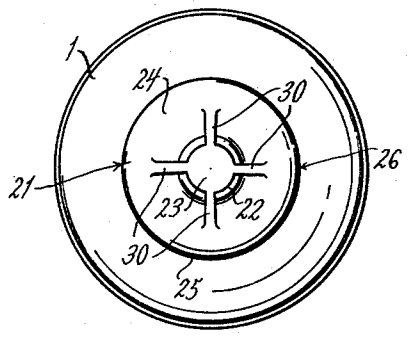
March 22, 1955 J. W. SOFFER 2,704,621

DISPENSER CLOSURE HAVING TILT VALVE AND ALIGNING CAP

Filed Jan. 25, 1952

FIG. 1.



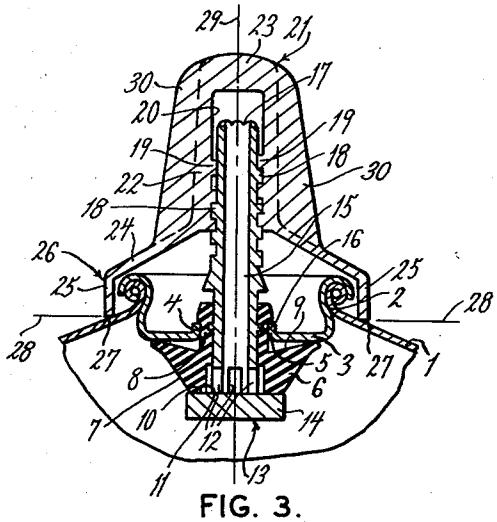


FIG. 3.

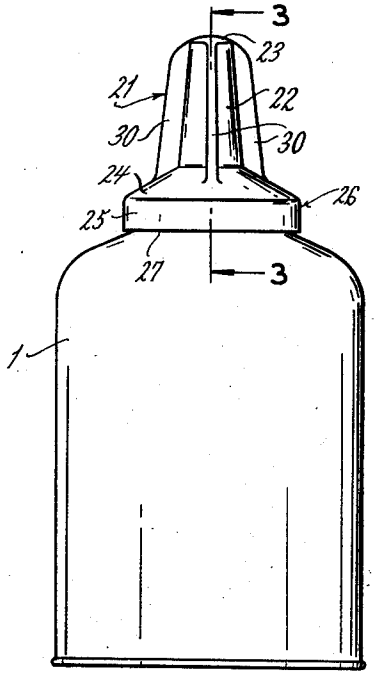


FIG. 2.

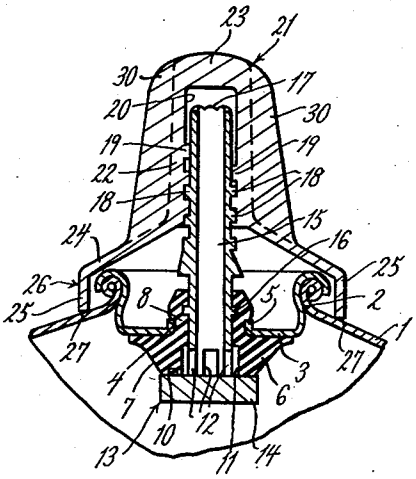


FIG. 4.

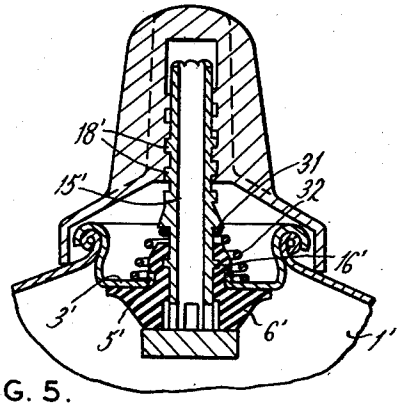


FIG. 5.

INVENTOR.
JACK W. SOFFER
BY Kalisch & Gross
ATTORNEYS

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DISPENSER CLOSURE HAVING TILT VALVE AND ALIGNING CAP

Jack W. Soffer, St. Louis, Mo., assignor to Development Research, Inc., St. Louis, Mo., a corporation of Missouri

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5 Claims. (Cl. 222—182)

This invention relates to closures for dispensing containers and specifically to valves of the type commonly used on disposable pressure containers for prepared lathers and the like. Such a container and a suitable form of tilt valve therefor are shown in my co-pending application Serial No. 195,620, filed November 14, 1950, and entitled, "Restricted-Tilt Dispenser Valve Having Flanged Stem."

