June 21, 1960 G. J. FEDERIGHI ET AL 2,941,725

APPARATUS FOR INJECTING DRYING AGENT INTO RINSE SPRAY OF DISHWASHING MACHINE

Filed Feb. 18, 1958 4 Sheets-Sheet 1

FIG. 1

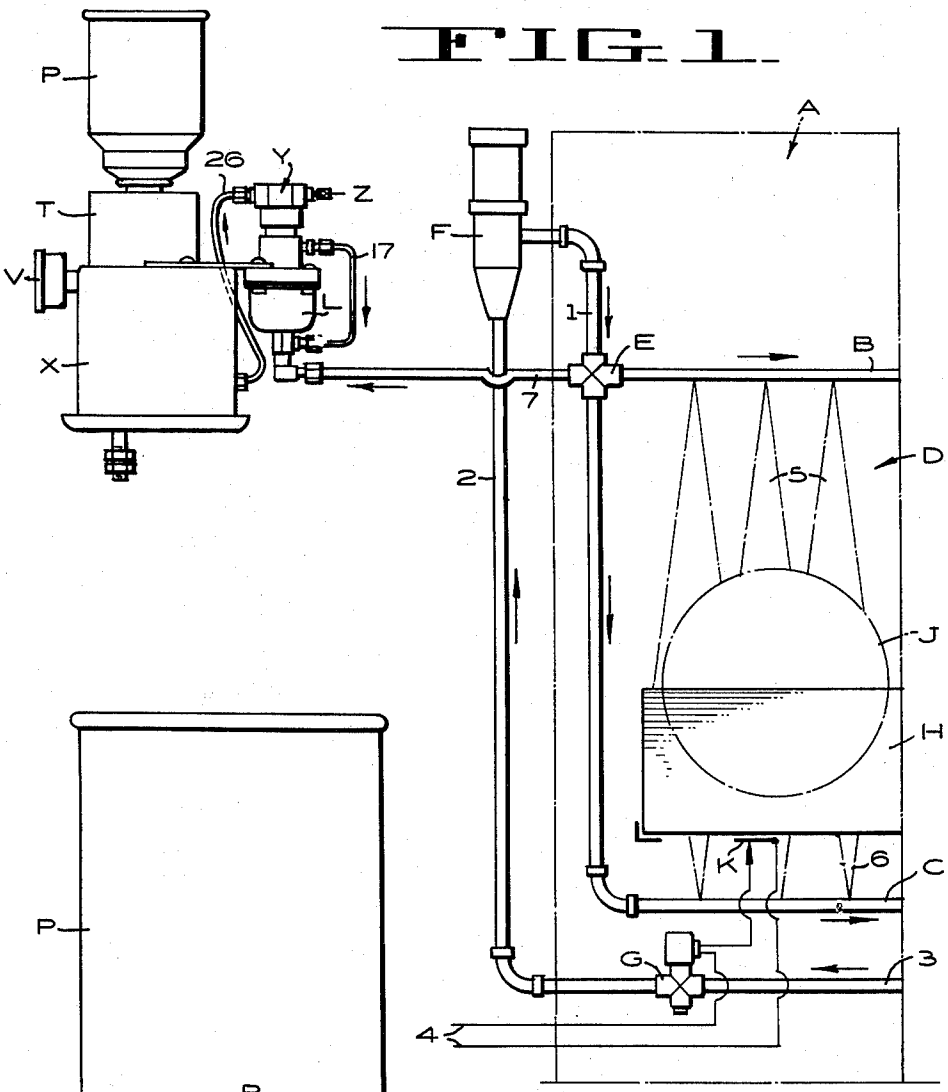


FIG. 2

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Filed Feb. 18, 1958 4 Sheets-Sheet 2

