United States Patent

De Putron

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[54] **EXTENSIBLE SPOUTS FOR CONTAINERS**

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[52] **U.S. Cl.**.....**222/524,** 222/549, 222/562

[51] **Int. Cl.**.....**B67d 3/00**

[58] **Field of Search**.....222/522, 549, 562, 551, 519, 222/520, 523, 524, 525, 566–570, 147, 153; 215/73

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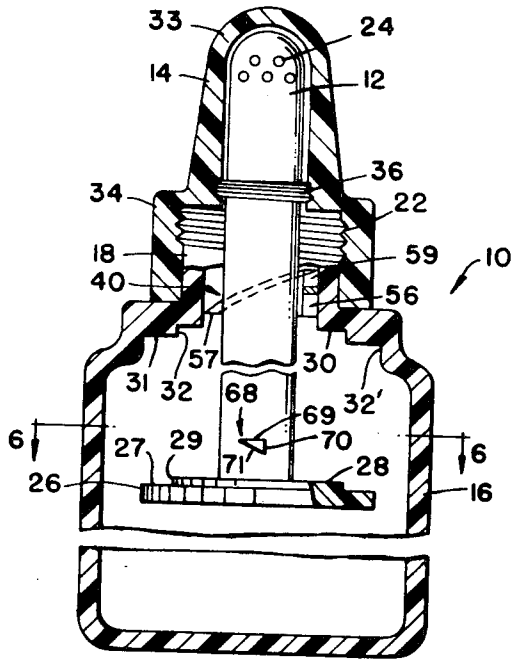
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[57] **ABSTRACT**

A container having an extensible dispensing spout. A cap is removably secured to the container and to the spout to seal the spout within the container in retracted position and to be used for extending the spout without touching it by hand.

