

[54] **ACTUATOR CAP WITH ACTUATION
DISABLING MEANS**

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[22] Filed: **Nov. 9, 1970**

[21] Appl. No.: **87,916**

[52] U.S. Cl. **222/153, 222/402.13**

[51] Int. Cl. **B65d 83/14, B67d 5/32**

[58] Field of Search **222/153, 402.11,
222/402.13, 182, 402.15**

[56] **References Cited**

UNITED STATES PATENTS

3,158,292	11/1964	O'Donnell.....	222/153
3,272,390	9/1966	Horwitt.....	222/153
3,184,115	5/1965	Meshberg	222/182 X
3,195,783	7/1965	Crowell.....	222/402.13
3,231,142	1/1966	McGhie et al.....	222/182 X

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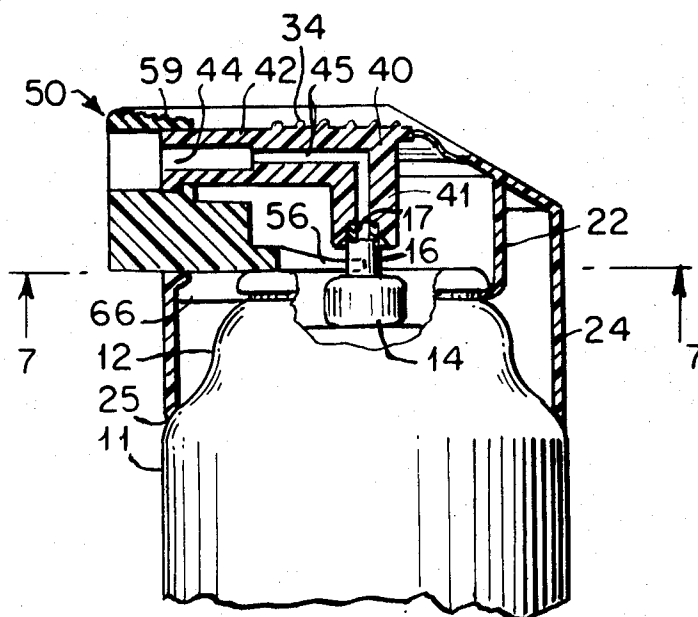
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[57] **ABSTRACT**

An actuator cap for use with conventional pressurized containers having a slidable locking member which prevents accidental discharge of the container contents. The slidable locking member has a flat base having one end bifurcated. The locking member is mounted to the actuator cap so that when moved to lock position its bifurcated end wedges between the actuator and the container preventing movement of the actuator so that the container valve is not opened to discharge contents. The slidable locking member may also be provided with a sleeve-like segment attached to the base. This sleeve-like segment telescopically fits over a horizontal spout provided for the actuator cap. This modified slidable locking member has the dual function of actuator lock and spout extender.

