Jan. 13, 1942. G. WEBB 2,269,746

DISHWASHING MACHINE

Filed July 26, 1937 2 Sheets-Sheet 1

Fig. 2

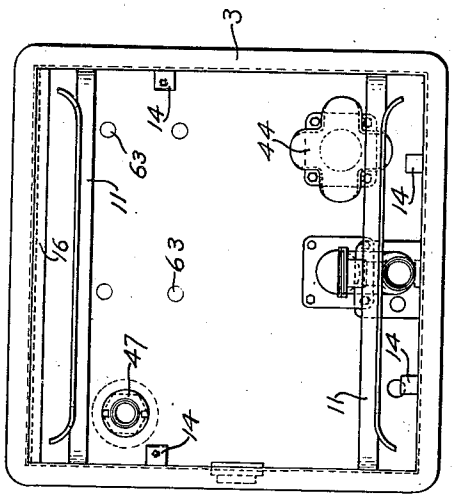


Fig. 3

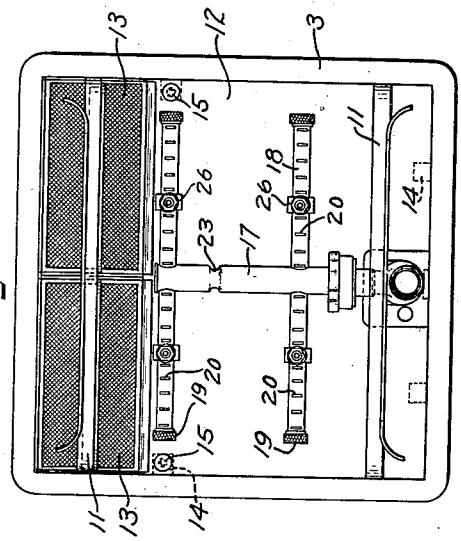
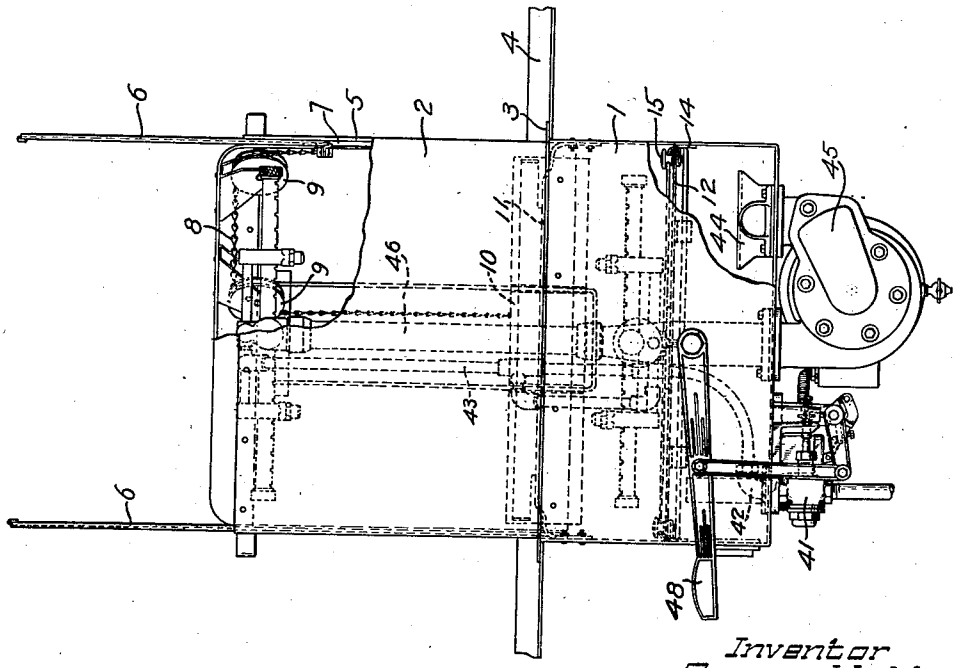