16 Claims, 7 Drawing Figures



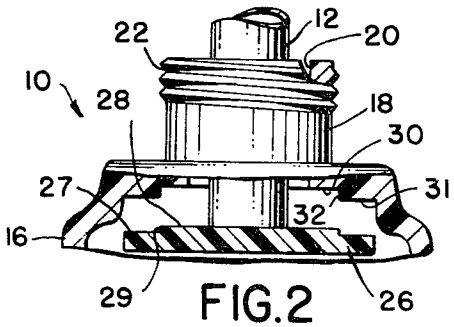


FIG.2

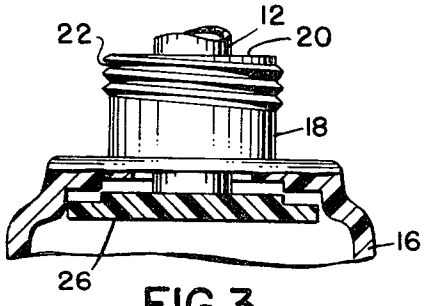


FIG.3

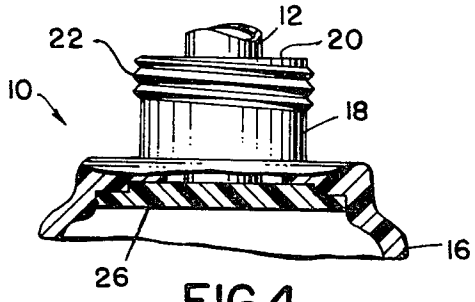


FIG.4

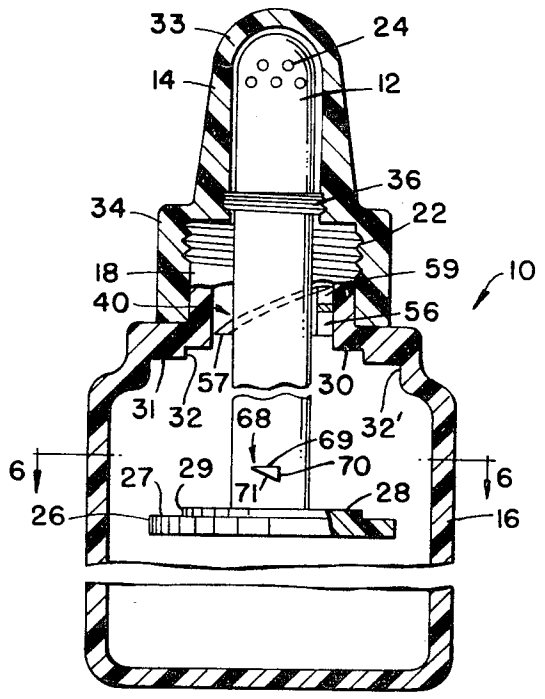


FIG.1

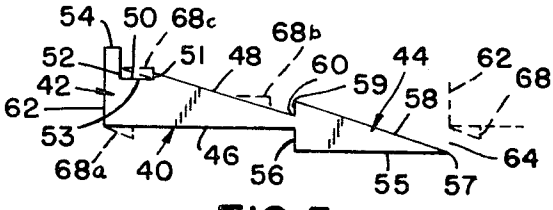


FIG.5

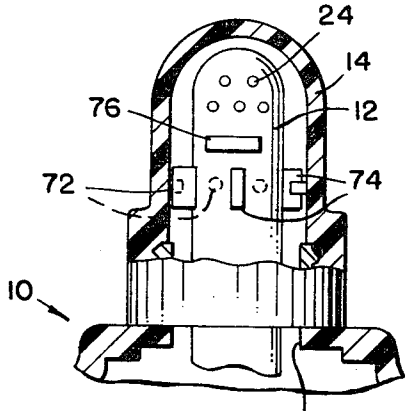


FIG.7

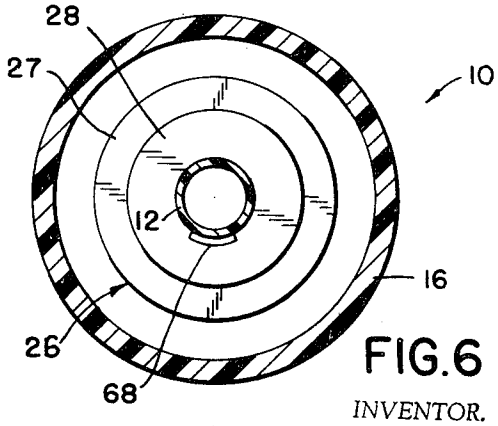


FIG.6

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EXTENSIBLE SPOUTS FOR CONTAINERS

BACKGROUND OF THE INVENTION

This invention is an improvement over the invention disclosed in my earlier U.S. Pat. No. 3,253,728.

SUMMARY OF THE INVENTION

One object of this invention is to provide improved means for controlling the position of the extensible spout.

Another object is to provide cooperating means on the container and on the spout operable, upon rotation of the spout, to secure the spout in its extended position.

Another object is to provide a container having a spout which may be partially extended by a straight pull, and then through the action of cooperating means on the container and on the spout, may be further extended to its final position of use by a turning movement.

Another object is to provide means for locking the spout in its extended position.

Another object is to provide means for preventing the spout from being retracted after it has once been extended.

Another object is to provide means on the container and on the spout to form a seal around the opening in the container when the spout is fully extended.

Another object is to provide a cap which is removably secured to the container to seal the spout within the container in retracted position and which is also removably secured to the spout so that it may be used to extend the spout without touching it by hand.

Other objects and features of the invention will become more apparent as this description proceeds, especially when taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a longitudinal view of a container embodying my invention with parts in section and with parts in elevation.

FIG. 2 is a fragmentary sectional view of portions of FIG. 1, showing the spout partially extended.

FIGS. 3 and 4 are similar to FIG. 2, FIG. 3 showing the spout further extended and FIG. 4 showing the spout in its final extended position for use.

FIG. 5 is a development of the annular cam means secured within the neck of the container for preventing reverse rotation and retraction of the spout and for locking it in its extended position.

FIg. 6 is a sectional view taken on the line 6—6 in FIG. 1.

FIG. 7 is a fragmentary sectional view illustrating a modification.

