

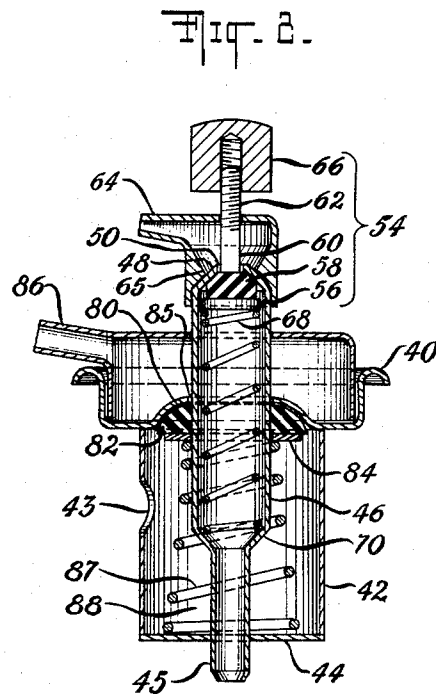
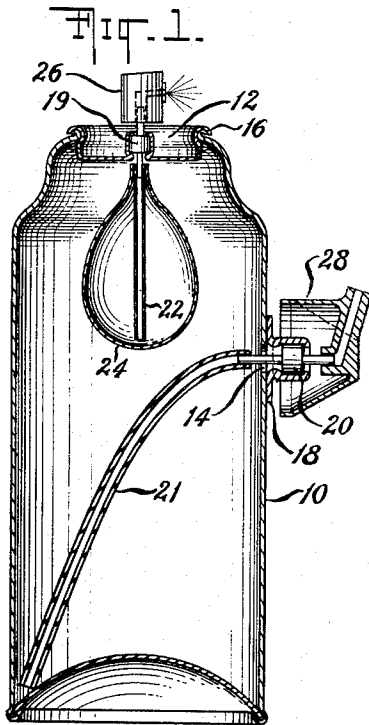
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LIQUID DISPENSING APPARATUS AND VALVE

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LIQUID DISPENSING APPARATUS AND VALVE

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The present invention relates to liquid dispensing means. More particularly it relates to pressure propelled liquid dispensing means wherein a single propellant effects expulsion of a plurality of distinct liquids, and to a valve particularly adapted for use on such apparatus.

It has previously been proposed to employ pressure-generating liquids or gases to dispense liquids from pressure-tight containers. An apparatus has now been discovered whereby it is possible to employ a single propellant load and selectively (or simultaneously) dispense, from within a single pressure-tight casing, either of two distinct liquids.

In accordance with the present invention, such apparatus comprises an outer casing having a discharge outlet, a valve closing said outlet, an inner casing deformable under pressure positioned within said outer casing and having a separate discharge outlet, a valve closing said separate discharge outlet, a liquid charge in said outer casing, a liquid charge of different composition in said inner casing, one of said casings including a pressure-generating ingredient for directly forcing the liquid charge therein through the outlet thereof when the valve therein is operated and for indirectly forcing the liquid charge from the other casing through the outlet thereof when the valve therein is operated, and means for selectively operating said valves.

The invention also encompasses a unitary valve assembly comprising an annular first valve means having axially positioned therein a second valve means, as such a valve structure is particularly useful as a part of the present dispenser.

In order to more fully illustrate the present invention reference is made to the accompanying drawings in which:

Fig. 1 is a sectional view through a pressure-tight container constructed according to one embodiment of this invention wherein said container carries independently operable top and side mounted discharge valves, and

Fig. 2 is a vertical sectional view of an alternative valve means suitable for top mounting on a pressure-tight container similar to that illustrated in Fig. 1.

The illustrative embodiment of Fig. 1 comprises a cylindrical outer casing 10 provided with openings 12 and 14 at the top and side thereof respectively. These openings are sealed by caps 16 and 18 respectively, carrying crimped thereto manually operable valves (19 and 20 respectively) of the type conventionally employed on pressure propelled dispensers. Affixed to the intake of the side-mounted valve 20 is a siphon or dip tube 21 extending to the bottom of the casing 10. Affixed to the intake of the top-mounted valve 19 is a second siphon tube 22. This second siphon tube extends to the bottom of an inner casing 24 which is mounted in a pressure-tight manner over said second siphon tube 22. The inner casing consists of a deformable container, preferably a collapsible bulb constructed of an elastomeric material such as rubber or the like.

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In assembling, the inner casing 24 is filled with a suitable liquid, such as an after-shave lotion, and is then mounted on its associated previously assembled siphon tube 22, valve 19 and cap 16. Next, the outer casing 10 (to which side-mounted valve 20 and its siphon tube 21 have already been affixed) is loaded with propellant (such as a liquefied gas, e.g. the Freons) and a liquid charge or concentrate, such as a lather shaving soap composition. The upper cap 16 is then crimped to the outer casing 10 completing the assembly of the dispenser with the exception of delivery spouts 26 and 28 which are slipped over the exposed portions of the top and side valves respectively.

