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WASHING APPARATUS AND METHOD

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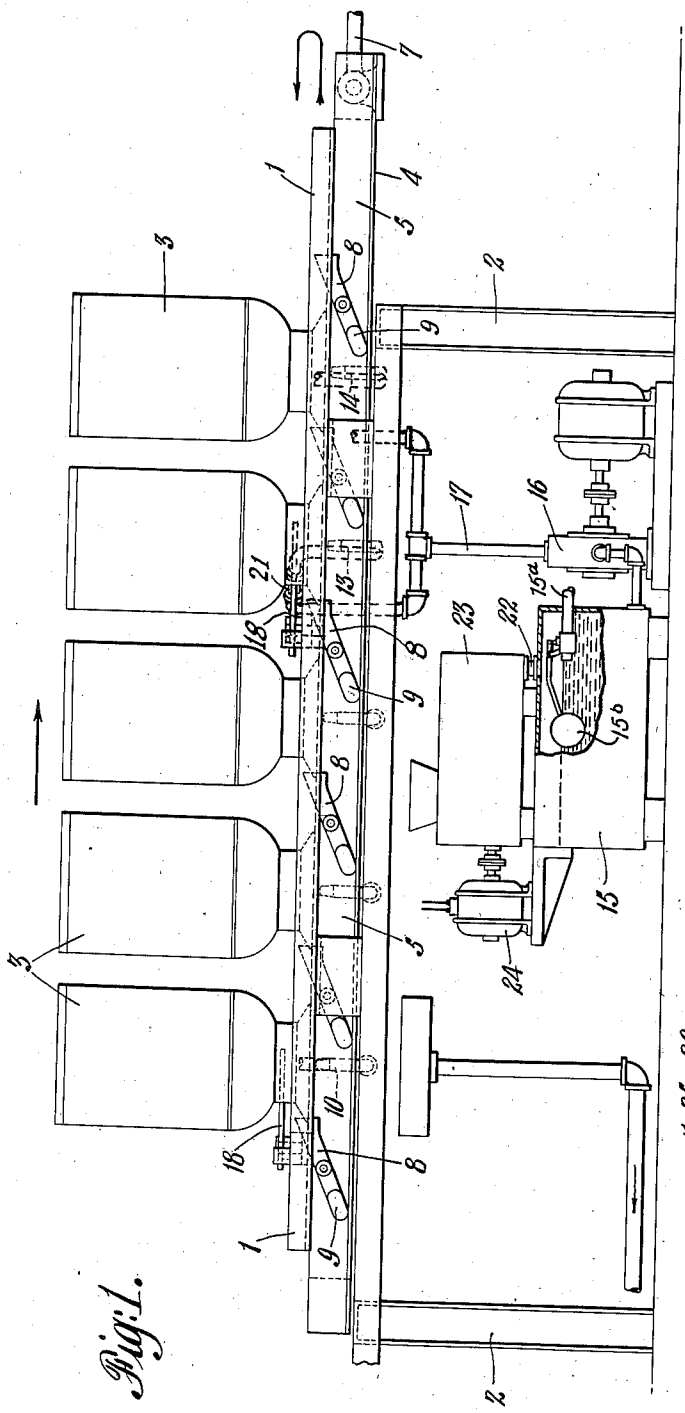


Fig. 1.

