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DISPENSING SPOUT NOZZLE-COVER HAVING AN AXIAL DETENT

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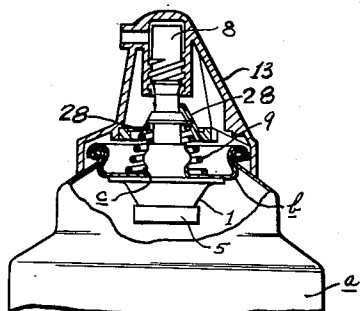


FIG. 1

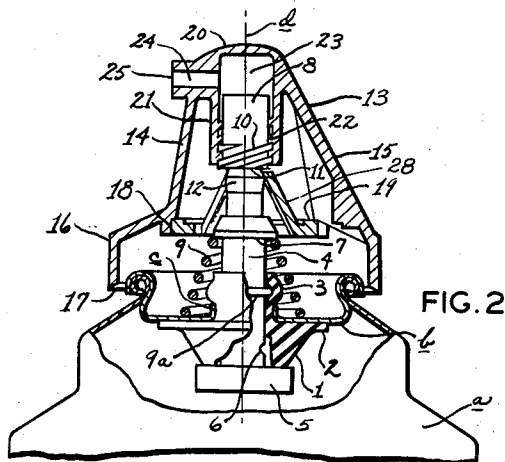


FIG. 2

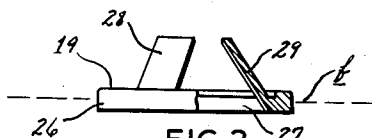


FIG. 3

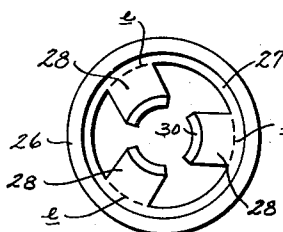


FIG. 4

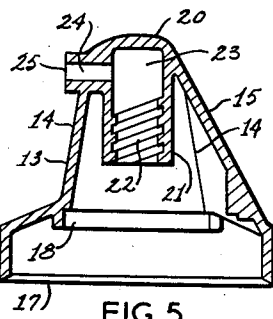


FIG. 5

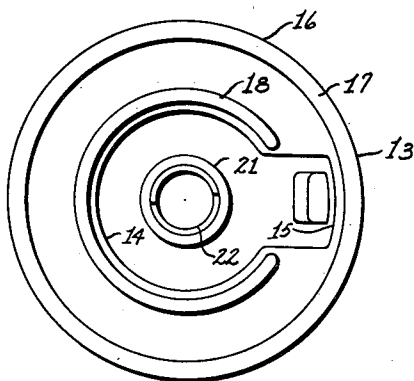


FIG. 6

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DISPENSING SPOUT NOZZLE-COVER HAVING AN AXIAL DETENT

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Application January 24, 1955, Serial No. 483,658

9 Claims. (Cl. 222—39)

This invention relates to spouted covers for dispensers, and has special application to popular types of single-use gas pressure containers in which are packaged fluids such as shaving and cosmetic lathers.

Several familiar types of valves for such pressure containers include a dispensing spout which projects upward along the container axis and has a valve head at its inner end. Such valve head may open on tilting of the dispensing spout or on depressing the spout axially.

The objects of the present invention include:

Providing such an axial dispensing spout with a protective cover and nozzle which adapts it to dispense side-ward;

Providing positive locking of such nozzle-cover against unscrewing an amount beyond the predetermined dispensing position;

Providing definite, yet readily overcome, torsional restraint to indicate to the user when the cover has been unscrewed to dispensing position and to insure against its inadvertent turning during the dispensing operation;

Furnishing audible signals indicating to the user when the closure has been turned to a point predetermined for dispensing, and when it is re-turned from such dispensing position toward a locking position.

Other objects of the present invention will be apparent from this specification and from the accompanying drawings (one sheet) in which:

Figure 1 is a view, partly in elevation and partly in section, of a preferred embodiment of the present invention applied to a pressure dispenser utilizing a tilt valve, shown in closed position.

Figure 2 is a view similar to Figure 1, somewhat enlarged, showing the dispensing position.

Figure 3 is an enlarged view, partly in elevation and partly in section, of the latching member of Figure 2.

Figure 4 is a plan view of the latching member.