Referring now more particularly to the drawing and especially to FIGS. 1 to 6, the numeral 10 designates a container, 12 designates an extensible spout and 14 designates a cap which seals the spout in retracted position within the container and which may be used to withdraw or extend the spout without touching it.

The container 10 may be of any suitable material, such as plastic for example. Preferably, the container is in the form of a flexible squeeze bottle so that the contents may be expressed through the spout by squeezing. The container 10 will be seen to have an elongated hollow body 16 for containing any desired liquid. The body 16 is reduced at one end to provide a neck 18 forming a discharge opening 20. The inner surface of the neck preferably is of uniform circular cross section as shown. The outer surface of the neck is threaded as indicated at 22.

The spout 12 is an elongated, non-flexible tubular member of plastic or like material. The spout is open at the inner end and closed at the outer end, but has a plurality of small openings 24 in the outer end for the discharge of liquid from the container. The spout is somewhat smaller in diameter than the neck 18 of the container and is capable of being withdrawn longitudinally from the retracted position of FIG. 1 to the extended position of use partly shown in FIG. 4.

The spout has an annular radially outwardly extending flange 26 at the inner end. The top of the flange 26 has

stepped horizontal circular sealing surfaces 27 and 28 separated by a circular step 29. Surfaces 27 and 28 are adapted, when the spout is withdrawn to its fully extended position for use, to sealingly engage horizontal circular sealing surfaces 30 and 31 in the inner wall of container 10 which are separated by circular step 32. Hence in the extended position of the spout, the container is sealed by the surfaces 27, 28 and 30, 31 around the neck 18, so that the contents of the container can be dispensed only through the openings 24 in the outer end of the spout 12. In the extended position, the inner circular surface 32' of the container wall also seals around the circular periphery of flange 26.

The cap 14 is in imperforate member of plastic or the like having a hollow dome-shaped portion 33 and a cylindrical skirt portion 34. The skirt portion 34 is of a diameter adapted to closely fit over the neck 18 of the container and is internally threaded so as to be threaded on the threads 22 of the neck as shown in FIG. 1. The skirt portion 34 is also internally threaded for engagement with the external threads 36 adjacent the outer end of port 12. FIG. 1 shows the parts of the container in the normal position prior to use in which the major portion of the spout is retracted within the container but projects a short distance through the neck. The projecting end of the spout is received in the dome-shaped portion 33 of the cap and is threadedly engaged therewith, and the cap in turn is threaded onto the neck of the container. Hence the spout is completely sealed within the container by the cap 14.

A ring-shaped cam control member 40 is secured to the inner surface of the neck 18 of the container so as to lie in a plane at right angles to the spout. The spout of course extends through the ring-shaped cam control member 40 and is capable of moving longitudinally relative thereto.

FIG. 5 shows a development of the cam control member. As there shown, the cam member consists of a quide-lock portion 42 and a wedge-lock portion 44. The guide-lock portion 42 has a horizontal inner or lower surface 46 and an outer or upper surface 48 which is inclined to the horizontal and which leads to a detent in the form of a trap-lock recess 50 at its upper end composed of the laterally spaced vertical surfaces or shoulders 51 and 52 connected by the horizontal bottom surface 53. The vertical surface 52 is extended upwardly to provide a stop 54. The wedge-lock portion 44 has the inner or lower horizontal surface 55 connected at one end to surface 46 by a vertical surface 56 and also connected at a vertex 57 to the outer or upper inclined surface 58. The vertical surface or shoulder 59 at the upper end of the inclined surface 58 connects with the inclined surface 48 of the guide-lock portion 42 to provide a detent in the form of a wedge-lock recess 60. It will be understood that when the cam member 40 is installed in the neck of the container in a circle as shown in FIg. 1, the vertical edge 62 of the guide-lock portion 42 will assume the position with respect to the guide-lock member 44 as shown in dotted lines in FIG. 5, providing an entrance 64 to the upper inclined surface 58.

A cam follower in the form of a wedge-shaped key 68 is secured to the spout near its lower end. This key 68 has horizontal and vertical surfaces 69 and 70, and an inclined surface 71. It is adapted to cooperate with the cam member 40 to control the final movement of the spout to its extended position, to lock the spout in its extended position and to prevent the spout from being reverse rotated and retracted back into the container.

