

[54] **ACTUATOR MEANS FOR USE WITH AEROSOL DISPENSERS**

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

[51] Int. Cl. **B65d 83/14**

[58] Field of Search **222/153, 182, 402.15, 222/402.13, 402.11, 402.24, 402.25, 402.17**

[56] **References Cited**

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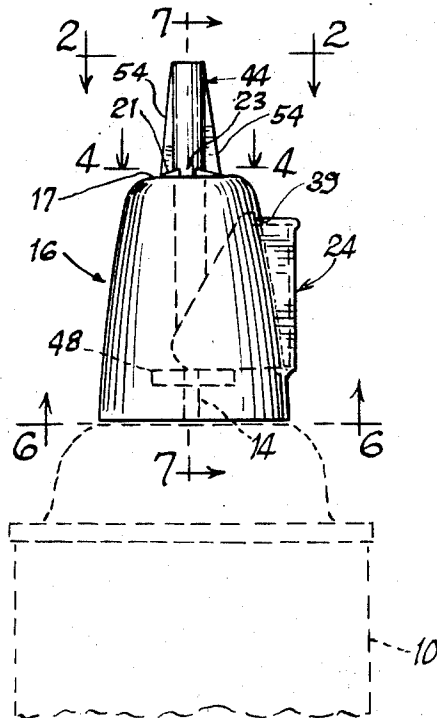
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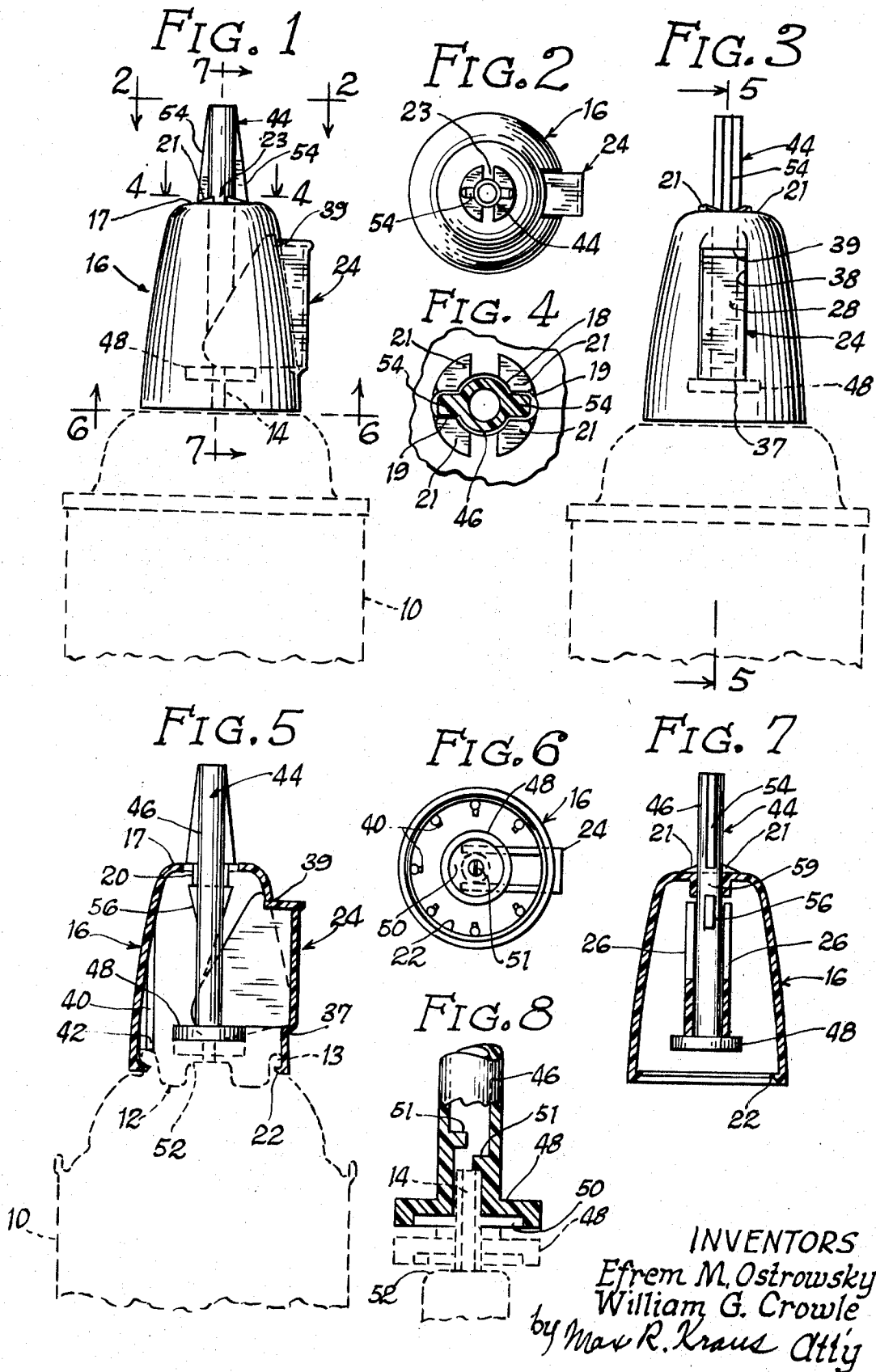
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[57] **ABSTRACT**

