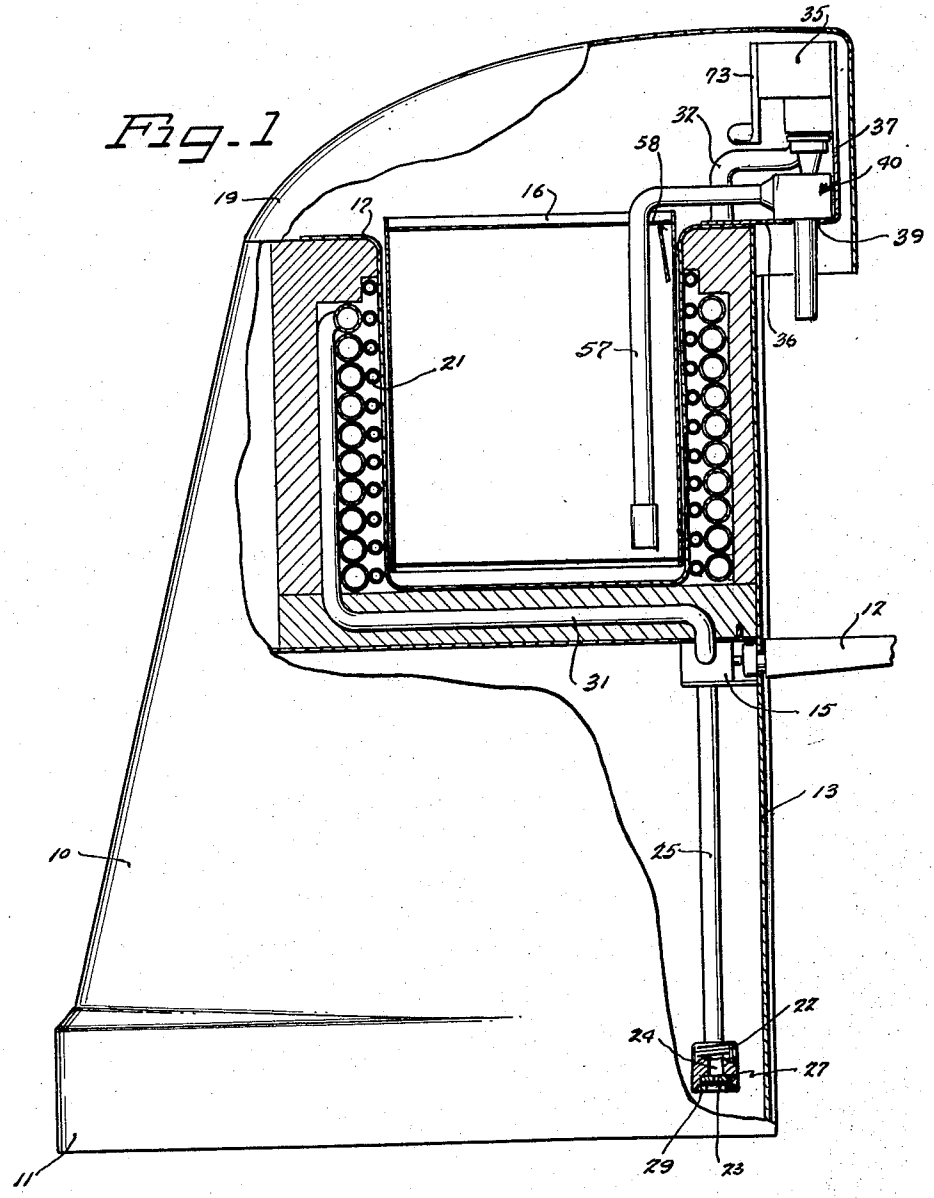
July 21, 1959 C. C. BAUERLEIN 2,895,642

THROW-AWAY TYPE OF CONCENTRATE PROPORTIONER

Filed May 6, 1955 3 Sheets-Sheet 1

Fig. 1



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THROW-AWAY TYPE OF CONCENTRATE PROPORTIONER

Filed May 6, 1955 3 Sheets-Sheet 2

Fig. 2

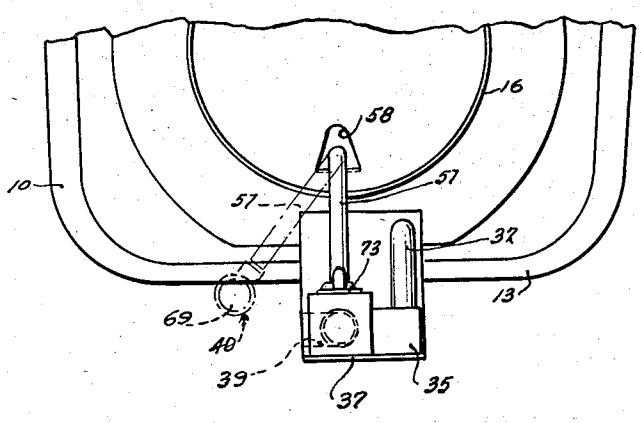


Fig. 3

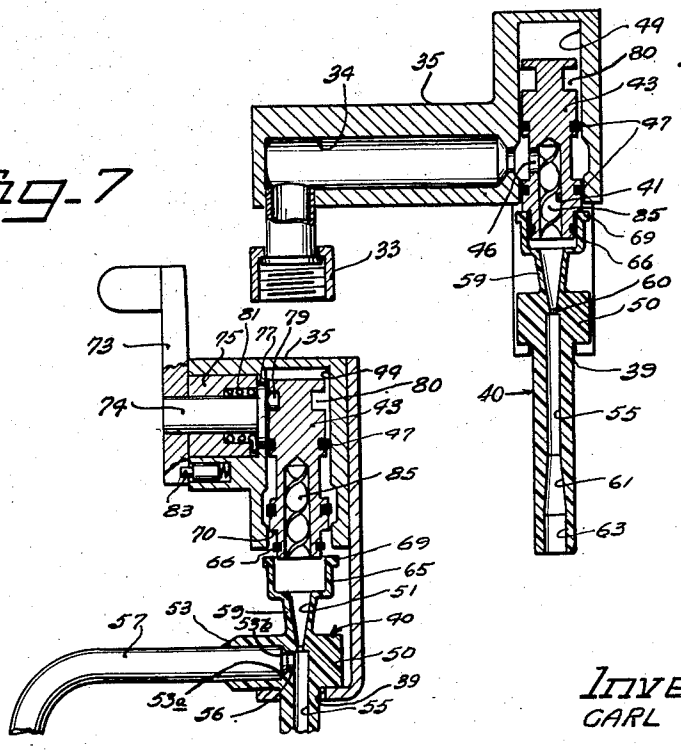


Fig. 7

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THROW-AWAY TYPE OF CONCENTRATE PROPORTIONER

Filed May 6, 1955 3 Sheets-Sheet 3

Fig. 4

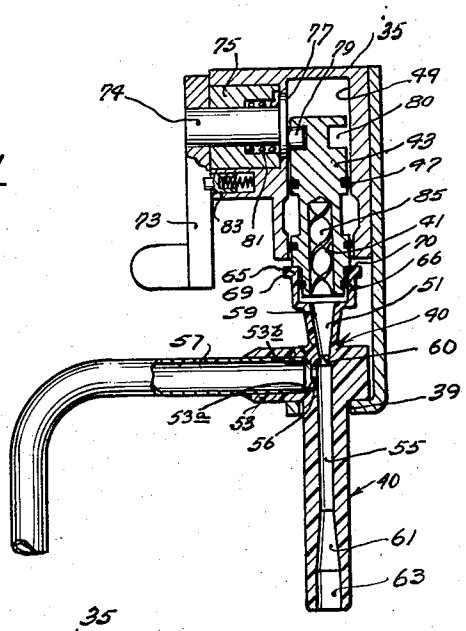


Fig. 5

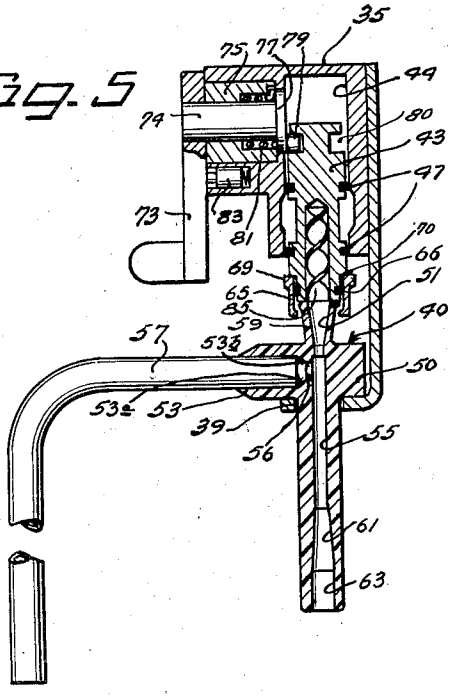
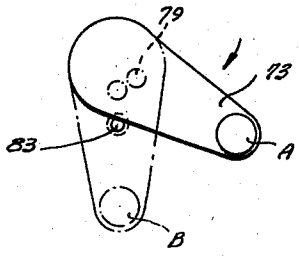


Fig. 6



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United States Patent Office 2,895,642 Patented July 21, 1959

2,895,642

THROW-AWAY TYPE OF CONCENTRATE PROPORTIONER

Carl C. Bauerlein, Mukwonago, Wis., assignor to The Dole Valve Company, Chicago, Ill., a corporation of Illinois

Application May 6, 1955, Serial No. 506,577

8 Claims. (Cl. 222—80)

This invention relates to improvements in dispensers for proportioning and dispensing fluids or concentrates and the like.

An object of my invention is to provide a novel and improved form of proportioning dispenser for proportioning and mixing concentrates directly from a can, the dispensing valve of which is destroyed during the operation of releasing the can when empty.