The cap 14 must be removed from the neck of the container in order to withdraw the spout to its extended position. This may be accomplished by grasping the cap in the fingers and rotating it to unthread it from the neck. The spout, during this unthreading of the cap, will turn with the cap because it is free-floating in the container.

The cap may then be used to withdraw the spout from the container without touching the spout. The spout is thus withdrawn longitudinally by the cap with a straight pull until the horizontal surface 69 of the key 68 contacts one of the lower horizontal surfaces 46 or 55 of the cam control member.

The cap is then rotated with the fingers to correspondingly turn the spout so that the key moves to the right in FIG. 5 to the position indicated at 68a. This position is also indicated in two places to better illustrate the key at the entranceway 64 to the inclined upper surface 58 of the wedge-lock member 44. At this time, the flange 26 of the spout is in the position shown in FIG. 2. Continued rotation of the cap and spout in the same direction causes the surface 71 of key 68 to ride up the inclined upper surface 58 and snap over and into the wedge-lock recess 60. When the key is in the position designated 68b in FIG. 5, the flange 26 is just below the surfaces 31 and 32 of the container as shown in FIG. 3.

Further rotation of the spout by the cap 14 causes the key to move up the inclined upper surface 48 of the guide-lock member 42 and to snap into the trap-lock recess 50. This position of the key is indicated at 68c in FIG. 5 and represents the fully extended position of the spout. In this fully extended position, the surfaces 27, 28 of the flange 26 are in full sealing engagement with the surfaces 30, 31 of the container as shown in FIG. 4 to provide a complete seal around the neck 18 of the container. Surfaces 29, 32 also seal, as well as surface 32' and the periphery of flange 26. The flange 26 not only provides a seal, but also prevents the spout from being pulled all the way out of the container. Thus the container cannot be refilled and reused.

After the key has entered the wedge-lock recess 60, the spout cannot be reverse rotated and hence the spout cannot be retracted back into the container and reused. When the key is in the trap-lock recess 50, the spout is locked in its fully extended position and this recess is also deep enough to prevent reverse rotation. Of course, the spout cannot be further rotated in the original direction, because of stop 54 engaging key 68.

The direction of the threaded connection between the cap 14 and the spout 12 is such that this threaded connection tightens upon rotation of the spout by the cap in a direction to cause the key to move from left to right in FIG. 5 and travel up the inclined surfaces of the cam control member 40 during the final movement of the spout to its fully extended position.

When the spout is fully extended, the cap 14 may be reverse rotated to unthread it from the spout 12 so that the contents of the container may be dispensed. The spout of course is prevented from rotating reversely the cap by the engagement of the key 68 in the trap-lock recess 50.

FIG. 7 shows a modification of the invention in which the only change is in the connection between the cap 14 and the spout 12. Instead of a threaded connection, the cap is provided with an annular series of equally circumferentially spaced inward projections 72, and the spout is provided near its upper end with an annular series of equally circumferentially spaced outward projections 74 and two diametrically opposed outward projections 76 spaced above the projections 74. All of these projections are flexibly resilient.

In the retracted position of the spout 12 with the cap 14 in place on the container, the projections 74 on the spout are located between the projections 72 on the cap so as to cause the spout to rotate with the cap. The projections 76 on the spout overlie the projections 72 on the cap so that when the cap is withdrawn with a straight pull the spout will be withdrawn with it. However, after the spout has been withdrawn and rotated to be locked in its fully extended position, if the cap is pulled and/or twisted with a little extra effort, the projections 72 on the cap will bend and flex past the projections 76 on the spout so that the cap can be removed from the spout.

What I claim as my invention is:

1. A container having an opening, an elongated tubular discharge spout at least the major portion of which is disposed within said container in retracted position, said spout being longitudinally extendable outwardly through said opening to an extended position for use, and cooperating engaging means on said container and on said spout operable, upon rotation of said spout relative to said container, to secure said spout in its extended position and prevent it from being returned to retracted position.

