Aug. 7, 1951 J. T. P. LE GORE 2,563,652

DETERGENT SUPPLYING MEANS FOR DISH WASHING MACHINES

Filed Feb. 5, 1947 4 Sheets-Sheet 1

Fig. 1.

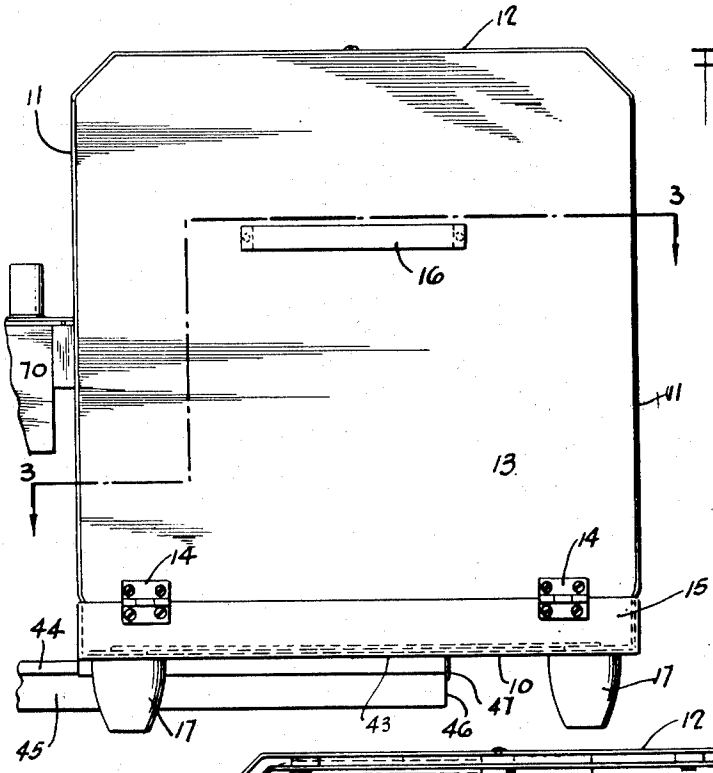
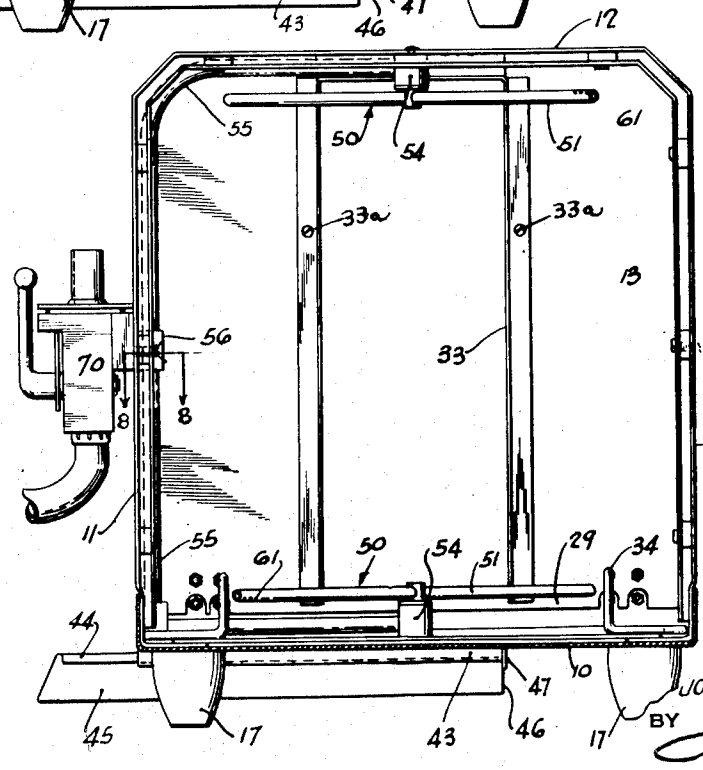


Fig. 2.



