

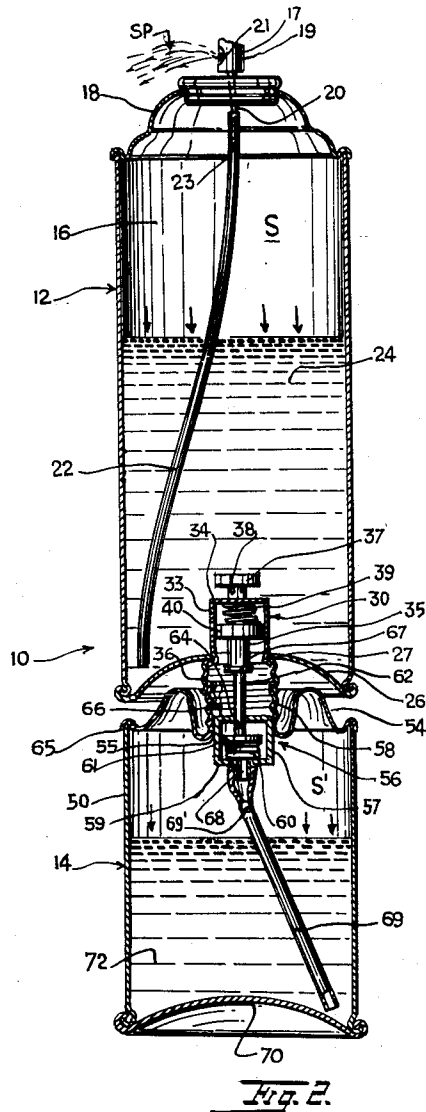
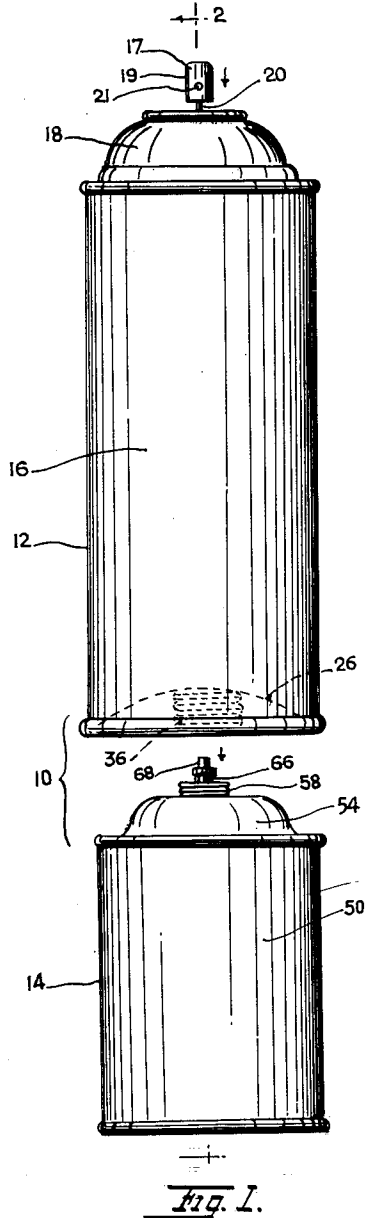
May 4, 1965

D. CHAUCER
METHOD OF STORING, COMBINING AND APPLYING
TWO-PART POLYMER MIXTURES

3,181,737

Filed Sept. 30, 1963

2 Sheets-Sheet 1



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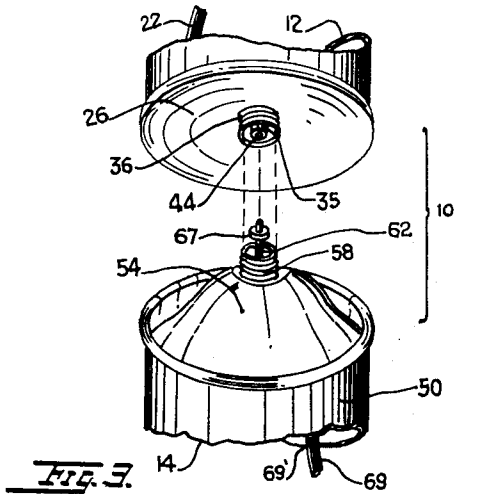


Fig. 3.