In ordinary commercial practice, such disposable containers are filled with the substance to be dispensed before the container tops, each carrying a discharge valve seated in a resilient sealing member, are crimped or spun thereon. After such crimping or spinning operation, gas is inserted through the valve into the container to pressures between 60 and 120 pounds per square inch.

In the course of the usual gassing operation, the discharge valves are axially depressed. While the amount of inward movement during the gassing operation is not great, in a simple valve designed to open by tilting it may be enough to disturb the working relationship of the valve in the resilient grommet, or the seal of the grommet against the container top. Such disturbance results in slow leakages of gas from the containers. Leakage may also result from unintended lateral pressures against the discharge valve.

It is an object of the present invention to provide a closure in cooperation with a dispensing valve of the rocking type, adapted together to insure the positioning of the valve and sealing member in the container top, to restore any misalignment thereof resulting from the gassing operation, and to prevent the inadvertent tilting of the valve.

It is a still further object of the present invention to provide a readily engageable and disengageable cap which on engagement exerts positive axial pressure to effect sealing between the valve, the sealing member and the container top.

It is a further object of the present invention to provide a container closure comprising a rockable valve and a skirted cap engageable by screw threads thereon, whereby abutting force of the cap skirt against the container forces the valve parts into gas-tight sealing alignment.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing—

Figure 1 is a plan view of the present invention in place on a container of suitable type;

Figure 2 is a side elevation thereof;

Figure 3 is a sectional view taken along line 3—3 of Figure 2, showing the valve parts displaced downward and the screw threads of the cap only partially engaged to the threaded valve stem;

Figure 4 is a view similar to Figure 3 but showing the screw threads of the cap fully engaged to the threaded valve stem, whereby the valve parts are restored to correct alignment; and

Figure 5 is a sectional view similar to Figure 3 showing the invention applied to a modified form of valve.

Referring now by reference characters to the drawings which illustrate preferred embodiments of my present invention, there is shown in Figures 1 and 2 a single-use disposable gas-tight container 1 suitable for the packaging of products adapted to be mixed with gas and dispensed therewith under pressure, such as prepared lathers. In the dispensing of such products and the maintenance

of gas pressure within the container so that there be no undue leakage thereof, a valve and closure structure is provided, such as is shown in greater detail in Figures 3 and 4. After the container 1 is filled with liquid soap (in the case of the dispensing of lather) or other basic product to be dispensed, there is spun or crimped to its mouth 2 a top wall 3 having a central aperture 4 provided with an up-turned aperture flange 5. Seated sealingly within said aperture flange 5 is a resilient grommet 6 molded of synthetic rubber or other suitable sealing material, having an enlarged tapering-edged annular flange 7 presented circumferentially outward, and a central upward-extending sleeve 8 adapted for protruding outwardly through and sealingly against the inner surface of the aperture flange 5. The annular upper surface of said resilient grommet 6 between said sleeve 8 and the periphery of said tapering-edged flange 7 is concavely cupped for sealing against the inner side of said top wall 3, as will be more fully described hereinafter.

The base of said resilient grommet 6, designated as valve seat portion 10, has a central bore 11 which communicates and is concentric with the sleeve 8 but of somewhat greater diameter. The bore 11 provides a flow passage to the radial ports 12 of a tubular rockable valve member 13, which has at its inner end a solid valve head 14 seated against the grommet seat portion 10. Projecting outwardly therefrom and sealingly enclosed by the sleeve 8, the valve member 13 continues in the form of a tubular discharge spout 15, the outer diameter of which is sufficient to press said resilient sleeve 8 tightly against the aperture flange 5.

While the natural resilience of the sleeve 8 sealingly grasps the portion of the tubular discharge spout 15 which it closes, additional sealing effect is obtained by providing a small integral collar 16 on the outer surface of the discharge spout 15 and within the sleeve 8. Referring to Figure 4 it will be observed that said integral collar 16 is disposed at such point along the length of the discharge spout 15 as is normally outward of the aperture flange 5 a distance roughly equal to the thickness of the sleeve 8. Thus, any rocking of the discharge spout 15 in the resilient grommet 6 will result in the compression of that portion of the sleeve 8 between the upper margin of the aperture flange 5 and the collar 16. This compression serves as a restoring force to return the valve spout 15 to its original position.