4 Claims, 9 Drawing Figures



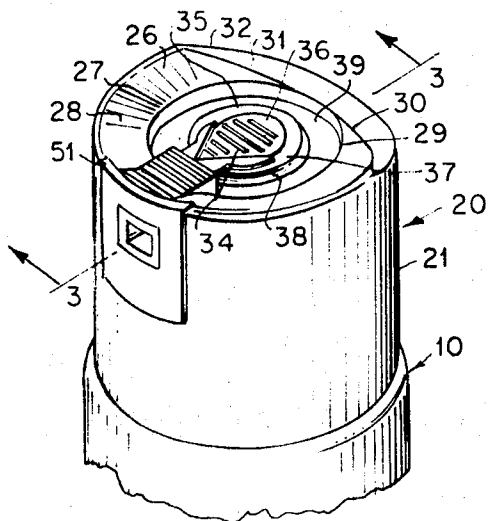


FIG. 1

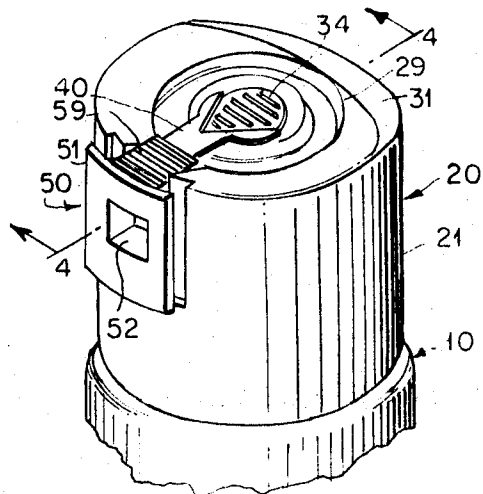


FIG. 2

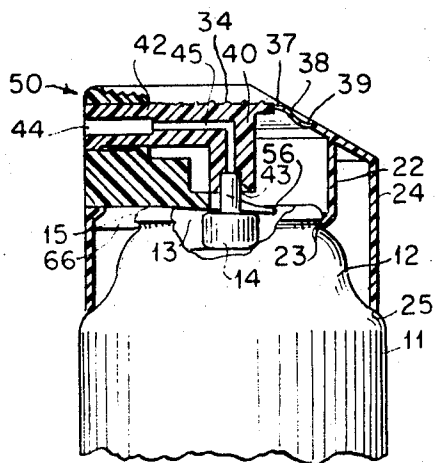


FIG. 3

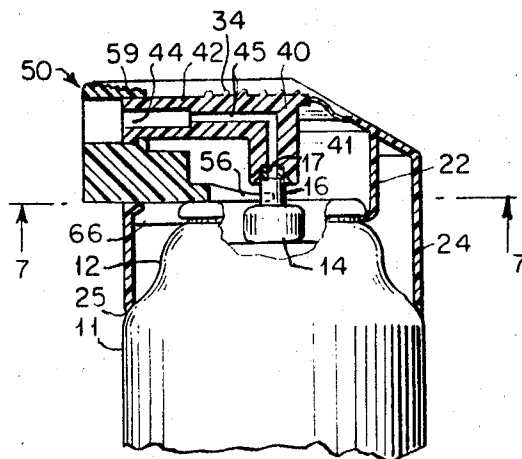


FIG. 4

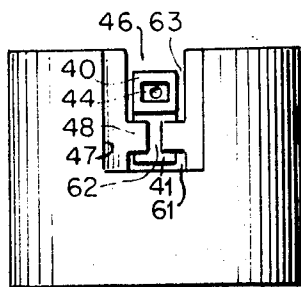


FIG. 5

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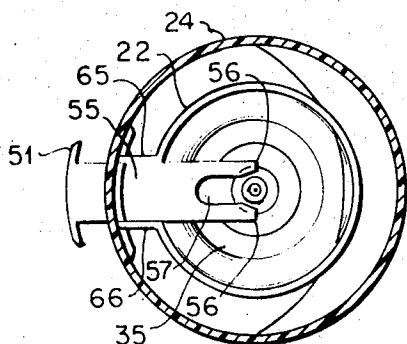


FIG. 7

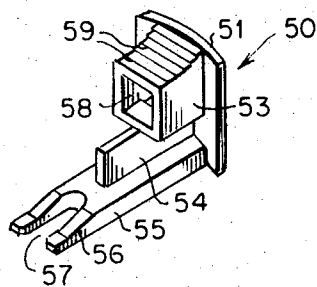


FIG. 6

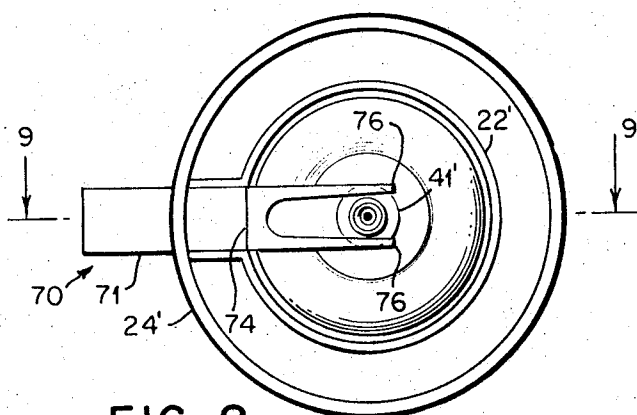


FIG. 8

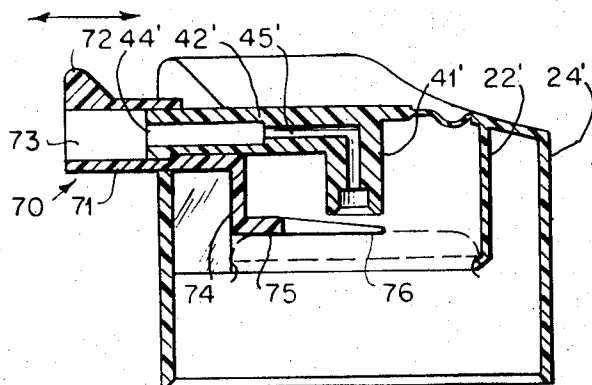


FIG. 9

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ACTUATOR CAP WITH ACTUATION DISABLING MEANS

BACKGROUND OF THE INVENTION

This invention relates to an actuator cap and actuator lock assembly for aerosol dispensers. It relates, more particularly, to an actuator locking means which also functions as a spout extension for the actuator cap.