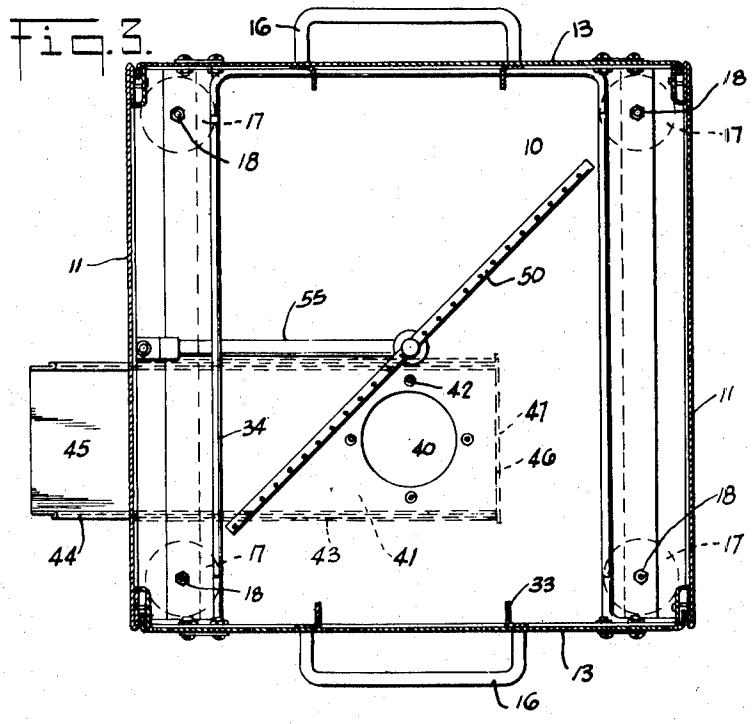
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Fig. 3.



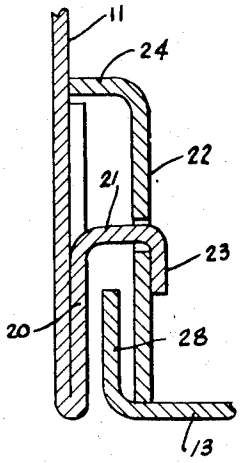
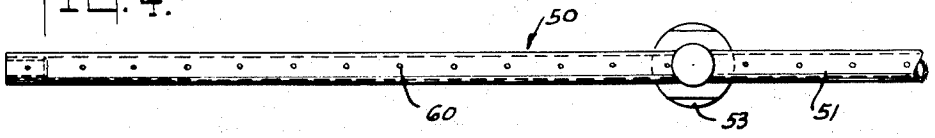


Fig. 8.

Fig. 4.



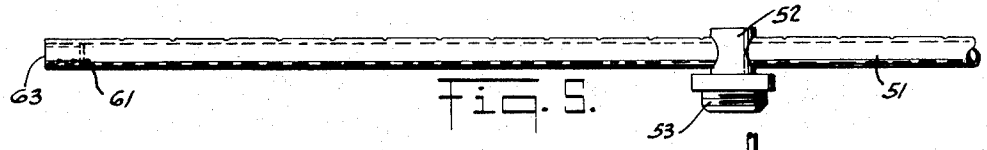
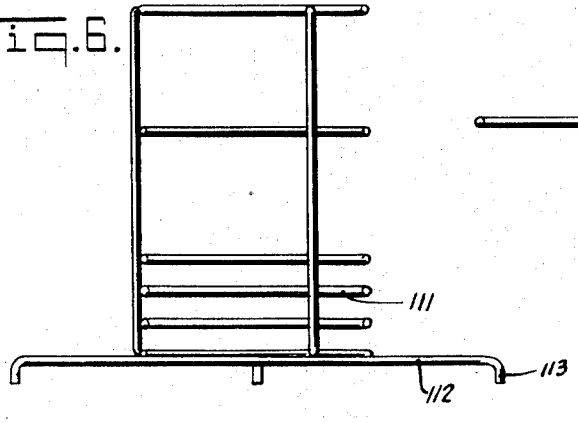


Fig. 5.

Fig. 6.



