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R. S. BRADEN ET AL

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REACTION SPRAY DISHWASHER HAVING AN IMPROVED WATER FILL SYSTEM

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8 Sheets-Sheet 2

Fig. 2

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Fig. 19

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This invention relates to a domestic appliance and more particularly to a dishwasher having an improved water fill system, water distribution system, drying system and operating cycle. In a dishwasher, it is desirable to keep the components associated with the water distribution system as simple and compact as possible in order to keep the cost of the appliance at a minimum. It is also desirable to effect a thorough distribution of the wash water during a washing cycle so that the dishes or the like being washed are thoroughly scrubbed by high speed jets of washing fluid. It is also desirable in dishwashers wherein the washing spray is directed toward the door for the dishwashing chamber to provide means for assuring that the water distribution will be inoperative when the door is open. Accordingly, it is an object of this invention to provide a dishwasher with an improved water distribution system. A further object of this invention is the provision of a dishwasher with an improved drying system for the dishes washed.

A more specific object of this invention is the provision of a vertically oriented water distribution system for a dishwasher including means for concealing stagnant wash fluids in the dishwasher. A further specific object of this invention is the provision of an improved washing system for a dishwasher utilizing in combination a cocked nozzle means spaced from and in functional cooperation with a universally mounted rotatable and nontuable or wobbly baffle.

A further object of this invention is the provision of an improved water fill system for a dishwasher including an inverted water pressure sensitive housing in control relationship with the water fill valve. Another aspect of this invention is an improved timer controlled operating cycle for a dishwasher including means for rapidly advancing the dishwasher through certain portions of an operating cycle, thereby to obtain other shorter cycles of operation.

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 embodiment of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a front elevation view of the dishwasher of this invention with parts broken away to disclose certain dispensing apparatus for use therewith;

FIGURE 2 is a fragmentary front perspective view of the dishwasher with the dishwasher door removed to illustrate the improved water distribution system of this invention;

FIGURE 3 is a fragmentary sectional view taken generally along the line 3—3 in FIGURE 2 and including the dishwasher door in a closed position as well as components of the dishwasher which are normally disposed within the dishwashing chamber;

FIGURE 4 is a fragmentary sectional view of the dishwasher taken along line 4—4 in FIGURE 3 and partly in elevation to show the operating components in the dishwasher sump;

FIGURE 5 is a top elevation view of the spray tube;

FIGURE 6 is a fragmentary sectional view of the spray tube taken along line 6—6 in FIGURE 5;

FIGURE 7 is a fragmentary sectional view of the spray tube taken along the line 7—7 of FIGURE 5 to illustrate the cocked orientation of the outlet nozzle thereof;

FIGURE 8 is a bottom perspective view of the water deflector;

FIGURE 9 is a bottom elevational view of the water deflector;

FIGURE 10 is a sectional view of the water deflector taken along line 10—10 in FIGURE 9 and including the means for mounting the deflector to the top of the dishwashing chamber for universal movement;

FIGURE 11 is a sectional view of the deflector taken along line 11—11 in FIGURE 9;

FIGURE 12 is a sectional view of the deflector taken along the line 12—12 in FIGURE 9;

FIGURE 13 is a schematic panoramic view of the deflector showing the completely unsymmetrical formation of the deflector pockets;

FIGURE 14 is a fragmentary front sectional view of the dishwasher showing the water fill arrangement therefor and with the fill tube shown outside the dishwasher for clarity;

FIGURE 15 is a fragmentary sectional view, partly in elevation of the drying system of this invention;

FIGURE 16 is a fragmentary front elevational view taken along line 16 in FIGURE 15 and showing the drying air grille;

FIGURE 17 is a fragmentary sectional view taken along line 17—17 in FIGURE 15;

FIGURE 18 is a schematic wiring diagram suitable for use with the dishwasher of this invention; and

FIGURE 19 is a timer cycle chart showing the functional relationships of the timer switches in FIGURE 18 in accordance with the improved operating cycle of this invention.