The usual aerosol dispenser for household, cosmetic, detergent, medicinal, sanitary, industrial, agricultural and like uses, comprises a container for the mixture to be dispensed having a centrally ascending, spring biased, hollow, discharge valve control element which when depressed releases product out of the container and into a discharge tube. Because aerosol containers are under pressure and the dispensing valve can be opened with correctly directed actuating force, it has been a problem to prevent unintentional actuation of the valve and the resulting accidental loss of pressurized product. In addition to the problem of accidental actuation of the valve, the use of pressurized containers has caused other difficulties associated with the operation of the valve atop the container-dispenser. In most containers the valve actuators project beyond the height of the container thereby hindering stacking of same. The inability to stack the containers is detrimental to displaying them in retail stores and also for shipping in cartons. Both of these problems, i.e., accidental actuation and loss of stacking capability are now eliminated by the instant invention.

The present invention concerns an actuator cap having a novel slidable locking means for the actuator thereby preventing the discharge of the container contents. In addition the construction of the actuator cap provides for stacking and displaying of the aerosol containers which make use of the present invention.

The actuator cap and lock assembly of the present invention are attachable to pressurized containers of the type having an upwardly spring biased, movably mounted hollow valve stem which when depressed toward the container will permit discharge of the container contents through the stem. The assembly comprises a hollow body having an opened bottom which is adapted for enclosing the top of a container, and a deformable center portion or diaphragm; an actuator component (valve operating member) integrally connected to the hollow body at the deformable area and an actuator locking means which is slidably mounted in the hollow body for wedging between the actuator and the container.

The actuator component comprises a walled conduit integrally connected to the deformable diaphragm. The walled conduit being L-shaped having a passageway or conduit, an inlet at the end of the vertical branch of the conduit which is in cooperative communication with the valve stem of the container and an outlet at the end of horizontal branch of the conduit through which the contents finally pass after discharge.

The preferred actuator locking means comprises a sleeve-type four sided structure having a base member connected to the under surface of the sleeved structure. The base member has a forked end so that when the locking means is in the locking position the valve stem is situated between the forked ends. The sleeve structure fits telescopically around the horizontal portion of the walled conduit. The locking means is manually shifted along said walled conduit, and can be posi-

tioned to physically obstruct the operation of the actuator component. When in this wedged position, forces applied to the actuator in the direction of the valve stem are blocked preventing the accidental discharge of the container contents. This telescopic fitment enables the sleeve-like structure of the locking means, when the locking means is in unlocked position, to function as an extension to the walled conduit, facilitating the discharge of the contents into the palm of the user.

BRIEF DESCRIPTION OF THE INVENTION

More important features of the present invention have been broadly stated in order that the detailed description thereof that follows may be better understood and that the present contribution to the art be better appreciated. There are, of course, usual features of the invention that will be described hereinafter and other structural features and advantages will become apparent from the reference to the following detailed description of the invention and the accompanying drawings which form a part of the specification herein where:

FIG. 1 is a perspective view of the external structure of the actuator cap assembly of the present invention according to a preferred embodiment and installed on a conventional type pressurized dispensing container.

FIG. 2 is a perspective view of the actuator cap assembly with the sliding lock member in a partially unlocked position.

FIGS. 3 and 4 are vertical sectional views of the actuator cap assembly taken along line 3—3 of FIG. 1 and line 4—4 of FIG. 2 respectively and illustrates the sliding lock means in locked and unlocked positions.

FIG. 5 is a vertical side view of the cap assembly of FIG. 1 with the sliding lock means removed.

FIG. 6 is a perspective view of the sliding lock means of the actuator cap assembly of FIGS. 1 through 4.

FIG. 7 is a bottom plan view of the actuator cap assembly of FIG. 2.

FIG. 8 is a bottom plan view of an actuator cap assembly with an alternate embodiment of the sliding lock means.

FIG. 9 is a vertical sectional view of the actuator cap assembly of FIG. 8 taken along line 9—9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings wherein similar reference characters are used to designate identical parts, the actuator cap assembly 20 is mounted on a standard type pressurized dispenser container 10.

