April 12, 1966 P. H. SAGARIN 3,245,588

TAMPER-PROOF ACTUATOR CAP FOR AEROSOL DEVICES

Filed Oct 5, 1964 2 Sheets-Sheet 1

Fig. 1

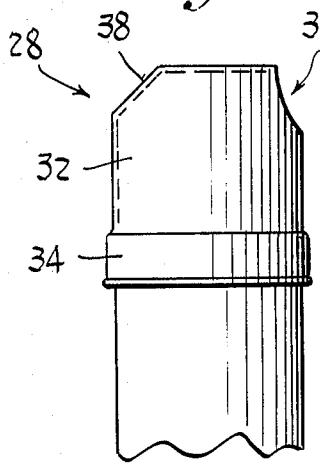


Fig. 3

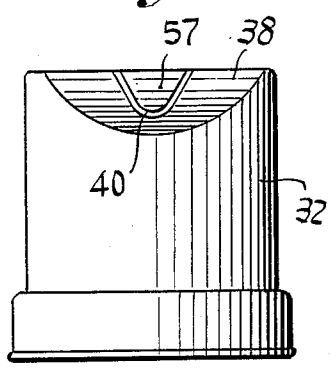


Fig. 4

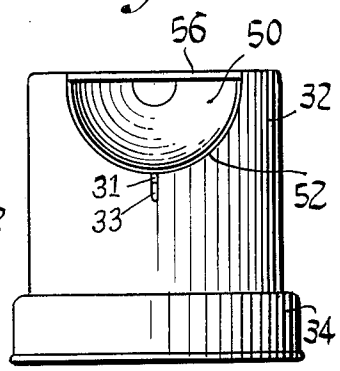


Fig. 5

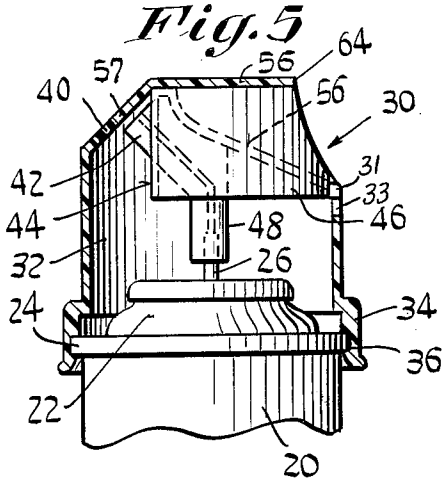


Fig. 2

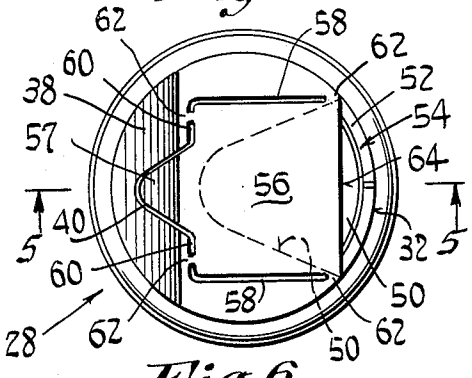
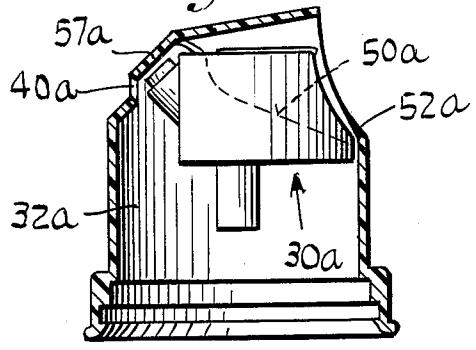


