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L. T. WARD

2,322,183

DISPENSING BULB

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Fig. 1



Fig. 2

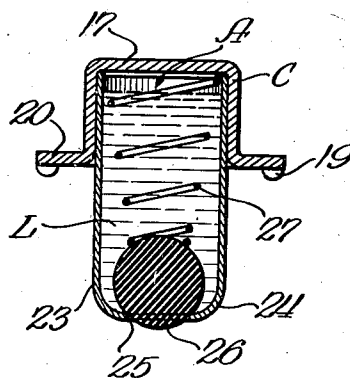


Fig. 3

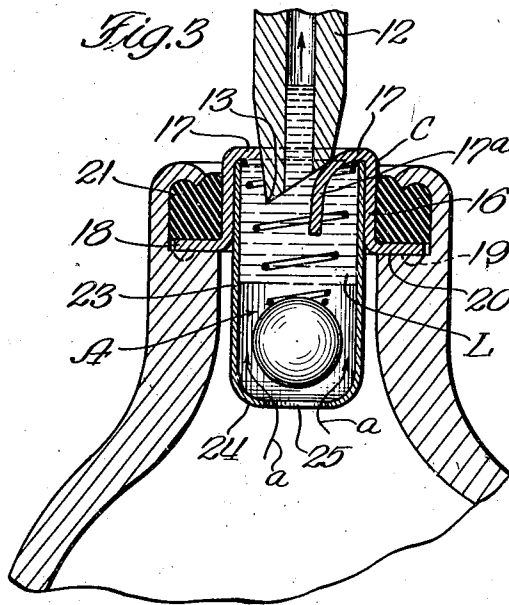
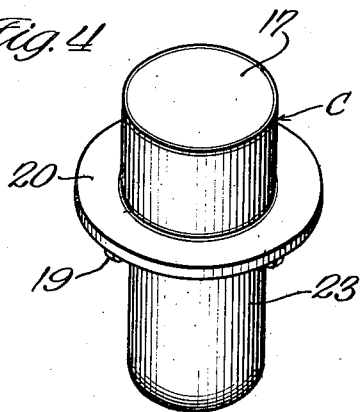


Fig. 4



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DISPENSING BULB

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9 Claims. (Cl. 225—18)

My present invention relates to a dispensing bulb and more particularly to that type wherein carbon dioxide (CO₂) is contained at high pressure, such bulbs being known to the trade as "Sparklet bulbs."

The primary object of the invention is to provide a bulb from which liquids such as vitamin B or the like, or other materials, may be dispensed in addition to the CO₂ gas itself.

A further object of the invention is to provide a structure from which liquid may be dispensed with the assurance that the liquid will neither remain in the bottom of the bulb and let the gas pass off nor will the liquid be permitted to be discharged first and the gas afterwards, with a film of the liquid remaining in the bulb due to clingage of the liquid with respect to the interior surface of the bulb.

More particularly, it is my object to provide means for dispensing a specified quantity of liquid from the interior of a gas filled bulb or capsule by providing a compartment within the bulb sealed at its outer end where the hollow piercing pin of a syphon or the like is to enter for communication with the interior of the compartment, the interior of the capsule or bulb being in communication with the interior of the compartment itself through a check valve opening toward the compartment.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawing. Although the invention is susceptible of a variety of embodiments, it is unnecessary to fully describe and illustrate more than one in order to give a full understanding of the invention both from its structural and functional standpoints. Accordingly, I have illustrated a preferred and desirable embodiment of the invention in the accompanying drawing, in which:

Figure 1 is a side elevation of a syphon with one of my improved Sparklet bulbs shown associated therewith for charging the syphon with carbon dioxide gas and liquid;

Figure 2 is an enlarged cross sectional view through a closure cap embodying my invention, the cap being for the gas flow;

Figure 3 is a similarly enlarged view showing the gas bulb being associated with a piercing pin of the syphon and the commencement of the transfer of liquid from the compartment in the bulb to the syphon, and

Figure 4 is a perspective view of the unit shown in Figure 2.

