

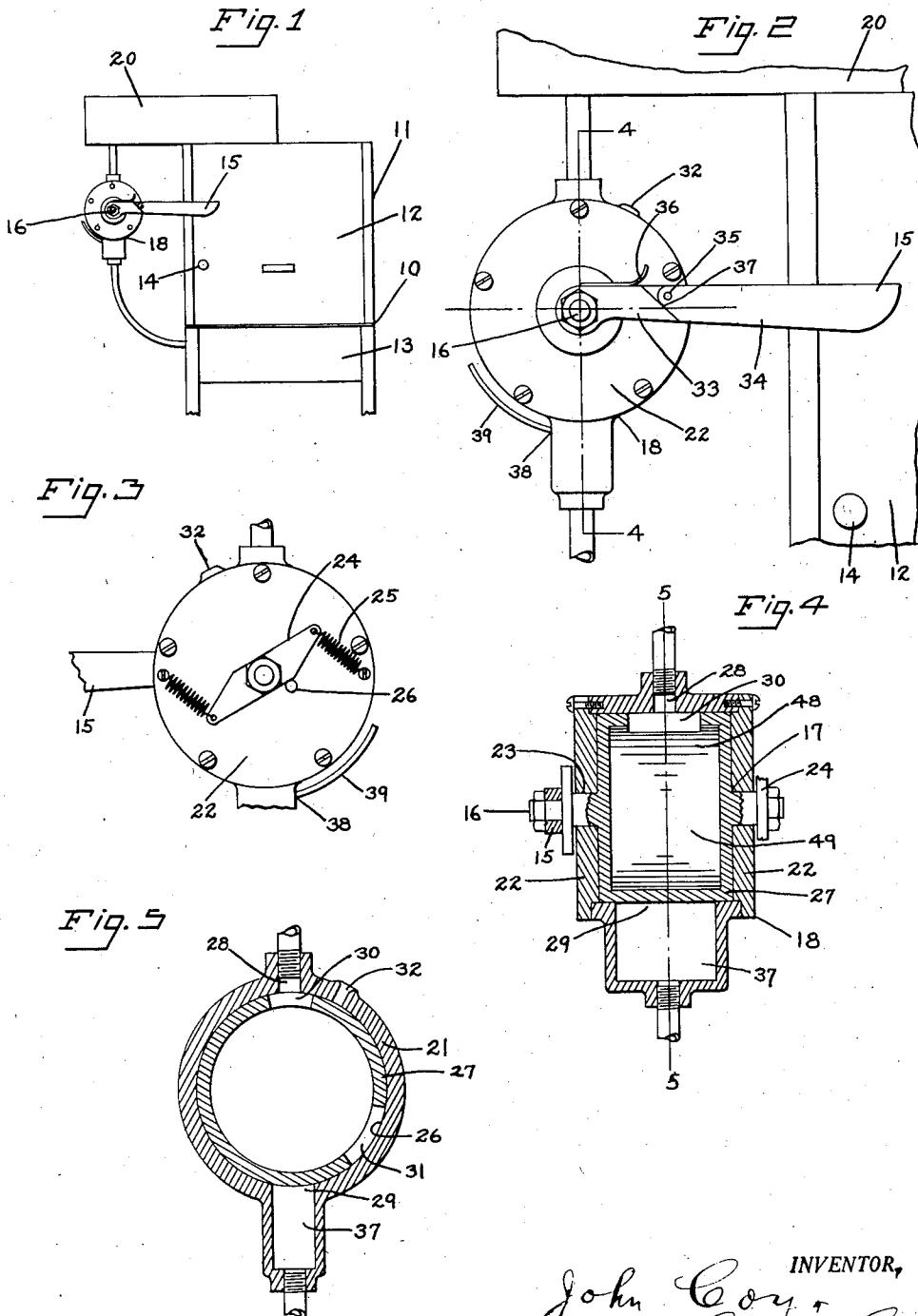
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SOLUTION DISPENSING ATTACHMENT

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SOLUTION DISPENSING ATTACHMENT

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My invention relates to improvements in solution dispensing attachments of the form that is particularly adapted for use in combination with dish washing machines for the
5 periodic charging of cleansing solution to the machine under conditions of use, and the object of my improvement is to produce a solution dispensing attachment that is adapted to feed or charge the liquid that is used
10 for washing the dishes with substantially a definite amount of cleansing solution from a supply tank therefor responsive to some usual use or operation of a moving part of the machine automatically, without any at-
15 tention by the operator, such moving part being selected according to the particular form of the machine or method of operating, as involving the opening of a door for some forms of machines, or the movement of a
20 conveyor in others.