General

In accordance with this invention and with reference to FIGURE 1, an improved dishwasher 50 is illustrated generally. The dishwasher 50 is comprised of casing means 52 defining a dishwashing chamber 54 closed at the front thereof by a dishwasher door 56 and having at the bottom thereof a depressed sump 58 leading to a pump and motor assembly 60 of the type taught in the commonly assigned copending application, Ser. No. 341,209, filed January 30, 1964. The pump and motor assembly is connected to the sump 58 by means of a novel mounting arrangement taught in the commonly assigned concurrently filed copending application, Ser. No. 403,480. In general, the dishwasher 50 may be adapted with a separate top or wood chopping block 62 when the appliance is portable or for installation under a counter wherein the top 62 would represent a portion of the counter top.

In general, and with reference to FIGURES 2 and 3, the water distribution system includes a revolving spray arm 64 beneath the lower rack 66 and a rotating spray column or spray tube 68 affixed to said spray arm and extending upwardly through a guard portion 70 of the lower rack permits the removal of the lower rack from the dishwashing chamber. The spray tube 68 has a cocked nozzle portion 10 having an outlet 72 aimed through an open passageway 74 formed by a central wire network on an upper dish rack 76. The jet stream from the nozzle 72 is aimed at a rotatable and freely nutating swirl spray impeller or wobble plate water deflector 78 above the upper rack 76. A reversible motor 61 in the pump and motor assembly 60 directly drives an axial flow pump in one direction in accordance with the aforementioned copending application Ser. No. 341,209 to recirculate the water for washing or rinsing, and, when reversed pumps the water to drain. A 1000-watt (115 volt) heater element 80 is periodically energized throughout the operating cycle to provide recovery heat to the wash and rinse.
water and for adding heat to the dishwashing chamber for the drying cycle. A blower fan 82 blows air from a grille 84 substantially in line with the heater 80 for blowing moisture laden air from the dishwashing chamber 54 during the drying cycle through a vent duct 86 in the door 56.

Various dispensers are periodically energized throughout the dishwashing cycle for providing desired washing or rinsing agents at effective points in the operating cycle represented in the timer cycle chart of FIGURE 19. For instance, and with reference to FIGURE 1, a detergent dispenser 92 of the type taught in the patent to Barbucescu et al., 3,126,131, issued March 24, 1964, includes a perforated cover through which detergent is gradually flushed during a first wash and another cover which is energizable for opening to dispense a second quantity of detergent during a second wash. A water conditioner dispenser 94 of the type taught in the copending application, Ser. No. 403,480, filed concurrently herewith and assigned to the same assignee as this invention, automatically dispenses a wetting agent or surfactant into the final rinse cycle. The following components provide for the safe operation of the dishwasher 50. With reference to FIGURES 1 and 18, a door switch 96 stops all washing, rinsing, draining, heating and/or filling operations whenever a door latch 100 is in the unlatched position. So that the switch 96 may not be closed while the dishwasher door 54 is open, the latch 100 may be of the type taught in the patent to Jacobs et al., 3,007,479, issued November 7, 1961. As a guard against flooding, a pressure actuated fill safety switch 102 automatically opens the electrical circuit to a fill valve solenoid 104 in the event the water level in the wash chamber 52 rises above normal level. The switch 102 automatically closes itself when the overfill condition has been eliminated. The motor 61 is protected with an overload protector switch 106 which automatically opens the electrical circuit to the motor windings in the event an overload condition should exist. The protector 106 is self-resetting after several minutes.