In attempting to introduce any liquids or similar materials into a syphon from a Sparklet bulb, prior to my invention, there have occurred two problems:

(1) If the syphon being charged is held in such position that the discharge end of the Sparklet bulb is uppermost, the liquid will remain in the bottom of the bulb and the gas will pass into the syphon, the liquid staying in the bulb.

(2) If the syphon is inverted so that the liquid in the bulb collects at the discharge end, some of the liquid will be discharged by the gas under pressure above it but there will be a considerable loss of the liquid due to wall clingage; i. e., a film of liquid will remain on the interior wall of the bulb.

To overcome these difficulties, I have designed a compartment so constructed and located with respect to the bulb itself that this compartment contains the liquid or other material to be introduced along with the CO₂ gas from the bulb to the syphon, and the relation of parts are such that expulsion of all the liquid is insured before the gas transfers from the bulb to the syphon.

On the accompanying drawing I have used the reference numeral 10 to indicate generally a syphon bottle, and the reference character B to indicate a gas bulb for charging the syphon. A syphon of the character illustrated is usually provided with a hollow piercing pin 12 having a point at 13 adapted to accomplish the piercing operation when the bulb is associated with the piercing pin. The syphon 10 has a threaded sleeve 14 surrounding the piercing pin 12 on which a bulb holder 15 is adapted to be screwed. The holder 15 forces the bulb B toward the piercing pin to accomplish the piercing operation.

In the usual construction of the character illustrated, a cap C is provided having a sleeve-like or tubular portion 16, a closed end 17 and an outstanding flange 18. The flange 18 has a plurality of projections 19 adapted to rest on a shoulder 20 of the bulb B and hold the cap C up high enough to permit the gas to pass under the flange 20 during the charging process at the factory. Thereafter a gasket 21 is placed on the flange 20 and the upper edge of the bulb peened over, as at 22, to hold the gasket 21 in position and force the flange 20 down to the position shown in Figure 3, with the projections substantially embedded in the relatively soft material of the bulb B.

The particular contribution to the prior art

which I have made will now be described. A compartment A for liquid is provided in the form of a tube 23 pressed into the sleeve 18 of the cap C under sufficient pressure to make a substantially liquid-tight joint between the tube and the sleeve. The tube 23 has a lower end 24 serving as a closure, with the exception of an opening 25 therein, the edge of which serves as a valve seat. A check valve 26, preferably of spherical shape and preferably formed of rubber or the like, is seated in the opening 25 by a relatively light spring 27. The unit consisting of the cap C and the sleeve 23 may be manufactured and then filled with a liquid L as in Figure 2. This unit is then assembled with relation to the bulb B in the usual manner already described and illustrated in Figure 3. Subsequently, when the bulb B is to be associated with a syphon 10, it is placed in the bulb holder 15 and the holder screwed onto the sleeve 14 with the result that the piercing pin 12 will pierce the wall 17 of the cap C as shown in Figure 3, bending the pierced out portion down as indicated at 17a. The bore of the piercing pin 12 is now in communication with the interior of the compartment A and accordingly the liquid L will be displaced by the gas from the bulb opening the check valve 26 and entering the compartment A, as indicated by the arrows a.

The check valve 26 eliminates the possibility of the liquid L entering the interior of the bulb B, yet readily permits the pressure of the gas in the bulb to displace the liquid through the piercing pin and into the diaphragm. The gas in flowing through the compartment A tends to evaporate any of the liquid remaining therein, thus insuring that all of the liquid will actually leave the bulb and enter the syphon. The tube 23 also serves as a measuring means and it can be substantially filled with liquid, and thus danger of overfilling the bulb is eliminated.

The use of the tube 23 can be varied for different quantities of liquid to be dispensed from the bulb B as desired. The arrangement is such that it does not in any way interfere with present filling methods for the bulbs, and the additional parts involved are comparatively simple and inexpensive. The construction is obviously such that the contents of the tube 23 are certain to be discharged into the syphon, regardless of the charging position, thus eliminating any possibility of wall clingage or settling to the bottom as where the liquid is merely introduced into the bulb itself.