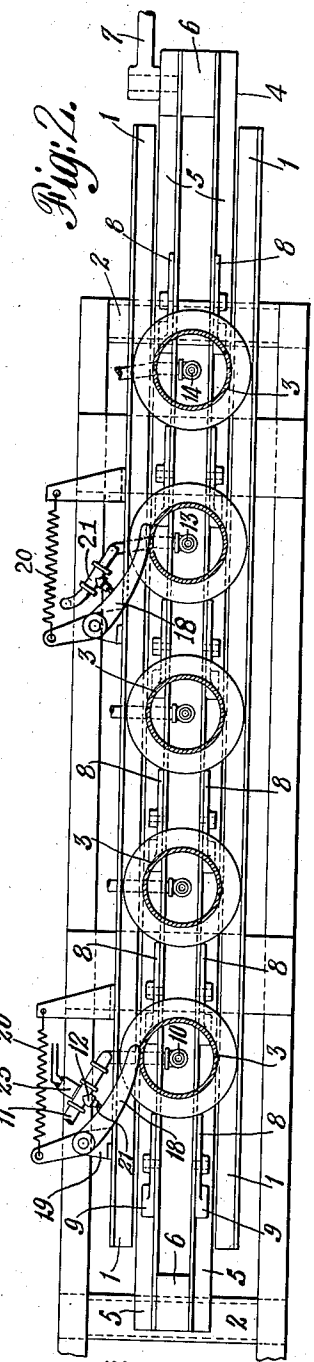


Fig. 2.

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WASHING APPARATUS AND METHOD

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8 Claims. (Cl. 141—7)

This invention relates to automatic feeding or dispensing apparatus, and particularly to apparatus for use in conjunction with automatic washing machines, for proportioning the amount of detergent material introduced into the washing solution in accordance with the demands of the work passing through the machine. For example, the invention is adaptable for use with machines for washing milk cans and similar receptacles, and will be described in connection with such a machine.

In machines for washing certain types of articles, for example large containers such as milk cans, automatic valves are customarily used for controlling the jets, in order to conserve the washing solution, such valves opening only when a can is in position to be acted upon by the jet in question. In accordance with the present invention, the apparatus for feeding detergent material into the solution tank is similarly controlled, so that a predetermined amount of the detergent is introduced into the tank for each container or can to be washed. It is the object of the present invention to provide means for automatically controlling the supply of detergent material, as described.

In the accompanying drawing, Fig. 1 illustrates in side elevation, and more or less diagrammatically, a machine for washing milk cans, to which the apparatus of the present invention has been applied. Fig. 2 is a plan view of the apparatus of Fig. 1, the milk cans being shown in section. Referring to the drawing, there is provided a track comprising a pair of spaced L-section rails 1, 1 supported upon a suitable framework 2. Suitable means, not shown, are provided for conveying the cans 3 to and from the rails 1, at the respective ends of the apparatus. Transfer mechanism is employed for successively positioning the cans, for short predetermined periods, at different points on the rails 1, where the successive washing operations are performed. Suitable transfer mechanism is illustrated, comprising a reciprocating member 4, having L-section side members 5, 5, spaced apart by spacer blocks 6. A crank arm 7, pivoted near the end of the reciprocating member 4, may be actuated by any suitable means, as for example an eccentric, not shown, in order to furnish reciprocatory movement to the member 4. Opposed pairs of counterweighted pawls 8 are pivoted at suitable intervals to the side members 5 of the reciprocating member 4. When the member 4 moves toward the right, each pair of pawls 8 engage a can 3 and move it to its next position upon the rails 1. Upon the back stroke of the member 4, the pawls 8 are deflected downwardly and ride under the cans 3 until free thereof, when they are caused to swing into operative position by reason of their respective counterweights 9.

Beneath each can position is arranged a jet for introducing rinse water, cleaning solution, etc., into the can, as the case may be. A preliminary rinsing jet 10 is located adjacent that end of the apparatus to which the cans are initially delivered. Pure water is supplied to the jet 10 through a pipe 11, the flow being controlled by a valve 12.

Further along the machine are located the first and second washing jets 13 and 14, which are supplied with washing solution from a solution tank 15, the solution being forced by a pump 16 through the pipe 17. The level of the solution in the tank 15 is automatically controlled by any suitable means. For example, a conventional float 15b may be employed to regulate the flow of water into tank 15 through inlet 15a. Additional rinsing jets are customarily provided before and after the washing jets, but since these have no part in the present invention, they are not described.