FIG. 3

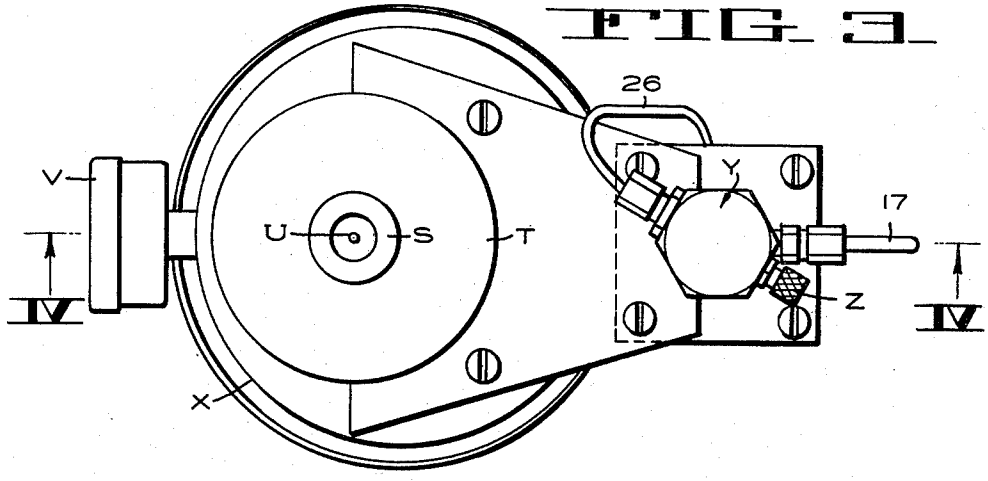


FIG. 4

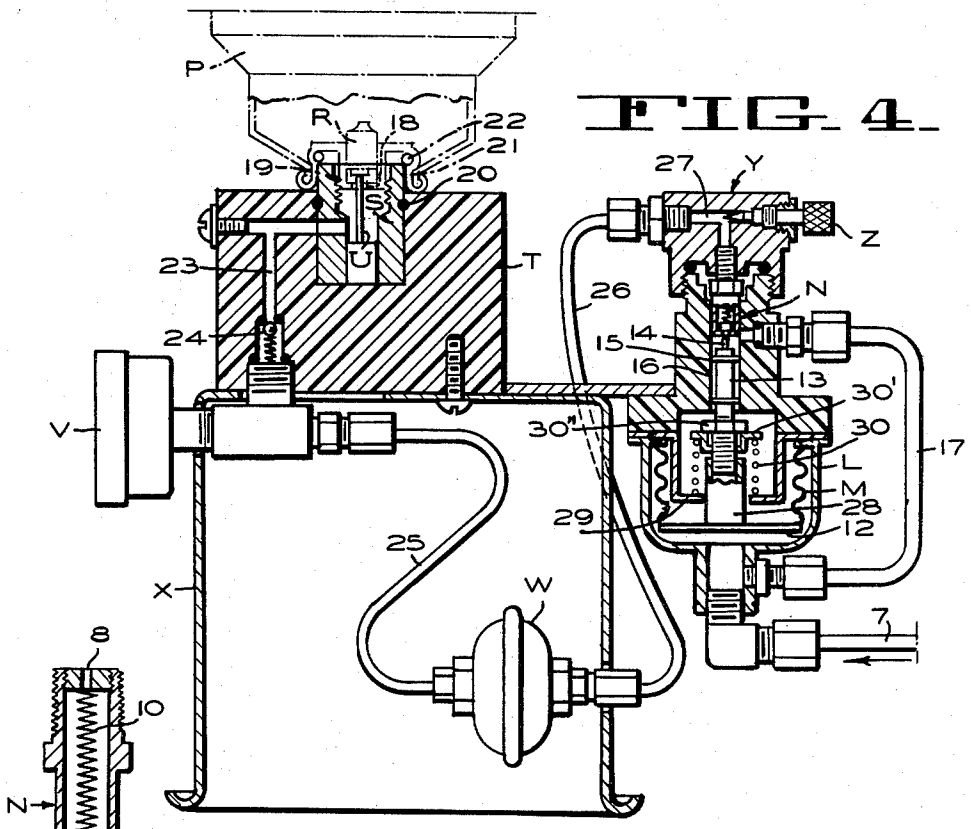


FIG. 5

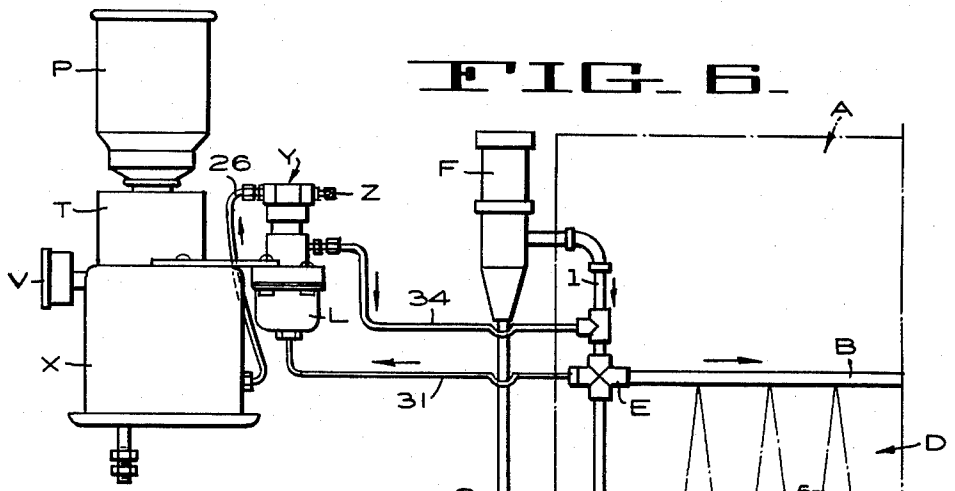
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Filed Feb. 18, 1958 4 Sheets-Sheet 3

FIG. 6.



