SAFETY ACTUATOR CAP FOR HAND-HELD DISPENSERS

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3 Claims

ABSTRACT OF THE DISCLOSURE

The herein disclosed actuator cap is intended for use on hand-held dispensers such as pump-type or pressurized aerosol cans, and comprises a depress button which is vertically movable in a stationary cap attachable to the container of the dispenser. The button is also turnable between limits, and is blocked against downward movement for all of its rotative positions except the position defined by one of said limits.

Cross references

Background of the invention

This invention relates to actuator caps for small hand-held dispensers, and more particularly to safety caps wherein the operable member can be normally locked against actuation, and can be released when dispensing is to be done.

U.S. Patent No. 3,050,219 discloses a locking cap wherein a large-diameter depress button is mounted on a container for vertical movement to effect the discharge, and for limited turning movement to effect a locking and unlocking. The underside of the button has an eccentrically disposed locking lug which is cooperable with a small-diameter locking collar disposed under the button and affixed to the container. The locking collar has two stop shoulders engageable by the sides of the lug, and also has an arcuate blocking surface engageable by the bottom of the lug for part of its arcuate travel. Thus the single lug determines the limits of the turnable movement of the button and also effects the locking of the same in the raised, inoperative position when the button is at one limit. The locking collar and no guiding whatsoever of the button, and the latter was not held captive by the collar or any other means, whereby it could come away from the container in response to an upward pull.

The above characteristics are obviated by the present invention, which provides a depress button movable in a larger, stationary cap and held substantially captive therein, the control of the freedom of movement of the button being effected by projections on the button and cap.

Objects of the invention are to provide an improved locking-type safety actuator cap comprising a depress button movable in an outer stationary cap, wherein the cap generally holds the button captive and also constitutes a guide therefor; to provide an improved cap as above, wherein the parts are simple and may be readily economically molded of plastic substance; to provide a cap in accordance with the foregoing, wherein a large vertical stroke is possible to accommodate the plunger action of a pump type dispenser; to provide a cap as outlined above, wherein the parts are compact and present a neat and attractive, closed appearance; a cap as above set forth, which is rugged, resistant to breakage, easy to use and reliable in operation over an extended period of use; and a molded cap as above characterized, wherein the parts may be fabricated in relatively simple, inexpensive molds.

Other features and advantages will hereinafter appear.

In the drawings:
FIG. 1 is a view partly in axial, vertical section and partly in side elevation, of the actuator cap provided by the present invention, mounted on a container.
FIG. 2 is a top plan view of the actuator cap, both Figs. 1 and 2 showing the cap button in readiness for depressing movement to effect a discharge.
FIG. 3 is a transverse or horizontal section, taken on lines 3—3 of FIG. 1.
FIG. 4 is a rear elevational view of the actuator cap, shown in the locked position.
FIG. 5 is a top plan view of the cap with the parts as in FIG. 4.
FIG. 6 is a transverse or horizontal section, taken on the line 6—6 of FIG. 4.
FIG. 7 is a section, taken on the line 7—7 of FIG. 6.

As shown, the actuator cap is mounted on a container of the type having a threaded neck 12 and a reciprocal pump construction 14 disposed in the neck portion 12 and provided with an upstanding hollow spring-charged reciprocable plunger 16.

The actuator cap comprises a two-part stationary body portion designated generally by the numeral 18, said body portion comprising a lower internally threaded fitting or adapter 20 which is screwed onto the container neck 12, and further comprising an upper tubular body portion 22 turnably carried by the portion 20.

The pump construction 14 has the usual out-turned flange 24 which is clamped against the lip of the bottle neck 12 by an internal annular flange 26 of the adapter 20.

An interlocking slip-type connection 28 exists between the adapter 14 and the upper body portion 22, involving cooperative annular shoulders or beads and grooves by which the portion 22 may be turnably adjusted with respect to the body portion 22 while the latter remains affixed to the container or bottle 10. Such connection 28 forms no part, per se, of the present invention and accordingly is not further described herein, being known to those skilled in the art.

