

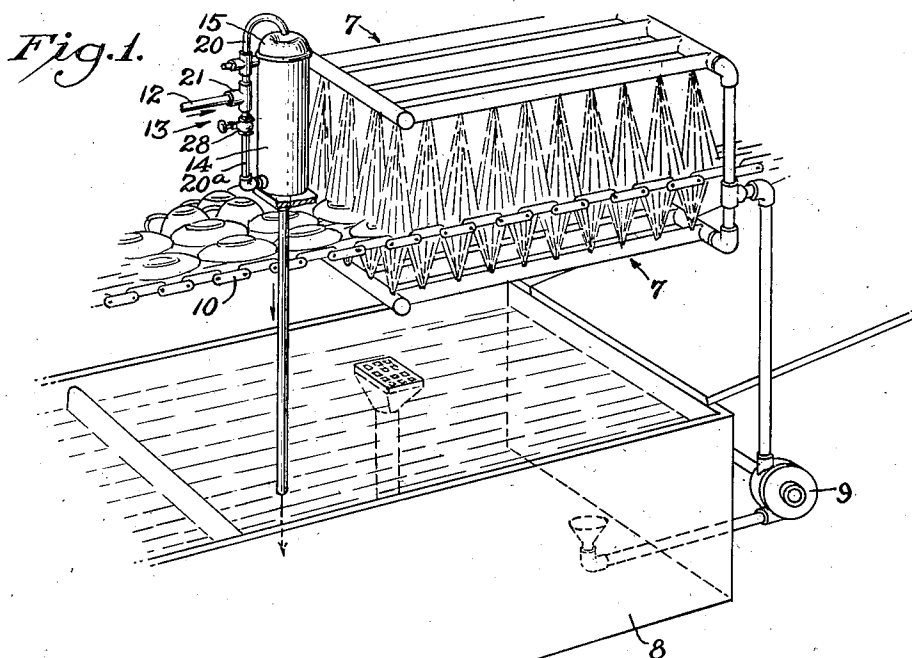
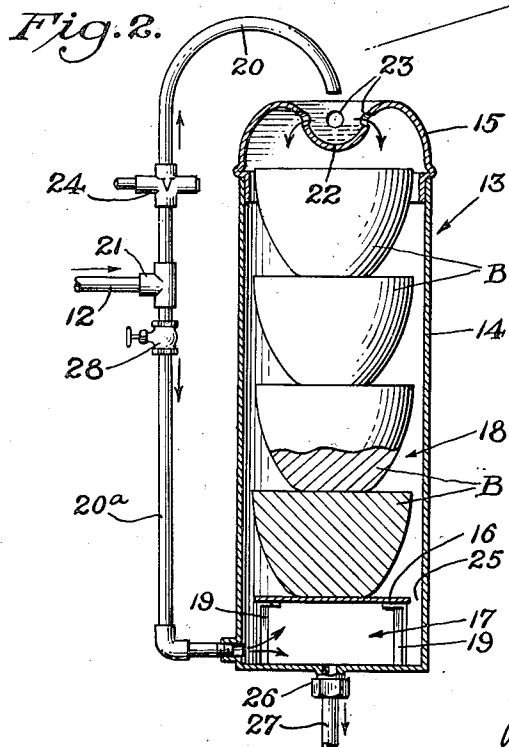
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DISPENSER FOR WASHING COMPOUNDS

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## DISPENSER FOR WASHING COMPOUNDS

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The invention relates to the dispensing of washing compounds of the mild alkaline class such, for example, as sodium carbonate, and has particular reference to the introduction of such compounds into the wash water of a dishwashing machine and the like. Such materials have a tendency when in solution to precipitate and solidify upon the surfaces over which the solution passes, this being especially true when a saturated solution formed by the use of hot water is cooled upon contact with the relatively cold surfaces of discharge pipes and the like. With this in view, the primary object of the invention is to provide for the dissolution and discharge of a water softening and cleansing material of the above class in a manner such as to prevent clogging of the apparatus and at the same time promote dissemination throughout the wash water.

The use of water softening and cleansing compounds in solid or briquette form is advantageous because it permits of the maintenance of a predetermined strength of solution by dissolving the material at a uniform rate. It is accordingly a further object of the invention to provide for the dispensing of a washing compound of the class above set forth and made in briquette form.

The objects of the invention thus generally stated, together with other and ancillary advantages are attained by the construction and arrangement, shown by way of illustration in the accompanying drawing, wherein

Figure 1 is a fragmentary perspective view of a dishwashing machine equipped to dispense a water softening and cleansing material in accordance with my invention.