The container 10 comprises a rigid can body 11 having a dome shaped top member 12 which is either secured to the can body or is contiguous with it and supports a valve assembly. The valve assembly comprises a discharge valve housing (not shown), a valve cup 13 having a valve stem housing 14, a discharge valve stem 16 having the discharge passage 17 said valve stem partially situated within stem housing 14 and a rim 15 crimped or adapted to be crimped to a bead surrounding an opening in the dome top member 12 of the container 10. The lower end of the can body 11 is closed by a bottom cover (not shown) secured to the can body. The container formed is rigid enclosure adapted to contain a mixture of liquids and vapor under considerable internal pressure.

The valve stem 16 (FIG. 3) is spring biased upwardly from the center of domed upper member 12 so that it is reciprocable axially of body 11. This valve control member 16 is of known construction and the manner of mounting it within the container is also known. A small downward depression of the element 16 toward the interior of the container, in FIG. 3, will result in opening a valve (not shown) inside the container to permit discharge of the container contents through passage 17. Any valve control element and valve mechanism may be used with the actuator cap assembly of the present invention.

It is to be understood that although the pressurized dispensing device shown in FIGS. 1-4 utilizes a container having a discharge valve of the type utilizing a vertical reciprocating valve stem, it will be readily apparent to those skilled in the art that this container and cap construction can be easily modified to actuate valves utilizing "tilting" valve stems. The actuation of a "tilting" valve would take place in a similar manner by the movement of the tilt valve through a small angle in the vertical plane. Valve control elements and valve mechanisms are well known and the invention is not to be construed as limited to any particular valve control element and/or valve mechanism.

Those skilled in the art will recognize that other and different forms of containers may be employed with the present invention. The container and the valve assembly may be constructed of any suitable material such as metal, glass, plastic or the like. Preferably, at least the upper end of valve control element 16 is a nylon or nylon-like hollow cylindrical tube.

The cap assembly 20 comprises an actuator cap 21, which may be an integrally molded assembly of polyethylene or a similar relatively stiff but resilient plastic, and slidable actuator locking means 50 made of similar material.

As shown in FIG. 3, the cap 21 has a pair of annular and concentric spaced outer and inner walls in the form of depending skirts 22, 24 extending from the top portion 26 of the cap 21. They are adapted to provide a snap-on cap for the container 10. The inner wall 22 is provided with an inwardly annular anchor lip 23 at its lower end so as to engage with the crimped rim 15 of the valve or mounted cup 13 in a stiff fit for the purpose of frictionally holding the cap assembly 20 on the container 10. The outer annular wall 24 of the cap 21 rests on the beveled edge of top member 12. The inner portion of the lower edge 25 of outer wall 24 is shaped to accommodate and conform to the beveled edge of the top member 12.

Top portion 26 of the cap 21 comprises a number of integral elements. Inclined downwardly from peripheral edge 27 is bowl-like concavely oblique wall 28 which bridges the depending skirts 22 and 24 and terminates centrally at the circular boundary line 29 which is the top of skirt of inner wall 22. Concavely oblique wall 28 terminates transversely at arcuate boundary line 30 which is almost tangent to the circular boundary line 29. Inclining downwardly and from arcuate boundary line 30 and away from the center of the cap is flat, oblique crescent shaped wall 31 which terminates at the peripheral edge 32. Bowl-like wall 28 is interrupted to accommodate slidable locking member 50 and spout of the actuator. Connected to the circular boundary line 29 is concentric annular fold 39 made of thin easily deformable material which is part of dia-

phragm 35 situated in the center of the actuator cap assembly.

Diaphragm 35 of the actuator component comprises said annular fold 39, thickened central portion 36 which is centrally disposed and connected to substantially thinner plateau 37, wall 38 depending from this plateau which forms a part of fold 39, and integrally connected to the center of diaphragm 35 is L-shape walled conduit 40 (FIGS. 2 and 3).

A cross-section of the actuator component comprising diaphragm 35 and L-shape walled conduit 40 is shown in FIGS. 3 and 4. The L-shape walled conduit is integral with the diaphragm and has vertical branch 41 and a horizontal branch 42. The conduit has at its vertical branch end inlet or socket 43 for receiving the projecting valve stem 16 and at its horizontal branch end discharge outlet 44. When the diaphragm is depressed by applying pressure at central portion 36 the valve stem is axially moved downward allowing the passage of the container contents into conduit passageway 45 and out the discharge end 44. The ribs 34 prevent the finger from slipping when the diaphragm is depressed. Referring to FIG. 5, concavely oblique wall 28 and outer wall 24 are interrupted, providing space 46. Segment 47 of outer wall or depending skirt 24 is slightly recessed and has projections 48 which act as guides to slidable locking member 50 (FIG. 6) when it is assembled with actuator cap. Located centrally in the space 46 is a portion of horizontal branch 42 of conduit 40. Its discharge end 44 is shown in FIG. 5.