The actuator cap further comprises a depress button 30 which has a central hollow depending boss 32 press-fitted onto the reciprocable pump plunger 16. The depress button 30 comprises an inverted cup-like body 34 having a transverse top wall 36 engageable by the fingers to effect recinitation of the button 30 and plunger 16.

The button 30 carries an orifice piece 38, and has vertical and horizontal, connected discharge channels (not shown) communicating respectively with the bore of the pump plunger 16 and the discharge passage of the orifice 38 in the well known manner.

With the construction as above set forth, operation of the pump 14 to effect a discharge is usually accomplished by holding the container 10 in the hand and applying the forefinger to the depress button 30, to reciprocate the latter and plunger 16 vertically. The discharge will occur from the orifice 38, as is understood.

Instead of the dispenser having a propellant means in the form of a reciprocable pump, it may just as well comprise a pressurized container of the type having a hollow upstanding valve stem in place of the upstanding pump plunger 16. With such pressurized dispensers, downward movement of the valve stem opens a discharge valve within the container, and effects a discharge of the contained
 substance, as it is well understood. The button 30 may be carried by such upstanding valve stem instead of by the pump plunger 16, whereupon depressing the button will effect a discharge without requiring reciprocation of the same as is necessary with a pump structure.

In accordance with the present invention, a releasable locking organization is provided involving the depress button 30 and the body 20, 22, in conjunction with guidance of the button 30 by the cap body and also retention of the button 30 in the cap body while still permitting easy and quick assemblage of these parts, the arrangement being such that the parts are of simple construction and may be easily and quickly molded of plastic substance in relatively simple mold cavities.

In accomplishing this, the body portion 22 is provided with an integral, annular notched flange 40 at its upper rim, said flange being cooperating with outwardly disposed projections and lugs 42, 44 respectively, which are disposed on the tubular body 34 of the button. Preferably, as seen in FIGS. 2 and 5, the flange 40 has two diametrically opposite notches 46 adapted to accommodate the projections 42 of which there are also two, located in diametrically opposite positions. FIGS. 1 and 2 illustrate the arrangement wherein the projections 42 are in registration with the notches 46. For such condition there is adequate clearance for the projections, and the button 30 may be depressed to operate the pump plunger 16. The inner arcuate edges 48 of the flange 40 engage the exterior side walls of the button 30 and constitute a guiding means for the button. If, now, the button 30 should be turned through an angle of 90° as permitted by turning of the plunger 16, to the position shown in FIGS. 4 and 5, the flange 40 will block the projections 42 and positively prevent downward movement of the button 30. Thus, the button will be locked in the raised position, this constituting a safety feature by which inadvertent actuation of the cap to effect a discharge is prevented.

Further in accordance with the invention, for cooperation with the flange 40, the button 30 has the two lugs 44, also preferably located diametrically opposite each other, and the flange 40 additionally has stop lugs 50, 52, preferably provided as pairs. The two lugs 52 are diametrically opposite each other, as are the two lugs 50, both pairs being disposed on the underside of the flange 40 along the inner edges 46 thereof.

It will be noted that the lugs 44 of the button are located at a level which is spaced slightly below the bottom ends or edges of the projections 42 of the button. Also, the lugs 44 of the button are offset or spaced circumferentially with respect to the projections 42. As with the projections 42, the lugs 44 are adapted to pass through the notches 46 of the flange 40, this occurring during the assemblage of the button to the cap body.

Referring to FIGS. 3 and 6, which correspond respectively to the positions of the parts shown in FIGS. 1, 2 and 4, 5, it will be seen that the lugs 44 of the button are engageable either with the pair of lugs 50 of the cap body or else with the pair of lugs 52 thereof. The said lugs thus serve as stops, limiting the relative turning movement of the button 30 with respect to the cap body 20, 22 to an angle of approximately 45°, the limits of which represent respectively the unlocked and locked positions of the button shown in FIGS. 1, 2 and 4, 5.