Fig. 6



INVENTOR.
Philip H. Sagarin
BY
H. Gibson Lehmann
AGENT

April 12, 1966 P. H. SAGARIN 3,245,588

TAMPER-PROOF ACTUATOR CAP FOR AEROSOL DEVICES

Filed Oct 5, 1964 2 Sheets-Sheet 2

Fig. 7

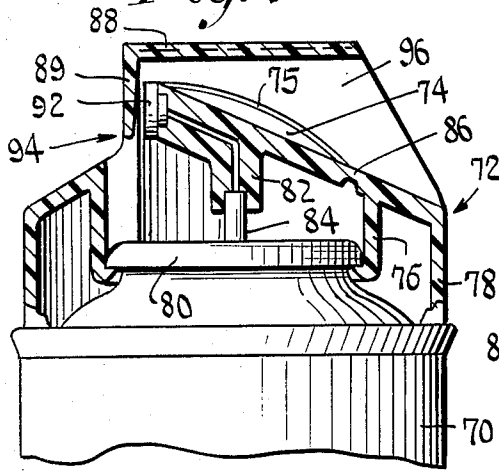


Fig. 9

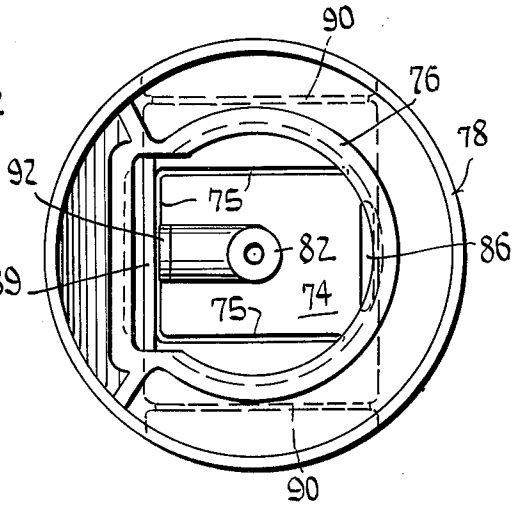


Fig. 8

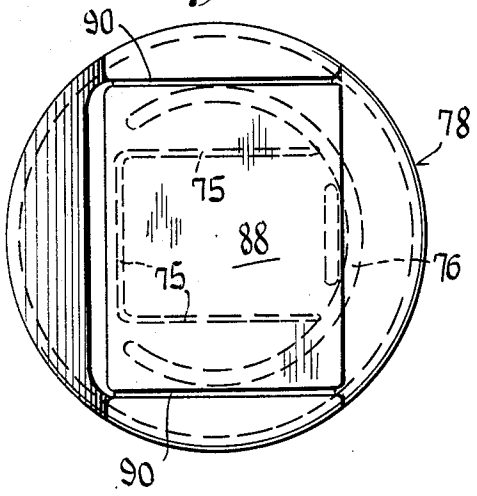


Fig. 10

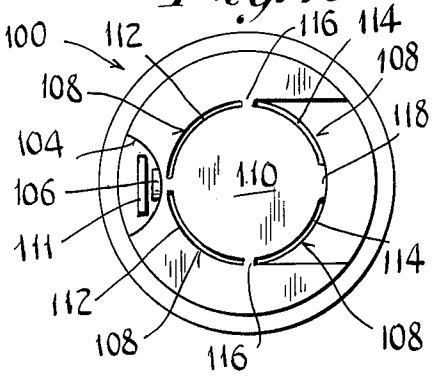


Fig. 11

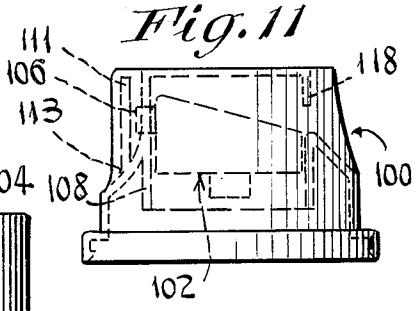


Fig. 12

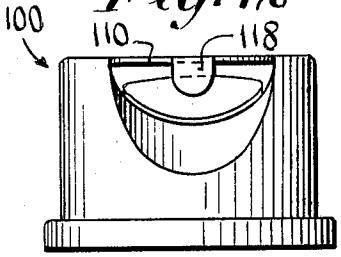
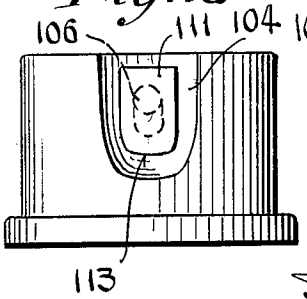