A further object of my invention is to provide a novel and improved form of proportioning dispenser particularly adapted to proportion and dispense concentrated milk and the like and arranged with a view toward conforming with the strictest of health standards and to prevent contamination of the source of supply of concentrate and the dispensing valve therefor.

A still further object of my invention is to provide a novel and simple form of throw-away type of concentrate proportioner for dispensing concentrates directly from the container therefor and so arranged that the proportioner must be thrown away when the concentrate container is empty.

A still further object of my invention is to provide a proportioning and dispensing device for concentrated milk and the like, together with a novel form of water connection thereto movable to accommodate insertion of the suction tube in a concentrate can, in which the water connection is sealed to the proportioning and dispensing device when the suction tube is in association with the source of supply of concentrate, and in which the water connection breaks the proportioning and dispensing device so it must be thrown away when it is desired to replace an empty can of concentrate in the dispenser.

A still further object of my invention is to provide a self-priming dispenser of the type in which a venturi serves as a proportioner for the concentrate with water.

Still another object of my invention is to provide a self-priming dispenser of the venturi type by imparting a swirling action to the water as it enters the venturi.

A further object of my invention is to provide a proportioning dispenser for concentrates in which the dispensing proportioner consists in a venturi having a vacuum chamber on the downstream side of the throat thereof and in which a spiral passage for water has communication with the upstream side of the venturi for imparting a whirling action to the water and rendering the venturi self-priming.

A still further object of my invention is to provide a self-priming dispenser of the venturi type by providing a spiral water passageway at the entering end of the venturi and by providing a vacuum chamber on the downstream side of the throat of the venturi of sufficient length to accommodate the free flow of concentrate thereinto by the suction created by the proportioning water.

A still further object of my invention is to provide a simple and improved form of dispenser particularly adapted for concentrated milk and the like in which

capillary attraction of the concentrate at the dispensing spout is obviated.