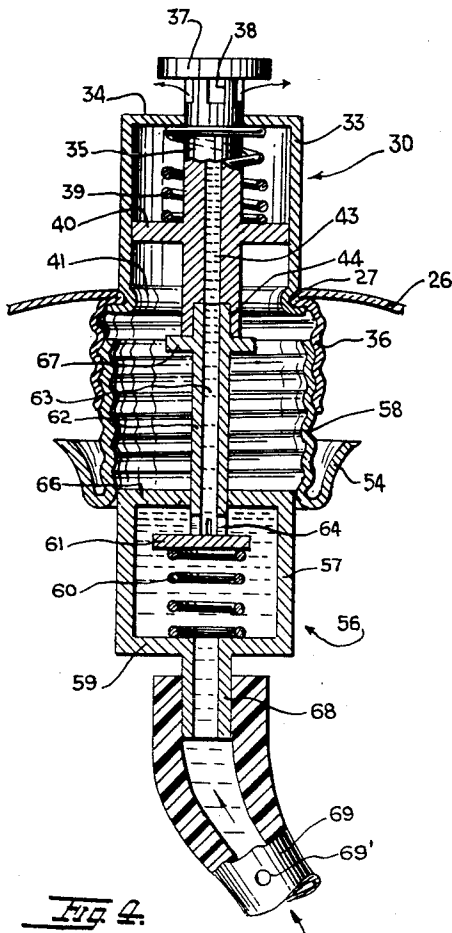


Fig. 4.

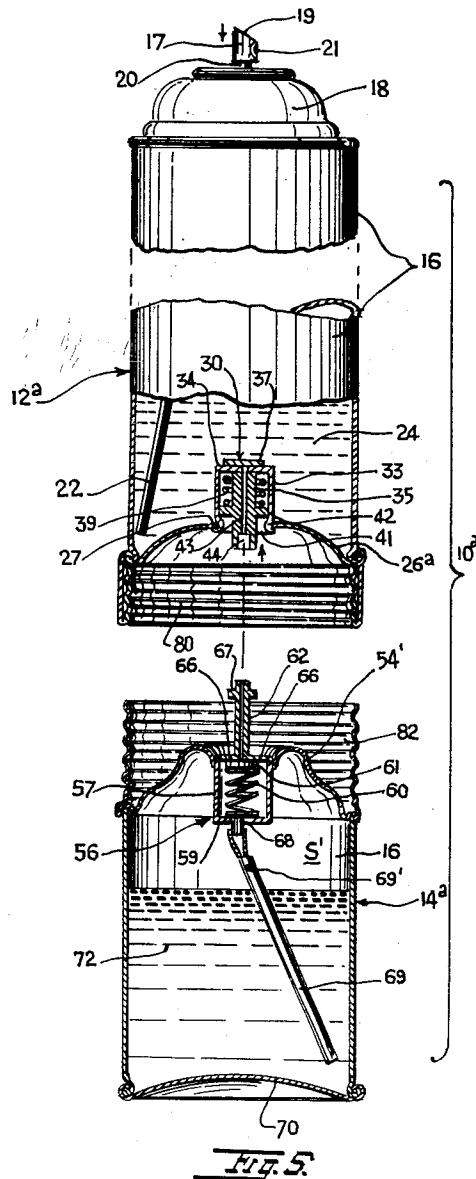


Fig. 5.

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METHOD OF STORING, COMBINING AND APPLYING TWO-PART POLYMER MIXTURES

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10 Claims. (Cl. 222—136)

This invention relates to the art of fluid dispensing devices employing containers of gas propellants for liquids and more particularly concerns a pressurized container assembly for dispensing liquids which are mixed together only when the liquids are to be discharged.

According to the invention there is provided a two-part dispenser including a first container in which a liquid is contained under low or atmospheric pressure of air or gas. In a second container another liquid is contained under high pressure of a gas propellant. The two liquids are kept separate and apart from each other until it is desired to discharge them as a mixture from the dispenser. Each container is provided with a one-way retractable discharge control valve. Screw means are provided for coupling the containers together and retracting the valve of the second container so that the second container discharges its liquid and gas propellant into the first container. The gas propellant pressurizes the first container from which the mixture of liquids can now be discharged through the valve of the first container. The invention is especially useful for dispensing liquid mixtures whose constituents must be kept or stored separately until they are to be dispensed as a mixture while they are being mixed together. Such liquid mixtures involve products as epoxy-polyester paints, urethane paints, foamants, lacquers, resin adhesives, and other co-polymer mixtures. If their constituents are mixed together and stored, the mixtures tend to set or solidify.

The present invention makes it possible to provide a fresh mixture at the time of use, in the form of an aerosol spray.

It is therefore one object of the invention to provide a two-part dispenser comprising a first can or container in which is contained a first fluent material under atmospheric pressure, and a second can in which is contained a second fluent material under pressure of a gas propellant, with means for coupling the cans together so that a valve of the second can is actuated to discharge the gas propellant and second fluent material into the first can, the first can having a valve for discharging the mixture of fluents under pressure of the gas propellant.