Fig. 13



INVENTOR.
Philip H. Sagarin
BY
H. Gilbert Lehmann
AGENT

United States Patent Office 3,245,588 Patented Apr. 12, 1966

3,245,588

TAMPER-PROOF ACTUATOR CAP FOR AEROSOL DEVICES

Philip H. Sagarin, Bridgeport, Conn., assignor to Valve Corporation of America, Bridgeport, Conn., a corporation of Delaware

Filed Oct. 5, 1964, Ser. No. 401,582
9 Claims. (Cl. 222—182)

This invention relates to small hand-held aerosol devices, and more particularly to tamper-proof guard-type actuator caps therefor.

The invention concerns improvements in the actuator cap of my copending applications Serial No. 360,394 filed April 16, 1964 and entitled "Actuator Top for Aerosol Devices"; and Serial No. 402,225 filed October 7, 1964 and entitled "Actuator Cap for Small Fluid Dispensers."

In packing and shipping of spray pump or pressurized aerosol dispensers, accidental discharge of the contents of the dispenser may occur from damage of the package, from the method of packing or the inclusion in the package of small lipsticks, vials, and the like at a location adjacent the cap button.

If a small article or a protuberant portion of the package exerts a pressure on the button there is a great likelihood of appreciable discharge of the spray substance taking place.

Another problem is that of unauthorized use, or of sampling, which uses a portion of the dispenser contents so that the consumer gets less than what he pays for.

An object of the present invention is to provide a novel and improved actuator cap construction for spray or aerosol dispensers and the like, which discourages sampling and unauthorized use and wherein the likelihood of accidental or inadvertent discharge of the contents of the dispenser is also greatly minimized if not wholly eliminated while at the same time the same freedom of action and ease of operation is had which characterizes the more conventional type actuators.

This is accomplished, in accordance with the invention, by the provision of a unique discardable cover tab means which is manually removable and which initially is spaced from and overlies the operating button and also the spout or discharge orifice of the actuator cap, such tab being so organized that it normally obstructs any force-applying instrumentability which might cause a discharge of the container contents and in some embodiments also effectively obstructs the finger of an unauthorized person if an effort is made to surreptitiously operate the spray device, the tab means also obstructing the spray discharge opening. By the use of thin frangible webs or portions connecting the cap body and tab means the desired safe-guarding function is had by which the above problems are eliminated while at the same time, after removal of the tab means the actuator cap constitutes a structure substantially similar to non-safety actuators, as regards appearance, function and operation.

The tab means may be incorporated in both a one-piece and two-piece cap construction as disclosed herein, thereby avoiding limitations as to its use; by virtue of its spacing from the button and orifice, close fits and tolerances are avoided, thereby reducing manufacturing cost, and this is an important feature of the invention.

A further object of the invention is to provide an improved tamper-proof actuator cap of the above type, wherein there is effectively prevented unauthorized discharge of the dispenser without discovery of such circumstance, thereby tending to insure that the customer will receive a completely full container, not one which is partially discharged.

Yet another object of this invention is to provide an improved tamper-proof safe-guarding enclosure-type actuator cap construction in accordance with the foregoing, which may be easily, economically fabricated as a molded structure of resilient or semi-rigid plastic substance.

Another feature of the invention resides in the provision of an improved actuator cap construction of the removable cover tab type as above characterized, wherein the tab overlies a major portion of a side recess of the cap body and still provides sufficient clearance space for partial insertion of the user's finger for the purpose of tearing out or removing the tab.

A further object of the invention is to provide an improved actuator cap for spray devices as set forth above, wherein the construction readily enables the actuator member or button of the cap to be either an integral part of the entire overall structure or else a separate part or piece which is applied to the stationary cap body part at a later time, that is, after the molding of the body.

