of this character, in the past, have been relatively expensive constructions, and this expense has been a factor in restricting their distribution. Moreover, the present machines have some disadvantages in that the floor space required is excessive compared to the size of the tank itself, and in view of the fact that the floor space in a modern kitchen is limited, it is desirable that the over-all dimensions in length and width of the cabinet be as near as possible to the corresponding dimensions of the tank within which the dish washing operation is performed.

It is also a very desirable feature of a dish washing machine that the operation of the device may be observed while the cabinet is closed. In fact, this is, in practice, the only way in which the operation can be observed, for, as a practical matter, if the cabinet is open, it is usually necessary to shut down the motor and arrest the operation of the device in order to prevent the splashing of water from the tank. For this purpose, a double cover is provided in the present embodiment of the invention, the inner or lower cover having a transparent panel through which the operation of the device can be observed while at the same time making a water-tight contact with the tank. At the same time, an upper or opaque cover is provided which fits closely over the lower cover and which upper cover may be raised independently of or coincidently with the lower cover, the latter function being performed by a single operation so that it is not necessary to first raise the upper cover and then the lower cover separately.

One of the objects of the present invention is to provide a cabinet for dishwashing machines which shall be of improved construction.

A further object of the invention is to provide a cabinet and tank for dishwashing machines, so constructed that the floor space required for the device will be substantially that of the corresponding dimensions of the tank available for reception of the dishes. That is, the horizontal dimensions of the outer cabinet will be substantially the same as those of the tank.

A further object of the invention is to provide improved closure or cover means for the tank or receptacle, and improved means for effecting a tight closure of the cover member with the tank itself to prevent splashing of the water therefrom.

A still further object of the invention is to provide an improved closure member or cover for the receptacle such that the interior of the tank may be seen while the machine is in operation, so that the operation of the device may be readily observed.

To these and other ends the invention relates to the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a front elevation view of a dishwashing machine embodying my improvement;

Fig. 2 is a top plan view of the same, partly broken away for the sake of clearness;

Fig. 3 is a sectional view through the tank of the dishwashing machine on line 3—3 of Fig. 2;

Fig. 4 is an enlarged sectional view of the cover construction adjacent the handle;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view on line 6—6 of Fig. 3;

Fig. 7 is an enlarged detail top plan view of a cover structure of modified form, some parts being broken away for the sake of clearness;

Fig. 8 is a sectional view on line 8—8 of Fig. 7;

Fig. 9 is a top plan view of the lower dish rack;

Fig. 10 is a top plan view of an upper dish rack of slightly modified form;

Fig. 11 is a side view of the dish rack shown in Fig. 10;

Fig. 12 is a fragmentary view of the upper portion of the dishwasher, showing a further modified form of dish rack;

Fig. 13 is a view similar to Fig. 12 but showing a dish rack in folded position;

Fig. 14 is a top plan view of the dish rack shown in Fig. 12; and

Fig. 15 is a sectional view on line 15—15 of Fig. 14.

As illustrated in the accompanying drawings, I have shown a dishwashing machine comprising a tub or tank supported upon legs or standards, four of which are provided, one at each corner of the bottom portion of the tank, which bottom portion is reduced in size as indicated at 12 in Figs. 1 and 3, the bottom portion of the tank being indicated at 13. It will be understood that the tank which is thus firmly supported upon the legs 14 will be enclosed in an outer decorative case the sides of which are shown at 14 and 15, and the front of which is indicated at 16 (Fig. 1).
Below the bottom portion of the tank is mounted a motor 11, the shaft of which extends through the bottom of the tank and carries on its extended end a propeller or agitator 18. As shown, the tank is substantially rectangular in shape in the horizontal cross section, and will preferably be made of sheet metal or of plastic material.

Adjacent to their upper ends, the walls of the tank are bent inwardly as shown at 20, then rise vertically for a short distance as shown at 21, from which point they are turned outwardly as at 22 to provide a ledge upon which the covers may rest, as will be hereinafter explained. From the outer edge of this ledge, the walls of the tank rise vertically as shown at 23 and are then turned in a horizontal direction at 24 to provide the upper surface of the cabinet surrounding the cover structure, at the periphery of which they are turned downwardly as at 25 to embrace the front and side walls 14, 15 and 16, and the rear wall (not shown).

It will be apparent that, within the top surfaces 24, provided as described above, is an opening within which is disposed the cover structure which will now be described and through which opening the dishes and other articles to be cleansed will be introduced into the tank. The cover structure is made of two parts, one of these parts constituting what may be termed the inner or lower cover comprising a pair of flanged or angle members 27 and 28 of rectangular form between which members is clamped a piece of glass or other transparent material 29. Packing material of rubber or the like, as shown at 30 and 31, may be placed between the flanged members and the glass so as to secure the latter in place and also make a tight seal. Also, between the depending portions of the angle members is a gasket 32 which may be formed of sponge rubber or other suitable material and which may extend entirely around the four sides of the cover so as to fit tightly against the flanged portion 22 of the tank to make a water-tight joint therewith.