In the accompanying drawing:—

Figure 1 is a front elevation of a dish washing machine in which is incorporated my improved solution dispensing attachment of a
25 form that operates responsive to the operation of a vertically moving door that is opened for admitting the dishes to be washed to the interior of the structure.

Fig. 2 is an enlarged view of the valve structure and associated parts.

Fig. 3 is a rear view of the valve structure.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a sectional view on the line 5—5 of Fig. 4.

My improved solution dispensing attachment is applied to a dish washing machine for the purpose of dispensing a soap solution or cleansing solution for use in the dish
40 washing machine in the operation of washing the dishes therein for replenishing the cleaning element proper in the mixture that is circulated in the machine under conditions of use. The attachment thus serves in
45 lieu of the usual hand methods of delivering the soap solution, soap powder, or the like.

In the attachment use the dispensing is effected automatically by being associated to
50 operate responsive to the operation of some part that is inherent in the machine and that

is moved and must be moved under normal conditions, such as a door in one form that is operated for admitting the dishes to the interior cleansing chamber; or in another form as a hood or the like that is lifted from time
55 to time; and still another form that involves the use of a conveyor.

In the present disclosure the dish washing machine 10 is generally of vertically elongated form and comprises at the upper end a
60 box-like chamber 11 in which the dishes are operated upon, access to the interior being obtained by means of a sliding door 12 that operates in vertical ways for up and down movement and is in the closed position when
65 down. Associated with the lower part of the chamber 11 is a tank or main tank 13 that contains the cleansing mixture that is circulated by pumps under conditions of use.

The door 12 is utilized for effecting the replenishing of the cleansing element proper
70 in concentrated form to the tank 13 by the use of the attachment and to this effect is provided with a trip in the form of an operating post 14 that projects from the outside face
75 of the door.

The trip 14 is in the path of a control arm 15 on a horizontal shaft 16 that is part of the rotating member 17 of the control device 18 that controls the delivery of the solution to be
80 supplied and which control device is located in the delivery line or tube delivery structure intermediate an overhead auxiliary tank 20 and the main tank 13.

Upon and responsive to each full operation of the arm 15 a measured quantity of
85 cleansing solution is released from the auxiliary tank 20 for delivery to the main tank 13 due to the limited to and fro movement of the rotating member 17.

As shown, the shaft 16 projects through a horizontal cylindrical valve chamber 21 that is closed at the two ends by end plates 22, bearings for the shaft being provided by openings
90 23 in said plates.

The control arm 15 is at the front end of the shaft 16. Associated with the rear end of the shaft 16 and the rear end plate 22 are spring positioning means in opposition to
95 which the rotating member 17 is operated and
100

stop means for limiting the return movement and thus effecting the proper positioning of the rotating member 17 for receiving solution from the auxiliary tank 20. Thus, the diametral arm 24 on the shaft 16 is connected by its ends to the restraining springs 25 and a stop 26 makes contact with some part thereof for limiting the rotative movement effected by said springs 25.

The cylindrical chamber 21 has a strictly cylindrical interior wall 26 that is of relatively large diameter so as to be adapted to house therein a valve structure 27 that is mounted on the shaft 16 that operates as a receiving and dumping device and to effect which the valve structure 27 is itself of hollow form.

Thus the valve operates as a cup or dipper and as used the parts are constructed and arranged so that the interior of the valve is filled during normal conditions of rest and it discharges responsive to downward movement of the arm 15.

Considering details, the chamber 21 has an inlet port 28 at the top and a delivery port 29 at the bottom. For registering with these ports at different times respectively the valve structure 27 has ports that extend across the cylindrical side wall for connecting with the hollow interior comprising the inlet port 30 and the delivery port 31.