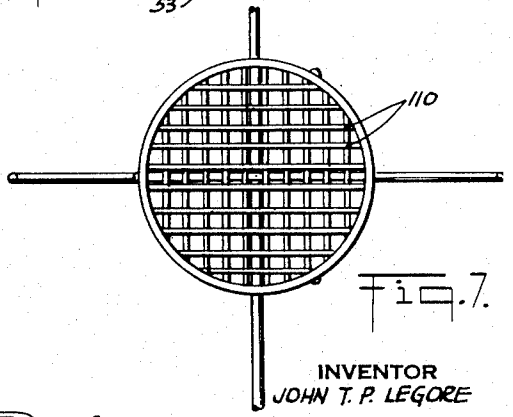


Fig. 7.

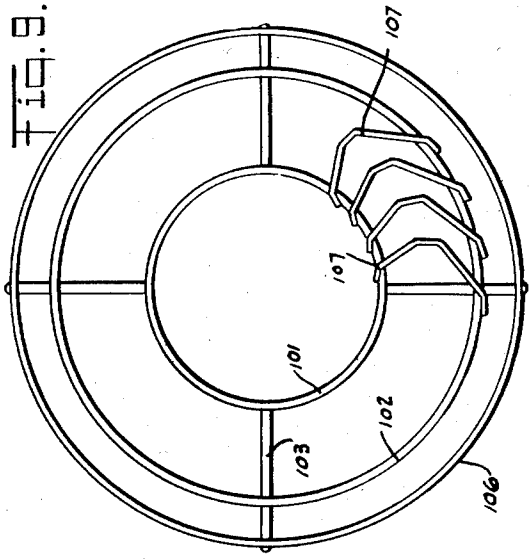
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DETERGENT SUPPLYING MEANS FOR DISH WASHING MACHINES

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Fig. 9.



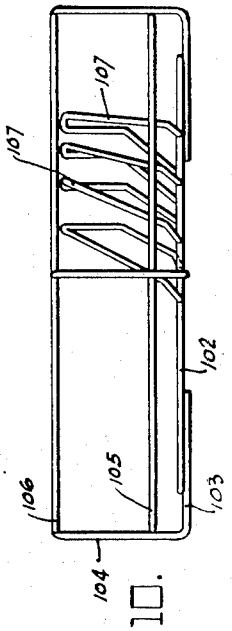


Fig. 10.

Fig. 11.

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Fig. 12.

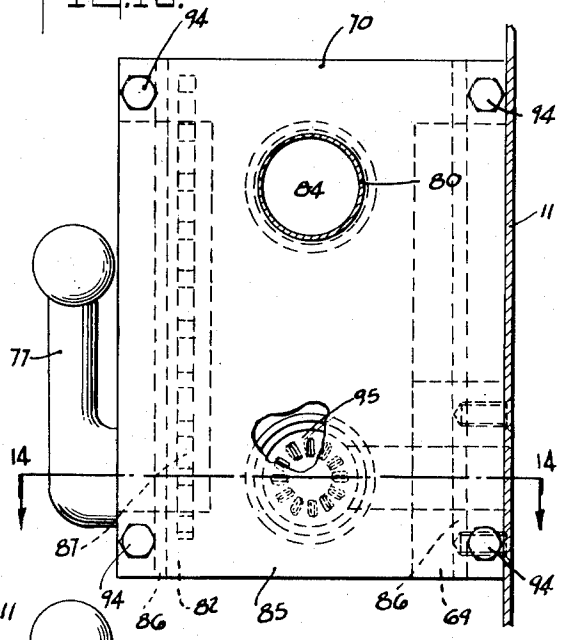
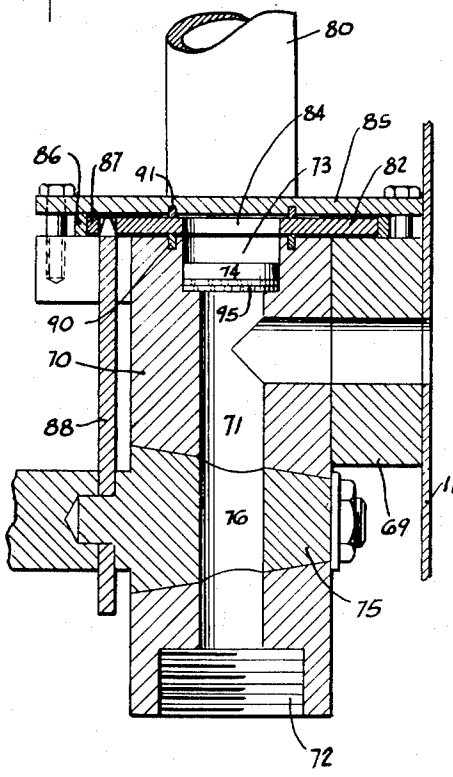


Fig. 14.