Fig. 1



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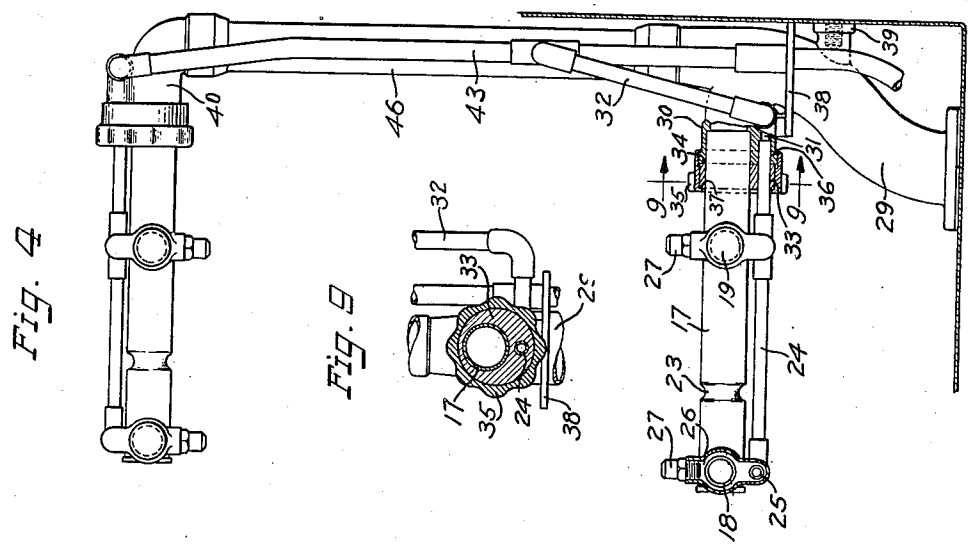


Fig. 4

Fig. 9

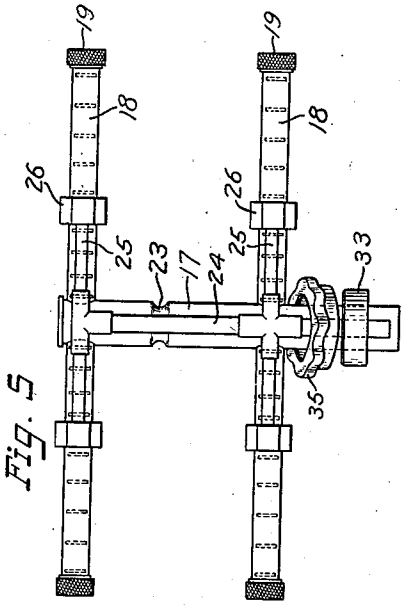


Fig. 5

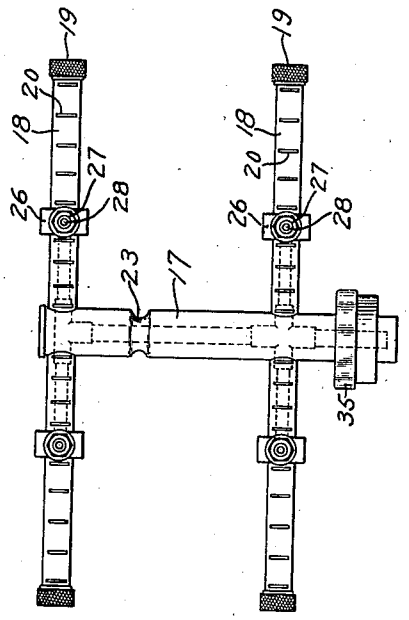


Fig. 6

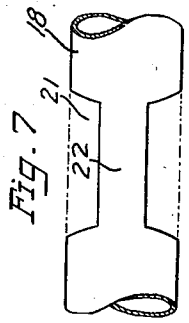


Fig. 7

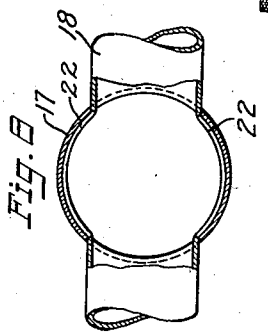


Fig. 8

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2,269,746

UNITED STATES PATENT OFFICE

2,269,746

DISHWASHING MACHINE

George Webb, Hartford, Conn., assignor to Colt's Patent Fire Arms Manufacturing Company, Hartford, Conn., a corporation of Connecticut

Application July 26, 1937, Serial No. 155,607

3 Claims. (Cl. 141—9)

The principal object of this invention is to provide a dish washing machine of compact construction in which certain parts may be readily removed to permit cleaning and inspection of the machine.

