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DISHWASHER

Original Filed Dec. 30, 1955

3 Sheets-Sheet 1

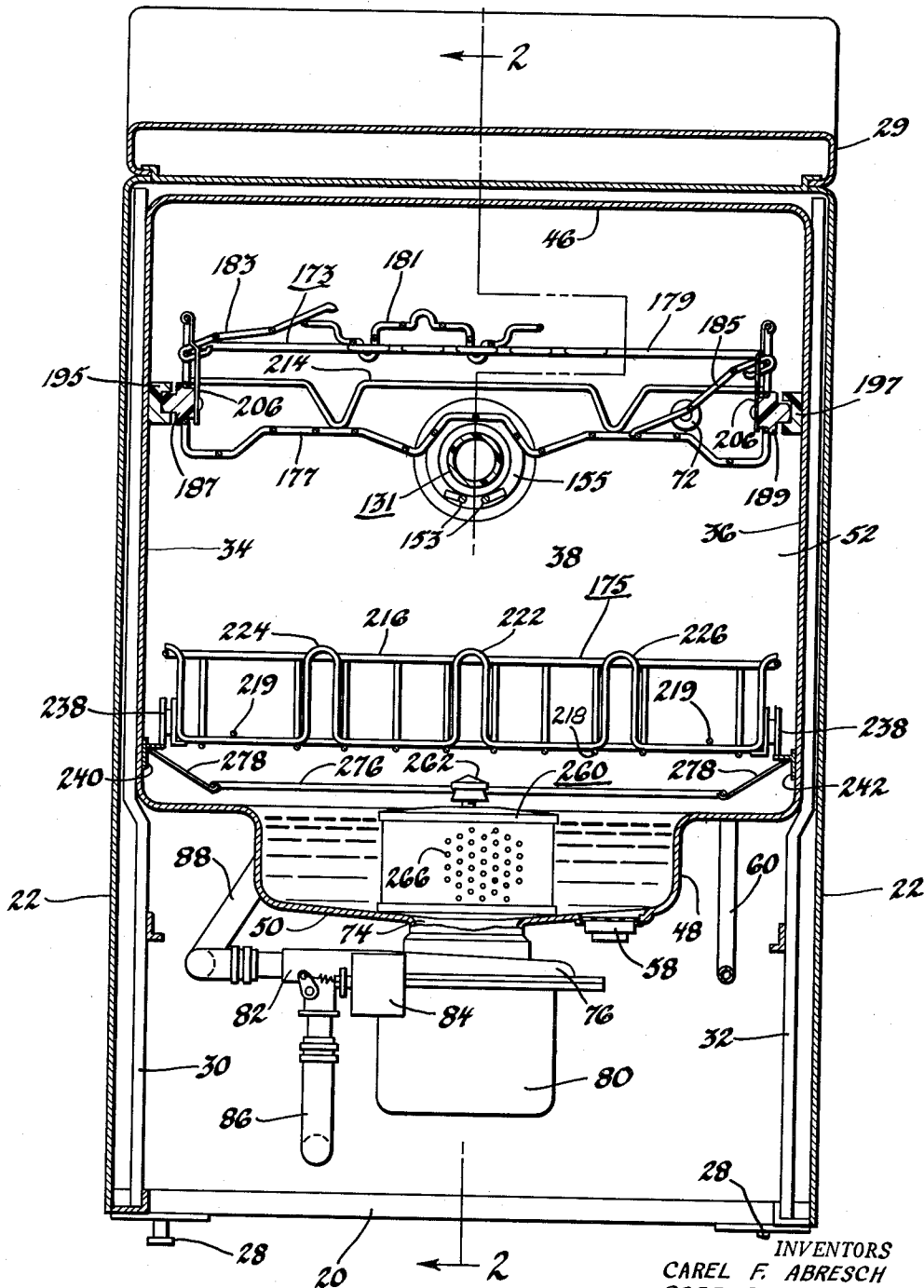


Fig. 1

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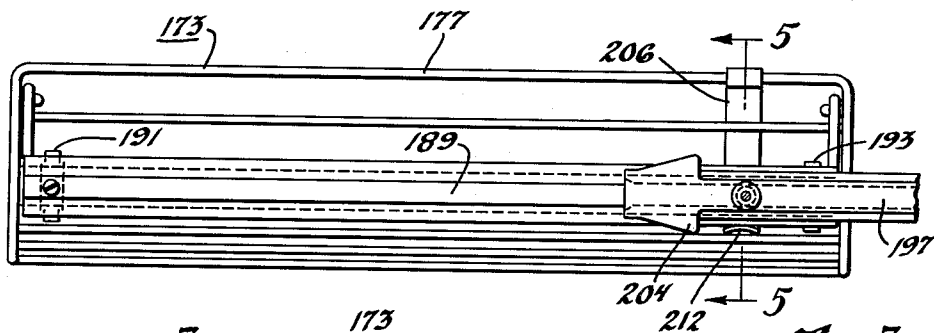


Fig. 3

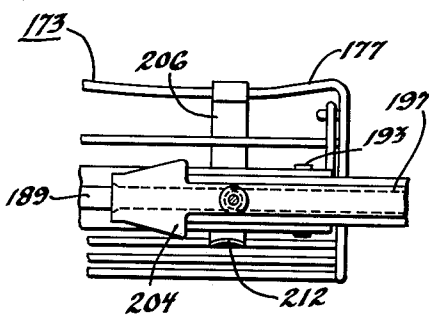


Fig. 4

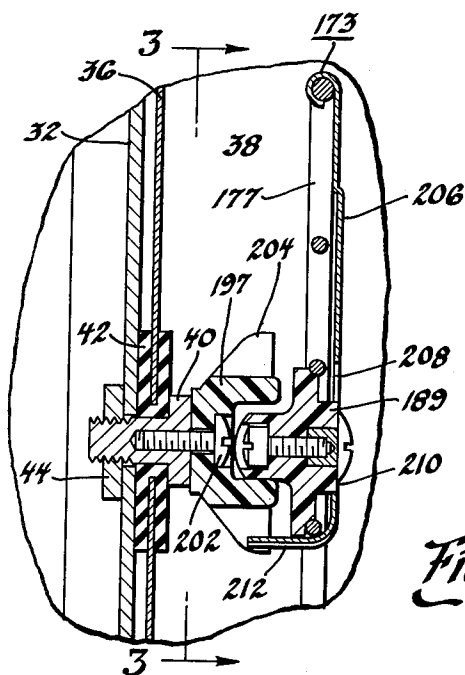


Fig. 5

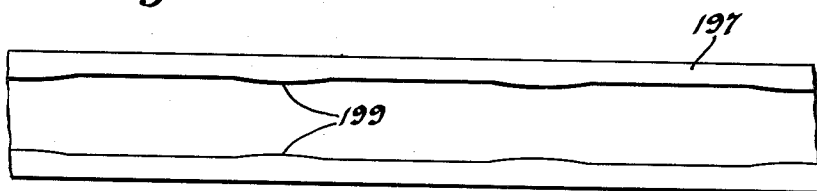


Fig. 6

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## DISHWASHER

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Original application Dec. 30, 1955, Ser. No. 556,613, now Patent No. 2,973,907, dated Mar. 7, 1961. Divided and this application Sept. 30, 1959, Ser. No. 843,595  
1 Claim. (Cl. 312-348)

This application is a division of our copending application S.N. 556,613 filed December 30, 1955, now Patent No. 2,973,907, issued March 7, 1961.

This invention relates to a domestic appliance and more particularly to means for supporting dishes in household dishwashers.

To make the racks and dishes easily accessible, it is desirable to make them more easily movable horizontally out of the cabinet as if upon ball bearings. The ball bearing construction provides easy movement but is susceptible to clogging and jamming by food particles and is expensive.

It is another object of this invention to provide a dish rack with a single inexpensive means for horizontally movably supporting the rack in such a way that easy and horizontal movement is provided without ball bearings and to provide a simple inexpensive latch permitting complete removal of the rack whenever desired but preventing unintentional removal.