Such positioning of the collar 16 outward of the up-turned aperture 5 follows if, in the assembly of the elements described, sufficient pressure has been exerted against the valve head 14 to flatten the originally concave upper surface 9 against the inner surface of the top wall 3. However, as mentioned in the opening paragraphs of this specification, on the inward movement of the valve member 13 during the gassing operation, it is possible that the collar 16 may become and be retained displaced within the aperture flange 5 as illustrated in Figure 3. Such displacement interferes with the sealing of the annular flange 7 and the cupped upper surface 9 against the inner surface of the top wall 3. In reading the portion of the description which follows, note should be taken how the described structure remedies such displacement and serves as well to effect the other objects hereinabove set forth.

Arranged on the outer surface of said discharge spout 15, beginning outwardly of the normal end position of the sleeve 8 and extending to a point near the discharge tip 17, are external projecting screw threads 18. These are adapted for engagement with internal projecting screw threads 19 formed in the inner wall 20 of a valve spout cap 21, which comprises a generally cylindrical spout-enclosing portion 22, and at the outer end thereof a top portion 23. At the inner end of said cylindrical portion 22 is an outwardly flared skirt portion 24 beneath which projects a downward flared portion 25, together comprising an annular skirt 26. At its lower margin the skirt 26 is provided with an abutting edge 27 lying in a plane, designated 28, normal to the central axis (designated 29) of the container 1 and discharge spout 15, and adapted for exerting pressure against the outer wall of the container 1.

Extending radially outward from the spout-enclosing

portion 22 and downward to the outward flare 24 of the skirt 26 are a plurality of finger lugs 30 whereby the valve spout cap 21 may be readily manipulated.

Referring again to Figure 3, and assuming that the container 1 has been filled to the desired extent with liquid soap or other substance to be dispensed, and the top wall 3, bearing the grommet 6 and valve member 13, has been crimped or spun thereon and gas inserted—if the valve member 13 has remained in the position shown in Figure 3, with the collar 16 displaced downwardly between walls of the aperture flange 5, when the valve spout cap 21 is screwed thereon and its abutting edge 27 comes in abutting contact with the outer wall of the container 1 and is rotated thereagainst, an upward movement will be imparted by the internal screw threads 19 of the cap 21 to the valve member 13. Such upward movement will continue until the collar 16 has been raised from the position shown in Figure 3 to that shown in Figure 4 and the concavely cupped upper surface 9 has been flattened tightly and sealed against the inner surface of the top wall 3, as shown in Figure 4. Likewise, any displacement of the valve member 13 with reference to the sleeve 8 of the resilient grommet 6 will be corrected so that the valve head 4 will press sealingly against the seat portion 10 of the resilient grommet 6 and hold the entire assembly in correct alignment. The screwing of the valve spout cap 21 may be continued until the pressure of the abutting margin 27 serves to stress the resilient grommet 6 to a desired value, both to insure sealing and resiliency on the lateral displacement of the discharge spout 15.

In handling products of the type referred to, inadvertent discharges of gas or other contents frequently occur from unintended lateral forces applied against the stems of rockable valve such as the valve member 1. It is apparent that if a conventional cap was screwed or otherwise affixed to the discharge tip 17, and such lateral force was applied, a portion of the gas or other contents would be permitted to pass through the valve seat 10 and head 14 and fill the tubular discharge spout 15; and on the subsequent removal of such a cap a sudden discharge of the contents trapped in the discharge spout 15 would be suddenly liberated and free to expand and ooze out of the tip 17. The use of such a cap screwed onto the discharge tip 17 would therefore be quite objectionable. My present invention entirely prevents any lateral force from rocking and opening the rockable valve 13, and thus prevents such loss of the container contents.

Referring now to Figure 5, there is shown an alternate form of valve structure utilizing a similar resilient grommet 6′ seated within an upturned aperture flange 5′ and sealingly supporting a tubular discharge spout 15′ having external screw threads 18′. Immediately beneath the inner end of said screw threads 18′ said tubular discharge spout is provided with an inwardly presented shoulder 31. A helically formed compressing spring 32 is forced over said discharge spout 15 so that its upper and smaller end bears against said shoulder 31 and its lower end against the outer surface of a container top wall 3′.

With the addition of such a helical spring 32 the likelihood of jamming of the valve components in the position shown in Figure 3, would be lessened if in the design of such spring the function of overcoming such jamming displacement is taken into account. To employ a spring 32 of sufficient strength to overcome this possibility might prove inconsistent with easy operation of the dispensing apparatus. The utilization of the valve spout cap 21 relieves the designer of this consideration. Hence, whether a helical spring 32 be utilized, as in Figure 5 or not, as in Figure 4, the structure common to both serves to achieve all the purposes hereof.