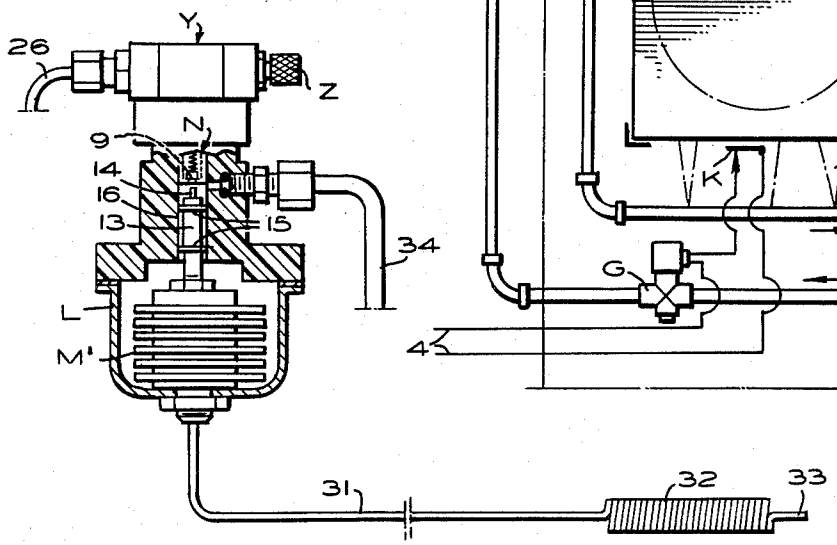


FIG. 7.

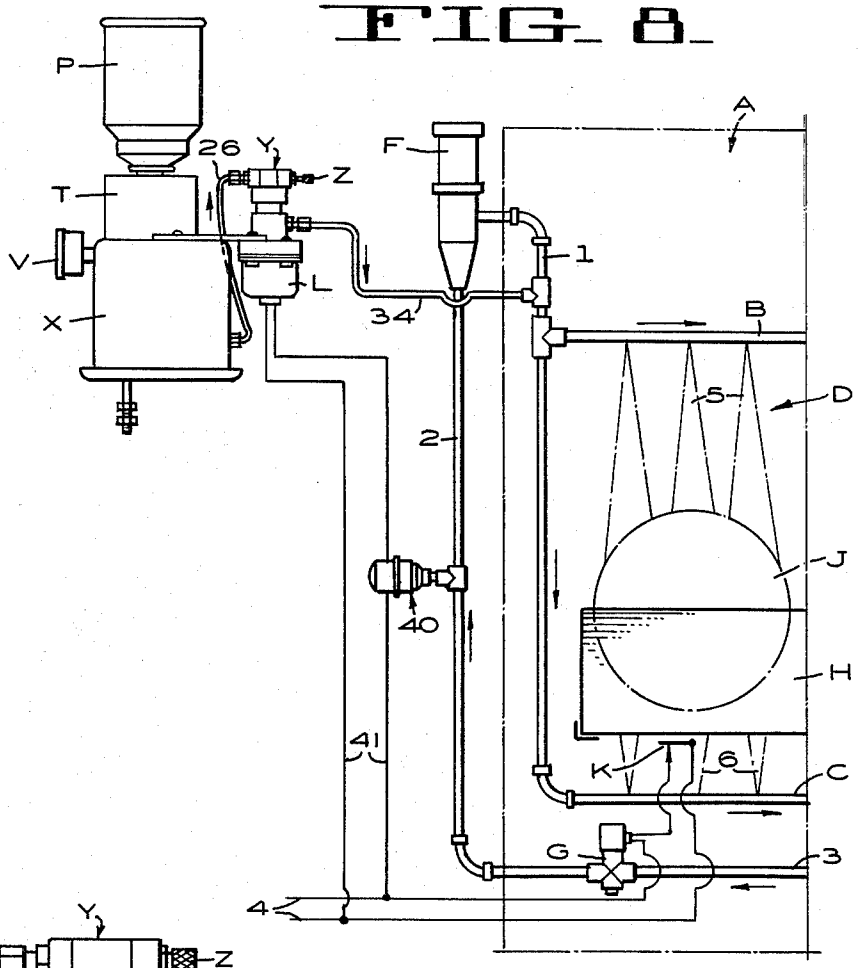
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APPARATUS FOR INJECTING DRYING AGENT INTO RINSE SPRAY OF DISHWASHING MACHINE

Filed Feb. 18, 1958 4 Sheets-Sheet 4

FIG. 8



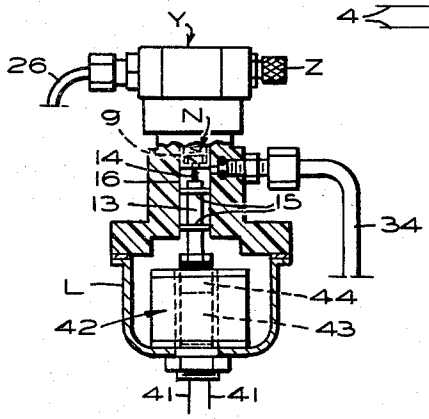


FIG. 9

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2,941,725

APPARATUS FOR INJECTING DRYING AGENT INTO RINSE SPRAY OF DISHWASHING MACHINE

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Filed Feb. 18, 1958, Ser. No. 715,934

14 Claims. (Cl. 239—61)

In our copending application on a Pressurized Device for Injecting Drying Agent Into Rinse Spray System, Serial No. 649,704, filed April 1, 1957, now Patent No. 2,910,075, we designed an apparatus to be used with a container in which the drying agent was under a constant pressure of say twenty-five to thirty pounds. The container has a spring-closed valve and automatic means was provided for opening the container valve each time the hot rinse spray was turned on so that a measured quantity of the drying agent would be fed from the container and mix with the rinse water just prior to the latter being sprayed upon the dishes.