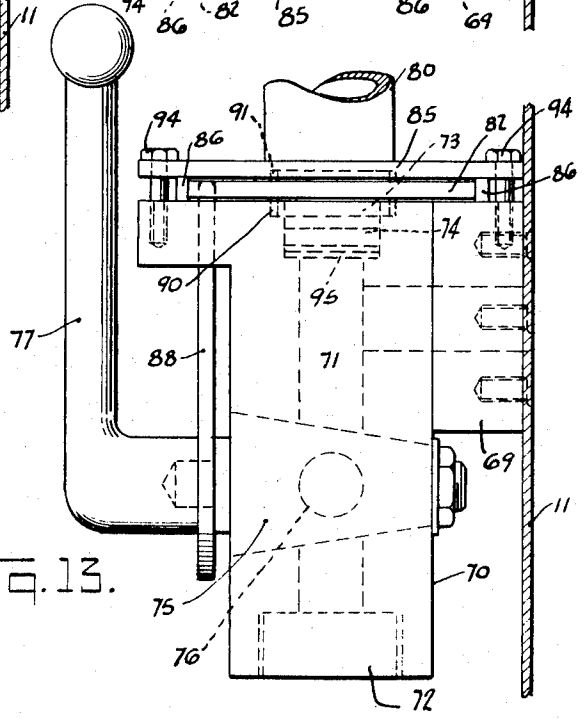


Fig. 13.

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UNITED STATES PATENT OFFICE

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DETERGENT-SUPPLYING MEANS FOR DISH WASHING MACHINES

John T. P. Le Gore, Hingham, Mass.

Application February 5, 1947, Serial No. 726,707

3 Claims. (Cl. 299—84)

1

This invention relates to dishwashing machines and more particularly to a portable dishwashing machine which is adapted to be placed on a kitchen sink or drainboard and attached to the hot water faucet of the sink.

An object of the invention is to provide a device of the above type having novel and improved details of construction and features of operation.

Another object of the invention is to provide a device of the above type using detergent pellets and having improved feed means therefor.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

In accordance with the present invention the dishwashing machine comprises a cabinet having doors on opposite sides through which the dish rack may be inserted. The edges of the doors and the corresponding portions of the cabinet are provided with interlocking tongue and groove seals which prevent leakage without interfering with the free opening of the doors. A downwardly extending flange on the door provides a shield for the hinge line. Hence the necessity for rubber or other compressible sealing means is avoided.

The cabinet cointains upper and lower spinners of the reaction jet type having spray openings positioned to direct a water spray onto the dishes to be cleaned. The pressure of the water is thus utilized for actuating the spinners as well as for providing the washing spray.

In accordance with one feature of the present invention detergent pellets are used for providing the necessary cleansing action, and means are incorporated in the machine for automatically feeding one pellet into the path of the wash water when the control valve is opened. The pellet is of such size that it will be completely dissolved by the time the washing action has been completed and the flow of the hot water is continued after the pellet is dissolved for rinsing the dishes in clear water. The device accordingly provides for automatically washing and then rinsing without manual attention.

Although the novel features which are characteristic of this invention are pointed out more particularly in the claims, the nature of the invention will be better understood by referring to the following description taken in connection with the accompanying drawings in which a specific embodiment thereof has been set forth for purposes of illustration.

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In the drawings:

Fig. 1 is a front elevation of a dishwashing machine embodying the present invention showing the door closed;

Fig. 2 is a front elevation of the machine partly in section with the door removed to show the interior;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged plan view of the spinner;

Fig. 5 is an enlarged elevation of the spinner;

Fig. 6 is a side elevation of the rack for supporting silverware to be washed;

Fig. 7 is a top plan view thereof;

Fig. 8 is an enlarged section taken on the line 8—8 of Fig. 2 showing the interlocked tongue and groove for sealing the edge of the door;

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

Fig. 10 is a side elevation thereof;

Fig. 11 is a side elevation of the washing machine cabinet with one door open;

Fig. 12 is a plan view of the pellet feed and control valve;

Fig. 13 is a front elevation thereof; and

Fig. 14 is a vertical section taken on the line 14—14 of Fig. 12.