Other and further objects of the invention will be readily apparent to those skilled in the art from the following disclosure.

In the accompanying drawings I have illustrated the invention as required by the statutes, but it will be understood that the drawings are for illustrative purposes only and are not to be construed as limiting or defining the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawings:

Fig. 1 is a front elevation of a dish washing machine embodying the invention, certain parts of the casing being broken away to show the internal construction and other parts of the internal construction being shown in dotted lines.

Fig. 2 is a plan view of the lower section of the dish washing machine casing, certain parts being omitted for clearness.

Fig. 3 is a view similar to Fig. 2 with all of the parts in place.

Fig. 4 is an enlarged side elevation of a washing and rinsing fluid conduit system made in accordance with one phase of the invention.

Fig. 5 is an enlarged bottom view of the lower washing and rinsing fluid discharge head.

Fig. 6 is an enlarged top view of the lower washing and rinsing fluid discharge head.

Fig. 7 is an enlarged plan view of the central portion of one of the washing fluid transverse conduits prior to assembly with a washing fluid main conduit.

Fig. 8 is an enlarged view of one of the washing fluid transverse conduits after being assembled with a main conduit, the view being taken transversely of the longitudinal axis of the main conduit and with parts of the transverse conduit broken away.

Fig. 9 is a cross sectional view taken on the line 9—9 of Fig. 4.

Prior to the present invention most dish washing machines have been of substantial size and consequently could not be used where only a limited space could be devoted to dish washing such as in soda and lunch fountains, small kitchens, and other similar places. These prior art machines were also of complicated and relatively expensive construction which further precluded a more universal use. My dish washing machine is primarily intended for use in such places as have been set forth, although its use is obviously not so limited. As will be apparent hereinafter, certain phases of the invention are susceptible of application to any dish washing machine, and as to these I mean to claim them broadly.

In Fig. 1, I have shown one form which a dish washing machine incorporating the features of the invention may take. This machine includes a casing, means for supporting a tray of dishes to be washed, and a washing and rinsing fluid distribution and control system.

The casing is preferably formed in two sections 1 and 2 from stainless steel and may be rectangular in cross section. The section 1 of the casing may be provided with a peripheral flange 3 which may rest upon or be secured to a table top or other supporting means 4. The section 2 has one or more openings 5 therein which permit access to the interior of the casing. Doors such as shown at 6 may be slidably mounted in guideways 7, and door counterbalancing means including chains 8, pulleys 9, and a weight 10, all of known construction, are preferably provided. The dishes to be washed are preferably stacked in trays which may be placed in the machine and be supported on guide tracks 11.

In accordance with one phase of the invention the casing is provided with means for dividing the same into upper and lower portions, the lower portion serving as a reservoir for the washing fluid which is to be recirculated. This dividing means or partition preferably includes a perforated portion, through which the fluid, after passing over the dishes, must pass to return to the reservoir. In this way the fluid to be recirculated is freed of any refuse from the dishes being washed. The perforated portion may take the form of one or more removable refuse trays, the same being preferably so located and supported that removal thereof may be easily effected.

I have shown a casing dividing means incorporating the above features of this phase of the invention and I shall now describe the same as it is the type which I now deem preferable.

The dividing means comprises a substantially horizontal imperforate portion or apron 12 and a perforate portion which, as shown in Fig. 3, comprises a plurality of refuse trays 13 and which is positioned in substantially horizontal register with the apron 12. The sum of the respective areas of the imperforate and perforate portions is such that it equals the cross sectional area of the casing, that is, the areas of the imperforate

and perforate portions are complemental with respect to the area of the casing.