Actuator means adapted for securement to an aerosol container including a cap and a dispensing nozzle, with said cap having a lever integrally formed with said cap and so positioned relative to said cap that pivoting of said lever will cause it to operate the dispensing nozzle which is operatively connected to the valve stem of the aerosol unit to permit the contents of the aerosol container to be discharged therefrom, said nozzle having means cooperating with the cap to lock the nozzle against any movement relative to said cap to prevent the accidental movement of the valve stem and thereby prevent the accidental discharge of the aerosol contents.

9 Claims, 13 Drawing Figures





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FIG. 9

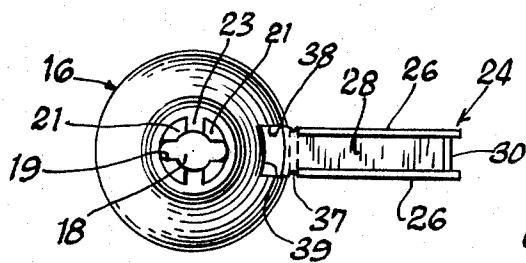


FIG. 12

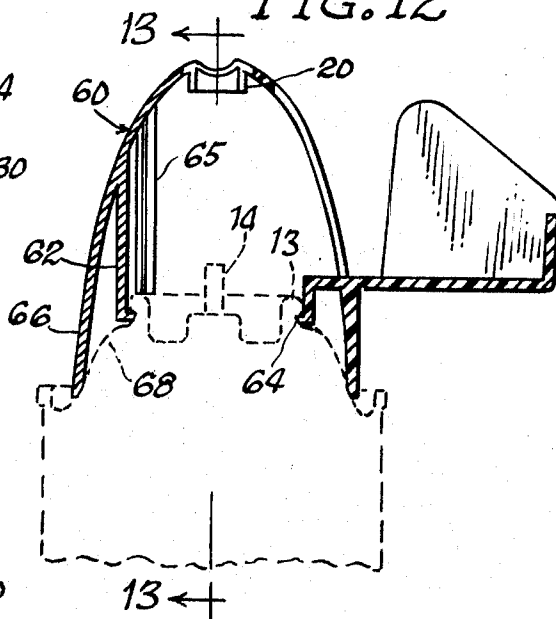


FIG. 10

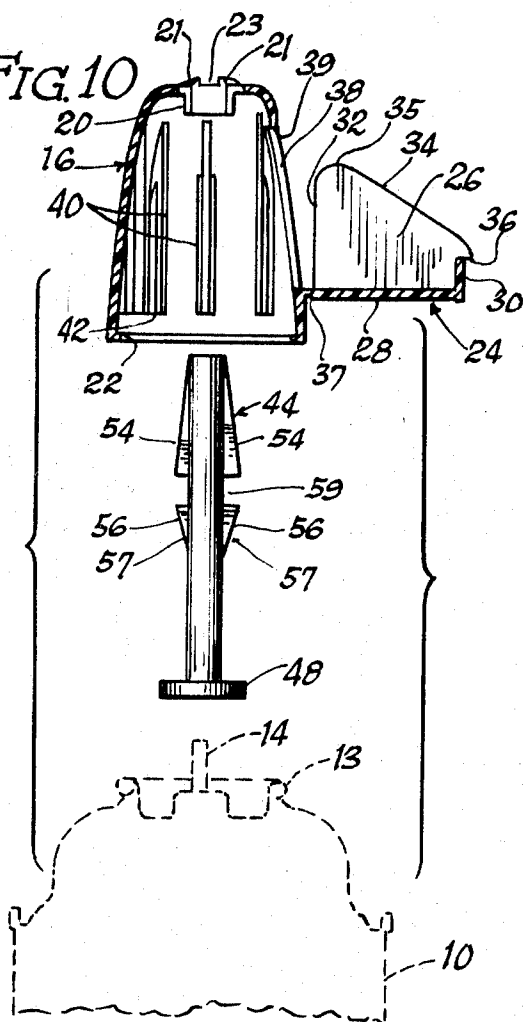


FIG. 13

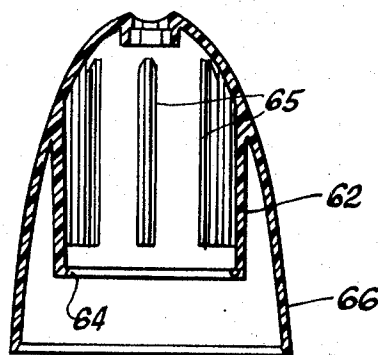
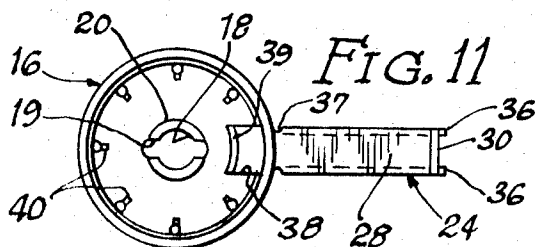


FIG. 11



ACTUATOR MEANS FOR USE WITH AEROSOL DISPENSERS

BRIEF SUMMARY OF THE INVENTION

The invention relates to a cap which may be used in connection with aerosol dispensers and is so constructed that the cap, including the actuating member in the form of a lever, is integrally molded from plastic material and the lever is then positioned relative to said cap for operating same so that a portion thereof extends into the cap and a portion extends exteriorly of the cap for manual engagement and in which the cap in association with the dispensing nozzle used therewith has means for positively locking said nozzle against relative movement with respect to said cap even though the lever is actuated, and this thereby prevents any discharge of the contents of the aerosol container through the valve stem during shipment and prevents the accidental operation of the nozzle.