Our copending case made use of a transparent reservoir for initially receiving the drying agent, and the purpose was to provide a visual aid so that an operator could see when a container was empty by noting when the container ceased to deliver any more drying agent to the reservoir. The reservoir held a sufficient quantity of the liquid to permit the empty container to be removed and a filled one substituted before the reservoir would be drained of its contents. The disadvantage of using the reservoir was that the high pressure gas exerted on the drying agent, while in the container, was reduced when the liquid entered the enlarged reservoir to a point where the gas ceased to be mixed with the chemical at all times, and therefore the propulsion effect of the gas on the chemical was lost.

To overcome this advantage, the present apparatus has a restricted passage or conveying means for the liquid drying agent from the container outlet to the point where the liquid is injected into the rinse spray. A fixed pin is used for opening the container valve as soon as the container outlet is placed in communication with the restricted passage and for keeping the valve open; and, therefore, the passage will receive the liquid drying agent and the pressure of the liquid in the passage will be the same as that in the container. A check valve is placed in the restricted passage and normally prevents the flow of the liquid drying agent into the hot water for the rinse spray until the rinse spray valve is opened. We provide automatic means, either controlled by the pressure or temperature of the hot rinse spray water, for opening the check valve when the valve for the hot rinse spray water is turned on. The liquid drying agent will, therefore, be fed into the hot rinse spray water at the proper rate only when the hot water valve is opened that feeds water to the rinse sprays.

A portion of the restricted passage for the liquid drying agent is made transparent so that the operator may view the passage of the liquid therethrough. We provide a pressure gage that communicates with the restricted passage between the container valve and the check valve for indicating the pressure of the liquid drying agent in the container and in the passage. The drying agent is put up in aerosol or other pressurized containers which will maintain a constant pressure until the container is practically depleted of its contents. The operator, by watching the pressure gage or indicator, is warned that as soon as the

gage indicates a substantial drop in pressure, a new container with a fresh quantity of liquid drying agent must be substituted for the old one. No tools are required to make this substitution. In order for our apparatus to operate successfully and automatically, the pressure within the container must be greater than the water pressure. If the water pressure is higher, a reducing valve can be used so that it will be less than the pressure in the container.

A further object of our invention is to provide an apparatus of the type described which is simple in construction, durable and efficient for the purpose intended.

Other objects and advantages will appear as the specification proceeds, and the novel features of the device will be pointed out in the appended claims.

In the drawings:

Our invention is illustrated in the accompanying drawings, forming part of this specification, in which:

Figure 1 is a schematic view of the apparatus in its relation to a dishwashing machine and a simple electrical circuit is shown;

Figure 2 is a view of a pressurized container that holds the liquid drying agent, and the self-closing release valve for the container being indicated;

Figure 3 is a top plan view of the apparatus on a larger scale than that shown in Figure 1;

Figure 4 is a vertical longitudinal section of the apparatus, and is taken along the line IV—IV of Figure 3;

Figure 5 is a vertical section on a larger scale of a part of the apparatus illustrated in Figure 4;

Figure 6 is a schematic view similar to Figure 1, but shows a modified form of the apparatus using the temperature of the hot water for actuating the automatic control means;

Figure 7 is an enlarged vertical section of a portion of the apparatus illustrated in Figure 6, parts being shown in elevation for clarity;

Figure 8 is a schematic view similar to Figure 6 but illustrates another modified form of the apparatus, where the turning on of the hot water spray will close an electric circuit to a solenoid that will actuate the automatic control means; and

Figure 9 is an enlarged vertical section of a portion of the apparatus illustrated in Figure 8, and is similar to Figure 7, but illustrates the solenoid-actuated control.

While we have shown only the preferred forms, it should be understood that various changes may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

In carrying out our invention, we make use of a dishwashing machine indicated generally by the dot-dash lines A in Figure 1. Only the rinse spray pipes B and C are indicated in a dish-washing compartment D of the dishwashing machine. The rinse spray pipes B and C are interconnected by a four-outlet coupler E, and a pipe 1 leads from a vacuum breaker F to one of the openings in the coupler.

A hot water rinse pipe 2 connects with the entrance to the vacuum breaker F, and the other end of the pipe communicates wtih the outlet of a normally-closed solenoid valve G. Another pipe 3 leads from a source of hot rinse water (not shown) to the solenoid valve G. When the solenoid valve G is opened by a tray H, which contains dishes J, closing an electric switch K that connects the solenoid valve to a source of current through wires 4 and energizes the solenoid, hot rinse water under pressure will flow from the pipe 3 into the pipes 2 and 1, respectively, and then issue as sprays 5 and 6 from the spray pipes B and C (see Figure 1). Any other

means for delivering hot rinse water to the spray pipes B and C may be resorted to, if desired.