A still further object of my invention is to provide a novel and improved method of eliminating capillary attraction at the spout of the dispenser by coating the inside of the spout with a silicone grease or like material.

These and other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a view in side elevation of a dispenser constructed in accordance with my invention with certain parts broken away and certain other parts shown in vertical section;

Figure 2 is an enlarged fragmentary plan view of the forward end portion of the dispenser shown in Figure 1;

Figure 3 is a fragmentary sectional view taken through the proportioner and illustrating the water connection thereto;

Figure 4 is a transverse sectional view taken through the proportioner showing the proportioner sealed to the water connection;

Figure 5 is a view somewhat similar to Figure 4 but showing the water connection crushing the proportioner at the end of a dispensing operation when it is desired to remove the proportioner to replace an empty with a full can;

Figure 6 is a fragmentary end view of the valve looking from the rear end thereof and showing the position of the handle for connecting the proportioner with its water connection when the proportioner is sealed to its water connection and when it has been crushed by the water connection; and

Figure 7 is a view somewhat like Figures 4 and 5 but showing the water connection and valve in position when replacing a new proportioner and can in the dispenser.

In Figures 1 and 2 of the drawings, I have shown a dispenser for diluting and dispensing concentrates, and particularly concentrated milk directly from the container or can in which the milk is supplied. This dispenser may include a cabinet or casing **10** having a base **11** which may be mounted on a counter or like support and having a glass rest **12** projecting outwardly from a front wall **13** thereof and pivotally supported to operate a water valve **15** for supplying water to dilute or proportion a concentrate contained in a can or container **16** contained in a refrigerated tank **17** of the dispenser.

The tank **17** is shown as having a cylindrical wall of sufficient diameter to accommodate the ready insertion and removal of a concentrate can **16** therein and as being of sufficient depth to contain the can, but accommodating the can to project over the top of the tank so it may readily be grasped for removal therefrom. The tank **17** and can **16** are shown as being closed by a detachable cover **19**.

The tank **17** and can **16** are shown as being cooled by refrigerating coils **21** encircling said tank and connected with a compressor and condenser (not shown) of a refrigerating unit, which may be mounted outside of the casing **10** or inside of said casing on the base **11** within the side walls of said casing. The inside of the tank **17** may be made from a corrosion resistant material, such as a stainless steel, which may act as a conductor of cold, to maintain the concentrate cold within the can **16** when the refrigerating unit is shut off.

A supply connection for water at city pressure is shown as being at the bottom of the base **11** and as including a connector **22** which may be threaded on its outside for connection with a source of city water. The connector **22** is shown as having an enlarged diameter passageway **23** therein in communication with a reduced

diameter passageway 24 having communication with a pipe 25 connected with the inlet side of the valve 15 for supplying water thereto.

A resilient annular flow control member 27 is shown as being seated at the junction of the passageways 23 and 24 on the shoulder formed thereby. A retainer ring 29 on the upstream side of the flow control member 30 is provided to retain said flow control member in position in the passageway 23.

Various forms of flow control members may be substituted for the flow control member 27, to accommodate the supply of a uniform volume of diluting water at the desired pressure, to the valve 15, regardless of variations in pressure of the water at the source. The flow control member 27 is herein shown as being a resilient flow control member similar to that shown and described in Patent No. 2,389,134, which issued to Clyde A. Brown on November 20, 1945, and is no part of my present invention, so need not herein be shown or described in detail.

As shown in Figure 1, the valve 15 controls the supply of water to a supply pipe 31 shown as leading across the bottom of the tank 17 and upwardly along the side thereof and outwardly in spaced relation with respect to the refrigerating coils 21, and as being coiled about said refrigerating coils to accommodate the water in said supply pipe to be cooled by said refrigerating coils. The supply pipe 31 coiled about the tank 17 terminates into a vertically extending pipe 32 having connection with a fitting 33 having communication with a water passageway 34 leading along a dispenser body 35. The dispenser body 35 is supported in advance of the front wall 13 of the casing 10, above the top thereof, on an angle bracket having a horizontal leg 36 extending outwardly from the top of the cabinet 10 and a vertical leg 37 extending in advance of the wall 13 upwardly therefrom and having the body 35 secured thereto.