Construction

With reference now to FIGURES 2 and 3, the wash tank or dishwashing chamber 54 is comprised of a welded assembly of steel panels 110, 112, 114, 116 and 118 which give a sturdy frame for mounting the other components of the dishwasher thereon. The entire steel assembly is preparatory phosphate treated and prime coat treated to prevent corrosion. The interior surfaces of the dishwashing chamber 54 have a finish coating of blue vinyl organisol to provide a tough durable lasting finish. The panels 110, 112, 114 and 116 define a front opening 120 to the dishwashing chamber in which a seal 122 is positioned for engagement by the top and two sides of the dishwasher door 56. The areas on the outside of the dishwashing chamber which are adjacent to the openings for the tub vent 86 and the fill funnel 128 are also finish coated with blue vinyl organisol. The two panels are held together at the bottom with screws whereas the top of the outer door panel fits under the lower front lip of the escutcheon 144 which extends across the top of the door and includes a substantially coextensive handle or grip 146 just above the latch 100. Absorbent material (not shown) is provided at the areas of the handle 146 where condensation from the door vent assembly 86 may occur, thereby to prevent condensation on the metal parts of the door. Attached to the inner door panel 142 are the door vent assembly 86, detergent dispenser 92, water conditioner dispenser 94, door latch assembly 100 and the door switch operated by latch 96. The door 56 opens downwardly approximately 90° from its vertical closed position and has connected thereeto a counterbalance spring (not shown) which hooks on to the inside end of each of the door hinges 150, 152 (FIGURE 2) in accordance with conventional practice.

The door vent assembly 86 is mounted to the upper left-hand corner of the inner door panel 142. When installed, the door vent extends vertically upwardly between the inner and upper door panels with the air being vented from the dishwashing chamber 54 from under the handle 146 of the control panel escutcheon 144.

In general, the door latch assembly 100 serves the two functions of locking the door 56 shut an operating cycle and of operating the door switch depending on whether the door is open or closed. When the door 56 is open, the switch 96 is opened and operated and when the door is closed and the latch handle is swung to the shut position, a portion of the latch mechanism 100 engages the door switch such that the electrical contacts on the door switch 96 become closed.

A lower front panel 156 is removable for easy access to the motor compartment 158. Sound deadening insulation 160 can be cemented to the back of the door panel as well as to other panels defining the dishwashing operation.

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The upper rack 76 may be used for cups, bowls, glasses, saucers, etc., while the lower rack 66 is adapted for retaining plates, bowls, serving dishes and the silverware basket shown in phantom at 162. The racks are made of heavy gage steel wires which are coated with white vinyl. Each rack has Nylon rollers, such as 166, riveted in place to allow easy movement of the racks in and out of the dishwashing chamber during loading and unloading thereof. The Nylon runners glide on stainless steel guides, such as 168, for the lower rack and extension guides, such as 169, for the upper rack which are screw fastened to the side walls of the wash chamber as at 170 (FIGURE 2). The center front area of the lower rack 66 is arranged to carry the separate silverware basket 162 which includes inverted U-shaped handles 172 at each end thereof for convenience in handling. The basket 162 may be divided into fifteen sections for separating the silverware being washed.

Water distribution system

The water distribution system of this invention for washing and rinsing can best be understood with reference to FIGURES 2 and 3. Note that the lower horizontal spray arm 64 includes a downwardly opening inlet 174 which circumscribes the top of an axial flow pump housing 176 of the pump and motor assembly taught in the aforementioned copending application, Ser. No. 341-209. Above the opening 174, the lower spray arm has a plate 178 attached thereto and including four ports 180 arranged circumferentially thereabout and placing the interior of the spray arm 64 in communication with the interior of the spray tube 68. A square shanked bearing 182 indexes with a square opening of the spray arm plate 178 and is retained at the top of a square groove in the pump and motor assembly 60 by a nut 186. When the pump is operating to supply water to the interior of the spray arm 64 the spray arm will be lifted free of the pump housing 176 in a manner whereby the top of the plate 178 will bear against the flanged top of the bear-
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ing 182, some of the water being pumped entered the interior of the spray tube 68 through the plate ports 180. With water being supplied to the spray arm 64 and with reference to FIGURE 2 the substantially illustrated spray pattern will result. More particularly, the horizontal zone of arm 64 includes reaction ports 190, 192 for causing the arm 64 and the attached spray tube 68 to rotate. Nonreaction type ports 194, 196 and 198 in the spray arm, and nonreaction ports 200, 202, 204 and 206 in the spray tube will provide jets of washing fluid in a spray pattern substantially as shown. Note that the spray tube 68 is formed with an elongated or bulbous housing portion 208 at the top thereof in which the ports 202, 204 and 206 are positioned. Moreover and with reference to FIGURES 5, 6 and 7, the housing 208 is formed in a central portion thereof with a nozzle means 210 cocked at an angle to the vertical axis of the spray tube 68 and aimed through the guard 74 in the top rack 76 at the rotatable water baffle or deflector 78 on the top wall 114 of the dishwasher. As the spray tube rotates, the jet of water issuing from the outlet 72 of the nozzles 210 will trace a path around the deflector and spaced from the center thereof.

