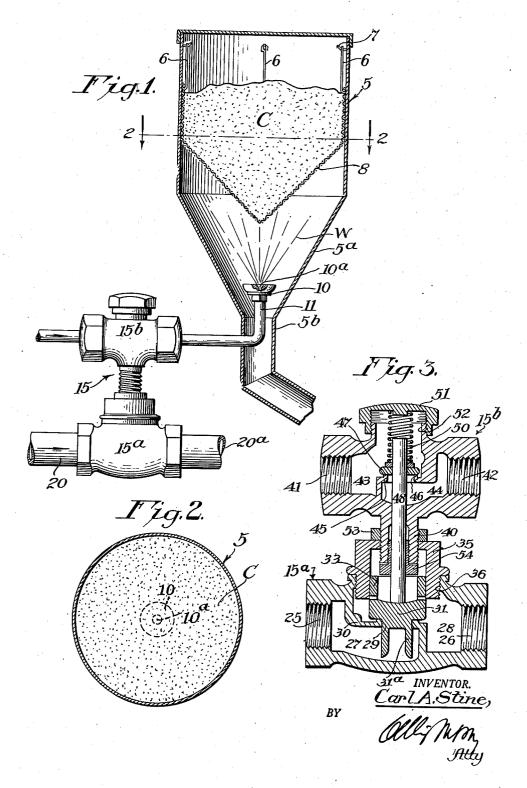
ADMIXING AND DISPENSING METHOD AND DEVICE

Filed Aug. 9, 1943



## UNITED STATES PATENT OFFICE

-800 กรีเลียงใต้สุดเป็น เป็น เป็นสูติเลียง

Ban niji kala je kairgiao din (1801), i tibi

28. (College, p. 1. 1. 1. 186 72 (194 outlet 20 1. 186 72 (194 outlet 18 best

2,371,720

## ADMIXING AND DISPENSING METHOD AND DEVICE

Carl A. Stine, Van Nuys, Calif., assignor to Turco Products, Inc., Los Angeles, Calif., a corporation of California

Application August 9, 1943, Serial No. 497,940

1 Claim. (Cl. 299-83)

This invention has to do with admixing and dispensing devices and methods and, more particularly, it relates to devices and methods for dissolving chemical masses and admixing them with liquid containing a solvent therefor.

For instance, in dish-washing machines a tank of soapy water is maintained, which water is sprayed over the dishes to clean them and subsequently a stream of rinse water is introduced over the dishes to rinse them, the rinse water 10 and dropping into the tank containing the wash water. Thus, unless additional soap is introduced to the tank in proportion to the quantity of rinse water added thereto, the soap content tion to a point where the apparatus ceases to perform efficiently. Heretofore it has been the practice to by-pass a certain amount of fresh water from the rinse water line and pass it through a container containing a pulverized soap or other cleaning chemical, depositing the fresh water in the top of the container above the chemical therein and allowing the water to pass downwardly by gravity through the chemical and thereby dissolve and pick up some of the chemical 25 the cake have a loose fit in the screen. before passing to the tank of the washing machine.

A serious difficulty with such mixing devices has been their lack of uniform and dependable admixing action. The chemical often becomes so caked and hardened that gravity flow of water is insufficient to dissolve a proper amount of the chemical and such devices cannot be depended upon to provide a definitely predeterminable admixture of chemical with the liquid. Moreover, the proportion of chemical admixed with the liquid in such devices becomes less as the chemical in the container is depleted.

It is therefore among the principal objects of my invention to provide a mixing method and device in which a uniform admixture of chemical and liquid may be obtained regardless of the quantity of chemical in the mixing device.

It is another object to provide a method and device in which the rate of admixture is governed and controlled automatically by the flow of liquid.

Another object of my invention is to provide a device which may be economically manufactured and simple to use as well as one which does not become clogged and inoperative.

Another object is the provision, in such a device, of means for maintaining the surface of the material to be dissolved a uniform distance from the liquid spray.

invention and how those as well as the objects hereinabove specifically mentioned are attained will become apparent from the following detailed explanation of one of the physical forms which 5 my invention may take, for which purpose I shall refer to the accompanying drawing in which:

Fig. 1 is a medial vertical section, showing some parts in side elevation;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged medial vertical sectional view of the proportioning valve.