The horizontal leg 36 of the angle bracket has a slot 39 therein to receive a proportioner 40 and to accommodate said proportioner to be placed in axial alignment with a water passageway 41 in a vertically movable passageway member 43. This passageway member 43 is movably carried in a downwardly opening vertically extending passageway 44 in the dispenser body 35, having communication with the passageway 34. The passageway 44 in turn has communication with the downwardly opening passageway 41 in the passageway member 43, as by a port 46. The passageway 44 is sealed by spaced O-rings 47 recessed within the passageway member 43 on opposite sides of the opening from the passageway 34 to the passageway 44 and having sealing engagement with the wall of the passageway 44.

The proportioner 40 is shown as including a proportioner body 50, which may be made from one of the well known thermoplastic materials, and is preferably transparent. The proportioner 40 includes a venturi 59 extending vertically along the proportioner body 50 and opening at the bottom thereof. The proportioner 40 is adapted to be supported in a slot 39 in axial alignment with the passageway 41. The proportioner body 50 has a coupling 53 extending to one side of the Venturi 59. The coupling 53 has a first interior portion 53*a* of relatively large cross-sectional area terminating into a second portion 53*b* of relatively small cross-sectional area defining a sharp edge orifice 56 having communication with a vacuum chamber 55 of the venturi 59. A suction tube 57 leads from the coupling 53 and is turned downwardly to be inserted in a pierced opening 58 in the can 16 for the dispensing of concentrate therefrom. The suction tube 57 terminates closely adjacent the bottom of the can to assure the scavenging of the can from concentrate therein.

The Venturi 59 includes an inverted truncated cone-like passageway 51 terminating at its small diameter end into a throat 60 of the Venturi, which terminates into the elongated vacuum chamber 55. A truncated cone-like passageway 61 leads vertically from the lower end of the vacuum chamber 55 and communicates with a vertical downwardly opening passageway 63 forming a dispensing spout.

At the base or upper end of the cone-like passageway 51 is a cup-shaped receptacle 65 within which the passageway member 43 is adapted to fit and to be sealed thereto as by an O-ring 66 recessed within the wall of the passageway member 43. The receptacle 65 has a flange 69 at its upper end having engagement with a downwardly facing shoulder 70 of the passageway member 43 when said member is in position to dispense and proportion a concentrate from the can 16.

The passageway member 43 is moved into sealing engagement with the receptacle 65 as by a uni-directional moving handle 73 on the outer end of a horizontal shaft 74 rotatably carried in a sleeve 75 mounted in the dispenser body 35 and fixed from rotation with respect thereto. The shaft 74 has a disk 77 on its inner end from which extends an eccentric or crank pin 79, extending within an annular groove 80 formed in the passageway member 43 adjacent the upper end thereof. Rotation of the hand crank 73 will thus move the passageway member 43 downwardly into position to fit within the receptacle 65 and continued rotation in the same direction will raise said passageway member to accommodate another proportioner to be positioned in the slot 39 in registry with the passageway member 43.

Recessed within the sleeve 75 is a spring brake 81 floatingly carried in said sleeve and having engagement with the shaft 74. The spring brake 81 is so placed as to accommodate the hand crank 73 to be turned in a clockwise direction as shown in Figure 6, but to wind up on the shaft 74 and positively hold the shaft 74 and crank 73 from turning movement in a counterclockwise direction, thus making it necessary to turn the hand crank 73 from position A, shown in Figure 6, to position B and to move the passageway member 43 from the position shown in Figure 4 to that shown in Figure 5, to break the retainer 65 from the venturi prior to removal of the proportioner 40 from the slot 39 and from the can 16, when the can is empty.