Figure 5 is a sectional view of the shell of the valve cover of Figure 2, as molded and before securing the latching member therein.

Figure 6 is an enlarged bottom view of the cover shown in Figure 5.

Certain of the features herein illustrated and described are shown in the co-pending applications of Jack W. Soffer, one of the applicants herein, Serial No. 195,620, filed November 14, 1950 (matured as Patent No. 2,704,622, issued March 22, 1955), and Serial No. 268,183, filed January 25, 1952 (matured as Patent No. 2,704,621, issued March 22, 1955), to which reference is made.

Referring now to the drawings by their reference figures, there is shown in Figures 1 and 2 the upper fragmentary portion of a steel gas-pressure container *a*, of the type ordinarily used for packaging fluids under gas pressures between 75 and 200 pounds per square inch. Such container *a* may have a spun-on or crimped top *b* tightly sealed thereto so as to withstand such gas-pressure, and having a flanged center opening *c* for mounting a valve as hereinafter described.

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A simple form of valve, commonly used in such pressure containers, includes a resilient seal 1 having a tapered flange 2 presented against the under side of the top *b*, and a seal sleeve 3 extending outward through the center opening *c* and in contact with its flange. The seal sleeve 3 sealably encompasses a tubular dispensing spout 4 which extends through the seal 1, the spout having a valve head 5 at its inner end, a port 6 through its wall adjacent to valve head 5, an annular spring-retention shoulder 7 on its outer wall outward of the outer end of the sleeve 3, and a dispensing tip 8 at its outer end. The wall of the spout 4, its valve head 5, and the spring retention shoulder 7 may be concentric with a spout axis generally designated *d*. This axis *d* is used herein as the reference line for words of direction. The terms "inner" and "outer" as used herein mean axially inward toward and outward from the body of container *a*; except that the axis *d* is used also as a reference for directions measured radially therefrom; "radially inward" meaning toward the axis *d* and "radially outward" meaning away from said axis.

A helical spring 9 is inserted around the spout 4 between the outer side of the top *b* and the spring retention shoulder 7, to provide a positive force for closing the valve when it is rocked or displaced axially from closed position. An annular sealing bead 9^a on the outer wall of the spout 4 inward of the outer end of the seal sleeve 3, aids in maintaining tight fit of the sleeve 3 against the wall of the spout 4 and, in cooperation with the outer edge of the flanged center opening *c*, prevents disarrangement of the function parts of the valve structure described.

Formed on the spout wall axially inward of the tip 8 are double-lead, high pitch screw threads 10. Inward adjacent these threads 10 is an inward-facing annular latching shoulder 11 and inwardly adjacent it is an annular tapered cam surface 12 which slopes first radially outward and then inward, as shown somewhat enlarged in Figure 2.

In normal use, the container *a* will be substantially filled with the fluid to be packaged before the top *b* is applied thereto; and after the top *b* has been spun in place, gas is inserted under pressure through the tip 8 of the dispensing spout, the pressure being sufficient to force its way between the valve head 5 and the seal 1. After the gas has been inserted, a novel nozzle cover, one of the principal parts of the present invention and generally designated 13, is screwed on to the spout.

The nozzle cover 13 may assume any of a variety of decorative shapes. That shown in Figures 1, 2, and 5 has a somewhat frusto-conical upper body portion 14, interrupted along its back side (shown to the left in those figures) by a flattened dorsal projection 15. Molded integrally is an outward and downward flaring skirt portion 16 having an annular bottom rim surface 17. The juncture of the skirt portion 16 with the upper body portion 14 is formed to include an inner concentric ledge 18, interrupted at its back side by a cavity into the dorsal projection 15, as shown in Figures 5 and 6.

At the upper, frusto-conical end of the upper body portion 14, the nozzle-cover 13 has a somewhat rounded top portion 20 from which extends annularly and concentrically downward a cover sleeve portion 21. The depth of the cover sleeve portion 21 is only a part of the depth of the upper body portion 14. Within the cover sleeve portion 21 and adjacent its lower end are internal double-lead, high pitch threads 22, adapted for screw engagement with the threads 10 on the spout 4. Within the upper end of the cover sleeve portion 21, inward of the top portion 20, is a cavity referred to as the spout cavity 23, opening into a radially outward flow passage 24 through the nozzle cover wall and terminating in a

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slightly extended nozzle opening 25, shown here to be rectangular.