The apron 12 is preferably supported by brackets 14 secured to the sides of the casing, and, if desired, one or more thumb screws 15 may be provided for detachably securing the apron to the brackets. The perforated portion may also rest upon one or more supports 16 extending from the side of the casing and it may also have an edge extending over the adjacent edge of the apron to be supported thereby. I have illustrated this construction for supporting the refuse trays 13, as is apparent in Fig. 3, wherein the forward edges (as viewed in this figure) of the refuse trays project over and rest upon the edge of the apron 12.

The construction so far described is disclosed and claimed in my copending application, Serial No. 192,295, filed February 24, 1938.

I have provided a novel washing and rinsing fluid distribution system for use with a casing embodying the phase of the invention so far described, but I realize that the casing construction may be advantageously combined with distribution systems other than the one to be described and that the distribution system is susceptible of use with other casing constructions.

The fluid distribution system preferably includes discharge heads or devices positioned above and below the dishes to be washed. Each discharge head may include a washing fluid conduit having fluid discharge openings therein and a rinsing fluid conduit also having discharge openings therein. I now prefer to so construct each of these two heads that it may be mounted in or removed from the casing as a unit. One method of effecting such unitary construction is to at least partially support one conduit from the other, preferably at a plurality of points. When this form of unit construction is used the conduits may extend substantially parallelly to each other and a portion of one may encircle the other to be supported thereby, the encircling portion assuming the form of a branch conduit.

In the drawings, and more particularly in Figs. 4–9, I have shown a portion of a fluid distribution system including discharge head units embodying one form which this phase of the invention may take. The upper and lower heads may be identical in structure, if desired, and they are so shown. In view of the identical construction, only the lower head unit will be described.

The washing fluid conduit includes a main portion or member 17 and transverse portions or members 18 which may have their ends closed by caps 19. Suitable discharge openings 20 are provided in the transverse portions through which the washing fluid may be forced. The portions 18 are of smaller diameter than the main portion 17 and may be secured thereto in any desired manner. In Figs. 7 and 8 I have shown a preferred connection which is effected by notching the members 18 as shown at 21 in Fig. 7, sliding them through transverse apertures in the member 17 until the notched portions are positioned therewithin, and then expanding the connecting strips 22 into contact with the interior of the member 17 as shown in Fig. 8. The contacting portions of the two members 17 and 18 may be brazed together if desired. A constriction such as shown at 23 is preferably formed in the member 17. This constriction tends to equalize the flow and the pressure of the washing fluid in the several transverse portions 18.

Positioned so as to extend substantially parallelly to the washing fluid conduit is a rinsing fluid conduit which includes a main portion or member 24 and transverse portions or members 25. In accordance with this phase of the invention one of the fluid conduits is at least partially supported by the other and in the construction shown the rinsing fluid conduit is supported by the washing fluid conduit. I prefer to provide means to so support this conduit at a plurality of points and, while other means of support may be utilized, I have shown portions 26 of the transverse members 25 encircling the transverse portions 18 of the washing fluid conduit. When encircling conduit portions, such as 26, are provided, I consider it preferable to position these encircling portions between the discharge openings 20 in the transverse members 18 so that they are outside the zone of direct discharge from said openings and therefore will not cause any diminution in the force of the fluid discharged through the openings 20. The encircling portions 26 are provided with nipples 27 having discharge openings 28 therein. In this manner the portions 26 constitute branch conduits with respect to the transverse members 25.

When my novel discharge head unit is used in a washing machine which includes a removable casing dividing means such as above described, the dimensions of the unit are preferably such that it does not interfere with the ready removal of the refuse trays. I have shown such construction in Fig. 3 wherein the lower discharge head unit is shown as projecting over only the apron 12. It should of course be understood that if some other type of discharge head construction were used in conjunction with a casing dividing means such as above described, the dimensions of the substituted construction might well also be so limited for the same reason.

In furtherance of the concept of making the lower discharge head readily removable to expedite removal of the apron 12 for cleaning and inspection purposes, I have provided plural conduit couplings for connecting the discharge heads with the fluid distribution systems. It should be understood, however, that the discharge units may be coupled with the fluid distribution systems in other ways if desired.