Turning movement of the hand crank 73 and downward movement of the passageway member 43 is stopped in the position shown in Figure 4 and in position A shown in Figure 6 by a spring pressed stop 83 carried in the dispenser body 35 and normally engaging the hand crank 73, to stop movement thereof in position A, shown in Figure 6. Thus, when it is desired to turn the hand crank 73 further to remove the proportioner 40, the stop 83 must be depressed to accommodate the handle 73 to pass thereby.

When the stop 83 is depressed, turning of the crank 73 will engage the shoulder 70 with the flange 69 of the receptacle 65 and will force said flange and receptacle downwardly with respect to the proportioner body, held from movement in the slot 39. This will crush or break said receptacle at the mouth of the venturi 59 and destroy the usefulness of the proportioner 40. Upon continued movement of the handle 73, the passageway member 43 will move upwardly along the passageway 44 to withdraw the passageway member 43 from the proportioner 40. The proportioner 40 may then be removed from the slot 39, and the suction tube 57 may be withdrawn from the pierced opening 58 in the can 16.

When it is desired to replace a new can in the tank 17, and to proportion and dispense concentrate therefrom, the can is pierced and placed in the tank 17 with the pierced portion located as shown in Figure 2. The crank 73 may then be turned in a clockwise direction to position the passageway member 43 in its extreme upper position, as shown in Figure 7. The suction tube 57 of the proportioner 40, which may come with the can and be sealed in a cellophane wrapper when delivered, may be placed within the pierced opening in the can, with the

valve body 50 offset to one side of the horizontal leg 36 of the angle bracket. The proportioner body 50 may then be moved inwardly from the dotted line position shown in Figure 2, to the solid line position shown in this figure, to position the spout of the proportioner 40 in registry with the passageway member 43. The hand crank 73 may then be turned in a clockwise direction into engagement with the spring pressed stop 83. In this position of the hand crank, the passageway member 43 will extend within and be sealed to the receptacle 65 to supply proportioning fluid such as water to the venturi 59 to withdraw and proportion concentrate from the can 16 in an obvious manner.

Referring now in particular to the means for rendering the venturi 59 self-priming, the passageway member 43 has a spiral blade 85 carried in the passageway 41 and extending therealong for the length thereof and forming two spiral passageways, one being on each side of said blade to impart a whirling action to the proportioning fluid and to prime the venturi in cooperation with the elongated vacuum chamber 55, so as to assure a full volume of concentrate for proportioning the diluting fluid, the instant the valve 15 is opened to supply water to the passageway 41.

The prime is thus attained by the turbulent whirling action of the diluting water in cooperation with the elongated vacuum chamber 55, assuring a full volume of concentrate for proportioning with the water within said vacuum chamber and affording an unrestricted flow of the proportioned concentrate and water therealong out through the spout 63.

It should here be understood that while I have shown a spiral vane or blade in the passageway 41 in cooperation with the elongated vacuum chamber 55 to render the venturi self-priming, that various other means may be provided in the passageway 41 to create a turbulence of the water as it enters the venturi and thus to expel air therefrom.

It may be seen from the foregoing that a more sanitary dispenser for concentrates and particularly milk concentrates and such concentrates as are subject to bacterial action when in a warm room has been provided, and that the spiral 85 and elongated vacuum chamber 55, besides rendering the proportioner 40 self-priming and assuring an instantaneous proportioning and dispensing of concentrate as soon as the valve 15 is turned on, also effectively scavenges the concentrate can 16 and frees the venturi of concentrates when the proportioning fluid is turned off.

It may further be seen that when the valve 15 is turned off, the concentrate in the suction tube 57 and chamber 55 will flow back into the refrigerated can 16, maintaining the concentrate at a low temperature free from bacterial action, which would tend to contaminate the same.