The parts thus far described form no part of our invention, except in so far as they cooperate with the parts now to be described. The apparatus for automatically dispensing a desired quantity of a liquid drying agent into the hot rinse water to mix therewith, before it is sprayed onto the dishes, is shown generally in Figure 1, and it will now be described in detail.

It will be noted that a hot water pipe 7 leads from an opening in the four outlet coupler E to a casing L in which a bellows M is housed (see Figures 1 and 4). The purpose of the bellows M is to control the opening of a check valve N, shown on a larger scale in Figure 5. This check valve comprises a casing having an inlet 8 at its top, and an outlet 9 at its bottom. A coil spring 10 normally keeps a valve body 11 seated so as to close the outlet opening 9. The bellows M has a bottom member 12 that carries an adjustable plunger 13, the latter having a pin 14 of less diameter than that of the outlet opening 9. Figure 4 shows the pin 14 in normal position, with its top spaced just below the outlet opening 9 so that the valve body 11 will close the opening.

When the hot rinse water valve G is opened, the pressure of the water in the pipe 7 and in the casing L will be increased for compressing the bellows M, and moving the pin 14 into the outlet opening 9 for unseating the valve body 11, and permitting fluid in the check valve casing N to flow out through the opening 9. Figures 4 and 5 show the plunger rod 13 as being provided with O rings 15, which seal the lower part of a bore 16 and prevent any drying agent liquid from passing into the interior of the bellows M, and counteracting the external pressure in the casing L that causes the bellows to contract. The liquid drying agent instead will flow through a pipe 17, that communicates with the hot water in the pipe 7 (see Figure 4).

Rather than continue describing the liquid drying agent conveying means back to its communication with the outlet of a container P, it is best to describe the container at this point, and show how it can be placed in communication with the liquid drying agent conveying means without the need of special tools. In Figure 2, we show the container P with the liquid drying agent Q therein. Aerosol or other pressure-producing medium is used to maintain a constant pressure of say twenty-five to thirty pounds within the container P, until all of the liquid drying agent Q has been dispensed. The container P has an outlet opening 18, which is normally kept closed by a self-closing valve R. The opening 18 is in a threaded end 19 of the container, and this end is adapted to be screwed into a coupling member S, provided in a transparent base T. An O ring 20 seals the coupling member S in the base T. The container P has a circular flange 21 that is concentric with the cylindrical threaded end 19, and the flange has a sliding and rotary fit with the outer cylindrical protruding portion of the coupling member S. Figure 2 shows an O ring 22 at the base of the circular flange 21, and this ring bears against the upper end of the coupling member S for sealing the container to the coupling member so that none of the liquid in the container can escape between the coupling member and the flange 21, when the container valve R is opened.

We provide means for opening the valve R and for holding it open, when the container P is connected to the coupling member S, and the O ring 22 seals any leakage into the atmosphere. A stationary valve-opening pin U is mounted in the coupling member S, and enters the container outlet 18, when the container P is screwed into position for opening the self-closing valve R. The diameter of the pin U is less than that of the outlet opening 18; and, therefore, the liquid drying agent in the container will flow into the interior of the coupling member. It should be noted that the entrance portion of the coupling member S is internally threaded for receiving the threaded end 19 of the container.

The transparent base T has a restricted passage 23, which communicates with the bore of the coupling member S so that the liquid drying agent will flow into the passage and it can be viewed by the operator through the transparent base. A pressure gage V communicates with the passage 23 and will indicate the pressure of the liquid in the passage and thus also indicate the pressure of the liquid in the container P. When the gage shows a decided pressure drop, the operator knows that the container P is practically empty and he can substitute a new container for the empty one. A check valve 24 is placed in the passage 23 and prevents any return flow of the liquid drying agent during the changing of containers P.

A pipe 25 having a passage about the same size as the passage 23 leads from the pressure gage V to a filter W, which is housed in an inverted cup-shaped casing X. Another pipe 26 of the same diameter as the pipe 25 leads from the filter W to a restricted passage 27 in a control unit Y that carries the check valve N. The passage 27 communicates with the inlet 8 of the check valve N, and a needle valve Z regulates the amount of fluid flowing through the passage 27.

The liquid drying agent conveying means or passage from the container P to the rinse spray pipes B and C comprises the coupling member S that receives the fluid from the container, the restricted passage 23, check valve 24, pressure gage V, pipe 25, filter W, pipe 26, restricted passage 27, needle valve Z, check valve N, pipe 17, and pipe 7 to the rinse spray pipes B and C. The pressure on the fluid in this conveying means is greater than the pressure of the water in the pipe 7; and, therefore, when the hot rinse water is turned on, and the bellows M is collapsed to move the plunger 13 and the pin 14 to open the check valve N, the drying agent fluid Q will flow into the water in the pipe 7, and on into the water entering the rinse spray pipes B and C to mix therewith, before the water is sprayed onto the dishes J. The lower water pressure in the casing L will act on the large area bottom 12 of the bellows M to collapse the bellows and move the much smaller area pin 14 to lift the valve body 11. This will open the check valve N, even though the pressure of the liquid drying agent in the check valve casing is considerably higher.