These and other objects are attained in the form shown in the drawings in which the cabinet is provided with box-shaped walls and a front opening door. The rear wall is provided with a molded plastic inlet fitting extending through the rear wall and provided with a helical cavity which directs the water flow in a helical direction. The inlet fitting connects directly with the rotatable molded plastic hollow spray tube extending forward horizontally from the inlet fitting protruding through the rear wall.

The bottom of the dishwashing machine is provided with a sump containing a molded plastic support for a spring mounted strainer extending over the outlet at the bottom of the sump. This outlet connects directly with the inlet of a motor driven pump. The outlet of this pump connects directly to a two-way solenoid controlled valve. When the solenoid of the valve is energized, the water discharged from the pump is directed to the inlet fitting connecting with the spray tube. When the solenoid is deenergized, the valve is connected so that the water is pumped through an outlet connection to a drain.

The dishwashing chamber is provided with dish racks above and below the spray tube. The upper dish rack is provided with rounded plastic guides having a high gloss finish. These slide in guideways mounted upon the walls likewise having a high gloss finish and in addition having an undulating surface providing easy movement.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of the invention is clearly shown.

FIGURE 1 is a vertical sectional view through a dishwasher embodying one form of my invention taken substantially along the line 1-1 of FIGURE 2;

FIGURE 2 is a vertical sectional view through the dishwasher taken substantially along the line 2-2 of FIGURE 1;

FIGURE 3 is a right side view of the upper rack and its guides and guideways showing the latch in normal position taken along the line 3-3 of FIGURE 5;

FIGURE 4 is a fragmentary view similar to FIGURE 3 showing the latch member in unlatching position;

FIGURE 5 is a fragmentary enlarged sectional view taken substantially along the line 5-5 of FIGURE 3; and

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FIGURE 6 is a fragmentary inside enlarged view of the guideway for the upper rack.

Referring now to the drawings and more particularly to FIGURES 1 and 2, there is shown a dishwasher including a base 20 having outer side walls 22 and a front wall 24 extending upwardly therefrom. The front wall 24 and the base 20 are recessed to provide a recessed toe-plate 26. The base 20 is provided with four adjustable feet 28 at the corners for supporting the cabinet. The cabinet has a top wall 29 resting upon the intumed top of the side walls 22. This top is provided with an upwardly extending back splash rear portion. Extending upwardly from the front and rear side portions of the base 20 are the channel-shaped supports 30 and 32 which extend along the side walls 34 and 36 of a dishwashing chamber 38. As better shown in FIGURE 5, a bolt 40 extends through a rubber grommet 42 and is provided with a nut 44 on the opposite end on the outside of the channel support 32. In this manner, the walls 34 and 36 are conveniently supported from the base 20. The walls 34 and 36 are part of a box-shaped structure which also includes the top wall 46, the bottom wall 48 which includes a sump 50 and a rear wall 52. The front of the compartment 38 is closed by a front door 54 which extends between the top and bottom and side walls.

The operation of the dishwasher is controlled by a timer 56, controlled through a knob shaft 57 by a knob accessible upon the front wall 24 and also by a liquid level responsive switch 58 provided in the sump 50 as shown in FIGURE 1. The dishwasher is supplied with hot rinse and wash water through a supply tube 60 which is provided with an inverted U-turn extending into a funnel-shaped vacuum breaker structure 62 provided upon the rear wall 52 of the dishwasher compartment. The extreme end of the tube 60 is clamped by the fitting 64 having two bolts 66 fastening it to the vacuum breaker structure. The vacuum breaker structure 62 is funnel shaped and is provided with a top opening 70 which will pass plumbing code. The bottom outlet of the funnel connects to a U-tube connecting to an elbow 72 extending forwardly through the rear wall 52.

The water discharges from the elbow 72 into the compartment 38 and is collected by a sump 50 having an opening 74 which connects directly with the inlet of pump 76, directly driven by an electric motor 80 located immediately beneath. The pump 76 discharges laterally into a two-way valve 82, operated by the solenoid 84. When the solenoid 84 is deenergized, the valve 82 is in a position in which it discharges into a drain tube 86. When the solenoid 84 is energized, the valve 82 discharges into a hose 88 which connects to the inlet 90 of the inlet fitting 92 mounted upon the central portion of the rear wall 52 as shown in FIGURES 1 and 2.