I have further increased the safety of my dispenser from a health standpoint by preventing the accumulation of drops of concentrate in the passageway 63 at the end of a dispensing operation so as to prevent contamination of the proportioned concentrate when the dispenser has been standing for some time, and it is again desired to dispense a fresh drink. This is attained by swabbing the passageway 63 with a chemical composition or grease, which may be a silicone grease or a carnauba wax or grease. When the bore 63 is so swabbed, liquid will not cling to said bore and capillary attraction of the liquid is effectively prevented. Thus, no bubbles will form at the bottom of the passageway 63 and the passageway will be clean at the end of a dispensing and proportioning operation.

A silicone grease has been very effective in preventing capillary attraction at the discharge end of the passageway 63 and it has been found that such a grease is effective for the life of the proportioner. While a carnauba wax is also effective, a silicone grease is preferred.

It may be seen from the foregoing that I have provided a simple and safe proportioning and dispensing

device particularly from health standards, which is particularly effective for dispensing concentrated milk or other concentrates which are sensitive to bacterial action, and that this is attained by providing a proportioner, which must be thrown away when the concentrate can is thrown away, and also by so arranging the proportioner that at the end of a dispensing operation the concentrate will flow back to the refrigerated can.

It may further be seen that a simple means has been provided for making the proportioner self-priming and that bacterial action is further prevented by preventing the formation of bubbles or globules of concentrate at the discharge end of the spout by swabbing the spout with a silicone grease so as to prevent the attraction of the concentrate by capillary attraction.

It will be understood that modifications and variations of the present invention may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. In a concentrate dispenser, a dispenser body, a passageway member for water guided for movement therealong, a proportioner, means removably supporting said proportioner in axial alignment with said passageway member and retaining said proportioner from axial movement with respect to said support means, means for moving said passageway member along said body into and out of sealing engagement with said proportioner, said means being movable in one direction only and moving said passageway member beyond a position of sealing engagement with said proportioner thereby crushing said proportioner prior to moving said passageway member out of engagement therewith.

2. In a dispenser for concentrates and the like, a dispenser body, a connection for water leading within said body, a passageway member for water guided for movement along said body and having a water passageway extending therealong, a proportioner, means supporting said proportioner in axial alignment with said passageway member in communication with the water passageway leading therealong and retaining said proportioner from axial movement with respect to said support means, means movable in one direction only for moving said passageway member along said body into sealing engagement with said proportioner, releasable stop means for stopping said passageway member in a position in sealing engagement with said proportioner, said stop means being releasable to accommodate further axial movement of said member beyond a position of sealing engagement with said proportioner and thereby crushing said proportioner prior to withdrawing said member from said proportioner for removal therefrom.

3. In a dispenser particularly adapted to dispense concentrates and the like, a dispenser body, a passageway member for water guided for movement therealong and having a water passageway leading therealong, a proportioner, means detachably supporting said proportioner for position in axial alignment with said passageway member and retaining said proportioner from axial movement with respect to said support means, a uni-directional crank for reversely moving said passageway member along said body into position to have sealing engagement with said proportioner, means stopping rotation of said member when said passageway member is in its sealing position with respect to said proportioner, said stop means being releasable to accommodate further movement of said passageway member beyond a position of sealing engagement with said proportioner and effect crushing of said proportioner prior to removal thereof from said support.

4. In a dispenser for concentrates and the like, a dispenser body, a connection for water leading within said body, a passageway member for water having a passageway extending therealong and carried in said body for axial movement therealong, a proportioner for concen-

trates having a Venturi having a restricted throat, a suction tube leading from said Venturi for insertion within a concentrate can, a support for said proportioner accommodating said suction tube to be inserted within a concentrate can and accommodating movement of said proportioner into axial alignment with said passageway member and retaining said proportioner from axial movement in a direction away from said passageway member, a uni-directional rotatable crank having connection with said passageway member for reciprocably moving the same along said dispenser body into sealing engagement with said proportioner in communication with the Venturi therein, said crank moving said passageway member beyond a position of sealing engagement with said proportioner and thereby crushing said proportioner prior to removing the same from said support.