Fig. 2 is a central vertical sectional view through a dispensing or feeding device for the water softening and cleansing material.

Referring first to Fig. 1, I have shown, for purposes of illustration, a dishwashing machine comprising upper and lower spray heads 7 for wash water contained in a tank 8, the water being drawn from the tank by a pump 9 and discharged through the spray heads which are spaced apart vertically for the passage of a conveyor 10 on which are supported the dishes or other articles to be cleaned. A second set of spray heads (not shown but located toward the left of Fig. 1) discharges rinse water onto the dishes on the conveyor. Hot water is supplied to this second set of spray heads from a rinse line in a manner well known in the art, an extension of this line being shown at 12. 13 designates generally an improved feeding or dispensing device connected

in the rinse line 12 so as to receive water whenever water is supplied to the rinse line.

The feeding or dispensing device 13 comprises a container 14 which is shown in the present instance in the form of a cylinder open at its upper end to receive a removable cover or cap 15. Spaced upwardly from the bottom wall of the container is a partition 16 forming with the bottom wall a lower chamber 17, and above the partition an upper compartment 18. For the sake of simplicity in manufacture, the partition 16 is in the form of a flat plate having depending legs 19 resting upon the bottom of the container.

The compartment 18 constitutes a holder for a plurality of briquettes B preferably arranged in superimposed relation. Herein we have shown four briquettes of a water softening and cleansing compound of the class above referred to and sold on the market under the name Marvarok. The briquettes are substantially hemispherical in form, approximately three and one-half inches in diameter. The internal diameter of the cylinder is somewhat greater so as to permit the easy insertion of the briquettes into the compartment.

Water from the rinse line 12 is supplied by a pipe 20 to the upper end of the container in a regulated flow for passage downwardly over the briquettes. As shown, the supply pipe 20 leads from a T-fitting 21 connected with the line 12, the pipe 20 extending upwardly along the container and thence downwardly with its free open end disposed above the cap 15. The latter has a central depression to form a cup or recess 22 with perforations 23 at spaced points.

The amount of water permitted to flow through the pipe 20 for discharge into the cup-shaped receptacle 22 and thence into the container is regulated by a valve 24. This valve is intended for adjustment by service men only. Accordingly, it is shown as in the nature of an ordinary T-fitting equipped with a control plug without an operating handle in order not to invite manipulation by unskilled persons.

Usually only a small amount of water is required, varying according to the temperature of the water and the degree of concentration desired. In the case of dishwashing machines, with the temperature of the rinse water from 100° to 150° F., the flow may be restricted to a rapid dropping or a very fine continuous stream. In any case the water passing downwardly thereover forms a primary solution of high concentration.

To avoid any danger of clogging it is important that the primary solution shall be permitted to pass freely from the upper compartment into the

chamber 17. To this end, the partition plate 16 is made of a diameter considerably smaller than the container, thereby forming a wide annular slot 25 between the edge of the partition and the wall of the container.

Precipitation and solidification in the chamber 17 of the primary solution of high concentration is effectually prohibited by the immediate conversion of this solution into one of low concentration. For this purpose, a second or branch pipe 20<sup>a</sup> leads from the T-fitting 21 downwardly along the container and enters the mixing chamber 17. Through this connection a relatively large volume of water enters under pressure and preferably from the side of the chamber. The resulting turbulence insures an intimate mixture of the primary solution with the water before the discharge of the final solution from the container into the wash tank 8. Also, the splashing of the water as it enters the chamber serves to flush the edges of the slot 25 through which the primary solution enters from the upper compartment.

The discharge outlet from the chamber is located at the bottom thereof and is preferably disposed centrally of the bottom wall. In the present instance, a fitting 26 has threaded therein a discharge pipe 27 leading downwardly to a point above the tank 8.

To regulate the volume of water supplied in the secondary or mixing stage, a control valve 28 is provided in the branch pipe 20<sup>a</sup>. It should be noted that the amount of water permitted to flow into the chamber 17 should be sufficiently restricted to prevent the level of the water in the chamber from rising above the partition 16. Moreover, the partition is preferably made imperforate so as to shield the briquettes from water splashing upwardly in the chamber as a result of its forcible entry therinto. In this connection it has been found that closer regulation of the degree of concentration may be obtained by subjecting the briquettes solely to the regulated flow of water discharged through the upper pipe 20.