My invention has been described in the foregoing specification and illustrated in the drawing more or less precisely as to details. It is to be understood, however, that changes may be made in the arrangement and proportions of parts, and equivalents may be substituted without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. In a dispensing bulb, a capsule having an opening in a wall thereof, a closure element for said opening, said closure element being adapted to be pierced by a piercing pin, a compartment within said capsule between said closure element and the interior of the capsule for containing material to be dispensed from the capsule through the piercing pin, said compartment being in communication with the piercing pin upon receiving the pin and having an opening to receive gas from the capsule and force out said material

through the piercing pin before the gas from the capsule passes through the compartment and the pin, a check valve in said compartment opening toward the compartment and closing toward the capsule, and a spring to retain said check valve seated.

2. In combination, a capsule having an opening in a wall thereof, a closure element for said opening, said closure element being adapted to be pierced by a piercing pin, a compartment within said capsule between said closure element and the interior of the capsule for containing liquid or the like to be dispensed from the capsule through the piercing pin, said compartment being in communication with the puncturing end of the piercing pin upon receiving the pin and having an opening to receive gas from the capsule and force out said liquid through the piercing pin before the gas from the capsule passes through the compartment and the pin, and means to prevent passage of said liquid from said compartment to the interior of said capsule and permit passage of gas into said compartment before such gas enters the piercing pin.

3. In a dispensing bulb of the character disclosed, a capsule having a portion adapted to be pierced by a hollow piercing pin, a compartment within said capsule for containing material to be dispensed from the capsule through the piercing pin, said compartment being sealed by said portion of said capsule and thereby communicating with the interior of the piercing pin upon the pin being received by the capsule, said compartment having an opening to receive gas from the interior of the capsule and force said material out through the piercing pin before the gas from the capsule passes through the pin, and means in said opening to automatically prevent said material from entering said capsule through said opening.

4. A dispensing bulb of the character disclosed comprising a bulb member having a neck, a cap for said neck having a tubular part with one end closed and an outstanding flange on the other end thereof adapted to seat in said neck, a tube in the tubular part of said cap, extending within said bulb and associated with said cap in liquid-tight manner, said tube having an opening in its inner end, a ball seated in said opening and closing toward the interior of the bulb, a spring between the closure member of said cap and said ball, and means for sealing said flange relative to the neck of said bulb.

5. In a dispensing bulb, a bulb member having an opening, a cap for said opening having a tubular part, a tube in the tubular part of said cap and sealed relative thereto, said tube having an opening in its inner end, and a check valve element seated in said opening and closing toward the interior of the bulb.

6. In a dispensing bulb of the character disclosed, a bulb member, a closure member therefor, a tube in said bulb having one end sealingly associated with said closure member and having an opening in its inner end, and a ball in said tube, said ball being spring seated in said opening in the inner end thereof.

7. In a dispensing bulb structure, a bulb having a closure element adapted to be pierced for forming a discharge opening therein, a compartment within said bulb for containing material to be dispensed from said bulb through the discharge opening formed in said closure element, said compartment being in communication with

the discharge opening so formed, said compartment having an intake opening to receive gas from the bulb, and a check ball in said opening which opens toward the compartment and closes toward the bulb.

8. In combination, a gas containing bulb having an opening through which gas is discharged to the exterior of said bulb, a compartment in said bulb for non-gaseous material and located over said opening, and check valve means located between said compartment and the remaining part of said bulb to admit gas from the interior of said bulb into said compartment to displace the non-gaseous material through said opening, the gas then discharging through said opening and said check valve preventing movement of the non-gaseous material from the compartment into the interior of the bulb.

9. In combination, a gas containing bulb, a compartment for liquid or the like within the bulb, said compartment having an opening through which liquid and gas are discharged from said bulb, and check valve means in said compartment and opposite said opening to admit gas from the interior of said bulb to said compartment whenever the pressure in the bulb exceeds that beyond the opening, the gas from the bulb expelling the contents of the compartment through said opening and thereafter also passing through the check valve means and compartment and being discharged through said opening, said check valve means preventing the escape of liquid or the like from said compartment to said bulb.

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