In use, the pressure generated by the propellant in the outer casing acts to compress and thereby eject shaving lather on opening of the side entry valve 20, and to compress the deformable inner casing or bulb 24 and thereby cause ejection of after-shave lotion when the top valve 19 is opened.

In Fig. 2 there is illustrated a unitary duplex assembly suitable for top mounting on an outer casing similar to that shown in Fig. 1 but lacking a side opening and valve. The valve assembly of Fig. 2 consists of two concentric valves adapted to be crimped to the outer casing by means of a cap 40. Fastened to the under side of said cap is an outer cylinder 42 carrying a side opening 43 and terminated at its base by an annular plate 44. Axially located within said outer cylinder and having a nipple 45 extending downwardly through the opening in said annular plate is a stepped, cylindrical valve body 46. This valve body is provided at its top with a domed closure 48 containing a centrally located restricted opening 50, the interior of said domed closure serving to form a valve seat. Centrally located in said restricted opening 50 is a plunger 54, comprising a head 56 which carries a resilient sealing ring 58, said head depending below the aforesaid valve seat 48, and a stem 60 somewhat smaller in diameter than the aforesaid restricted opening 50. The stem 60 carries a helical thread 62 on its upper end and extends through and protrudes above said restricted opening 50. A delivery spout 64, snugly mounted by a slip fit on the valve body 46 and restrained from downward travel by an internal protuberance 65, directs the flow of fluid when the plunger 54 is depressed. An internally threaded pressure button 66 is carried by the helical threads 62 of the plunger shaft 60, the plunger being normally biased to a closed position by a relatively soft spring 68 compressed between the base of the plunger head 56 and a step 70 in the wall of the valve body 46. In use, a siphon tube is affixed to the nipple 45 on the valve body so as to communicate it with liquid to be delivered, which, on depression of the plunger 54, flows through said valve body 46, between the resilient sealing ring 58 and the valve seat 48, through the restricted opening 50, and thence emanates from the delivery spout 64.

Delivery of the second liquid is accomplished by opening the valve formed by the previously referred to valve body 46, cap 40 which is domed so as to form, on its interior, a concave valve seat 80, and a resilient sealing ring 82 carried by a lip 84 projecting from said valve body 46. Liquid thus released from the outer cylinder 42 flows through an annular space 85 between said valve body 46 and domed cap 40 into a dispensing head 86 mounted by a friction fit on the valve body 46 and cap 40. The entire valve body 46 is biased to a closed position by the action of a relatively stiff spring 87 compressed between the aforesaid projecting lip 84 and the annular base plate 44. Liquid is delivered to the chamber 88 formed by the previously referred to outer cylinder 42 by a siphon tube (not shown) inserted into the side opening 43 of the outer cylinder.

In use then, when the threaded pressure button 66 has been rotated so as to cause downward travel sufficient to lock against the upper surface of the delivery spout 64, the application of pressure to said button compresses the relatively stiff spring 87 and causes the valve body 46 and its associated resilient sealing ring 82 to drop, permitting liquid in the chamber 88 to be ejected between said sealing ring 82 and the domed cap 40, through the annular opening 85, and into the aforesaid dispensing head 86, whence it issues to the user.

On the other hand, manual depression of the threaded pressure button after it has been raised by rotation thereof results only in compression of the relatively soft spring 68 and depression of the plunger 54, thereby accomplishing delivery of the liquid in communication with the interior of the valve body.

Thus it is apparent that when biasing springs of the proper difference in resiliency are employed, if the pressure button is depressed while screwed down against the upper surface of the delivery spout 64, liquid communicating with the outer cylinder 42 will be delivered from the dispensing head 86. If, on the other hand, the button is elevated by rotation on its helical thread, on depression of the button, liquid in communication with the valve body 46 will be delivered by the delivery spout 64.

In use, the outer cylinder 42 will normally communicate with the mixture of liquid charge and propellant in the bottom of a pressure-tight casing and the valve body 46 will communicate, by means of a siphon tube, with the liquid contained in a collapsible chamber such as illustrated in Fig. 1.

It is apparent from the foregoing that the present invention is particularly useful where it is desired to dispense from a single container, a liquid which is in contact or emulsified with a propellant, e.g. a shaving cream, and a liquid which is isolated from the propellant, e.g. after-shave lotion.