A rod 33 extends through openings in the upper right-hand portion 23 of the tank and also through openings in the angle member 21 to hinge this cover to the tank so that the cover may be swung freely to open and closed positions. It will be understood that, as the supporting flanged surface or shelf 21 lies in a position substantially below the surface 24, this provides a recess in which this cover is disposed so that the top of the cover will be slightly below the level of the surface 24. This disposition of the parts enables the use of a second or opaque cover above the transparent cover but in a position substantially flush with the top of the cabinet of the machine, this top surface being represented by the surface 24.

This second or opaque cover 35 is provided with downwardly depending flanges 36 at both sides and at the front thereof, this flange being omitted, however, at the back as shown in Fig. 6. The side flanges of this second cover are also perforated to receive the rod 33 so that this cover will likewise be hinged upon this rod. It will be understood that the flanges 35 will lie without and in a position embracing the flange members 27 of the transparent cover, so as to lie within the shallow depression above the shelf 22.

The outside cover 35 is provided with a rotatable handle 37, as shown in Figs. 2 and 4, the shank of which extends through the cover and is provided with a wing or cam 38 adapted to enter through a slot 39 of keyhole shape in the horizontal portion of the flanged member 27 of the lower cover. From Figs. 4 and 5 it will be noted that, when the handle 37 is in the position shown, the member 38 will secure the two covers together so that both may be simultaneously lifted or swung about the hinge rod 33 by an upward pull upon the handle. When, however, the handle 37 is turned to an angle of 90°, the member 38 will no longer engage the flange 27 but will pass through the slot 39 and will therefore permit the raising of the upper opaque cover 35 while leaving the transparent cover in closed position. Anyone operating the machine and desiring to view its action may, by releasing the lower cover, raise the upper one and observe the action of the machine through the transparent member 29. Normally, the handle 37 may be left in the position shown in Figs. 4 and 5 so that the two covers will be raised and lowered together as is of course desirable when loading or unloading the machine.

It may here be noted that this raising of the upper cover, independently of the lower one, is facilitated by omission of the flange 36 at the back of the upper cover, as illustrated in Fig. 6 wherein the upper cover is shown in raised position in dotted lines.

Mounted upon the hinge rod 33, between the portions 23 of the tank and the flanges 36 of the upper cover, are angle-shaped plates 40 having extended ends 41 and 42 joined by an arc-shaped surface 43, and a lip 44 is turned outwardly from the flange 36 of the cover 35 to engage one side of the extensions 41, the lip riding along the arc-shaped surface 43 when the cover is swung from open to closed position. The rear edges of the members 40 rest against the surface 23 along the rear wall of the tank so that the plates will be held against movement. It will thus be seen that the movement of the cover 35 is limited by the engagement of the member 44 with the end portions 41 so that the cover may rest in raised or open position as shown in dotted lines in Fig. 6. If the two covers are simultaneously raised, these will likewise rest in open position due to their connection about the wing 39 on the shank of the handle 37.

Upon the front and rear walls of the tub are provided flange members 45, these members having upper surfaces 46 designed to support the front and rear ends of the upper dish racks designated generally by the numeral 47. These dish racks are made in two sections hinged together by the links 48 and pivoted to the members 45 at 49 so that they may be folded downwardly upon the surfaces 46 in operative position as shown at the left side of Fig. 3, or folded upwardly in an out of way position as shown at the right hand side of this figure.

Adjoining the lower part of the tub is a flanged member 55 of rectangular shape secured to the tub walls so as to form a support for a supporting grid 56 upon which grid is in turn supported the lower dish rack 57 which may be of any approved form.

In Figs. 7 and 8 of the drawings, I have shown a construction of somewhat modified form, particularly with reference to the means by which the upper and lower covers may be raised or opened simultaneously or individually. In the form of my invention, the upper cover 35 is provided with an opening 59 through which the fingers of the user may be inserted to grasp the edges of the opening and raise the upper cover, leaving the
lower cover in closed position. The edge of this opening may be covered by a protective ring 58, of rubber or similar material.

The flange 27 of the lower cover is likewise provided with an opening 61, a part of which registers with the opening 59, and a tongue 62, provided on the flange 27, within this opening, projects upwardly into the opening 61. The opening 61 in the upper cover is cut back as shown at 63, in Fig. 7, on each side of the tongue 62 so that the fingers of the user may be placed below the edge portion of the cover 35 surrounding the opening 59 above the portions 63 without engaging the flange 27 of the lower cover.