Another object of this invention is to provide a device of the foregoing character which may be economically produced in that it may be integrally molded in a most economical manner and may be readily applied and used in connection with aerosol dispensers.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side elevational view of one embodiment of the invention applied to an aerosol container.

FIG. 2 is a top plan view taken on line 2—2 of FIG. 1.

FIG. 3 is an elevational view taken from the lever side.

FIG. 4 is a view taken on line 4—4 of FIG. 1 and showing the dispensing nozzle in an unlocked and in a movable position relative to the cap.

FIG. 5 is a central sectional view taken on line 5—5 of FIG. 3.

FIG. 6 is a view taken on line 6—6 of FIG. 1.

FIG. 7 is a sectional view taken on line 7—7 of FIG. 1.

FIG. 8 is an enlarged sectional view of the lower portion of the dispensing nozzle applied to the valve stem of the aerosol unit.

FIG. 9 is a top plan view of the cap with the lever extended laterally in the manner in which it is ejected from the injection molding machine.

FIG. 10 is an exploded view of the cap and dispensing nozzle with the cap in section and in the position shown in FIG. 9.

FIG. 11 is a bottom plan view of the cap.

FIG. 12 is a sectional view of a modified cap, and

FIG. 13 is a sectional view of the cap taken on line 13—13 of FIG. 12.