The preferred embodiment of the slidable locking member 50 is illustrated in FIG. 6. The locking means 50 comprises a base member or strip 55 having one end bifurcated 56 and each forked end being inclined. At the other end of the strip is shield-like structure 51 which is integrally connected to the end of strip 55. This shield-like structure has window-like opening 52 (shown in FIG. 2). Integral with the shield-like structure is sleeve 53. Passageway 58 is contiguous with opening 52 and forms an extension for tubular spout or horizontal branch 42 of conduit 40. Support wall 54 adjoins sleeve 53, and flat strip 55 and provides rigidity to the overall locking member structure. Also shown are stepped ridges 59 which provide a friction surface so that the slidable locking member is finger-movable out of locking position without finger slippage. The slidable locking member is positioned within the path of movement of the conduit's vertical branch 44 when the diaphragm 35 is depressed. When the locking means is in this position, the valve stem 16 is situated in space 57 created by forked ends 56. Positioning the locking means in such a manner effectively blocks the actuator element, constituting an abutment therefor, whereby all downward movement of the diaphragm is prevented. When this movement is arrested, the valve stem does not open when a force is applied and there is no loss of the container contents.

By sliding the locking member gradually outward from the center, for a small distance, a variation in the degree of depression of the valve stem can be accomplished. In a partially locked position, on depression of the diaphragm, the socket end 44 of the actuator will come to rest midway up the inclined forked ends 56 and allow only certain amount of material to flow from the container within a period of time thereby controlling the rate of flow of the contents from the dispenser.

Based on the detailed description of the locking means 50 and the structure illustrated in FIG. 5, it is readily understood how the locking means is fitted in the cap assembly. Reference is made to the spaces formed by the interruption of walls 24 and 28. The base member 55 passes through space 61, support wall 54, passes through space 62, and sleeve 59 passes through space 63 and thereby encompassing horizontal branch 42. When the locking means is in the locked position, shield 51 is situated in the recess in wall 24 and abuts recessed wall 47. When in this position, the shield 51 becomes part of annular wall 24 of cap 21 as shown in FIG. 1. The recess area 47 is best shown in FIG. 2.

FIG. 4 depicts the locking means in the non-locked position. The sleeve 59 extends beyond the outer wall 24 and is in telescopic engagement with conduit branch 42. The telescoping of these elements provides an extension to the discharge passageway 45 of the actuator-conduit 40 and enables one to place their palm under the sleeve extension to receive the discharged contents. FIG. 4 also shows that when the locking means is in the unlocked position, it does not prevent the downward movement of the actuator. Therefore the actuator may be depressed and socket 43 engages valve stem 16 and the valve stem is displaced resulting in discharge of the container contents.

The fitment of the slidable locking member in the actuator cap is further illustrated by the bottom plan view shown in FIG. 7 of the cap actuator. The locking means slides in the channel formed by the walls 65 and 66 which bridge the inner concentric wall 22 and outer concentric wall 24. The walls 65 and 66 are integral with the inner concentric wall and the combination gives an overall keyhole-like appearance. FIG. 7 also illustrates the underside of the cap structure in particular the deformable diaphragm 35 and the depending skirts 22 and 24.

An alternate embodiment 70 of the slidable locking member is illustrated in FIGS. 8 and 9. The actuator cap shown is constructed similar to cap 21 as indicated by the primed reference characters. FIG. 8 shows the bottom view of an actuator cap with the alternate embodiment 70. FIG. 9 is a sectional view of the same actuator cap assembly of FIG. 8 taken along line 9-9. Referring to FIG. 9, the bifurcated base member 75 is connected to sleeve-like spout extender 71 by means of a transverse vertical support 74. The bifurcated ends 76 are longer and further spaced apart than ends 56 and their taper is not as pronounced as that of ends 56. The spout extender 71 telescopically fits about horizontal conduit 42' and provides a discharge extension for this conduit and discharged contents pass through orifice 73 of the extension. Integral with the top surface of the spout extender 71 is tab 72 which facilitates moving slidable locking means 70 from locked to unlocked positions as indicated by the double headed arrow. FIGS. 8 and 9 show embodiment 70 in the open (unlocked) position. In this position it acts as an extension to the discharge spout or conduit 42'. In closed position the member 70 is moved toward the valve stem and abuts the actuator at its vertical branch end 43' and prevents actuating movement since the forked ends 76 are farther apart than ends 56, the forked ends extend further pass the valve stem or cap center than ends 56.