Referring now to the drawing I show at 5 a hopper or casing having a conical bottom porion of the wash water becomes depleted by the dilu- 15 5a terminating in a discharge neck 5b, which neck typically may discharge into a wash water supply tank such, for instance, as is employed in a dishwashing machine, not shown. Suspended in the hopper by links 6 there is a conical screen 20 8, the links being hung at their top ends from hooks 7 carried by the hopper. The screen is adapted to support or contain a mass of caked or powdered chemical such, for instance, as soap C. If the material is caked it is preferable that

An upwardly disposed spray nozzle 10 is mounted in the lower portion of the hopper axially of the screen, this nozzle having a conical spray orifice 10a adapted to project an axial conical spray against the bottom of the screen and, through the screen, against the bottom surface of the charge of chemical.

Nozzle 10 is threadedly mounted on the discharge end of a pipe 11, the inlet end of which 35 pipe typically may be connected to a source of water under pressure. Pipe 11 may have interposed between its inlet and outlet a proportioning valve 15 which will be hereinafter described. In some uses to which my admixing device may 40 be put, the proportioning valve 15 and the remaining elements to be described are not essential. For instance, the supply of liquid introduced through pipe ii may be controlled solely by a conventional manually controlled valve, 45 not shown, which may be interposed in the line where it is not desired to proportion the admixture with some other liquid stream.

At 20 I show what may be termed a main rinse water supply pipe whose inlet may be connected to a water main for supplying water under pressure. The discharge end 20a may, for instance, discharge into a washing machine, not shown, for the purpose of supplying rinse water thereto.

Valve 15, which is connected into both lines 11 Still further advantages are provided by my 55 and 20, is of the construction shown in my co-

pending application Serial No. 465,840, filed November 17, 1942, and comprises a casing 15a and a second casing 15b. Casing 15a has an internally threaded inlet 25 and outlet 26, an inlet chamber 27 and an outlet chamber 28, said chambers communicating through an opening 29 in a dividing partition 30. A check member 31 seats against partition 30 toward the inlet, and has a guide portion 31a slidable through opening 29 and an upper guide portion 33 slidably mounted 10 in a cap 35, which cap is threadedly mounted in opening 36 provided in the top of casing  $0.5a_c$ .

Casing 15a has a neck 40 threadedly mounted in the cap 35, and a threaded inlet 41, outlet 42, inlet chamber 43, outlet chamber 44, a partition 15 45 having an opening 46, and a check member 47 seating towards the inlet against partition 45. Check member 47 is secured on a stem 48 which passes downwardly through opening 46. neck 40, and bears at its bottom end against the 20 top of check member 31, being resiliently urged downwardly, by coil spring, 50... A cap 51 covers, the top opening 52 in casing 15b to provide access. to the interior and a lock nut 53 is provided around neck 40. A guide member 54 is thread-25. edly mounted on the bottom end of neck 40 and has a longitudinal bore to slidably pass stem 48.

The function of the proportioning valve :15 is to proportion the amount of liquid flow through line II in consonance with the flow through line 30 a lower solution-receiving chamber, said wall. 20, the proportioning being accomplished by check 31 being lifted by the fluid pressure in chamber 27 against the pressure of spring 50 to commensurately lift the check 47.

From the foregoing description it will be ob. 35 served that the spray W. discharged from nozzle: 10 impinges against the conical screen carrying the chemical and thus evenly dissolves chemical from the surface area exposed through the screen. Inasmuch as the velocity of spray large- 40 a capacity to maintain the lower chamber-free ly determines the rate of dissolution of the chemical, the chemical-liquid admixture is governed by the liquid flow through line of which, in turn,

is proportioned in accordance with the liquid flow through the rinse water line 20. The initial admixture effected by impingement of the spray against the chemical contained in the screen is further augmented as the liquid drops downwardly and passes out through the restricted neck of the hopper.

Inasmuch as the conical spray effects a dissolution of the chemical evenly over the conical surface by virtue of being axial therewith, the charge in the screen drops down into the screen as its surface area is dissolved, so that the surface is always the same distance from the spray and so that the rate of dissolution is the same regardless of the quantity of chemical supported by the screen...

While, in the foregoing, I have resorted to considerable detail of structure and association of parts in describing a particular example of my invention, I wish it to be understood that I have done so merely to make my invention understood and that I do not limit my invention to such details. On the contrary, my invention is only to be limited as appears in the appended claim. I claim:

A device for mixing a soluble chemical material with a liquid solvent, comprising a container, a conical foraminate wall dividing the container into an upper material-containing chamber and providing a support for the material and having its vertex disposed downwardly in the container, a liquid spray member mounted in the lower chamber in position to project a liquid spray axially against the wall whereby to dissolve material exposed therethrough, and a solution discharge port in the container, said port having its: inlet communicating with the lower chamber below-said-wall and spray member and being of of any pool of solution in contact with the ma-

CARL A. STINE