It will be understood that the button 30 may thus be turned between the two limiting positions shown, and during such turning except for one very specific, intermediate position, the lugs 44 will hold the button 30 captive on the cap body 20, 22. For the said one specific intermediate position, the depress button 30 may be removed from the assemblage by pulling it upward to disengage the boss 32 from the pump plunger 16. The assembly of the button 30 to the cap body is just the reverse of such removing movement. Immediately after such assembly the projections 42 will be disposed in some intermediate position as indicated by the broken lines in FIG. 5. The button 30 is then turned clockwise through approximately 45°, whereupon the position shown in FIGS. 4 and 5 is arrived at. This is the locking position of the actuator cap, and the button 30 cannot be removed by pulling it upward, nor can it be depressed by pushing it downward. The cap is therefore in its "safety" condition. When the user desires to operate the dispenser, he merely turns the depress button 30 counterclockwise through approximately 90°, bringing the projections 42 in registration with the notches 46, whereupon the pumping action may be carried out, as already stated above.

The upwardly limited position of the pump plunger 16 is that shown in FIG. 1, wherein the depress button 30 is carried in such a manner that the projections 42 are above the flange 40, and the lugs 44 are below the flange 40. Thus, the turning of the button either to the operating or else to the safety position can be effected without interference by the projections or lugs, and is characterized by a relatively smooth motion.

It will now be seen from the foregoing that I have provided a novel and improved safety type actuator cap for hand-held dispensers, which presents a neat, closed appearance, which involves relatively simple parts of the type capable of being economically molded of plastic substance in simple cavities. The depress button is normally held captive by, and is guided in the stationary body portion of the cap, and the disposition of the projections 42 and lugs 44 makes it possible for the button to be readily molded without resorting to a complicated mold cavity.

The notched flange 40 and the projections 42 and lugs 44 cooperating therewith effect the locking and capturing action in an extremely simple and reliable manner, whereby operation of the cap is essentially foolproof.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

I claim:
1. An actuator cap for a hand-held dispenser of the type having a container provided with a hollow depressible stem through which the contained substance is discharged, comprising in combination:
   (a) a finger-operable depress button adapted to be mounted on the depressible stem, said button having a discharge passage communicating with the bore of the stem and having a discharge orifice communicating with said passage,
   (b) a stationary tubular cap body adapted to be mounted on the container, said body having an inwardly extending flange at its top, with a top opening defined by said flange, in which the depress button is disposed and turnable, said button being vertically movable with the stem between raised and lowered positions,
   (c) first cooperable means on the button and cap body, operative with the button in raised position for limiting turning of the button relative to said cap body through a predetermined angular range and between fixed angular limits, said first cooperable means comprising a lug on the button, disposed below the level of the cap body flange, and comprising a pair of lugs carried by the cap body under the said flange and cooperating with said lug on the button,
   (d) second cooperable means on the button and cap body, operative to block the button and prevent downward movement thereof from its raised position, said second means being inoperative when the button is at least at said fixed limits whereby the button when so disposed may be depressed to effect a discharge, said second cooperable means comprising said flange of the cap body and comprising a projection on the button disposed above the level of the cap body flange when the button is being blocked, said flange having a notch to receive said projection when said second cooperable means is inoperative and the button is depressible to effect discharge,
3,422,996

2. An actuator cap as in claim 1, wherein:
(a) the lug on the button is spaced circumferentially with respect to the projection.

3. An actuator cap as in claim 1, wherein:
(a) the said lugs comprise two sets of three each, one lug of each set being on the button and two lugs of each set being on the cap body,
(b) said button having a second projection constituting part of said second cooperable means,
(c) said flange having a second notch for passage therethrough of the second projection, said notches receiving the lugs on the button to enable the latter to be assembled into the cap body.

4. An actuator cap as in claim 6, wherein:
(a) the projections on the button extend upward a vertical distance sufficiently great to enable some portions of them to remain in the notches throughout the entire depressing movement of the button.

5. An actuator cap as in claim 1, wherein:
(a) the projection on the depress button extends upward a vertical distance sufficiently great to enable some portion of it to remain in the notch of the cap body flange throughout the entire depressing movement of the button.

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