In operation, a plurality of briquettes are placed in the container 14, the valve 24 set to regulate the amount of water permitted to flow downwardly over the briquettes according to the strength of the solution desired, and the valve 28 adjusted to insure that the amount of water supplied to the mixing chamber shall be sufficient only to maintain the level of the liquid in the chamber at or below the partition 16. With each operation of the usual valve (not shown) controlling the delivery of water to the rinse line 12, hot water is supplied to the two branch pipes 20 and 20<sup>a</sup> with the result that a strong or concentrated solution is formed in the upper chamber and flows freely downward directly into the lower chamber where it becomes converted immediately into a solution of low concentration by intermixture with the hot water entering through the pipe 20<sup>a</sup>, the final solution being discharged through the pipe 27 to the wash tank 8.

It has been found that when the water softening and cleansing compound is introduced into the wash water in the manner above set forth, it is possible to maintain a washing solution of substantially constant strength. Of primary importance in the attainment of this result is the gradual dissolution of the material from a solid or briquette form by causing a regulated quantity of water to flow thereover to produce a strong primary solution, and thereafter supply-

ing a relatively large quantity of water in a manner such as to produce an intimate mixture of low concentration for rapid dissemination in the wash water. Also of substantial importance is the absence of any pockets in which the solution may collect, the unimpeded flow of the primary solution into the mixing chamber, and the flushing of the communicating passage by the water discharged under pressure into the mixing chamber, to effectually prevent clogging of the passage.

I claim as my invention:

1. A dispensing apparatus of the character set forth comprising, in combination, a holder for water soluble briquettes, means for supplying a regulated quantity of water for passage downwardly over said briquettes to form a strong primary solution, a lower mixing chamber having an inlet for said solution and a lower outlet, and means for supplying a relatively large quantity of water under pressure to said chamber for admixture with the primary solution, the inlet to said chamber permitting the free flow of the primary solution to the chamber, and the outlet from the chamber being relatively restricted.

2. A dispensing apparatus of the character set forth comprising, in combination, a container open at its upper end, a cap removably closing said container and having a cup-shaped recess in its upper portion with spaced apertures therein, a partition in the lower portion of said container dividing it into an upper compartment adapted to receive a plurality of water soluble briquettes, one above the other, and a lower mixing chamber freely communicating with said compartment, means for supplying a regulated quantity of water to said cup-shaped recess for distribution over said briquettes whereby to form a solution of high concentration, means supplying a relatively large quantity of water to said mixing chamber for admixture with the primary solution discharged from said compartment, and means for discharging the mixture from the mixing chamber into a wash tank or the like.

3. A feeding device of the character set forth comprising, in combination, a container, a partition removably supported on the bottom of said container and dividing it into an upper compartment adapted to receive a water soluble briquette and a lower mixing chamber freely communicating with said compartment, means for supplying a regulated quantity of water for distribution over said briquette whereby to form a solution of high concentration, means for supplying a relatively large quantity of water to said mixing chamber for admixture with the primary solution discharged from said compartment, and means for discharging the mixture from the mixing chamber into a wash tank or the like.

4. A dispensing apparatus comprising, in combination, a container, a partition disposed above the bottom of the container and dividing it into an upper compartment adapted to receive a plurality of water soluble briquettes and a lower mixing chamber, said partition having means for supporting it upon the bottom of the container and being constructed to establish free communication between the said compartment and said mixing chamber, means for supplying a regulated quantity of water to said compartment, and means for supplying water under pressure to said chamber horizontally thereof.

5. In a dispensing apparatus of the character set forth comprising a container having an upper compartment for receiving briquettes adapted to

be dissolved by the introduction of water to the compartment to form a strong solution, a separate lower mixing chamber communicating freely with said upper compartment, said chamber having a discharge outlet at the bottom thereof, and means for supplying water under pressure to said chamber at one side thereof for admixture with the primary solution flowing downwardly thereinto from the upper compartment.

6. A dispensing apparatus comprising, in combination, a container, a partition disposed above the bottom of the container and dividing it into an upper compartment adapted to receive a plurality of water soluble briquettes and a lower mixing chamber having an outlet, means for supplying a regulated quantity of water to the compartment to form a strong primary solution, and means for supplying water under pressure to said chamber for admixture with said primary solution, said partition being constructed to provide

free communication between the compartment and the chamber.

7. A dispensing apparatus for cleansing or water softening compounds comprising, in combination, a container having a bottom wall, means for supporting the compound above and in spaced relation to the bottom wall and defining an upper compartment and a lower mixing chamber, outlet means for said chamber, means for introducing water to said compartment to dissolve the compound therein so as to form a strong primary solution, and means for supplying water under pressure to the mixing chamber, said supporting means permitting free communication between said compartment and said mixing chamber to permit the primary solution to flow downwardly by gravity into said mixing chamber for thorough mixture with the incoming water before discharge through said outlet means.

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