It might be best to describe the construction of the bellows M and its associate parts more in detail at this time. The corrugated wall of the bellows is made of metal and it has a tendency to return to normal position, as shown in Figure 4, when the hot rinse water is turned off. The plunger 13 is threaded into a socket 28, that in turn is supported by the bottom member 12 of the bellows. A coil spring-supporting member 29 has a central opening for receiving the socket 28. A coil spring 30 has its lower end resting on the supporting member 29, and has its upper end bearing on a washer 30′ which in turn bears against a nut 30″ that is threaded upon the threaded portion of the plunger 13. The nut 30″ may be adjusted for varying the compressive force of the coil spring 30 on the plunger 13, socket 28 and bellows M, so that the bellows will be sensitive to a desired water pressure in the casing L. The water pressure may vary from two to fifteen pounds. Of course, the incoming water pressure, if too high, could be reduced to the desired point by a reducing valve (not shown). The plunger 13 may be rotated in the socket 28 to adjust the overall length so that the pin 14 will open the check valve N, when the hot rinse water is turned on and the bellows is contracted.

Operation

From the foregoing description of the various parts of the first embodiment of our invention, as shown in

Figures 1 to 5, inclusive, the operation thereof is summarized as follows:

As soon as a tray H of dishes J reaches the rinse compartment D, the tray will close the switch K to open the hot water valve G. Hot rinse water will flow from the inlet pipe 3 to the spray pipes B and C. Some of the water will flow into the pipe 7 and enter the casing L to build up sufficient force that will compress the bellows M, and cause the pin 14 to open the check valve N. An aerosol or similar pressurized container P has already been connected to the coupling member S, and the stationary pin U has opened the container valve R to permit the liquid drying agent to flow to the check valve N, the gage V indicating the pressure of the liquid. The pin U is likened to means in the liquid conveying means for holding the container valve R open.

The liquid drying agent Q will flow through the outlet opening 9, when the check valve N is opened, and will flow through the pipe 17 and enter the water in the pipe 7. The check valve N can be considered as permitting the liquid Q to flow in only one direction in the conveying means. The liquid drying agent will be under a higher pressure than the water in the pipe 7; and, therefore, it will be forced through the water and will mix with the water entering the coupler E. This mixture of the drying agent Q and the hot rinse water will issue from the spray pipes B and C as sprays 5 and 6, respectively.

The quantity of the liquid drying agent Q has been regulated by the needle valve Z, and is sufficient to cause the rinsing water to flow off the dishes without any of it remaining on the dishes in the form of bubbles. No drying of the dishes by dish-cloths is necessary. Therefore, the dishes are more sanitary, when dry, and a great deal of time is saved in eliminating the hand-drying of dishes.

The filter W removes any foreign matter from the liquid drying agent Q that might otherwise clog the passage 27 at the needle valve Z, or at the check valve N. The gage V is important to the operator so that he will know when to change containers P. The check valve 24 prevents any return flow of the liquid Q in the passage 23 and also prevents any water in the line 7 from flowing into the passage 23, in the event that the container P should be removed from the coupling member S, and a relatively long period of time elapse before a full container P is connected to the coupling member. The restricted passage from the coupling member S to the pipe 17 is designed to keep the liquid Q mixed with the aerosol all through the passage; and, therefore, the liquid Q will be forced into the water in the pipe 7 at about the same pressure as that in the container P. The control unit housing Y, and the apparatus therein, can be considered as means responsive to the hot rinse water flowing to the spray pipes B and C for opening the check valve N.

As soon as the dish tray H, passes beyond the switch K, the switch will open and will open the electric circuit to the solenoid valve G. The rinse valve G will thereupon instantly close and will stop any further flow of hot rinse water into the pipe 2, the rinse spray pipes B and C, and the pipe 7. The water pressure in the pipe 7 will quickly drop because the water in the pipe will flow into the rinse spray pipes B and C, and will issue from these pipes as sprays 5 and 6.

It has been mentioned in an earlier part of the specification that a restricted passage for the liquid drying agent extends from the pressurized container outlet to the point where the liquid is injected into the rinse spray. The purpose is to keep the gas mixed with the chemical at all times so that the gas can act as the propulsive effect on the chemical. The restricted passage also reduced the quantity of the liquid drying agent delivered to the pipe 7 to mix with the water therein. Therefore the flow of water from the pipe 7 and out through the spray pipes B and C, when the rinse valve G is closed, is more rapid than can be replaced by any liquid drying agent Q, flowing through the uncovered outlet 9, the pipe 17, and into the pipe 7. The drop of water pressure in the pipe 7 will also drop the water pressure in the casing L. When this takes place, the bellows M, will return to normal position and will move the plunger 13, and pin 14, downwardly to permit the spring 10 to move the valve body 11, to close the outlet 9. Further flow of the liquid drying agent Q, is now stopped until the next tray H, of dishes closes the switch K to open the solenoid valve G, and start the next rinse cycle operation.