Deflector 78 and the mounting thereof comprise an important part of this invention and will be described more particularly with reference to FIGURES 8-13. The deflector 78 is a round molded plastic part having a bearing 216 press fit in the center thereof and including a plurality of completely differently shaped concave pockets 218, 220, 222, 224, 226 and 228. The shape of the deflector 78 leaves a cavity 230 between the top wall 114 of the dishwashing chamber and the deflector and for this reason weep holes 232, 234 are left in the casting to drain any water which gets trapped above the deflector. FIGURE 13 schematically emphasizes the complete lack of symmetry between the pockets. Thus, the spray pattern issuing from the peripheral edges of each of the pockets is different.

The novel spray pattern of this invention is particularly enhanced by a novel mounting arrangement of the deflector 78, a wobby mounting which is completely lacking in the prior art dishwashers. More particularly and with reference to FIGURE 10, the deflector 78 is carried on an adapter 236 fastened as at 238 to the top wall of the dishwashing chamber. The adapter 236 has a reduced diameter spindle section 240 which is smaller than the interior diameter of the bearing 216 so that the deflector 78 can rock, wobble or undulate on the spindle 240 in response to the impingement thereon of the jet of water from the cocked nozzle outlet 72. This combination of undulation or non-uniform wobbling plus completely variable swirl inducing pockets creates a spray pattern which is substantially non-repeatable.

Now returning to FIGURE 2, the lower spray arm 64 is shown to include the reaction ports 190 and 192 which effect the rotation of the spray arm and the spray tube attached thereto as well as providing an oblique spray directed toward the bottom of the lower rack 66. Further, the vertically directed ports 194, 196 and 198 of the lower spray arm direct their jets of washing fluids directly upwardly into the bottom of the lower rack 66 while the port 200 in the spray tube essentially supplies water from a point within the center of the lower rack. The top of the spray tube 68 is positioned between the upper and lower racks in a manner whereby the spray port 202 sprays water and hot water 204 while the ports 204 and 206 spray upwardly and outwardly on the upper rack 76. The top of the upper rack 76 is completely washed by the spray pattern created by the jet of water from the cocked nozzle 210 aimed through the guard 74 toward the universally mounted water deflector 78 which undulates between a representative solid line position A to phantom line position B (FIGURE 2).

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Operation

The operation of the dishwasher will best be understood with reference to FIGURES 18 and 19. The door interlock switch 96 is a single pole, single throw type which controls power supply to all of the electrically operated components of the dishwasher. The internal contacts of the switch 96 are spring loaded so that the contacts open as the force on the switch actuator is removed when the latch mechanism 100 is moved into an unlatched position.

A timer 250 programs the sequence of operation for all dishwashing cycles. Its automatic advance is actuated by an electric timer motor 252 which, through an escapement mechanism, sequentially operates a plurality of timer switches by means of a cam actuated timer shaft 254—the motor 252 incrementally advancing the cycle in sixty-second intervals.