If the user desires to raise the upper cover only, so as to view the operation of the machine through the transparent lower cover, the fingers are inserted in the opening 59 to grasp the edge of the cover 35 upon each side of the tongue 62, and within the portions 63 of the opening in the lower cover so that the upper cover only is engaged and raised. If, however, it is desired to raise both covers simultaneously, the user simply inserts the fingers below the lip or tongue 62 and thus engages and raises the lower cover which brings the upper cover with it.

The ornamental sides 14 and 15, and the front 16, may be conveniently assembled with the tank and held in place by having their upper ends slipped behind the flange or downturned portion 29 of the tank. The lower edges of these members similarly lie rearwardly of the upper edges of base members 85 (only one of which is shown), which extend horizontally along the lower edges of the front and side walls.

In Fig. 9 of the drawings I have shown a preferred form of dish rack to be used in the lower part of the tub. This dish rack is provided with a pair of rings 70, and wires 71 connecting these rings to form supports for saucers or like dishes, for example. A guard 72 may be provided to surround these supports and maintain the dishes against any tendency to fall therefrom. A pair of curved or arcuate shaped wires or rods 73 may also be provided in a position slightly spaced upwardly from the base of the rack, as shown more particularly in Fig. 3. These may be employed for supporting large plates or platters, or the like. It will be understood that this rack is substantially like that shown in my prior application, referred to.

In Figs. 10 and 11 I have shown an upper rack comprising foldable sections 75 and 76 hinged together at 71. The outer portion 75 of the rack is provided with hinge pins 78 by which it is pivotally connected to the tank so that it may fold toward the wall of the tank, as shown in Fig. 3. That is, this rack not only hinges or folds upwardly in the tank, but also collapses or folds about the pivot points 77 so as to give full access to the lower dish rack for filling the same. The portion 75 of this rack may be provided with standing cross members 79, while such members may be omitted from the part 76. It will be understood that these members 79 are substantially rectangular in form, having legs at their ends extending downwardly to be attached to the part 76 of the rack.

In Figs. 12 to 15 of the drawing I have shown a further modified form of upper rack, comprising two sections 80 and 81 pivotally connected together by the hinge plates 82. The section 80 is hinged at each side, as shown at 83, to brackets 84 supported by the walls of the tank. The sections of the rack may rest upon or be supported by pins 85 projecting outwardly from the walls of the tank.

The section 80 of this rack is provided with three upstanding supports 86, 87 and 88, which are of rectangular shape, each having a horizontal cross bar and depending legs at the ends thereof. The lower ends of the legs of these members are bent at a slight angle to the body thereof and pivoted to the rack 80 at the points 89, 90 and 91, so that they may fold over upon the rack when it is desired to fold the latter against the wall of the tank.

This folded position is shown in Fig. 13, and it will be seen that the entire rack will nest snugly against the walls of the tank in a very compact position. It may also be noted that the member 85 will fold inwardly or toward the right, as shown in Fig. 12, and that the members 87 and 88 fold toward the left, so that the members in folded position will lie within the outlines of the section of the rack to which they are connected. Also the slightly bent lower ends of these members will provide that the bodies thereof will, when folded downwardly, lie parallel with the base portion of the rack and fit snugly thereagainst. Stop members 82 may be provided to limit the movement of the members 81 and 88 so that they will be held in upright position. Also the members 86, 87 and 88 may be provided with cross rods 83 adjacent their lower ends, which cross rods will be useful in connection with the bottom of the rack in engaging the edges of dishes placed between the members 86, 87 and 88, to hold them in substantially upright position, supported upon their edges, for proper application of the washing fluid thereto.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all of the details shown but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A dish washing machine comprising a tank and a hinged cover for the tank, said cover comprising a pair of frame members of open rectangular form and a panel of transparent material clamped between said members at its edges and closing the opening within said members, said members being L-shaped in cross section and each having a depending flange, the flange of the upper being disposed in parallel spaced relation to the flange of the lower, and sealing strips between said flanges.

2. A dish washing machine having a tank, a cover for the tank having a transparent panel therein, a second cover overlying the first cover and having a depending edge flange extending downwardly over the edges of the first cover when the covers are closed, said tank having a recess in its upper surface with a shoulder below said recess, and both of said covers lying within said recess and, when in closed position, resting on said shoulder with the upper surface of the second cover being substantially flush with the upper surface of the tank.

3. A dishwashing machine comprising a tank and a hinged cover for the tank, said cover comprising a pair of frame members of open rectangular form and of L shape in cross section, said members being assembled in nested relation with the flanges of one lying parallel to and spaced from the flanges of the other, a panel of transparent material clamped between one set of flanges of said members, and strips of sealing material
secured between the other pair of flanges of said members, and said tank having an integrally formed upwardly facing shoulder upon which said sealing strips rest to seal the space between the cover and tank.

4. A dishwashing machine as in claim 2, wherein the overlying cover is provided with an opening, and the lower cover is provided with means connected thereto and extending through said opening for manual engagement, whereby both covers may be raised simultaneously.

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