Modified form: temperature controlled

In Figures 6 and 7, we show a modified form of the apparatus where the temperature of the hot rinse water in the coupler E controls the opening of the check valve N. Where the parts in the modified form of the invention are the same as in the first embodiment, like reference letters and numerals have been applied to corresponding parts, and no further description need be given.

Figure 7 shows a bellows M', which is secured at its bottom to the casing L that encloses it. Instead of the pipe 7 communicating with the interior of the casing L, we provide a hollow tube 31 that has one end communicating with the interior of the bellows M', and has its other end formed into a coil 32 that constitutes a temperature-sensitive "bulb." The end of the tube 31 adjacent to the bulk 32 is closed, as at 33, and a gas or liquid responsive to temperature changes fills the bellows M', the tube 31 and the bulk 32. When the bulb 32 is heated, as by hot water, the gas or liquid in the bulb will expand and force additional gas or liquid into the bellows M' for expanding it, whereupon the plunger 13 will move its pin 14 into the outlet opening 9 of the check valve N for opening it.

Figure 6 shows the tube 31 extending from the casing L, in which the bellows M' is mounted, to the coupler E, with the bulb 32 being mounted in the coupler E so as to be surrounded by the hot rinse water as soon as the valve G is opened. A pipe 34 takes the place of the pipe 17 in the first form, and this pipe receives the liquid drying agent from the check valve N, when the latter is open, and conveys the liquid to the pipe 1 by means of a T that connects the pipe 34 to the pipe 1, at a point just above the coupler E.

The operation of this form of the invention is about the same as that of the first embodiment, except for the fact that the bellows M' expands, when the hot rinse water is turned on, and opens the check valve N for the delivery of the liquid drying agent to the pipe 34, and the mixing of this liquid with the hot rinse water at pipe 1 takes place just prior to rinse water issuing from the spray pipes B and C, as sprays 5 and 6, respectively.

When the tray H closes the switch K to open the valve G, the heat from the hot rinse water will expand the gas or liquid in the bulb 32, which will enlarge the bellows M', and open the check valve N by the pin 14. Immediately, the liquid drying agent will flow through the opened check valve N and into the pipe 34, and mix with the water in the pipe 1, because the pressure of the liquid drying agent will be greater than the water pressure in the pipe 1. The liquid drying agent will be thoroughly mixed with the hot rinse water just prior to this water being sprayed onto the dishes. In all other respects, the modified form operates in the same manner as the first embodiment and no further description is necessary.

Second modified form: solenoid controlled

In Figures 8 and 9 we show another modified form of the apparatus, where the pressure of the hot rinse water in the pipe 2, when the solenoid valve G is turned on, will actuate a pressure switch 40 that is connected to the pipe. The pressure switch is electrically connected by wires 41 to a solenoid 42 (see Figure 9) and to the wires

4, that connect with a source of electric current (not shown). The solenoid is housed within the casing L.

The metallic core 43 of the solenoid 42 is connected to the plunger 13, while being insulated therefrom by an insulating core 44. When the hot water is turned on by the solenoid valve G, the pressure switch 40 will close an electric circuit to the solenoid 42 for energizing it. The solenoid 42 will actuate the plunger 13 for opening the check valve N, and permitting liquid drying agent under pressure to flow through the pipe 34 and mix with the hot water immediately prior to the water issuing from the rinse spray pipes B and C, as sprays 5 and 6, respectively.

As soon as the hot water is turned off, the pressure switch 40 will open, and the solenoid 42 will be deenergized. The plunger 13 will be retracted to permit the check valve N to close and shut off any further flow of the liquid drying agent through the pipe 34. In all other respects the operation of this form of the device is the same as shown in Figure 6, and no further description need to given.

It is obvious that the closing of any electric switch could close an electric circuit for energizing the solenoid 42; and, therefore, the switch K could be electrically connected to the solenoid 42 in place of the pressure switch 40, and a tray H of dishes will close the switch K to actuate this solenoid.

We claim:

1. The combination with the hot water spray pipes of a dishwashing machine; and a hot water pipe communicating with the spray pipes to deliver hot rinse water thereto; of a pressurized container having a liquid drying agent under pressure therein, the container having a self-closing valve in the container outlet; a liquid drying agent conveying means communicating with the container outlet and with the hot water spray pipes; means in said conveying means for holding the container valve open when the container outlet communicates with said liquid drying agent conveying means; a check valve in the conveying means and normally preventing the flow of the liquid drying agent thereby; and means responsive to the hot rinse water flowing to the spray pipes for opening the check valve for permitting the liquid drying agent to flow into the rinse water for mixing therewith.

2. The combination as set forth in claim 1; and in which a pressure-indicator communicates with the liquid drying agent conveying means at a point between the container self-closing valve and the check valve for indicating the pressure within the container.

3. The combination with the hot water spray pipes of a dishwashing machine; and a hot water inlet pipe communicating with the spray pipes to deliver hot rinse water water thereto; of a pressurized container having a liquid drying agent under pressure therein, the container having a self-closing valve in the container outlet; a supporting base for the container; coupling means on the base for removably connecting the container to the base, and including means for opening the container valve when the container is connected to the coupling means; a liquid drying agent conveying means communicating with the hot water spray pipes and with the container outlet when the container is secured to the coupling means; a check valve in the conveying means and normally preventing the flow of the liquid drying agent thereby; and means responsive to the hot rinse water flowing to the spray pipes for opening the check valve for permitting the liquid drying agent to flow into the rinse water for mixing therewith.