Occasionally, it is desired to advance the dishwasher through certain of its functions while retaining other functions. For this purpose, an additional rapid advance timer motor 256 cooperates with the cam shaft 254 to advance the shaft at a rate of three seconds for each increment of regular advancement. In other words, during normal automatic timer advance, each incremental advancement takes sixty seconds, while on rapid advancement the incremental advancement takes place every three seconds. Irrespective of which motor 252 or 256 is driving the cam shaft 254, the timer contacts 2-4, 6, 8-18 and 20-24 will be opened and closed in accordance with the timer cycle chart of FIGURE 19.

Although FIGURE 19 is representative of the switch operation in the timer, the following sequence notes apply to the design of the timer 250. At timer increment or impulse line 1, contact 18 must open before contact 9 closes. At timer interval line 2, contact 15 must close before contact 13 opens. At timer interval line 10, contact 9 must open before contact 8 closes. The timer interval lines 60, contact 15 must open before contact 17 closes, but contact 17 must close before contact 16 opens at timer interval line 1. Also at timer interval line 60, contact 16 must close. In accordance with the rapid advance concepts embodied in the dishwashing timer of this invention, the timer must stop at timer interval lines 11 and 58 following rapid advance through contacts 20 or 22. Further, the timer must stop at timer interval line 11 following rapid advance through contact 24.

A push button user's control 260 is provided for selecting a particular cycle for the dishwasher. More particularly, the cycles are identified as regular wash 262 (Regular Wash), 264 (Light Wash), 266 (Pots and Pans), 268 (Rinse and Hold), 270 (Cancel for those situations where you want to cancel any of the previous push buttons selected) and a signal light 272 which indicates whether or not the dishwasher is in operation. The push button cycle selector 260 includes a switch 274 which is closed momentarily to energize a holding coil 276 whenever any of the push buttons 262, 264, or 268 are pushed. A switch 278 is closed whenever the push button 264 is selected; a switch 280 is closed whenever the push button 268 is selected; a switch 282 is closed whenever the push button 270 is selected; and a rapid advance, each incremental advancement takes place every three seconds.

With the foregoing circuitry, the fill valve 104 is electrically operated to a predetermined level in the dishwashing chamber for any wash or rinse cycle. During the two minutes of flow, a flow washer in the valve 138 will allow 2.7 gallons of water into the sump 58 of the washer. When the water reaches a proper level 292 in the sump, a water level 294 will exist in the inverted pressure sensing housing 296 which creates a pressure within the housing which is reflected at the pressure switch 182 for deenergizing the
solenoid 104. In the event of an over charge of water in the sump, a fill safety switch 102 will operate to open the circuit of the solenoid 104, thereby stopping the flow of additional water. Interconnecting the pressure switch 100 and the inverted housing 296 is a rubber hose 298 routed in loop fashion along the side of the dishwasher sump. The housing 296 extending into a recess 300 in the side of the sump 58 acts as a cavity area to trap air. When the water level rises high enough to create 2.6 inches water column pressure (about four gallons), the pressure is transmitted through the rubber hose 298 to the pressure sensitive diaphragm 300 of the fill safety switch for opening the contacts thereof. When the water level is reduced to a level whereby only .4 inch of water column air pressure (minimum) is sensed by the diaphragm of the fill safety switch (about three gallons), the diaphragm allows the pressure switch to again close, thus allowing the fill valve to become energized for successive fill cycles.