Referring to the drawings more in detail the cabinet is shown as comprising a bottom member 10, sides 11 and top 12. The ends are closed by doors 13 which are attached by hinges 14 to a bottom closure strip 15 and are provided with handles 16. The doors 13 are provided at each end of the machine so that the dish rack may be inserted from either side, thereby avoiding the necessity for making the machine in left and right hand models. The machine is supported on page 17 which are attached to the bottom 10 by suitable means indicated as bolts 18. It will be noted that the upper corners are bevelled, thereby imparting additional rigidity to the structure.

As shown more in detail in Fig. 8 the edges of the side members 11 are bent over to provide a strengthening flange 20 from which positioning lugs 21 are struck. A flange 22 is positioned over the lugs 21 and is secured by tongues 23 formed on the ends of the lugs 21 which are bent over for locking the flange 22 in place. The flange 22 is provided with a lip 24 at the rear which extends around the end of the flange 20 into contact with the side member 11. The flanges 20 and 22 are spaced by the lugs 21 to provide a channel therebetween in which an inturned flange 28 formed on the edge of the door 13 extends for providing a water seal. The flanges 20 and 22 and the flange 28 extend completely

around the door opening except for the bottom where the door is hinged. Along the bottom edge the door is provided with a flange 29 which extends over the hinge line and shields the same from the spray within the casing. The doors 13 are provided with arcuate brackets 30 (Fig. 11) which extend through slots 31 formed in the lip 24 of the flange 22 and are provided at their inner ends with ears 32 which engage the back of the lip 24 to provide a stop to hold the door in horizontal position when open.

The door is provided with a pair of rails 33 which may be secured by the door handle screws 33a (Fig. 2) and, when the door is open, are the same height as wire runners 34 which are formed as a wire loop and are removably secured within the cabinet to carry the dish rack. The runners 34 may be frictionally secured in the cabinet and may be readily removed for cleaning. The rails 33 and runners 34 provide means for resting the dish rack on the open door and sliding the same easily into the cabinet. The runners support the rack above the lower spinner to be described.

The bottom 10 is provided with a drain opening 40 (Fig. 3) beneath which a plate 41 (Figs. 3 and 11) is attached by screws 42. The screws 42 are equally spaced around the drain opening 40 so that the plate 41 may be attached to extend toward any of the four sides of the cabinet. The plate 41 is provided with side rails 43 (Figs. 1, 2 and 11) forming a track in which flanges 44 of a drain trough 45 slide. The drain trough 45 is provided with a closed end 46 which engages a flange 47 on the plate 41 to position the trough. The trough 45 is thus made removable so that it may be readily cleaned and may also be extended or retracted according to the overhang required.

Top and bottom spinners 50 (Figs. 2, 4 and 5) comprise hollow arms 51 carried in heads 52 which are mounted to rotate on coupling members 53 which are attached to sockets 54 on the ends of pipes 55. The pipes 55 extend around the side of the cabinet and are attached to a coupling 56 which extends through the side wall 11. The coupling members 53 are arranged to screw into the sockets 54 so that the spinners 50 may be readily removed. The arms 51 are provided with a plurality of spray openings 60 which are adapted to spray wash water onto the articles within the cabinet. As shown in Fig. 4 the openings 60 on the two sides of the axis of rotation of the spinners are staggered in a radial direction so that the spray circles produced as the spinners rotate are interleaved, thereby producing a more uniform spray coverage. At their ends the spinners 50 are provided with reaction openings 61 through which a reaction jet is discharged for causing the spinners to rotate. A plurality of reaction openings 61 may be provided at different radial distances from the ends of the spinners and a stud 63 may be threaded into the end of the spinners to seal the same and to close off the desired number of the openings 62, thereby providing means for adjusting the number of reaction jets used in any particular installation. Such adjustment is provided in order to adapt the device for use with water of different pressures encountered in the various domestic installations. It is to be noted that the reaction jet openings 62 are disposed below the center line of the spinners as seen in Fig. 4 so that the water is discharged in a downwardly inclined direction in the case of the lower spinner and in an upwardly inclined direction in the case of the upper spinner. The arrangement is such that the reaction jets on the bottom spinner hit the casing below the hinge line, thereby eliminating the possibility of the water being forced through the hinge opening to the outside of the cabinet.