Although the present invention has been described with reference to particular embodiments and examples, it will be apparent to those skilled in the art that variations and modifications of this invention can be made and that equivalents can be substituted therefor without departing from the principles and true spirit of the invention. Thus, for instance, the propellant and liquid charge in admixture therewith may be placed in the deformable bulb and act to expel liquid from the outer casing by expansion of the inner casing or bulb. Moreover, the inner casing or bulb and the valve associated therewith may be located at the base of the outer casing, or at any other suitable location. Furthermore, while the present invention has been illustrated with reference to lather shaving cream and after-shave lotion, it is by no means limited thereto but may be used with any combination of suitable liquids, e.g. shampoo and hair conditioner, pancake mix and syrup, and the like.

Having thus described the invention, what is desired to be secured by Letters Patent is:

1. A dispensing container adapted to dispense a plurality of distinct liquid charges under the influence of a single, self-contained compressed pneumatic propellant which comprises an outer casing having a discharge outlet in the upper part thereof, a valve closing said outlet, a siphon tube communicating said valve with the bottom of said outer casing, an inner casing deformable under pressure positioned within said outer casing and having a separate discharge outlet, a valve closing said separate discharge outlet, a first of said distinct liquid charges in said outer casing, and a second of said distinct liquid charges of different composition in said inner casing, one of said casings including, in admixture with the liquid charge therein, said compressed, liquefied pneumatic propellant for directly forcing a mixture of said pneumatic propellant and the liquid charge in admixture therewith through the outlet thereof when the valve therein is operated and for indirectly forcing the liquid charge from

the other casing through the outlet therein when the valve therein is operated.

2. A dispensing container adapted to dispense a plurality of distinct liquid charges under the influence of a single, self-contained compressed pneumatic propellant which comprises a pressure-tight outer casing, a first of said distinct liquid charges in said outer casing, a deformable bulb disposed within said casing, a second of said distinct liquid charges within said bulb, said compressed pneumatic propellant being in admixture with one of said liquid charges and generating pressure within said casing, and valve means disposed on said casing for manually controlling the selective discharge of each of said liquid charges under the influence of said pneumatic propellant.

3. A dispensing container adapted to dispense a plurality of distinct liquid charges under the influence of a single, self-contained compressed pneumatic propellant which comprises a pressure-tight outer casing, a mixture of a first of said distinct liquid charges and said liquefied propellant generating pneumatic pressure within said outer casing, a collapsible bulb mounted within said outer casing, a second of said distinct liquid charges within said collapsible bulb, said collapsible bulb being subjected to the pneumatic pressure in said outer casing and transmitting said pressure to the said second liquid charge contained therewithin, and, disposed on said casing, manually operable means for controlling selective expulsion of each of said liquid charges to the exterior of said casing under the influence of said pneumatic propellant.

4. A dispensing container adapted to dispense a plurality of distinct liquid charges under the influence of a single, self-contained compressed pneumatic propellant which comprises an upright cylindrical pressure-tight outer casing having an imperforate recessed bottom, said outer casing containing a first of said distinct liquid charges; an inner casing deformable under pressure and positioned wholly within said outer casing, said inner casing containing a second of said distinct liquid charges; an opening in the upper part of said outer casing; a closure member sealing said opening in said outer casing; valve means mounted on said closure members; and siphon means communicating said valve means with said first and second liquid charges; said compressed, liquefied pneumatic propellant being admixed with the liquid charge in one of said casings for directly forcing the mixture of liquid charge and liquefied propellant therein through the siphon tube and valve means associated therewith and for forcing said deformable casing against the liquid charge within said other casing, thus indirectly forcing the liquid charge therein through the siphon tube and valve means associated therewith.

5. Pressure propelled liquid dispensing apparatus as set forth in claim 4 wherein said valve means comprises an annular first valve means communicating with said outer casing and adapted to dispense said first liquid charge and, axially positioned within said annular first valve means, a second valve means communicating with said inner casing and adapted to dispense said second liquid charge.

6. A unitary duplex valve assembly comprising an outer valve body, an annular valve seat and an annular sealing means adapted to mate with said seat and seal said outer valve body, an inner valve body disposed within said outer valve body and having an inlet exterior of said outer valve body, said annular sealing means being carried on said inner valve body, a second valve seat in said inner valve body, and a second sealing means adapted to mate with and seal against said second valve seat.

7. A unitary duplex valve assembly comprising an annular valve seat, an annular sealing means adapted to mate with and seal against said seat, and a hollow cylindrical member, said annular sealing means being carried on said cylindrical member, a second valve seat in said hollow cylindrical member, and a second sealing means adapted to mate with and seal against said second valve seat and

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biasing means adapted to maintain said annular sealing means and said second sealing means in normally closed position, the biasing means acting on said annular sealing means being relatively stiffer than the biasing means acting on said second sealing means.

8. A manually operable unitary duplex valve assembly as set forth in claim 7 wherein said second sealing means is provided with manually operable locking means adapted to lock said second sealing means in a closed position.

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