Figure 5 shows the nozzle cover 13 before a cover detent 19 is affixed thereto. A preferred form of cover detent member is shown enlarged in Figures 3 and 4. For purpose of easy inexpensive construction, reliability of operation, and suitability for use with fluids and gases having various chemical compositions, both the nozzle cover 13 and cover detent member 19 are molded of any of the pastics, such as polystyrene, which are relatively hard; not softly resilient or "rubber-like." Those such relatively hard plastics have a spring-like resiliency, which is utilized functionally in the cover detent member 19.

The cover detent member 19 shown in Figures 3 and 4 includes a molded ring portion 26, whose upper shape conforms to the concentric ledge 18, so that it may be inserted from below and readily cemented in place. It has a somewhat thinned radially inward extension 27, in a plane designated in Figure 3 and referred to as the plane *f* of the ring. Extending upward out of the plane *f* and sloping toward the ring center, are three parallel-edged latching projections 28. These are integrally molded, and have body portions 29 which may be slightly arcuate in cross section, as shown at the right side of Figure 3. Their compressive strength resists with rigidity, linear forces exerted between their tips (referred to as the arcuate tips 30 and shown in Figure 4) and the ring portion 26. The junctures of the latching projections 28 with the narrowed inward extension 27 of the ring portion 26 are designed for bending, to occur along lines of flexure designated *e*. The thinned inward extension 27 of the ring portion 26 permits clearance for flexure of the latching projections 28 further out of the plane *f*, when the tips 30 are moved over the cam surface 12 on the spout 4.

With the cover detent 19 cemented in the ledge 18 and the nozzle cover applied to the spout 4, the latch tips 30 extend and press yieldingly against the wall of the spout 4. Flexure of the latching projections 28 along the lines flexure *e*, permits the latch tips 30 to pass over the spout tip 8 and threads 10, and (on engaging these to the cover threads 22) to spring under the latching shoulder 11.

Turning the nozzle cover 13 draws it axially inward. Resistance to turning will be felt as the upper (axially outer) portion of the cam surface 12 forces the latch tips 30 outward; but after they pass over the cam surface 12, they spring back against the wall surface of the spout 4 axially inward of the cam surface 12. Turning is continued until the lower rim surface 17 of the nozzle cover 13 presses against the outer wall of the container *a*, as shown in Figure 1; drawing the spout 4 upward and seating the valve head 5 tightly against the seal 1.

If now the user wishes to dispense a portion of the container contents, he turns the spout cover 13 towards open position, shown in Figure 2. Because of the high pitch double-lead threads, a large axial movement accompanies a single turn. As the latch tips 30 press against the outward-sloping under face of the cam surface 12 and are pressed outward, there is a readily-sensed increase in turning resistance. When the tips 30 pass over the greater diameter portion of the cam surface 12, this resistance lessens; after an additional short angular distance, the latch tips 30 will engage against the latching shoulder 11, in position shown in Figure 2.

This movement to open position is accomplished quickly. Audible vibrations are produced by flexing the latching projections 28, and by the contact of the latch tips against the spout wall. The sound so produced, and the stopping of angular movement, indicate to the user that the cover is in open position. To discharge the container contents, the user inverts the container and presses sideward against the flattened outside surface of the dorsal projection 15, to tilt the spout 4. The fluid contents of the container, expanded or propelled by

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gas pressure, will flow through the port 6 and the spout tip 8 into the spout cavity 23, then through the flow passage 24 to be discharged out of the nozzle opening 25. Inadvertent turning of the nozzle cover 13 toward closed position, is prevented by the turning resistance of the latching projections 28 against the cam 12.

When the user twists the spout cover to close it, and the latch tips 30 pass axially inward of the cam surface 12, such turning resistance is relieved. Knowledge that the dispensing position has been passed is signalled audibly by the striking of the latch tips 30 against the wall of the spout 4 axially inward of the cam surface 12, as well as by vibrations attending the relaxation of flexure. Tightening of the spout cover 13 back into position shown in Figure 1, with the rim surface 17 pressing against the container *a* and drawing the valve head 5 against the seal 1, gives assurance against inadvertent valve tilting and leakage.

Because of the straightness and rigidity of the body portions 29 of the latching projections 28, and the high pitch of the threads, there is no gradual tightening as the dispensing position is reached. Rather, with a short angular turn, the nozzle cover 13 seemingly snaps into open position.