The valves controlling all of the jets may be actuated by any suitable automatic means. Two such means are illustrated in Fig. 2, and each comprises a rocker arm 18 pivoted upon a bracket 19 secured to the rail 1. The rocker arm 18 is normally maintained, by means of a spring 20, in such a position that its inner end lies in the path of the cans 3. In this position the rocker arm does not engage the valve stem 21. When a can is pushed into position over the jet 10, as previously described, the neck of the can engages the rocker arm 18 and moves it into the position illustrated, engaging and moving the valve stem 21 to open position. The remaining jets may be similarly controlled.

Atop the solution tank 15, and connected therewith by a conduit 22, is a detergent hopper 23, containing suitable mechanical feeding means, as for example a screw conveyor. An electric motor 24 drives the detergent feeding mechanism at a suitable uniform rate, forcing the detergent through the conduit 22 into the solution tank 15. The motor 24 is controlled by a switch 25 which is responsive to the movements of the valve 12, which is in turn actuated by the presence of a can over the rinsing jet 10. Thus, when a can arrives in this position, and while it is being rinsed, the motor 24 starts and continues to operate, forcing into the solution tank 15 a cer-

tain amount of detergent. It will be obvious that this operation will be repeated once for each can which passes the jet 10. As a result, the strength of the solution in the tank 15 will remain constant, securing optimum results with the expenditure of a minimum of detergent.

It will be obvious that the present invention may be adapted to different uses than those here described.

The terms and expressions employed herein are used for purposes of description and not of limitation. It is recognized that many modifications of the construction disclosed may be made within the scope of the present invention.

We claim:

1. In apparatus of the character described, a rinsing jet, means for operating said jet by an article upon the arrival of the article to be washed at the rinsing position, a solution tank positioned at a station beyond and independent of said rising jet, means for applying solution from said tank to a rinsed article, means for feeding detergent material into said tank, and means for actuating automatically said detergent feeding means each time said jet is operated.

2. In a can washing machine, a detergent solution tank, a receptacle for storing solid detergent in a substantially dry condition, means for conveying cans to be washed successively through said machine, means for supplying solution from said tank to wash said cans, means for adding just sufficient water to said tank to maintain the level of solution therein substantially constant, and means for feeding automatically a predetermined quantity of solid detergent from said receptacle into said tank as each can is passed through said machine.

3. Washing apparatus comprising means for delivering washing solution to a succession of articles to be washed, a tank for washing solution connected to said means, and means actuated by an article approaching said delivering means for automatically adding a quantity of solid detergent to said tank for each article to be washed prior to delivery of washing solution from said tank to the said article.

4. Washing apparatus comprising means for advancing an article to be washed to a washing station, a washing solution container, means for delivering washing solution from said container to the article at said station, and means actuated by the advancing article before arriving at said station for supplying detergent material to said container.

5. Washing apparatus comprising means for conveying articles to be washed successively past a rinsing and a washing station, a container for washing solution, means for supplying said solution to an article at the washing station, means for maintaining the level of liquid substantially constant in said container, and means actuated by an article at the rinsing station for adding detergent to the solution in said container.

6. Washing apparatus comprising means for conveying articles to be washed successively past a rinsing and a washing station, a container for washing solution, means actuated by an article for supplying said solution thereto at the washing station, means for maintaining the liquid level in said container substantially constant, and means actuated by an article for adding solid detergent to the container while said article is at the rinsing station.

7. A method of washing articles successively comprising maintaining a supply of washing solution and an independent supply of dry solid detergent, using successive quantities of said solution to wash said articles, adding just sufficient water to said solution supply to maintain the level thereof substantially constant, and adding successive predetermined quantities of said solid detergent to said solution supply for each article washed.

8. A method of washing a series of articles comprising maintaining a substantially uniform supply of washing solution available, rinsing said articles at a rinsing station, subsequently supplying said solution to the articles at a washing station, and adding a quantity of solid detergent to said supply of solution each time an article arrives at said rinsing station.

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