Still another feature of the invention resides in the provision of an improved actuator cap construction as outlined, wherein there is presented to the user a relatively large tapered or semi-conical finger-receiving side recess in the cap body after the removal of the protective tab, and wherein the depress button is located in the said recess in an arrangement such that easy and convenient access is had to the button, enabling the latter to be readily operated.

Other features of the invention reside in the provision of an enclosed removable guard-type cap of the type specified, which is extremely simple, comprises relatively few parts, and which may be economically fabricated while at the same time providing a sturdy construction which is characterized by reliable and trouble-free operation.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, in which:

FIG. 1 is a fragmentary side elevational view of a pressurized aerosol dispenser having the improved removable-guard-piece type actuator cap.

FIG. 2 is a top plan view of the actuator cap of FIG. 1.

FIG. 3 is a front elevational view of the actuator cap.

FIG. 4 is a rear elevational view of the actuator cap.

FIG. 5 is an axial sectional view of the cap, taken on the line 3—3 of FIG. 2, an upper portion of the pressurized container being shown in elevation. The actuator cap construction shown here is of the two-piece type, having a stationary cap body and a movable depress button, the latter being fabricated as a separate piece and being applied to the cap body at a later time.

FIG. 6 is an axial vertical sectional view of a two-piece actuator cap construction constituting another embodiment of the invention, wherein the cover piece is curved upward.

FIG. 7 is a view partly in axial section and partly in side elevation of an aerosol dispenser and actuator cap constituting still another embodiment of the invention wherein the cap construction is constituted as a single molded piece.

FIG. 8 is a top plan view of the actuator cap of FIG. 7.

FIG. 9 is a bottom plan view of the actuator cap of FIGS. 7 and 8.

FIG. 10 is a top plan view of an improved actuator cap construction illustrating yet another embodiment of the invention, comprising a two-piece actuator cap with a circular cover piece.

FIG. 11 is a side elevational view of the actuator cap of FIG. 10.

FIG. 12 is a rear elevational view of the actuator cap of FIGS. 10 and 11.

FIG. 13 is a front elevational view of the actuator cap of FIGS. 10–12.

Referring first to FIGS. 1–5, there is illustrated a container 20 of a usual type, having a shouldered top closure 22 surrounded by a crimped shoulder 24 and further having an upstanding vertically movable plunger or valve stem 26.

The improved cap construction as provided by the invention in FIGS. 1–5 comprises a two-piece assemblage, an outer stationary cap body designated generally by the numeral 28, and a vertically movable inner depress button designated 30. The cap body 28 is of inverted cup-like construction, having a main cylindrical wall 32 provided at its bottom edge with an enlarged mounting rim 34 including an internal annular groove 36 receiving the shoulder 24 of the container 20. The arrangement is such that the cap body 28 is rigidly affixed to the upper portion of the container by the above designated structures.

At its upper forward portion, the cap body 28 has an inward and angularly extending wall 38 provided with a central opening or slot 40 behind which there is disposed the nozzle or orifice member 42 of the depress button 30. The button 30 may be of semi-cylindrical configuration, with a flat front wall 44 from which the orifice member 42 projects angularly, and a cylindrical remaining wall 46.

Depending from the button 30 is a hollow boss 48 in which there is frictionally received the upstanding plunger or valve stem 26 of the dispensing container. The button has a lug 31 received in a guide slot 33 of the cap body, to prevent it from turning.

The button 30 is thus vertically movable in the stationary cap body 28, and to facilitate the actuation of the button a relatively deep radial finger notch 50 is provided in its upper portion. The side wall 32 of the cap body is correspondingly cut away, having a curved edge 52 to form a deep notch 54 which is normally aligned with the finger notch 50.

In accordance with the present invention, a readily removable protective cover piece or tab 56 is provided on the cap body 28, said tab having a downwardly extending cover finger 57 and being adapted to overlie not only the depress button 30 in spaced relation to constitute a guard element for preventing inadvertent or unauthorized actuation of the button and discharge of the contents of the dispenser 20, but also to overlie in spaced relation the discharge orifice 42 to obstruct the same. The cover tab 56 is separated from the remainder of the cap body by long narrow slits 58 and 60, and is joined to the cap body by narrow frangible webs 62. The webs 62 are so narrow and thin that the user may readily break them by applying moderately strong pressure to the cover piece 56, while at the same time the webs will not readily break or fail during normal packing, shipping or storage procedures.