5. In a dispenser for concentrates and the like, a dispenser body, an inlet for water leading thereinto, a passageway member for water movable along said body, a disposable proportioner for dispensing and proportioning a concentrate, said proportioner having a Venturi having a restricted throat and a suction tube leading therefrom on the downstream side of said throat for insertion in a concentrate can and the like, a support for said proportioner accommodating insertion of said tube in a concentrate can and positioning of said proportioner in axial alignment with said passageway member and retaining said proportioner from axial movement in a direction away from said passageway member, a crank moving said passageway member along said dispensing body into sealing engagement with said proportioner, said crank being operable to move said passageway member a further distance toward said proportioner after its position in sealing engagement therewith, and means holding said crank from rotating in a direction to move said passageway member out of sealing engagement with said proportioner and forcing said crank to move said passageway member beyond its position in sealing engagement with said proportioner, to break said proportioner, prior to moving said passageway member out of sealing engagement with said proportioner.

6. In a dispenser for concentrates and the like, a dispenser body, an inlet for water leading thereinto, a passageway member for water movable along said body, a disposable proportioner for dispensing and proportioning a concentrate, said proportioner having a Venturi having a restricted throat and a suction tube leading therefrom on the downstream side of said throat for insertion in a concentrate can and the like, a support for said proportioner accommodating insertion of said tube in a concentrate can and positioning of said proportioner in axial alignment with said passageway member and retaining said proportioner from axial movement in a direction away from said passageway member, a crank moving said passageway member along said dispensing body into sealing engagement with said proportioner, said crank being operable to move said passageway member a further distance toward said proportioner after its position in sealing engagement therewith, and means holding said crank from rotating in a direction to move said passageway member out of sealing engagement with said proportioner and forcing said crank to move said passageway member beyond its position in sealing engagement with said proportioner, to break the same prior to moving said passageway member out of sealing engagement with said proportioner comprising a one-way brake accommodating said crank to rotate in one direction and holding said crank from rotating in an opposite direction.

7. In a dispenser for concentrates and the like, a dispenser body, an inlet for water leading thereinto, a passageway member for water movable therealong, a disposable proportioner for concentrates, said proportioner having a Venturi and a suction tube leading therefrom for insertion in a concentrate can and the like, a support for said proportioner accommodating insertion of said suction tube in a concentrate can and the positioning of said proportioner in axial alignment with said passageway member and retaining said proportioner from axial movement in a direction away from said passageway member, a crank for moving said passageway member along said body into sealing engagement with said proportioner, releasable means stopping rotation of said crank when said passageway member is in sealing engagement with said proportioner and prior to the end of movement of said passageway member toward said proportioner, means holding said crank from rotation in a direction away from said stop means to withdraw said passageway member from said proportioner and forcing release of said stop means from said crank to accommodate rotation of said crank and movement of said passageway member beyond a position of sealing engagement with said proportioner into crushing engagement with said proportioner prior to withdrawal of said passageway member therefrom.

8. In a self-priming proportioner for proportioning a liquid of relatively heavy viscosity with a liquid of relatively light viscosity and dispensing the proportioned liquid as a liquid mixture of predetermined proportions, a body member, a first inlet passageway in said body member converging in a downstream direction and having a restricted throat, a turbulence creating device in said first inlet passageway upstream of said throat comprising a spiral blade, an outlet passageway in axial alignment with said inlet passageway and said throat and extending from said throat in a downstream direction, said outlet passageway having a larger cross-sectional area at its junction with said throat, than the cross-sectional area of said throat and being of a length equal to at least three times its diameter, a second inlet passageway in said body member communicating with said portion of said outlet passageway of larger cross-sectional area than said throat, adjacent the junction of said outlet passageway with said throat, and said second inlet passageway having a first portion of relatively large cross-sectional area and having a second portion defining an orifice in communication with said outlet passageway through the wall of said outlet passageway and of a small cross-sectional area relative to the cross-sectional area of said first portion, and said second portion being of a substantially shorter length than any radial measurement of the orifice defined thereby and defining a sharp edged orifice.

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