The coupling member 56 communicates through a bushing 69 with a vertical passage 71 in a valve housing 70 which is attached to the outside of the side wall 11 of the cabinet. The vertical passage 71 terminates at the bottom of the housing 70 in a port 72 to which a hose (not shown) may be attached for connection to the hot water faucet of the sink. The upper end of the passage 71 is formed with a chamber 73 which is adapted to receive a pellet 74 of suitable detergent material. A tapered valve 75 is journaled in the housing 70 and is provided with a passage 76 which controls the flow of water from the port 72 through the passage 71 to the pellet chamber 73. A handle 77 is attached to the valve 75 to control the operation thereof. A stack 80 is attached to the housing 70 and is positioned at one side of the passage 71. A slide 82 extends horizontally beneath the stack 80 and over the chamber 73. The slide 82 is provided with an opening 84 which is adapted to be shifted by movement of the slide from beneath the stack 80 to a position above the chamber 73. The slide 82 slides between side guides 86, top plate 85, and the top surface of the housing 70 and carries near one edge a rack 87. A segmental gear 88 attached to the valve 75 meshes with the rack 87 and is positioned to impart a feeding stroke to the slide 82 when the valve 75 is turned from a closed to an open position and to retract the slide 82 when the valve 75 is closed. In this way a single pellet is fed from the stack 80 to the chamber 73 each time the valve 75 is opened. Gaskets 90 and 91 are mounted in the housing 70 and in the top plate 85 which is attached to the housing 70 by bolts 94. The gaskets 90 and 91 seal the chamber 73 and prevent escape of liquid therefrom and also wipe the surfaces of the slide 84 to prevent moisture from being transferred to the pellet received from the stack 80 when the slide is retracted. A spring may also be provided to push the pellet from the slide 84 into the chamber 73 if required. A shield 95 having adjustable openings is positioned in the recess 73 to control the amount of water which contacts with the pellet 74. This shield comprises a pair of discs which may be adjusted in accordance with the temperature and pressure of the water where the device is installed.

Obviously other linkages may be provided for connecting the handle 77 to actuate the slide 82. A rack and gear has been shown merely as illustrative. Also the automatic feed feature may be omitted and the pellets placed in the chamber 73 manually if desired.

The dishes to be cleaned are stacked in a rack of the type shown in Figs. 9 and 10. This rack comprises a frame having bottom ring members 101 and 102 secured by radial wires 103. The wires 103 project beyond the ring member 102 and are formed with vertical extensions 104 to which ring members 105 and 106 are attached. Dish supports 107 are attached to the ring members 101 and 102. The members 107 constitute wire guides of substantially inverted U-shape which are inclined to the vertical and to the radius of the frame so that the dishes which are

held between the guides 107 are inclined both vertically and radially thereby facilitating the contact of the spray from the spinners 50 with all parts of the dishes.

For washing table silver a basket, as shown in Figs. 6 and 7, may be used. This basket comprises crossed wires forming a mesh bottom 110 and a mesh side wall 111, designed so that table silver may stand in the basket. At the bottom the basket is provided with radial supporting wires 112 having depending ears 113 at their ends which are adapted to rest upon the ring member 101 of the dish rack. In this way the silver basket may be used or removed as desired and when used permits the silver and dishes to be washed simultaneously.

In the operation of this device a stack of detergent pellets is placed in the stack 80. Such pellets may comprise any suitable detergent such as a soap composition or washing compound such as hexametaphosphate, trisodium chloride, or the like. Such pellets are made in solid form and are of a size such that they will normally be dissolved under washing conditions in from 45 seconds to 1 minute. With the handle in a position to close the valve 75, the slide 82 is positioned to bring the opening 84 beneath the stack 80. It is to be understood of course that the slide is of a thickness such that only one pellet is received from the stack at a time. When the handle 77 is turned to open the valve 76 the slide is actuated by the rack 87 and segmental gear 88 to feed the pellet into the chamber 73. The pellet is thus brought into the path of the water which is supplied through the valve 75 to the pipes 55 and spinners 50.