It will be observed that the cover piece 56 overlies but is spaced from a major portion of the finger groove 50 in the button 30, that the finger 57 overlies and is spaced from the orifice 42, and that there is enough space below the cover piece 56 to enable the fingers to readily grasp the free edge 64 of the piece with the full grip necessary to apply the desired disruptive or removing force. In the embodiment of FIGS. 1–5, the cover piece 56 is flat or planar at its top, thereby to not interfere with stacking of the aerosol devices, or with any compact arrangement for shipping, etc. Where the compact shipping arrangement or vertical stacking is not a consideration, the protective cover tab 56 may be curved or arched upward in an arrangement as seen in FIG. 6. This enables a better grip to be had upon the tab. In this figure similar numerals have been employed to designate like components, but with the added suffix comprising the letter "*a*."

Another embodiment of the invention comprising a wholly one-piece cap construction having a removable cover tab, is illustrated in FIGS. 7, 8 and 9. On a container 70 there is mounted a cap body 72 having a movable or depressible actuator portion 74 separated from the body by slot portions 75. The cap body has a pair of concentric, spaced depending skirts or walls 76 and 78, the wall 76 engaging a detent shoulder 80 of the container 70 as seen in FIG. 7. The depressible portion 74 of the actuator cap has a depending hollow boss 82 engaged with the vertically movable plunger or valve stem 84 of the container. A weakened hinge portion 86 connects the actuator portion 74 of the cap with the stationary body portion 72.

Overlying the actuator portion 74 is a tear-away cover tab 88 which is joined to the cap body portion by two oppositely disposed straight grooves 90, said tab having at its front a depending cover flange 89. The bottom walls of the grooves 90 are extremely thin whereby they may readily tear upon a removing force being applied to the cover tab 88.

The depressible portion 74 of the cap has a discharge orifice 92 which directs the aerosol substance through a front opening 94 in the cap body 72 when the tab 88 and flange 89 are removed. Below the cover tab 88 there exists a space 96 which is available to the fingers for the purpose of firmly grasping the tab to remove the same. The parallel grooves 90 as well as the space 96 permit the one-piece actuator cap to be molded by the use of suitable mold and coring techniques. As seen in FIG. 9, the slot portions 75 form a U, and separate most of the depressible portion 74 of the actuator from the stationary cap body.

Another embodiment of the invention, comprising a two-piece actuator construction, is illustarted in FIGS. 10–12. In these figures the stationary cap body is designated generally by the numeral 100, and the movable depress button by the numeral 102. The cap body 100 has an indented front wall portion 104 provided with a discharge opening 106 through which the aerosol substance may be sprayed after removal of a protective tab.

As seen in FIG. 11, the cap body 100 has an inner cylindrical wall 108 providing a guide and bearing for the depress button 102.

In accordance with the present invention, located above the bore formed by the cylindrical wall 108, there is provided a removable protective cover tab 110, separated from the remainder of the cap body at the front portion of the actuator cap by two narrow arcuate slots 112 each extending through an arc of slightly less than 90°, and by wider spaces 114 at the rear portion of the actuator cap, and also provided a front protective tab 111, obstructing the space 106 to prevent spray from issuing through the same. The protective cover tab 110 is connected to the cap body portion by three thin frangible webs 116; which join the piece to the cylindrical wall 108. The protective cover tab 110 overlies the entire actuator button 102, and is located inwardly of a theoretical upward extension of the bore wall 108.

A tamper-proof depending finger 118 is provided, secured to the rear edge of the tab 110 and extending downwardly into the space below the said tab, as indicated in FIG. 11. The finger 118 is arranged to prevent entrance of a human finger in the space above the depress button 102, thereby to minimize the likelihood of such button being actuated by an unauthorized person, to effect any discharge of the contents of the aerosol container.