Whenever the pump motor 61 is started through the energization of the relay coil 310, water will be pumped through the pump outlet 176 into the interior of the lower spray port 64. The force of the water against the under side of the plate 178 will lift the spring arm off the pump housing, the relative shifting of adjacent wall portions self cleaning away any debris which might exist in the opening 174 between the spray arm 64 and the pump housing 176 which could bind up the spray arm. Then the reaction effect of the water spray from ports 190 and 192 will cause the water distributing means, including the spray arm 64 and the spray tube 68, to rotate. Water pressure will fill the interior of the spray arm 64 and the spray tube 68 substantially equally throughout so that a dish covering spray will issue from the spray arm ports 194, 196 and 198 directed upwardly over the dishes in the bottom rack 66. This is in addition to the spray cleaning force of the spray from the reaction ports 190 and 192. At the same time, a spray jet issuing from the port 200 on the spray tube will be directed toward the dishes in a lower rack from a more central position. The spray pattern afforded by the housing 208 on the top of the spray tube will spray down on the dishes in the lower rack from the spray port 202 and will spray upwardly on the bottom of the upper rack 76 by means of spray ports 204 and 206. In order to spray the dishes in the upper rack from above, the cocked nozzle outlet 72 is aimed toward a radial button at the axis of the deflector 78. As the jet traces a circular path around the axis of the deflector 78, the force of the jet will cause the deflector to rotate as well as wobble due to the sloppy fit of the pivot pin 240 in the deflector. As the deflector wobbles or nutates in response to the action of the jet, the spray will be returned to the top of the upper dish rack 76 in an ever changing nonrepeatable spray pattern.

As aforesaid, the inlet 174 of the spray arm 64 loosely overfits the top of the pumping housing. Thus, a cylindrical curtain of water issues downwardly from this annular slot. If the curtain of water were allowed to persist, the water flowing toward the inlet to the pump would be retarded by the force of the water curtain and the pump would tend to be starved for water. For this reason, a deflector or sump water cover 312 is carried on a shoulder 314 of the pump outlet to deflect the curtain of water coming out of the space between the spray arm inlet and the pump housing. The deflecting means 312 may have flow straighteners 316 therein and a cutout portion 318 for retrieving any lost items which may get under the cover 312. Note that the cover is slidable rotatable on the shoulder 314 of the pump housing, but note further that the solid portion of the cover is intended to face the opening to the dishwashing chamber as a means for concealing any stagnant water which may exist in the dishwasher sump.

After a plurality of wash and rinse cycles in the dish-

washing chamber, the soiled water is pumped from the dishwashing chamber and the fan motor energized at the timer interval line 42 to initiate a drying cycle which forces air from the inlet grille 84 at the bottom of the dishwashing chamber over the energized heater 80—the exhaust of the heated air and steam occurring by means of the front vent 86 in the dishwasher door.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. A dishwasher comprising a dishwashing chamber having a sump, means for supplying water to said sump including a pressure sensitive means in said sump for controlling the supply of said water, means for concealing the water in said sump, and means for distributing said water in said chamber for washing dishes or the like, said distributing means including rotatable horizontal spray arm means having an inlet opening overlying said water concealing means and a spray port facing upwardly in said chamber, a vertical spray tube attached to said spray arm for rotation therewith and extending upwardly to a central part of said chamber, said spray tube including a spring arm connected to said spray arm and in communication with the inlet thereof, said column having a spray port in a lower portion of the side thereof facing downwardly and having a bulbous hollow spray header on the top thereof having a spray port in the bottom thereof facing downwardly and three ports in the top thereof facing upwardly and outwardly, one of said ports comprising a nozzle having an axis at an angle to the axis of said hollow column, deflector means on the top of said chamber having a plurality of downwardly facing pockets at least one of which is in alignment with the axis of said nozzle and configured reactively to rotate said deflector spray arm around the impingement thereon of a jet of water from said nozzle, and means for rotatably and universally supporting said deflector means whereby said deflector means wobbles as it rotates in response to said jet.

2. The combination of claim 1 wherein said pressure sensitive means includes an inverted housing means in said sump having a bottom opening in communication with said sump, the water level in said housing means above said bottom opening being lower than the water level in said sump and rising and falling in response to the water level in said sump.