The invention heretofore described is adapted generally to any type of dispenser dischargeable through an axial spout, or having a flow-control member a portion of whose outer surface is generated by revolving a line about an axis. Specifically the present invention may be used with metal, glass, or plastic containers, whether or not intended for gas-pressurization; collapsible tubes; and other types of vessels from which fluid or viscous substances may be dispensed. The dispensed substance may be expanded as a foam, or atomized as a spray, or merely propelled in liquid or viscous form.

Modifications of the present invention will occur to those familiar with the art and problems of the packaging industry. Accordingly, the present invention should not be narrowly construed, but instead should be deemed as fully co-extensive with the disclosure hereof and the claims hereinafter set forth.

We claim:

1. Non-removable protective dispensing means for a container, comprising a tubular spout, threads formed on said spout with respect to an axis therethrough, and an annular, axially-inward-facing shoulder thereon, further comprising a cap-like spout cover having a wall surrounding the spout, a threaded spout-engaging portion adapted for screw engagement with the threads on the spout, a flow passage communicating between the spout and the outside atmosphere, and cover-detent means including a latching projection extending radially inward from the cover wall toward the spout thread axis and axially outward with respect thereto, the said latching projection having an inner end latch tip positioned to bear against said spout and adapted to deflect axially outward and pass over said shoulder when the cover is screwed onto the spout and to engage latchingly against said shoulder when the cover is screwed outward to a predetermined position suitable for dispensing.

2. The combination defined in claim 1, the latching projection extending column-like from the cover wall so as to resist in compression the force attendant such latching, the said threads being multiple-lead threads, whereby their pitch is increased, so that axial movement of the cover from closed to dispensing position attends a relatively small angular movement, thereby minimizing the compressive force exerted by the shoulder on the said column-like latching projection.

3. Non-removable protective dispensing means for a container as defined in claim 1, the cover-detent means being of one piece molded construction and including a ring portion secured to and within the spout cover wall, there being a plurality of said latching projections extending radially inward therefrom, each having a line of

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flexure at its juncture with said ring portion and having a straight body portion adapted to resist stiffly in compression and without bending, such force as is exerted between said ring portion and the shoulder on latching thereagainst.

4. The combination defined in claim 1, the spout having an annular cam surface axially inward of said shoulder over which the latch tip of the latching projection is adapted to ride both when the cover is screwed outward to said dispensing position and when secured inwardly therefrom, the latching projection possessing spring-like resistance to axially-outward deflection.

5. The combination defined in claim 4, the latching projection being formed integral with a molded ring mounting within the cover, and spring resistance in the juncture of said projection with said mounting, said resistance being discernible on the riding of the latch tip over the cam whereby change of position of the cover is readily sensed.

6. The combination defined in claim 5, there being a plurality of said latching projections formed at angular intervals along the inner side of said ring mounting and having their latch tips converging against the spout.

7. Non-removable protective dispensing means for a container, comprising a straight tubular spout having an annular inward-facing shoulder on its outer wall, and further comprising a cap-like spout cover having a spout-enclosing cavity, a nozzle opening therethrough, and a detent member within the spout cover having projections extending somewhat axially outward and radially inward with respect to an axis extending lengthwise through the middle of the spout, said projections having tips extend-

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ing upwardly within the cavity thereof so as to deflect axially and radially outward on contacting the tip of said spout and permit said cover to be put in place over said spout and to latch against said inward-facing shoulder, whereby to prevent removal of said cover from such spout.

8. A dispensing spout and position-signaling nozzle-cover therefor, comprising the construction defined in claim 7, the detent member being hard and elastic, the tips of its projections having surfaces presented against the outer surface of the spout, said spout surface including an annular cam, said tip surfaces producing an audible sound on striking the spout surface on either side of said cam under the urging of the elasticity of the detent material.

9. The combination of a dispensing valve for gas pressure dispensing containers and a non-removable nozzle-cover therefor, comprising the construction defined in claim 7, together with an elastic tubular seal in which the dispensing spout is seated for mounting in a wall of such container, the spout further having a valve head seating against said seal when the spout is in normal closed position, further having a port through the spout wall adjacent the head, whereby to permit valved dispensing through the spout when the valve head is disengaged from seating against the seal.

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