4. The combination with the hot water spray pipes of a dishwashing machine; and a hot water pipe communicating with the spray pipes to deliver hot rinse water thereto; of a pressurized container having a liquid drying agent under pressure therein, the container having a self-closing valve in the container outlet; a liquid drying agent conveying means communicating with the container outlet and with the hot water spray pipes; means in said conveying means for holding the container valve open when the container outlet communicates with said liquid drying agent conveying means; a check valve in the conveying means and normally preventing the flow of the liquid drying agent thereby; and means responsive to the pressure of the rinse water flowing to the spray pipes for opening the check valve for permitting the liquid drying agent to flow into the rinse water for mixing therewith.

5. The combination with the hot water spray pipes of a dishwashing machine; and a hot water pipe communicating with the spray pipes to deliver hot rinse water thereto; of a pressurized container having a liquid drying agent under pressure therein, the container having a self-closing valve in the container outlet; a liquid drying agent conveying means communicating with the container outlet and with the hot water spray pipes; means in said conveying means for holding the container valve open when the container outlet communicates with said liquid drying agent conveying means; a check valve in the conveying means and normally preventing the flow of the liquid drying agent thereby; and means responsive to the temperature of the hot rinse water flowing to the spray pipes for opening the check valve for permitting the liquid drying agent to flow into the rinse water for mixing therewith.

6. In combination: a base; a pressurized container with an outlet and a self-closing valve therefor; said base having a passage for receiving the contents from the container; a content-conveying means communicating with the passage and leading to an outlet; a normally-closed check valve disposed in said content-conveying means; coupling means for removably securing the container to the base, with the container outlet communicating with the passage; said coupling means including means for opening the container valve and for holding it open so long as the container outlet communicates with the passage; pressure-indicating means communicating with the passage for indicating the pressure of the container contents received in the passage; and means for opening the check valve for permitting the pressure in the container to force the container contents into the passage and thereby force the contents already in the passage through said content conveying means.

7. The combination as set forth in claim 6: and in which the passage is restricted so as to maintain substantially the same pressure on the container contents that has been delivered to the passage as there is in the interior of the container.

8. The combination with the hot water spray pipes of a dishwashing machine; and a hot water pipe communicating with the spray pipes to deliver hot rinse water thereto; of a pressurized container having a liquid drying agent under pressure therein, the container having a self-closing valve in the container outlet; a liquid drying agent conveying means communicating with the container outlet and with the hot water spray pipes; means in said conveying means for holding the container valve open when the container outlet communicates with said liquid drying agent conveying means; a check valve in the conveying means and normally preventing the flow of the liquid drying agent thereby; and electrically-controlled means for opening the check valve for permitting the liquid drying agent to flow into the rinse water for mixing therewith.

9. In an apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, the combination of: a pressurized container having a liquid drying agent under pressure therein; the container having an outlet provided with a self-closing valve for releasing the liquid when the container valve is opened; a base provided with a coupling member to which the outlet of the container may be removably coupled; the base being formed with a restricted passage having an inlet which communicates with the outlet of the coupled container;

a fixed valve-opening pin mounted in the inlet of the passage in a position to automatically open the container valve, when the container is coupled to the coupling member, whereby the pressure in the container will expel liquid drying agent into the passage; a control unit having a restricted passage defining an inlet and an outlet; a pipe placing the passage of the base in communication with the inlet of the passage in the control unit, whereby the liquid drying agent will be forced into the control unit by the pressure in the container; a normally-closed check valve disposed in the passage of the control unit between the inlet and the outlet of the control unit; a discharge pipe connected to the outlet of the control unit to receive the liquid drying agent, when the control unit check valve is opened; a plunger mounted in the control unit and being movable to open the check valve of the control unit; and means operable to actuate the plunger to open this check valve.

10. The apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, as defined in claim 9; and in which a pressure gage communicates with the restricted passage of the base for indicating the prevailing pressure of the liquid drying agent in the container and the passage of the base.

11. The apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, as defined in claim 9; and in which a filter is arranged in the pipe that extends between the base and the control unit to remove any foreign matter from the liquid drying

agent that might otherwise clog the restricted passage of the control unit and the check valve in the latter.

12. The apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, as defined in claim 9; and in which a check valve is disposed in the passage of the base to prevent any return flow of the liquid drying agent, when the container is disconnected from the coupling member.

13. The apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, as defined in claim 9; and in which both of said pipes are restricted and are substantially the same in diameters as said passages, whereby there will not be an appreciable drop in pressure of the liquid drying agent from the time it leaves the container until it flows through the discharge pipe.

14. The apparatus for injecting a liquid drying agent into the rinse spray of a dishwashing machine, as defined in claim 9; and in which the control unit is made separate from the base and is spaced therefrom in the direction in which the liquid drying agent flows toward the discharge pipe.

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