The two ports of the outside valve chamber 21 are in vertical alignment and the two parts of the moving cooperating valve structure 27 have an angular separation that corresponds to an obtuse angle that is much less than one-hundred and eighty degrees, the parts being constructed and arranged so that in rotating the valve structure 27 from the initial filling position wherein the port 30 is in registration with the port 28 to the discharge position the inlet is closed.

While in such initial position the discharge ports are closed.

A vent opening 32 may be provided in the wall of the outside chamber 21 that is in registration with the valve inlet port 30 during discharge.

The direction of movement for effecting discharge is clockwise, responsive to the downward closing movement of the door 12 and of the arm 15. During the upward movement of the door the arm 15 is inactive, and to permit this said arm is in the form of a two-part-jointed structure, composed of the inner supporting part 33; the outer free end part 34; the pivot pin 35; and the flat strip positioning spring 36.

The joint 37 provided for the arm parts 33 and 34 comprises overlapping parts such that during upward movement of the trip 14 such movement is essentially free, the trip snapping past the arm and during downward movement of the trip the arm 15 operates like a rigid structure.

The dipper or cup characteristic of the control structure is desirable because of the quickness of operation required in that, while the door movements are not instantaneous they are nevertheless to be designated as quick. Feed is facilitated by providing ample dimensions for the different ports and the time for discharge will be extended by extending the length of the arm 15, and these means are provided in the structure as shown.

In order to further facilitate discharge additional means are provided in the form of an auxiliary discharge chamber 37 that mechanically is incorporated in the structure of the valve chamber 21 and operatively is in full open communication with the discharge port 29 for receiving a charge of solution from the valve structure 27 and which is the part that delivers to the tubular conductor that delivers to the tank 13. Said discharge chamber 37 may be provided with a vent opening 38 and to this may be connected a vent tube 39 that projects an appreciable distance upwardly so as to elevate the actual vent inlet.

With a conveyor form of dish washing machine a trip such as the trip 14 would be applied to some part of the conveyor for operating the arm 15 or the equivalent, and corresponding changes would be made in other forms of dish washing machines.

The auxiliary discharge chamber 37 does not receive the full contents of the hollow dispensing valve during the discharge operation; because of the excess capacity of the one relatively to the other and because of the vent that is provided in the discharge position of the valve; the chamber 37 is readily substantially filled during the discharge or dumping operation, notwithstanding the short period of contact of the trip stop or button on the door of the washing machine with the tripping arm of the valve.

The jack-knife construction of said tripping arm permits of the use of a longer arm and the consequent relatively longer time of tripping contact. The longer the arm the more length to slide over.

I claim as my invention:—

1. A dispensing valve for use with a dish washing machine comprising a hollow cylindrical valve adapted for limited rotative movement for filling and discharge and having supporting shaft elements, a cross-arm mounted on one of said elements, a stop in the path of said arm, and spring positioning means in the form of a pair of springs operatively connected respectively to the ends of said arm tending to maintain said arm in contact with said stop.

2. A dispensing valve as described in claim 1, a crank-arm for rotating said valve in opposition to said spring positioning means, and said crank-arm being in the form of a two-part jack-knife structure so as to be

adapted to operate actively one-way only responsive to contact with a trip button on a moving part of a dish washing machine.

5 3. A dispensing valve for delivering cleansing solution to a dish washing machine comprising a casing structure enclosing a horizontally disposed cylindrical valve chamber, provided with an inlet at the upper end and
10 a vent opening adjacent thereto, and having a part of the bottom wall open for the full length for discharge, an auxiliary chamber extending along said bottom wall and provided with an open upper end that registers with said open part and having a bottom that
15 is provided with a discharge opening, a hollow valve rotatively housed in said casing, provided with ports for alternate communication with said inlet and open part for filling and for discharge and arranged to cover said
20 vent while filling and to uncover the same for discharge, cooperating spring and stop means tending to hold said valve to the filling position, and a crank-arm for use in rotating the valve from the filling to the discharge position.

25 4. A dispensing valve as described in claim 3, said crank-arm being in the form of a two-part jack-knife structure so as to be adapted to operate actively one way only responsive
30 to contact with a trip button.

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