The rotatable spray tube 131 sprays into the inverted cups, glasses, pans and receptacles upon the upper rack 173 located above and onto the plates and dishes located in the lower rack 175 below. The upper rack includes a heavy perimeter wire member 177 extending across the top of and fencing both sides and extending down at the front and back forming the lower heavy cross member. This wire member 177 is provided with numerous longitudinal wire members extending from its front to rear edges. It is humped over the spray tube 131 as shown in FIGURE 1. It is provided with front and rear upper connecting cross members 179 which are horizontally corrugated at the center points to support a movable sub-rack 181. This sub-rack 181 is adapted primarily to support two rows of cups turned in either side direction partly downward so that their interior is directly subject to the spray issuing from the spray tube 131. However, other receptacles may be placed in an inverted position thereon.

In addition, on each side there is provided a pivoted sub-rack 183 and 185 each having a long pivotal connection to the second member of each side of the rack as shown on the right side of FIGURE 1. This sub-rack 185 is adapted to hold glasses or tumblers at the proper angle to receive in their interiors and exteriors a direct spray from the tube 131. The sub-rack 183 may likewise be moved down to this position or it may be turned up to the position shown on the left side of FIGURE 1 for supporting various receptacles in an inverted position so that they may be subject to the direct spray from the tube 131. The exteriors of receptacles also receive the washing action from the spray which is returned or bounces from the upper walls of the dishwashing compartment.

As shown in FIGURES 1 and 5, each side of the upper rack 173 is provided with a guide 187 and 189 of molded high gloss phenolformaldehyde resin. The guides 187 and 189 are T-shaped in cross section with the outer edges being rounded and have a high gloss surface finish to make them slide easily. They are fastened to the horizontal side bars by front and rear clips 191 and 193 which are fastened to the adjacent horizontal connecting bars. The guides 187 and 189 are adapted to slide in the left and right guideways 195 and 197. These guideways 195 and 197 are likewise formed of molded phenolformaldehyde resin with a high gloss finish. These guideways 195 and 197 have raised portions 199 at intervals to reduce the area of sliding contact so that the guides 187 and 189 will slide very smoothly with little effort in the guideways. The guideways 195 and 197 are fastened to the bolts 40 by screws 202 which thread through the guideways into the bolts 40 in a manner shown in FIGURE 5.

At their forward ends, the guideways 195 and 197 are each provided with upper and lower projections 204. These projections serve as catches for engaging the latch members 206 which are located upon opposite sides of the upper rack. The upper ends of the latch members 206 are curled about the heavy wire rod 177 as shown in FIGURES 3 to 5. They are slidably mounted upon the guides 187 and 189 by providing a suitable slot 208 therein which surrounds a projection 210 upon each of the guides 187 and 189. The lower ends of the latch members 206 are bent outwardly to provide an outwardly extending projection 212 at such an elevation that they will engage the catches 204 when the upper rack 173 is pulled forwardly. This prevents accidental removal of the upper rack 173. If it is desired to completely remove the upper rack 173, the rear portion of the bar 177 is depressed so as to lower the latch member 206 in the manner illustrated in FIGURE 6 so that the projecting portion 212 will clear the catch 204 and allow the forward horizontal withdrawal of the upper rack 173.

The upper rack is reinforced by the transverse wire member 214 at the front and rear. The sub-rack 181 is movable to a plurality of lateral locations so that the upper rack may accommodate a wide variety of receptacles, pots and pans. The sub-racks 183 and 185 are also bent so they can better support glasses or cups at various angles to directly receive the solid streams or spray from the spray tube into their interior and exterior.

The lower rack has a heavy wire bar 216 extending completely around its interior. There are forward and backward and transverse horizontal bars 218 and 220 for holding plates transversely of the spray tube 131 but at a slight angle thereto. For this purpose all except the front and rear transverse wire bars are provided with central upwardly projecting loops 222 extending in a row directly below the spray tube 131. In addition, there are the upwardly projecting loops 224 and 226 located in rows on opposite sides of the row 222 excepting for the last bar. This omission makes it possible to skew large plates slightly in the lower tray and also to fit various types of pans therein.