3. The combination of claim 1 including a vertically oriented pump outlet means extending into the inlet of said horizontal spray arm means and including a spindle forjournaling said water distributing means when water is being supplied through said pump outlet means, said pump outlet means being spaced from the edges of said inlet to permit limited vertical movement of said spray arm means, the concealing means for said sump water having means in vertical alignment with the space between said pump outlet means and said spray arm inlet to deflect water issuing from said space when water is being supplied through said pump outlet.

4. A machine for dishwashing comprising a dishwashing chamber having a sump adapted to contain water and means in communication with said sump for distributing said water in said chamber for washing dishes or the like, said distributing means including rotatable horizontal spray arm means having an inlet opening facing downwardly and a spray port facing upwardly in said chamber, a vertical spray tube attached to said spray arm for rotation therewith and extending upwardly to a central part of said chamber, said spray tube including a hollow column connected to said spray arm and in communication with the inlet thereof, said column having a spray port in a lower portion of the side thereof facing inwardly and having a hollow spray header on the top thereof with a spray port in the bottom thereof facing down
wardly and a port in the top thereof facing upwardly and outwardly, said last named port comprising a nozzle having an axis at an angle to the axis of said hollow column, deflector means above said nozzle having a plurality of downwardly facing pockets at least one of which is in alignment with the axis of said nozzle and configured reactively to rotate said deflector means in response to the impingement thereon of a jet of water distributed from said nozzle, and means for rotatably and universally supporting said deflector means whereby said deflector means wobbles as it rotates in response to said jet.

5. The combination of claim 4 wherein said water distributing means includes a vertically oriented pump outlet means extending into the inlet of said horizontal spray arm means and including a spindle for journaling said water distributing means when water is being supplied through said pump outlet means, said pump outlet means being spaced from said inlet to permit limited vertical movement of said spray arm means.

6. The combination of claim 4 including a cover for concealing water in said sump and wherein said water distributing means includes a vertically oriented pump outlet means extending into the inlet of said horizontal spray arm means above said cover and including means for journaling said water distributing means when water is being supplied through said pump outlet means, said pump outlet means being spaced from said inlet to permit limited vertical movement of said spray arm means, said cover for concealing said sump water having means in vertical alignment with the space between said pump outlet means and said spray arm inlet to deflect water issuing from said space when water is being supplied through said pump outlet.

7. In combination with means forming a water distributing chamber, means for supplying water to said chamber, and means for controlling the supply means, said control means including a pressure sensitive means in said chamber comprising an inverted housing means having a downwardly facing lower opening in said chamber and configured in a manner to trap air in an upper portion thereof, the pressure of the air trapped in said inverted housing varying in response to the level of water in said chamber, the level of water in said housing means being different than the level of water in said chamber.

8. In combination, casing means defining a chamber having a sump adapted to contain water or the like and means in communication with said sump for distributing said water or the like in said chamber for washing dishes or the like, said distributing means including spray means rotatable about an axis in said chamber and having a spray port, said spray port comprising a nozzle having an axis at an angle to the axis of said spray means, deflector means having a pocket facing said nozzle and in alignment with the axis of said nozzle and configured reactively to rotate said deflector means in response to the impingement thereon of a jet of water distributed from said nozzle, and means for rotatably and universally supporting said deflector means whereby said deflector means wobbles as it rotates in response to said jet.

9. In combination with a dishwashing chamber having a sump in the bottom thereof adapted to contain a washing fluid, vertically oriented pump means having housing means extending into said sump, said housing means having upper and lower portions, spray arm means rotatably mounted relative to said upper portion a spaced distance therefrom for freely rotating to distribute said washing fluid in said chamber and forming with said upper portion by the spaced distance an opening in communication with washing fluid being distributed from said upper portion of said pump housing means, and cover means on said pump means between said upper and lower portions for concealing stagnant washing fluid in said sump when said washing fluid is not being distributed and aligned with said opening for diverting washing fluid issuing from said opening when said washing fluid is being distributed for preventing said lower portion of said pump housing means from being starved for washing fluid.

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