Aug. 10, 1954 R. D. COOKSLEY 2,686,081

PLASTIC PRESSURIZED CONTAINER AND DISPENSER

Filed Sept. 24, 1953

Fig 1

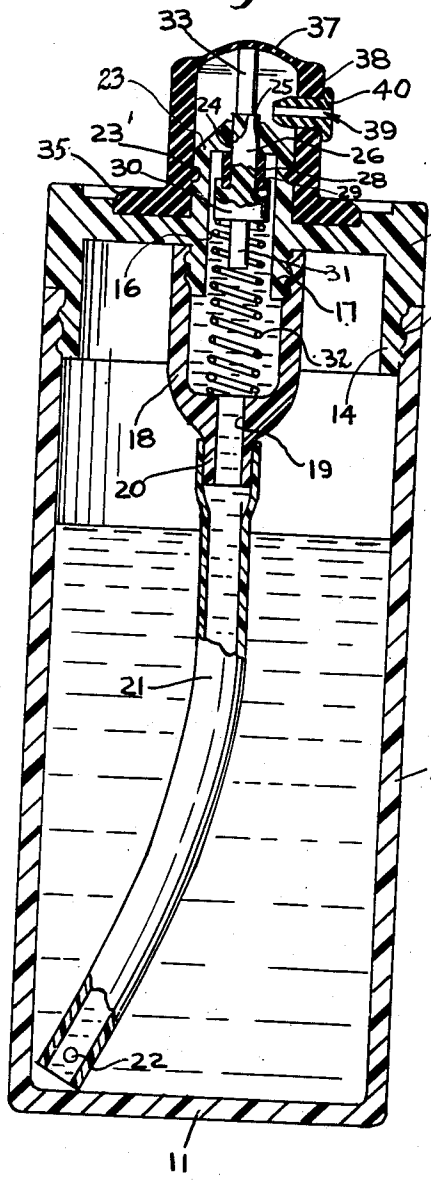



Fig 2

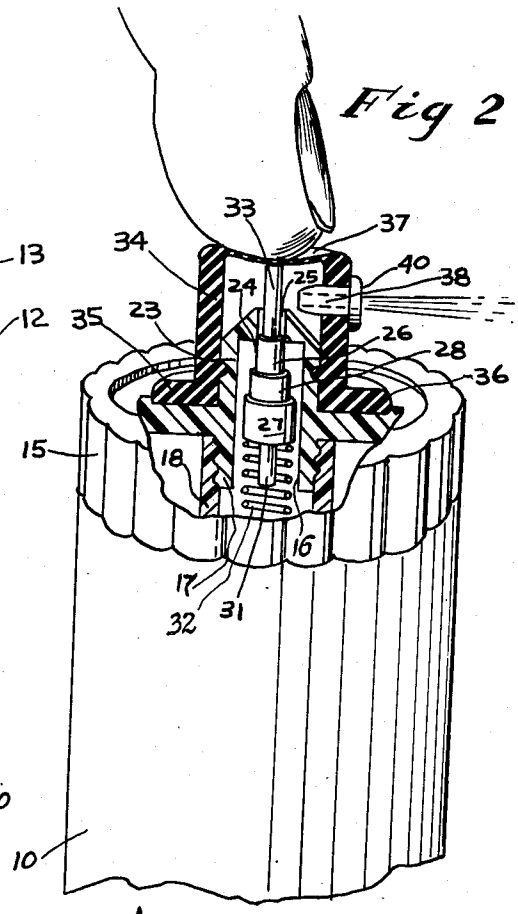
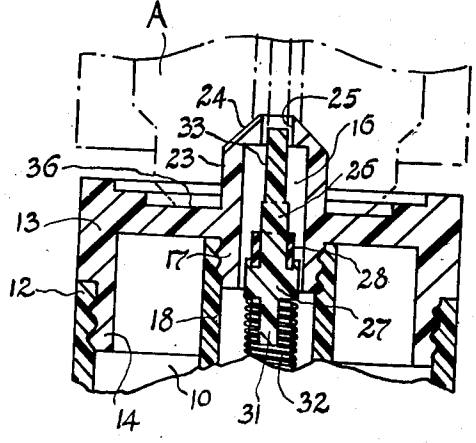



Fig 3




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## PLASTIC PRESSURIZED CONTAINER AND DISPENSER

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4 Claims. (Cl. 299—95)

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This invention relates to a plastic pressurized container of a type adapted to contain a liquid or gas under pressure and having a manually operable valve to dispense the fluid therefrom at will.