The upstanding tab 111 is connected only at its base portion 113 to the cap body by a thin section, and may be readily torn away from the latter by merely bending it forward and down. Upon its removal the space 106 will be free to pass substance from the orifice 103.

When it is desired to use the aerosol device, the cover tab 110 is pulled upward, breaking the webs 116, and discarded, and the tab 111 is torn off.

It will now be understood from the foregoing that I have provided a novel and improved actuator cap construction for aerosol devices, comprising either a one-piece molding or a two-piece assemblage, wherein there is

a readily removable cover tab means preventing accidental or unauthorized operation of the actuator to effect a discharge of the contents of the aerosol container, and blocking the spray passage. The actuator cap construction is simple and economical to fabricate, reliable and foolproof in its operation, and provides an improved product and result in that accidental or unauthorized discharge or sampling of the aerosol substance is discouraged and substantially minimized, in many cases being wholly averted.

In each of the embodiments of the invention the protective tab is spaced from the depress button and its orifice, eliminating the necessity for close fits and tolerances, eliminating the likelihood of malfunctioning and reducing fabrication costs.

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 dispenser comprising, in combination:

(a) a depress button having a finger-engageable top surface, said button having a discharge orifice and being adapted for connection to the valve of the dispenser to actuate the same and effect a discharge of the dispenser contents,

(b) a stationary cap body surrounding the depress button and arranged to provide access to the finger-engageable surface of the button, and

(c) manually removable means adapted to be discarded, comprising a cover tab fixedly carried by the cap body and overlying and spaced from the discharge orifice of the button to prevent free flow from the orifice, said means including frangible webs which join the cover tab and cap body together and which may be readily broken to release the cover tab upon applying a removing force thereto.

2. An actuator cap as in claim **1**, wherein:

(a) the cover tab also overlies the finger-engageable surface of the button.

3. An actuator cap as in claim **1**, wherein:

(a) the button, cap body, cover tab and webs are molded as a single integral piece, of plastic substance.

4. An actuator cap as in claim **1**, wherein:

(a) the cap body, cover tab and webs are molded as a single integral piece of plastic substance, and

(b) the depress button is molded as a separate piece, of plastic substance.

5. An actuator cap as in claim **2**, wherein:

(a) the cap body has a top recess in which the finger-engageable surface of the button is disposed,

(b) said removable cover tab spanning at least a portion of said recess and having a depending guard finger at one edge, extending into the recess and providing a finger grip.

6. An actuator cap as in claim **5**, wherein:

(a) the top recess of the cap body is defined by a rounded wall thereof,

(b) said button being circular and having a marginal portion which is coextensive with a rounded wall of the cap body,

(c) said cover tab having a circular configuration commensurate in size with the button.

7. An actuator cap as in claim **5**, wherein:

(a) the distance between the depending guard finger and the adjoining portions of the cap body is too small to admit a human finger, thereby to prevent unauthorized operation of the button without breaking the cover tab away from the body.

8. An actuator cap as in claim **7**, wherein:

(a) the cap body, cover tab and depending finger are molded as a single piece,

(b) said body having a central bore the walls of which constitute a bearing for the depress button,

(c) said cover tab being aligned with the bore of the body, and

(d) said frangible webs being connected to the said walls of the bore, and said finger being disposed inwardly of a theoretical upward extension of the bore walls.

9. An actuator cap as in claim **2**, wherein:

(a) the cap body has a top recess in which the finger-engageable surface of the button is disposed,

(b) said removable cover tab spanning at least a portion of said recess and being curved upward to provide increased space in the recess for enabling the tab to be readily grasped when it is to be broken off.

References Cited by the Examiner

UNITED STATES PATENTS

2,982,448	5/1961	Leonard et al.	222—182 X
3,137,414	6/1964	Steinkamp	222—182
3,162,329	12/1964	Gregory	222—182

LOUIS J. DEMBO, *Primary Examiner.*

C. R. CARTER, *Assistant Examiner.*