Another object is to provide a two-part dispenser as described, wherein the coupling means includes a threaded body part on the first can and a mating threaded body part on the second can.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a side elevational view of the two-part dispenser, with container parts shown separated.

FIG. 2 is a vertical sectional view taken on line 2—2 of FIG. 1, but with container parts shown connected.

FIG. 3 is a fragmentary exploded perspective view of container parts of the dispenser.

FIG. 4 is an enlarged sectional view of portions of FIG. 2.

FIG. 5 is a vertical sectional view of parts of another dispenser according to the invention, portions be-

ing broken away and other portions shown in side elevation.

Referring to the drawings, there is shown in FIGS. 1-4 a two-part fluid dispenser assembly 10 having two cans or containers 12 and 14. Container 12 has a cylindrical body 16 with a dome closure 18 at the top end in which is set a push-button one-way valve 19 of conventional type for discharging a spray of fluid from the container. The valve has a depending inlet nipple 20 to which is connected a siphon tube or pipe 22. The pipe has an upper lateral hole 23. The pipe extends below the surface of liquid 24 in the container and has an open end located near the internally convex bottom end closure 26 of the container.

Centrally located in a hole 27 in the bottom closure 26 is a valve 30. The valve 30 has a cylindrical casing 33 extending axially inward of the container and engaged at its bottom end with a threaded fitting 36 having a bottom open end and extending axially out of the bottom closure 26 from hole 27. Casing 33 has an apertured circular end 34 through which extends a hollow stem 35 with a head 37 on the end of the stem. Holes 38 are formed at the top end of the stem to serve as liquid discharge openings when the stem is elevated as shown in FIGS. 2 and 4. A spring 39 in the casing bears on an annular flange 40 around the stem. A bead 41 is formed at the lower end of the casing to serve as a seat for the flange 40 when the stem 35 is lowered. At the bottom end of the axial passage 43 of the stem is an enlargement or recess 44.

Liquid 24 fills the container except for a large air or gas space S at the top which is under atmospheric or low pressure. Space S may contain air or some other gas or vaporized liquid. With atmospheric pressure in space S the liquid 24 under low pressure will not be discharged when the push button 17 of valve 19 is pushed down.

Associated with container 12 of the dispenser is container 14. This is a container having a cylindrical body 50 which may differ in length from the body 16 of container 12.

On the top end of body 50 is a dome closure 54 having a central opening 55 and a threaded cylindrical fitting 58 extending axially upward from opening 55. At the bottom of fitting 58 at opening 55 is secured casing 57 of a valve 56. The casing extends axially downward into the container 14. Fitting 58 engages with fitting 36 to hold the two containers together in axial alignment.

Seated on the circular bottom 59 of casing 57 is a coil spring 60 bearing upwardly on a circular disk 61 at the bottom end of a hollow stem 62. The stem has an axial passage 63 with lateral openings 64 providing communication between passage 63 and the interior of the casing 57 when the stem is lowered and spring 60 is compressed as shown in FIGS. 2 and 4. Stem 62 passes through an opening in the upper circular end 66 of the casing. The upper end of stem 62 fits in the enlargement or recess 44 of passage 43 in stem 35. A flange 67 near the upper end of stem 62 bears on the bottom end of stem 35. When the containers are coupled together, stem 62 is retracted downward and stem 35 is retracted upward which provides communication between the valves 30, 56 and between the containers 12 and 14.

A nipple 68 is formed on the lower end of casing bottom 59. To this nipple is secured the upper end of siphon tube or pipe 69 having an opening 69' near its upper end. The pipe extends obliquely downward and terminates near the internally convex side of bottom end closure 70. The container has a quantity of liquid 72 therein. At the top of the container is a space or compartment S' in which is a gas propellant under rather high pressure. Sufficient gas is provided at such pressure that

both quantities of liquids 24 and 72 can be discharged out of valve 19 when the dispenser is operating.

To operate the dispenser 10, container 14 will be coupled to container 12 by screwing fitting 58 into fitting 36 until stem 35 moves up to clear openings 38 and stem 62 moves down to clear openings 64. The gas in space S' will force the liquid 72 in container 14 into the tube 69 and then through the valve assembly 30 ultimately to be mixed with the liquid 24 in can 12. After the liquid 72 has been transferred the gas in space S' rushes over the same route and through tube 69 into the can 12 and therein provides the necessary pressure for the ultimate operation of can 12. In can 12, the transferred liquid 72 thoroughly mixes with the liquid 24. The high pressure gas in the spray will rise to the top of the container 12 to space S. Then when push button 17 is depressed, the spray SP consisting of a mixture of liquids 24 and 72 will pass out with gas propellant through valve 19. The high pressure gas will enter hole 23 in pipe 22 while the mixture of liquids 24 and 72 will enter the bottom open end of pipe 22 in container 12.