It is an object of the invention to provide a pressurized container which has substantially all of the parts made of plastic to thereby render the container suitable for use with certain liquids or gases which heretofore could not be packaged in a pressurized container because of the chemical reaction of the fluid with the metal parts of the container.

It is another object of the invention to provide a plastic pressurized container wherein the plastic parts will be assembled by hand without machinery upon a cap forming a part of the container and wherein a valve is disposed in the cap and operable from a stem normally protruding from the end of the cap and manually depressible by a finger to permit the release of the fluid past the protruding stem of the valve element upon the same being depressed and wherein a cover member of plastic and flexible material extends over the valve stem and serves as a cover to prevent the collecting of dirt about the valve stem and to act as a mixing chamber through which, upon the valve being depressed, fluid under pressure is dispensed, there being a nozzle element within the wall of the cover member.

It is another object of the invention to provide a plastic pressurized container adapted to be filled with the use of a special filling head that may dispense the pressurizing gas, such as Freon, without the need for refrigeration to maintain the stability of the gas while passing it to the container.

Other objects of the invention are to provide a plastic pressurized container which is of simple construction, durable and so proportioned as to maintain fluids under high pressure without breakage, has a minimum number of parts, inexpensive to manufacture, easy to assemble and fill, of pleasing appearance, sanitary and efficient in operation.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a vertical sectional view of the container with the cap and its valve parts assembled thereon;

Fig. 2 is a perspective view of the container with the cap broken away to show the interior construction of the valve.

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Fig. 3 is an enlarged sectional view of the cap and nozzle with the filling head applied thereto and forcing the valve element to the open position as when the container is being filled.

Generally, the invention comprises a valve stem of different diameters assembled in the cap such a way that when the valve stem is completely depressed or in the filling position there is a sufficiently large orifice to permit rapid and low pressure filling; after the container has been filled and the valve stem is in the operating position for dispensing, the middle diameter or metering portion is located in the choke area of the plastic cap with a very close tolerance. The cover cap or cover is so designed that during the dispensing action the middle circumference of the valve stem cannot be depressed out of the choke area and, therefore, the product can be dispensed in very small quantities with a short and highly atomized display pattern which is very desirable for personalized products.

Referring now to the figures, 10 represents a round container body portion having a bottom 11 and an internally threaded open upper end 12. Adapted to be secured to the internally threaded open upper end is a cap 13 having a depending externally-threaded sleeve portion 14. Upon the cap being assembled with its parts, it is permanently secured to the upper end of the container 10 by cement so as to prevent the same from being loosened and to render the container fluid-tight. The threads also avoid the necessity for any jig or fixtures to hold the parts together until the cement sets, reduces assembly costs, and adds immeasurably to the strength of the container. The exterior of the cap 13 is serrated, or ribbed, as indicated at 15 to provide a good hand grip to tighten the cap upon the container body 10. Both of these parts are formed of rigid thermoset plastic material.

The cap 13 has a central opening 16 extending therethrough and terminating in a depending threaded sleeve portion 17 to which a bottom funnel and spring retaining member 18 or adaptor is threadedly connected. This makes an easy hand assembly and makes it unnecessary to cement the adaptor due to the equal pressure inside the adaptor and the container which would tend to prevent transmission of the fluids between the adaptor and the container. This retaining member 18 is also of plastic and has a hole 19 extending through its lower end and through a reduced diameter portion 20 to which there is fitted a piece of flexible plastic tubing providing a syphon tube 21 that leads to the bottom of the container 10 and which has a hole

22 in its lower end to prevent the end of the syphon tube from ever being blocked off by being bottomed on the bottom of the container.