The dishes are stacked in the dish rack shown in Figs. 9 and 10 and with the door 13 in open position, as shown in Fig. 11, the tray is rested upon the rails 33, and is then slid into the cabinet to rest upon the runners 34. The door 13 is then closed and the valve 75 opened as above mentioned. Hot water under pressure is thus supplied to the spinners 50 and is discharged through the spray openings 60 and the reaction openings 61. The reaction jets cause the spinners to rotate and to bring the spray from the openings 60 into contact with all parts of the articles being washed. The water from the faucet to which the device is attached contacts the pellet 74 in the chamber 73 and dissolves the same, thereby imparting detergent properties to the water so that the dishes are washed with a detergent action. The adjustment of the shield is such that the pellet dissolves in 45 seconds to 1 minute, after which the continued flow of water rinses the dishes in clear water.

The number of reaction jets 61 which are exposed may be adjusted in accordance with the water pressure in the particular installation so that the spinners 50 are driven at a proper rate for producing the necessary cleaning and rinsing action.

After the dishes have been completely washed and rinsed as above stated, the valve 75 is closed, thereby shutting off the water and returning the slide 82 to its original position. The doors 13 may then be opened and the dishes removed. If it is desired to shut off the water temporarily without feeding a new pellet to the chamber 73 when the valve is again opened, the handle 77 is moved to an intermediate position to close the valve without bringing the opening 84 in the slide 82 beneath the stack 80. The water may then be again turned on by the valve 75 without feeding a new pellet to the chamber 73.

It will be noted that the interlocked tongue and groove construction above described prevents leakage around the door openings and the bottom flange 29 on the doors protects the hinge line against leakage. Hence special fastening or sealing means which would interfere with the free closing and opening of the door are obviated.

With the cabinet placed upon the sink drainboard the drain water is removed from the drain opening 40 through the trough 45 which, as above stated, may be positioned to extend to any of the four sides of the cabinet so as to conform to the position of the drainboard in the particular installation.

The drain trough may be arranged to be extended beyond the side of the cabinet as required and may be slidably retracted in the guide rails. Obviously the cabinet may be placed on a movable table as required or may be permanently installed in a suitable housing and connected to the water main independently of the sink faucets.

Although a specific embodiment of the invention has been shown, it is to be understood that the invention is capable of various uses and that changes and modifications may be made therein as will be readily apparent to a person skilled in the art. The invention is only to be restricted in accordance with the scope of the following claims.

What is claimed is:

1. A dish washing machine comprising a spray nozzle, a water supply duct connected to feed wash water to said nozzle, a chamber communicating with said duct to receive said wash water therefrom on its path to said nozzle, said chamber having means to hold a detergent pellet in contact with said wash water, a valve in said duct, a pellet receiver, means successively feeding pellets from said receiver to said chamber, control means for said valve, and means actuated by said control means to actuate said feed means simultaneously therewith.

2. A dish washing machine comprising a spray nozzle, a water supply duct connected to feed wash water to said nozzle, a chamber communicating with said duct to receive said wash water therefrom on its path to said nozzle, said chamber having means to hold a detergent pellet in contact with said wash water, a pellet receiver displaced from said chamber, a slide having means feeding said pellets singly from said receiver to said chamber, a rack on said slide, a rotary valve in said duct having a central shaft and a segmental gear on said shaft to actuate said rack so as to feed said pellets simultaneously with the opening of said valve.

3. A dish washing machine comprising a spray nozzle, a water supply duct connected to feed wash water to said nozzle, a chamber communicating with said duct to receive said wash water therefrom on its path to said nozzle, said chamber having means to hold a detergent pellet in contact with said wash water, a pellet receiver displaced from said chamber, a slide having means feeding said pellets singly from said receiver to said chamber, a valve in said duct having an actuating shaft, and means actuated by said shaft to actuate said slide so as to feed said pellets simultaneously with the opening of said valve.

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