This invention is adapted for use in connection with aerosol containers having a depressible valve stem and is applicable to the type of aerosol containers having a two-way valve in which two liquids or materials are separately contained within the container and are simultaneously discharged through the depressible valve stem when actuated as, for example, in hair coloring sprays where there is contained within one compartment of the container a coloring material and in another compartment of the container a chemical, and when the valve stem is depressed both are forced out simultaneously from the aerosol container through the same valve stem and are intermixed as they are discharged.

This invention is likewise applicable to the conventional aerosol container in which a single ingredient is discharged from the valve stem. The aerosol operated container and the depressible valve stem therefore form no part of this invention.

The conventional aerosol container, indicated by the numeral 10 is provided with a closure or mounting cup 12 which is peripherally clinched to the container in the conventional manner to provide an annular bead 13. The closure or mounting cup 12 has a central opening through which extends the conventional depressible valve stem 14 which is spring biased and which is normally maintained in its elevated or raised position to close the discharge outlet through the valve stem. When the valve stem 14 is depressed the aerosol material in the container is discharged through said valve stem. The foregoing is conventional.

One embodiment of the actuator cap forming this invention is shown in FIGS. 1 through 10 inclusive, and is generally designated by the numeral 16. It is preferably injection molded of plastic material. The top 17 of the cap has a central opening 18 which communicates with a pair of opposed diametrically positioned slots 19. The opening 18 and adjoining slots 19 are bounded by a wall or sleeve 20 which extends into the interior of the cap a short distance below the top thereof. The top 17 of the cap is provided with two pairs of spaced upwardly extending projections or ramps 21 defining a detent 23 between each pair of ramps. The detents 23 are diametrically positioned and are at right angles to the slots 19. The ramps and detents serve as stops for maintaining the nozzle in its locked or immovable position relative to the cap, as will be more fully described hereafter. The interior of the cap is hollow and the lower end of the cap has an inwardly extending annular lip or flange 22 which, as best shown in FIG. 5, is adapted to engage in the annular bead 13 on the container for the purpose of non-detachably securing the cap to said container.

A lever generally designated by the numeral 24 is integrally molded and formed with the cap and when it is formed and withdrawn or ejected from the molding machine the lever is positioned in the manner shown in FIG. 10, in which the lever is at right angles to the vertical axis of the cap. The lever 24 is provided with a pair of spaced side walls 26 connected by a rear connecting wall 28 and by a connecting top wall 30. The spaced side walls 26 of the lever are shaped as best shown in FIG. 10, having a straight or planar inner or bottom edge 32 which then continues to slope upwardly and rearwardly to form an inclined front edge 34 which is rounded adjacent to the bottom as at 35. There is an undercut at the top to provide a shoulder or lip 36 at the upper end of the lever. The bottom of the connecting wall 28 is connected along a hinge line 37 to the cap. The side of the cap adjacent the lever 24 is provided with a generally rectangular-shaped opening designated by the numeral 38 which extends from adjacent the bottom hinge line 37 to that indicated by the numeral 39 which is below the top of the cap.

While the cap is molded in the manner shown in FIG. 10, it is adapted when in use to have the lever 24 positioned as best shown in FIGS. 1 and 5, that is, the lever is moved from the FIG. 10 horizontal position to the vertical position shown in FIGS. 1 and 5, in which the spaced side walls 26 of the lever are positioned to extend into the interior of the cap, with the top lip or

shoulder 36 of the lever adapted to engage the upper edge 39 of the cap adjacent the opening 38 to normally prevent the lever from pivoting or hinging outwardly of the cap. Once the lever 24 is positioned in this normal vertical operating position (FIGS. 1 and 5), the shoulders 36 will prevent the lever from moving outwardly of the cap and the lever will then be maintained in its vertical position for operation. However, in the first instance when it comes from the mold in the position shown in FIG. 10, the lever is moved from its horizontal to its vertical position into the interior of the cap and the plastic material is sufficiently resilient to permit this inward movement of the lever.

The interior of the cap is provided with a plurality of spaced vertically extending reinforcing ribs designated by the numeral 40, the lower ends 42 of which terminate above the bottom of the cap to rest on the top of the bead 13 to properly seat the cap on the top of the can.