Extending upwardly from the top of the cap 13 is a nozzle projection 23 which forms the body of the valve itself and is an integral part of the cap and eliminates soldering, fabricating or cementing a valve as such into the container, thereby reducing construction costs. The nozzle 23 has a tapered upper end 24 with an aperture 25 therein. This aperture 25 is of a diameter adapted to receive an intermediate portion 26 of a valve element 27. This aperture 25 is of a diameter made to receive valve portions 26 with a close tolerance to provide the choking or metering effect of the valve when in the dispensing position. This valve element has a rubber sealing sleeve 28 surrounding the portion 26 at the root of the same that has its lower edge fitted into an annular groove 29 in an enlarged diameter portion 30.

Within the depending sleeve member 18 is a spring 31 preferably made of stainless steel and which bears against bottom enlargement 30 of the valve element 27. The valve element has a depending stem 31 to help keep the spring 32 centered.

Extending upwardly beyond the portion 26 of the valve element 27 is a stem 33 of reduced diameter which is depressed into the aperture 25 to form a large entrance into the container in the manner as shown in Fig. 3 and by a special pressure filling head indicated generally at A.

An over cap or cover member formed of a flexible plastic or rubber is indicated at 34 and is snapped over the nozzle 23 and fitted in tight sealing relationship due to a flange 23' which snaps into a groove on projection 23. A large flange 35 fits into an annular recess 36 in the top of the cap 13. The top of the over cap 34 has a thin membrane 37 that is pliable and can be depressed by a finger, as illustrated in Fig. 2. However, the over cap 34 is designed in such a way that the stem cannot be depressed far enough to get portion 26 on the stem out of aperture 25 in the cap. This maintains the metering of the product when being dispensed. The stem 33 of the valve element engages the underside of this membrane 37 and accordingly when the membrane is depressed, the valve element is pushed downwardly against the action of spring 31 to cause the rubber seal 28 to be lowered and allow the product to pass through the choke area of the valve. Upon release of the finger, the valve element will be returned so that the portion 26 and the rubber ring or sleeve 28 will positively seal off the aperture 25 from the underface of the tapered end of the nozzle 23. Since the over cap or cover member is not on the container during the filling operation, it is possible to depress the small diameter of the stem into the choke area and remove the choke portion of the stem out of the way. The valve element 27 is made of nylon or other similar plastic and is molded to close tolerance.

On the over cap 34 is a small nozzle element 38 formed of hard plastic and having an aperture 39 through which an atomized spray will be projected upon depressing the valve element 27. This nozzle element 38 has a flange 40 engaging the outer face of the cover cap 34. This small nozzle element 38 is formed of hard plastic so that the aperture 39 is not closed.

It should now be apparent that there has been provided a pressurized container wherein all of the parts are of non-corrosive material each performing a special function that makes it so possible to place under pressure in this type of container liquids or gasses that can be dispensed with a controlled spray pattern and is not subject to the many corrosive hazards now found in the metal containers.



As the aerosol industry grows, and especially in the direction of the cosmetic trade, it will be possible, using this type of container, to furnish a wide variety of shapes and colors which will mean a freedom of design to indicate the individual products that are prevalent today from a packaging standpoint in the cosmetic industry. A great many cosmetic houses have refrained from exploiting the possibilities in the aerosol field as they refuse to put their product, as they say, "in a beer can."