The container 14 which contains the gas propellant is provided as a fresh product only when required to mix with liquid 24. In accordance with the present invention, the two liquids 24 and 72 are stored in separate containers so that reaction between them, polymerization and solidification are prevented. When the two containers are coupled together they form the single dispenser unit or assembly 10.

In FIG. 5 is shown a modified two-part dispenser assembly 16^a including containers 12^a and 14^a. Parts corresponding to those of containers 12 and 14 are identically numbered. Container 12^a has a female threaded fitting 80 formed integrally with bottom closure 26^a at its outer periphery. Fitting 36 of container 12 is omitted from container 12^a. Container 14^a has a threaded male fitting 82 formed integrally with the top end dome closure 54'. The threaded fitting of container 14 is omitted. When fitting 82 is screwed into fitting 80 stem 62 interfits with stem 35 causing both valves 30 and 56 to open and the liquid 72 in container 14^a sprays into liquid 24 in container 12^a and the gas follows.

There has thus been provided according to the invention, an effective means of storing two liquids separately until it is required to mix and dispense them as a mixture so that a fresh mixture is always available for use when required.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve; and means for detachably securing the containers together with the first and second

valves in communication with each other, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

2. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve; said first and second valves being normally closed and having mutually engageable extensions for securing the first and second valves in open communication with each other, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

3. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve; said first and second valves being normally closed, the first and second containers having mutually engageable portions for securing the containers together with the first and second valves in open communication with each other, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

4. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected

5

to the third valve for conveying a mixture of the first and second liquids to the third valve; said first and second valves being normally closed, the top end closure of the first container and the bottom end closure of the second container having axially aligned mutually engageable threaded fittings to secure the containers together with the first and second valves in open communication with each other, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

5. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve; said first and second valves being normally closed, the first and second containers having mutually engageable threaded peripheral portions for securing the containers together with the first and second valves in open communication with each other, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

6. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve, said first and second valves having movable pistons normally closing the valves, mutually interfitting nipples on the pistons of the first and second valves, and coupling means between the first and second containers to secure the containers together with the pistons of the first and second valves held in open positions, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

7. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a

6

second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve, said first and second valves having movable pistons normally closing the valves, mutually interfitting nipples on the pistons of the first and second valves, and coupling means between the first and second containers to secure the containers together with the pistons of the first and second valves held in open positions, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve, said coupling means comprising axially aligned threaded fittings extending outwardly from the top end closure of the first container and bottom end closure of the second container.

8. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve, said first and second valves having movable pistons normally closing the valves, mutually interfitting nipples on the pistons of the first and second valves, and coupling means between the first and second containers to secure the containers together with the pistons of the first and second valves held in open positions, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve, said coupling means comprising threaded body portions on the first and second containers extending circumferentially around the top end closure of the first container and around the bottom end closure of the second container respectively, said threaded body portions being detachably engageable with each other.

9. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liquid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first

and second liquids to the third valve, said first and second valves having movable pistons normally closing the valves, mutually interfitting nipples on the pistons of the first and second valves, and coupling means between the first and second containers to secure the containers together with the pistons of the first and second valves held in open positions, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve, said coupling means comprising aligned threaded portions on the first and second containers respectively, said threaded portions being detachably engageable with each other.

10. A dispenser assembly for liquids, comprising a first cylindrical container for a first liquid under high gas pressure, said container having top and bottom end closures, a first valve in the top end closure for discharging the first liquid in a gas propelled spray from the container, and a first siphon tube in the container connected to said valve for conveying said first liquid to the valve, said tube having an open end located near the bottom end closure; a second cylindrical container for a second liquid under low gas pressure, said second container having other top and bottom end closures, a second valve in said other bottom end closure for passing the gas propelled first liq-

uid into the second container, a third manually operable valve in said other top end closure for passing a gas propelled spray of a mixture of the first and second liquids from the second container, another siphon tube connected to the third valve for conveying a mixture of the first and second liquids to the third valve; said first and second valves being normally closed and having movable outwardly extending mutually engageable portions for opening the valves simultaneously to provide communication between the first and second containers, and means for detachably securing the first and second containers together with said portions of the first and second valves in engagement with each other and opening the first and second valves, whereby the first liquid in a gas propelled spray is discharged into the second container through the second valve, and whereby a gas propelled spray of a mixture of the first and second liquids is discharged from the second container through the third valve.

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