In addition, there extends over the transverse wire bars 220, the horizontal wire bars 219 extending from front to back parallel to the sides of the rods. These bars 219 hold the lower edges of large meat and other types of long platters which are placed along and against the sides of the lower rack 175.

At the front of the rack 175 is the silverware rack 228 which extends transversely. It is provided with nine compartments of uniform size for holding silverware and a larger compartment containing a perforated receptacle 230 for receiving the detergent. This is located on the opposite side of the cabinet from the inlet connection 72. The rear of the rack 228 is provided with a loop 232 which encircles a loop of the transverse bar 234 so that the rack 228 must always be placed in the position shown in FIGURE 3, thereby insuring that the detergent receptacle 230 is always on the side opposite the inlet elbow 72 so that the detergent therein will not be washed into the drain before the washing action begins.

Each side of the rack 175 is provided with two sets of trucks 236 and 238 each provided with two wheels which roll upon the metal tracks 240 and 242 provided upon the side walls 34 and 36. These tracks are placed at the same elevation as assumed by the ledge portion 243 of the front door when the front door is pulled out and down to its horizontal position to open the dishwasher chamber. The door may be provided with a conventional handle and latch arrangement. The wheels of each track are spaced sufficiently so as to bridge the gap between the rails 240 and 242 and the ledge portion 243 of the door 54. This makes it possible to readily pull the lower rack 175 all the way out on the door 54 when the door 54 is open. Likewise the slide and slide-ways of the upper rack allow the upper rack to be pulled out substantially to the position indicated in FIGURES 5 and 6 in which the greater portion thereof is outside the cabinet.

The liquid issuing from the spray tube 131 not only sprays the liquid upon the dishes in the upper and lower racks as well as the silverware in the rack 228 but it also irrigates the detergent container 230 so that the detergent is gradually but quickly washed into the solution for cleansing purposes. All this liquid is collected by the bottom wall and flows into the sump 50 which is provided with the outlet 74.

A sheathed tubular type of electric heater extends around the bottom of the sump 50. This heater 276 is supported by the supports 278 diverging downwardly from the tracks 240 and 242. This heater 276 operates during the entire washing and rinsing periods to keep up the temperature of the liquid circulated and also operates during the drying period to provide warm air for drying the dishes on the upper and lower racks.

The door 54 is arranged to provide an air inlet adjacent its lower edge. To allow the entrance of air without allowing the escape of water from the dishwashing chamber, a transverse vertical metal strip 280 extends across the front of the bottom wall 48 and is sealed thereto by a suitable rubber gasket. The upper edge of the strip 280 is bent forwardly to catch all condensate flowing down to the lower edge of the reinforcing sheet 292 for return to the sump 50. The inner and outer walls 282 and 284 of the door extend downwardly and straddle this strip 280 as shown in FIGURE 2 with sufficient clearance to allow the free ingress of air there-through over the strip 280.

The door 54 is also provided with a transverse reinforcing plate or sheet 292 having its upper edge turned forwardly and sealed by the rubber gasket 294 to the upper rear face of the front wall 282. The sides of this reinforcing sheet are fastened to the side flanges 196 of the door. As better shown in FIGURE 2, this reinforcing sheet 292 also causes any condensed moisture or drops of liquid within the interior of the door 54 to

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flow down behind the forwardly bent strip 280 so as to be returned to the sump 50.

The foregoing construction provides an efficient compact dishwashing machine having a large capacity and is capable of holding and washing effectively all the usual type of dishes and pots and pans used in a domestic kitchen.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claim which follows:

What is claimed is as follows:

A dishwasher including walls enclosing a dishwashing chamber, a dish rack within the chamber having fencing comprising a resilient member extending longitudinally along one side thereof, said dish rack being provided with guides, said walls being provided with guideways for movably supporting the guides of the rack, a releasable latch member mounted in an upright position upon said fencing and connected to and movable relative to said

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rack downwardly with the deflection of said resilient member and extending downwardly therefrom and having a portion extending laterally beneath one of said guideways, and a catch located upon the lower portion of said guideways in the path of movement of said laterally extending portion when said guides move within said guideways.

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