In the illustrated construction a T fitting is used for connecting the lower discharge head with the distribution systems, the construction of the T being shown in detail in Figs. 4 and 9. The washing fluid distribution system includes the T fitting, the bar of the T being the portion 29 and the leg of the T being the portion 30. The bar and leg portions of the T fitting are formed with intersecting passages in the usual manner. In the leg or coupling portion of the T is a passage 31 which is connected with the rinsing fluid distribution system by the conduit 32. Another member 33 has passages therein which are adapted to register with the passages in the T leg 30. Although any desired means could be used for clamping the member 33 against the coupling face 34 of the T leg, I now prefer to use a clamping nut 35 for this purpose. When a clamping nut is used, the leg of the T is preferably provided with a flange 36 of circular outline which is peripherally threaded to cooperate with the internally threaded clamping nut 35. The nut has an inwardly directed flange 37 which engages the member 33 to draw it tightly against the face 34, and at least a portion of the periphery of the nut may be non-circular in order to facilitate rotation of the same. As is apparent

in Fig. 9, the member 33 is circular in outline so that the nut 35 is freely rotatable thereabout.

In using this type of coupling in my dish washing machine I prefer to form straight passages through the member 33 of such diameters that the conduits 17 and 24 may project through the member and beyond the face thereof for reasons which will be hereinafter apparent. As shown in Fig. 4, the passages in the leg of the T are of such diameters that the portions of the conduits 17 and 24 projecting beyond the face of the member 33 are receivable therein. In order to reduce the possibility of leakage, the member 33 is preferably brazed or otherwise secured to the conduits 17 and 24.

The combination of a discharge head unit such as already detailed with a plural conduit coupling not only permits the head to be readily connected to or disconnected from the fluid distribution systems, but has the additional advantage of preventing rotation of the conduits 17 and 24 with respect to each other and with respect to the fitting to thereby insure proper directional discharge from the discharge openings in these conduits. This prevention of rotation results from the fact that the washing and rinsing fluid discharge heads are non-rotatably secured to each other by the encircling portions 26 and from the fact that portions of the conduits 17 and 24 project into the passages in the leg of the T.

For reasons to be set forth hereinafter, the T fitting preferably has a flange 38 and a projection 39 formed thereon.

In the illustrated form of the invention the upper discharge head is connected with the distribution systems by a similar coupling construction, an elbow fitting 40 being substituted for the T of the lower head connection for obvious reasons. It should, however, be understood that some other form of coupling might be used if desired.

The remaining portions of the fluid distribution system may, if desired, take the form illustrated. The rinsing fluid distribution system includes, in addition to the upper and lower discharge portions already described, a valve 41 having its inlet side adapted to be connected to a supply of rinsing fluid by a service pipe, and conducting means including an elbow 42 and a pipe 43 which passes through the flange 38 on the T fitting to be supported and held in place thereby and which is connected with the rinsing fluid passages in the T and elbow fittings. The conduit 32 is preferably connected to the pipe 43 at a point located well above the level at which the washing fluid is normally maintained in order to eliminate any possibility of the washing fluid entering the service pipe connected to the valve 41 in the event of a vacuum being formed in the service pipe. The washing fluid distribution system includes an outlet 44 in the bottom of the casing, a motor driven pump 45 connected with the outlet and with the T fitting, and a pipe 46 connected with the T and elbow fittings. The tank may be filled with washing fluid in any desired manner, such as by filling with rinsing fluid and then adding any desired detergent, for example. A drain plug 47 is preferably provided in the bottom of the tank.

In the washing machine the pump is secured to the bottom of the casing and due to the fact that its inlet and discharge passages are connected to the outlet 44 and T fitting, respectively, it serves to continually recirculate the washing fluid as long as the pump motor is operating.

Suitable control means for the electric pump motor and the rinsing fluid valve 41 are provided. As the control means forms no part of the invention claimed herein, no detailed description of the particular means illustrated is given other than to note that the construction is such as to include a single operating lever 48.