2. A container having an opening, an elongated tubular discharge spout at least the major portion of which is disposed within said container in retracted position, said spout being longitudinally extendable outwardly through said opening to an extended position for use, said container having circumferentially extending cam means adjacent said opening, a cam follower on said spout, said follower, upon partial longitudinal extension of said spout, being engageable with said cam means and, upon subsequent rotation of said spout, being movable along said cam means to extend said spout to its extended position for use, said cam means including detent means engageable with said follower to prevent said spout from being returned to its retracted position after it has been extended as aforesaid.

3. The container defined in claim 2, including a cap removably secured to said spout over the outer end of the latter, said cap being removably secured to said container over the opening therein to close said opening and to seal said spout within said container in retracted position.

4. The container defined in claim 3, wherein said cap is threaded to said spout.

5. The container defined in claim 3, wherein said cap and said spout have interengaged, raised, flexible projections by means of which said cap is removably secured to said spout.

6. The container defined in claim 2, wherein cooperating means are provided on said container and on said spout to engage in the extended position of said spout and form a seal around said opening, and also to prevent the spout from being removed from the container.

7. The container defined in claim 6, wherein said spout has an annular, radially outwardly extending flange adjacent its inner end, and said cooperating means comprises annular sealing surfaces on said flange and in said container.

8. The container defined in claim 2, wherein said cam means includes an inclined surface engageable with said follower to advance said spout to its extended position upon rotation of said spout in one direction.

9. The container defined in claim 2, wherein said cam means includes an inclined surface engageable with said follower to advance said spout toward its extended position upon rotation of said spout in one direction, said detent means comprising a shoulder to which said inclined surface leads adapted to engage said follower and prevent reverse rotation of said spout.

10. The container defined in claim 2, wherein said cam means includes an inner surface adapted to be engaged by said follower to interrupt the extension of said spout, and an outer inclined surface leading circumferentially from said inner surface, said outer inclined surface being adapted to be engaged by said follower upon rotation of said spout to advance said spout toward its extended position.

11. The container defined in claim 10, wherein said detent means comprises a locking shoulder to which said outer inclined surface leads adapted to prevent reverse rotation and retraction of said spout.

12. The container defined in claim 11, wherein said cam means includes a second outer inclined surface leading circumferentially from said shoulder to a locking recess, said follower being engageable with said second outer inclined surface upon further rotation of said spout and finally with said locking recess to lock said spout in its extended position.

13. The container defined in claim 2, wherein said cam means includes a guide-lock member having an inner surface adapted to be engaged by said follower to interrupt the extension of said spout, said cam means also including a wedge-lock member having an outer inclined surface leading circumferentially from said inner surface, said follower being engageable with said outer inclined surface to advance said spout toward its extended position upon rotation of said spout in one direction, said detent means comprising a first recess to which said upper inclined surface leads adapted to engage said fol-

lower and prevent reverse rotation of said spout, said guide-lock member having an outer inclined surface leading circumferentially from said first recess to a second recess, said follower being engageable with said second-mentioned outer inclined surface upon further rotation of said spout in said one direction and finally with said second recess to lock said spout in its extended position.

14. The container defined in claim 13, wherein said spout has an annular, radially outwardly extending flange adjacent its inner end, annular sealing surfaces on said flange, and annular surfaces in said container surrounding said opening and adapted to sealingly engage said sealing surfaces on said flange when said spout is extended as aforesaid.

15. The container defined in claim 14, including a cap removably secured to said spout over the outer end of the latter, said cap being removably secured to said container over the opening therein to close said opening and to seal said spout within said container in retracted position.

16. A container having an opening, an elongated tubular discharge spout at least the major portion of which is disposed within said container in retracted position, said spout being longitudinally extendible outwardly through said opening to an extended position for use, a cap removably secured to said spout over the outer end of the latter, said cap being releasably secured to said container over the opening therein to close said opening and to seal said spout within said container in retracted position, said cap being adapted to be grasped in the fingers to extend said spout as aforesaid without touching said spout with the fingers.

* * * * *