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A pressurized container and dispenser comprising a hollow body adapted to retain and receive fluid under pressure, a nozzle extending from one end of the hollow body externally thereof and a concentric tubular member extending from the interior of said body and registering with the nozzle and having a reduced tubular member extending through to the bottom end of the hollow body, said nozzle and tubular member providing a valve chamber, said nozzle having an aperture in the end thereof, a valve element slidable in the valve chamber and aperture and a compression spring in the tubular member engaging the valve element to urge the same toward said aperture, said valve element having a metering portion adapted to snugly fit the aperture in the nozzle and a sealing sleeve surrounding said valve element and engageable with the nozzle about the inner end of the aperture to provide sealing engagement therewith upon the spring urging the valve element toward the nozzle, said valve element having a reduced diameter stem extending outwardly of the metering portion and of the nozzle, said reduced diameter stem being slidable through the aperture to provide an enlarged opening through which the fluid may pass to fill the hollow body, and an over cap secured to said body concentrically about the nozzle thereof, said over cap having a depressible top engageable with the reduced diameter stem of the valve element and a spray discharge nozzle on said over cap.

2. A pressurized container and dispenser comprising a container body having a threaded open end, a cap secured to said threaded open end in a fluid tight manner, said cap having an integral nozzle portion and a depending sleeve portion having external threads, a depending spring retaining member threadedly connected to the threads of the depending sleeve portion and having a bottom opening, a syphon tube connected to the lower end of the retaining member and extending into the bottom of the container body, said nozzle portion having an aperture through which fluid may be dispensed, a valve element having a metering portion slidably fitting to the aperture with close tolerance, a compression spring supported in the spring retaining member, and engaging said valve element to urge the same and the metering portion thereof into said aperture, a sealing sleeve sur-

rounding a part of the portion fitting the aperture and engageable with the nozzle portion at the inner end of the aperture to normally seal off the same, said valve element having a stem of a reduced diameter extending outwardly from nozzle beyond the metering portion, said stem being slidable through the aperture to provide an enlarged opening through which the fluid may pass to fill the container, and an over cap surrounding the nozzle portion and having tight sealing engagement therewith, said over cap having a depressible top engageable with the stem of the valve element, and said cap having a fluid dispensing opening.

3. A pressurized container and dispenser as defined in claim 2 and said cap having an annular recess about the nozzle portion, said over cap having a flange filling, said annular recess and an internal circular rib, and said noozle portion having an annular groove receiving said circular rib.

4. A pressurized container and dispenser comprising a container body having an internally-threaded open end, a cap having a depending externally threaded portion engaging with the internally-threaded open end of the container body in tight sealing engagement therewith, said container body and said cap being formed of plastic, said cap having a nozzle portion with a tapered end, the tapered end being adapted to receive a pressure filling head, said cap further having a depending externally-threaded sleeve portion, said nozzle and said sleeve portion communicating with one another and providing a valve chamber, a plastic tubular member having an internally-threaded upper end engaging with the depending threaded sleeve portion and having a reduced lower end with an opening therein, a syphon tube connected to the reduced lower end and extending into the bottom of the container body, the tapered end of said nozzle portion having an aperture therein, a valve element operable in the valve chamber and having a metering portion slidable through the aperture, said valve element further having an enlarged portion with an annular groove therein lying below the metering portion, a sealing sleeve surrounding the metering portion and having its lower end in the annular groove of the enlarged portion of the valve element, said valve element being formed of plastic, and a compression spring extending into the valve chamber and engaging with the enlarged portion of the valve element and abutting the reduced portion of the tubular member, said valve element having a reduced diameter stem projecting outwardly from the metering portion and from the tapered end of the nozzle, and an overcap having a large bottom flange, said first-mentioned cap having an annular recess receiving said bottom flange, said over cap having a depressible top portion engageable with the valve stem to depress the same, said top portion having a limited downward movement to limit the downward movement of the valve after the dispenser has been filled to thereby prevent the unseating of the metering portion of the valve element from the aperture, and a spray nozzle element connected to the side of the over cap.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 741,965 | Henrich | Oct. 20, 1903 |
| 1,614,532 | Mobley | Jan. 18, 1927 |
| 1,892,750 | Rotheim | Jan. 3, 1933 |
| 2,570,909 | Benson | Oct. 9, 1951 |
| 2,623,785 | Henchert | Dec. 30, 1952 |