The operation of the dish washing machine will now be described, it being assumed that the machine is properly connected with suitable sources of electrical energy and rinsing fluid. The dishes to be washed may be arranged in a suitable rack which is placed in the machine and rests on the guide tracks 11. The doors 6 are lowered to close the machine. The operator now moves the operating handle 48 to starting position whereupon the pump motor drives the pump which draws the washing fluid from the tank portion of the casing through the outlet 44 and pumps it into the distribution system from which it is discharged through the apertures 20 in the discharge heads. After passing over the dishes the fluid drains onto the apron 12 or refuse trays 13, passes through the perforations in the trays to be freed of refuse and into the lower tank portion of the casing to be recirculated by the pump. After the dishes have been subjected to the action of the washing fluid for a sufficient length of time, the operator moves the handle 48 to rinse position. This movement serves to open the switch in the pump motor circuit and thus causes the pump to stop operating and also serves to open the rinse fluid to flow into its distribution system. After the dishes have been thoroughly rinsed movement of the handle 48 to its original or neutral position closes the valve 41.

If desired the operator may easily lift out the refuse trays 13 for cleaning as the lower discharge head does not project over them. The apron 12 may also be easily and quickly removed. To effect removal of the apron the lower discharge head must be first removed and to do so it is only necessary to unscrew the single clamping nut 35, separate the lower discharge head unit from the T fitting and lift it out. The apron may now be easily removed by simply removing the thumb screws 15 and sliding the rear edge of the apron out from under the flange 38 on the T fitting. The apron, lower discharge head, and refuse trays can be reassembled in the machine by a mere reversal of these steps.

Alternative forms of the invention will be apparent to those skilled in the art, and I do not intend to limit myself to any particular embodiment except as defined in the claims.

What I claim is:

1. In a dish washing machine of the type comprising a casing having upper and lower portions, the said upper portion having an opening therein permitting access to the interior of the casing and the said lower portion constituting a tank for the reception and storage of washing fluid, dish supporting means, and washing and rinsing fluid conducting means positioned within said casing at one side thereof and in close proximity to each other; a washing and rinsing fluid discharge unit, a single coupler connecting said unit to said conducting means so as to be readily connectible thereto and disconnectible therefrom, said discharge unit comprising a washing fluid conduit having discharge openings therein, a rinsing fluid conduit closely adjacent thereto, and means projecting from one of said conduits remote from the point of coupling for at least partially supporting the same from the other

conduit, said means being a branch conduit connected with said one conduit and having a discharge opening therein.

2. In a dish washing machine of the type comprising a casing having upper and lower portions, the said upper portion having an opening therein permitting access to the interior of the casing and the said lower portion constituting a tank for the reception and storage of washing fluid, dish supporting means, and washing and rinsing fluid conducting means; a washing and rinsing fluid discharge unit coupled to said conducting means so as to be readily connectible thereto and disconnectible therefrom, said discharge unit comprising a washing fluid conduit having discharge openings therein, a rinsing fluid conduit adjacent thereto, and a branch conduit connected to one of said conduits and having a discharge opening therein, said branch conduit encircling the other said conduit at a point remote from the point of coupling whereby one of said conduits is at least partially supported by the other.

3. In a dish washing machine of the type comprising a casing having upper and lower portions, the said upper portion having an opening therein permitting access to the interior of the casing and the said lower portion constituting a tank for the reception and storage of washing fluid, dish supporting means, and washing and rinsing fluid conducting means; a washing and rinsing fluid discharge unit coupled to said conducting means so as to be readily connectible thereto and disconnectible therefrom, said discharge unit comprising a washing fluid conduit including transversely extending portions having discharge openings therein, a rinsing fluid conduit positioned adjacent the washing fluid conduit and including transversely extending portions, the said second conduit being of such configuration that portions thereof extend substantially parallelly to corresponding portions of the first said conduit and being so positioned as to be outside the zone of direct discharge from the first said conduit, and branch conduits connected to the rinsing fluid conduit and encircling the washing fluid conduit at a point remote from the point of coupling whereby the former is at least partially supported by the latter, the said branch conduits having discharge openings therein and also being secured to the washing fluid conduit.

GEORGE WEBB.