Although the drawings show the preferred embodiment of the invention, i.e., slidable spout extension and

actuator lock combined in one structure, it is understood that the invention also relates to a novel, slidable actuator locking means without the spout extension. The invention also relates to a locking means composed of elements shown in FIG. 6, namely flat strip 55 with bifurcated ends 56 without the sleeve structure 52 movably mounted so that it can be slidably wedged between the actuator element (vertical branch 41) and the valve housing 14. When the locking means is in this position it prevents actuation of the valve as previously described with regard to the slidable locking members 50 and 70 except that it would not have a spout extension to facilitate dispensing of contents to the user. This locking means, like locking means 50 and 70, is operable both with vertical and tilt valves. FIG. 7 which is a bottom plan view of the actuator cap assembly is also illustrative of the locking means having just a slidable bifurcated strip. This strip as previously stated can be movably mounted within the hollow body e.g. situated in a narrow opening in annular wall 24 and depending skirt 22 which would provide support and a slideway for the strip.

This invention provides a finger operable actuator cap assembly which has unique locking features. The cap assembly can be unlocked and the valve actuated in a continuous movement. No twisting of cap is involved but just simple, lateral push or pull movement and then actuation. The slanted, crescent-shaped wall of the cap readily accommodates one finger action for pushing the locking member into use position and depressing the diaphragm. The assembly is easily locked again by pushing locking member inward to lock position. Also contemplated by this invention is the novel feature of locking means and spout extension in one simple, molded structure.

This invention also provides an actuator cap for aerosol containers which facilitates the stacking of these containers by providing a substantially flat stacking surface. Also since the actuator and cap are part of the same unit there is no need to remove the cap to discharge the contents. This eliminates inconvenience of removing cap and also guards against misplacement of the cap.

Although the invention has been described and illustrated by reference to certain specific embodiments of the invention representing the modes presently contemplated for carrying out the invention, those skilled in the art will appreciate that modifications and variations in structure and materials of construction may be made without departing from the principles and true scope of the invention as defined in the claims hereof.

What is claimed is:

1. An actuator-cap for fitment atop an aerosol container having a discharge valve and a valve stem at one end thereof, comprising a cylindrical hollow body with a top and having an open bottom; means for actuating said valve positioned within and integral with said hollow body; means for controlling said actuating means; and means for supporting and providing a slideway for said controlling means positioned in and integral with said hollow body; said controlling means has inclined forked ends which control the rate of discharge and in locked position the controlling means is wedged between said actuator and said aerosol container preventing movement of said valve actuator.

2. An actuator-cap for fitment atop an aerosol container having a discharge valve and a valve stem at one

end thereof, comprising a cylindrical hollow body with a top and having an open bottom; means for actuating said valve positioned within and integral with said hollow body; said actuating means being an L-shaped walled conduit having a vertical branch which receives the valve stem of said valve and a horizontal branch through which the contents of the container finally pass; means for locking said actuating means; said locking means being slidable and comprising a sleeve-type four-sided structure having open ends, a base member, and means for connecting said sleeved structure to said base member, said sleeved structure telescopically fitting around the horizontal branch of said walled conduit, and said base member having a forked end so that when said locking means is moved into locked position, the valve stem of said valve is situated between the bifurcations and at the same time the bifurcations are wedged between said actuator means and said container; and means for supporting and providing a slide-

way for said locking means positioned in an integral with said hollow body; said locking means is slidable so that in locked position it is wedged between said actuator and said aerosol container preventing movement of said valve actuator and wherein a portion of the top of said hollow body is depressible, and said actuating means is integrally connected to said depressible portion.

3. The actuator cap of claim 2 wherein a shield-like structure having a window-like opening is connected to and overlaps one end of said base member and sleeve structure and the window-like opening is contiguous with an open end of the sleeve structure.

4. The actuator cap of claim 2 wherein said base member is connected to said sleeve structure by means of a vertical support and a tab is attached to the top of said sleeve structure to facilitate movement of said locking means.

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