While there are above disclosed but a limited number of embodiments of the structure and product of the invention herein presented, it is possible to produce still other embodiments without departing from the inventive concept herein disclosed, and it is desired therefore that only such limitations be imposed on the appended claims as are stated therein, or required by the prior art.

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

1. A container closure comprising in combination a centrally apertured top wall, a resilient grommet having a concavely cupped annular flange presented against the inner surface of said wall and a sleeve extending outwardly through said aperture, a rigid rockable valve member seated in said grommet having a tubular discharge spout extending through said sleeve and maintaining said sleeve compressed against said aperture, the outer portion of said spout having external screw threads, and a rigid cap having an internally threaded spout-enclosing portion adapted to mate with the external screw threads of said spout, and a flared skirt terminating in a plane perpendicular to the spout axis and on closing, abutting the top wall of the container around the spout, the lower skirt portion being adapted to exert axially inward force abuttingly against the top wall of the container, the rigid cap being adapted to transmit the axially outward reaction of such force through the mating screw threads to the discharge spout and thereby hold the rockable valve member centered and tightly sealed in the resilient grommet.

2. A container closure comprising in combination a centrally apertured top wall, a resilient grommet having a concavely cupped annular flange presented against the inner surface of said wall and a sleeve extending outwardly through said aperture, a rigid rockable valve member seated in said grommet having a tubular discharge spout extending through said sleeve and maintaining said sleeve compressed against said aperture, the outer portion of said spout having external screw threads, and a rigid cap having an internally threaded spout-enclosing portion adapted to mate with the external screw threads of said spout and a flared skirt terminating in a plane perpendicular to the spout and on closing, abutting the top wall of the container annularly around the spout, whereby on screwing the said cap on said spout, the said skirt will exert axially inward force against the container top wall around the spout and the outward reaction thereof will be transmitted through the cap and screw threads to center and raise the valve member and flatten said cupped flange of the grommet sealingly against said top wall.

3. A valving closure for a gas-pressure dispensing container, comprising in combination a wall having an aperture, a resilient grommet having a tubular sleeve extending outwardly through said aperture and having an annular body portion including a free-edged annular flange, the flange having a face bearing against the inner surface of the wall around the aperture, a tilt-opening valve member having a discharge spout extending through said grommet body portion and sleeve portion, the said sleeve portion being adapted to tilt with the spout, the valve member further having a head at the inner end of the discharge spout adapted to close against the body portion of the grommet, the discharge spout having screw threads outward of the grommet sleeve, together with a cap having a spout-enclosing portion including screw threads adapted to mate with the spout threads and having an outer rim adapted to bear against such container when the cap is screwed onto the spout and thereby to press the face of the free-edged flange into tight sealing engagement against the inner surface of the wall.

4. A valving closure for a gas-pressure dispensing container, comprising in combination a wall having an aperture, a resilient grommet having a tubular sleeve extending outwardly through said aperture and having an annular body portion including a free-edged annular flange, the flange having a face bearing against the inner surface of the wall around the aperture, a tilt-opening valve including a threaded spout at the outer side of the wall and a valve head inward of said wall and closing against the grommet body portion, together with a cap having a spout-enclosing portion including screw threads adapted to mate with the spout threads and having an outer rim adapted to bear against such container when the cap is screwed onto the spout and thereby to lift the valve head against the body portion of the grommet and press the face of the free-edged flange into tight sealing engagement against the inner surface of the wall.

5. A valving closure for a gas-pressure dispensing container of the type adapted for the insertion of gas through the closure after it is applied to the container, comprising in combination a wall having an aperture, a resilient grommet having a tubular sleeve extending outwardly through said aperture, the outer wall of the sleeve bearing sealedly against the edge of said aperture, the grommet further having an annular body portion including an annular flange, the flange having a face bearing against

the inner surface of the wall around the aperture, further comprising a tilt-opening valve member having a discharge spout extending through said grommet body portion and sleeve portion, and having a head at the inner end of the discharge spout adapted to close against the body portion of the grommet, the discharge spout having screws threads outward of the grommet sleeve, together with a cap having a spout-enclosing portion including screw threads adapted to mate with the spout threads and having an outer rim adapted to bear against such container when the cap is screwed onto the spout and thereby to press the face of the grommet flange into tight sealing engagement against the inner surface of the wall.

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