A dispensing nozzle, generally designated by the numeral 44 cooperates with the cap and the lever thereof for dispensing the aerosol material that passes from the valve stem 14. The nozzle has a tubular stem portion 46 and an annular disk 48 at the lower end thereof which disk has an annular recess 50. Instead of the disk 48 being annular it may have one or more flat portions (not shown) for assembly purposes. The interior of the stem, particularly adjacent the lower end thereof, is provided with oppositely positioned and inwardly extending spaced horizontally staggered projections 51, best shown in FIG. 8, which provides a tortuous passageway for the aerosol material passing through the dispensing nozzle to more thoroughly intermix the discharged aerosol material before it is discharged. The lower end of the nozzle is positioned on the valve stem 14 with the top of the valve stem abutting one of the inwardly extending projections 51 which serves to limit the insertion of the nozzle on the valve stem. As best seen in dotted lines in FIG. 8, the bottom of the annular disk 48, including the recessed portion 50 thereof is adapted when the nozzle 44 is depressed to be spaced above and not in contact with the top 52 of the central portion of the mounting cup 12. The limit or extent to which the valve stem 14 may be depressed is determined by the structure of the valve stem and the operating spring therein which is known in the art.

As best seen in FIG. 10, the dispensing nozzle is provided with a pair of diametrically positioned upper ribs 54 which are inclined or slope outwardly as at 55 from the top towards the bottom. Positioned below but in spaced relation to said upper ribs is a pair of diametrically positioned lower ribs 56 which are inclined inwardly as at 57 from the top towards the bottom thereof. The lower ribs 56 are vertically aligned with the upper ribs 54. The portion of the dispensing nozzle between the upper and lower ribs is indicated by the numeral 59 and in the non-actuating position of the nozzle this portion is positioned within the sleeve 20. When the dispensing nozzle 44 is positioned on the valve stem 14 it will be frictionally held on said valve stem but may be rotated relative to said valve stem. As shown in FIGS. 1, 4 and 7, the spaced side walls 26 of the lever 24 are positioned on the opposite sides of the dispensing nozzle 44 with the nozzle therebetween and with the bottom edges 32 of the side walls 26 resting on the disk 48 of the dispensing nozzle.

The spring, not shown, within the valve assembly of the conventional valve stem 14 will normally maintain the valve stem in its upper position to close the valve stem and prevent any of the material within the container from passing through the stem. With the lever 24 in the position shown in FIGS. 1 and 5, the valve stem will remain in closed position. However, when it is desired to release some of the material from the container the dispensing nozzle 44 must be rotated, if same is not already in such position, so that the aligned ribs 54 and 56 on the nozzle are in registry with the communicating slots 19 of the cap. The entire unit is then inverted, with the nozzle pointing towards the hair or other surface to be treated and the lever 24 is manually engaged and pressed inwardly at right angles to the axis of the container, as shown in dotted lines in FIG. 5, causing the side walls 26 of the lever to press against the disk 48 and in turn push the valve stem 14 downwardly or inwardly, parallel to the axis of the container, to open the valve stem and permit the material in the container to pass outwardly through the nozzle. As long as the lever 24 is manually pushed inwardly the valve stem 14 will be pushed downwardly or inwardly to continue the flow of material, however, when the lever is manually released the spring means operating the valve stem will push the valve stem outwardly or upwardly to close the valve opening and at the same time will allow the lever to move to the full line position shown in FIGS. 1 and 5, although in inverted position, since the lever naturally tends to move towards its original "as molded" position (FIGS. 9 and 10) providing a small amount of spring return action due to the "plastic memory" of the polyolefin material. The lip or shoulder 36 on the lever will prevent the lever from passing outwardly of the cap. The lever is thus positioned for a slight pivotal or hinging movement along the hinge line 37.

When it is desired to lock the dispensing nozzle 44 against any relative reciprocal movement with respect to the cap 16, such as, for example, when the unit is shipped or when it is desired to positively prevent unauthorized actuation of the nozzle, as by a child, the nozzle is rotated 90° from that shown in FIG. 1 to position the upper and lower ribs 54 and 56 out of registry with the communicating slots 19. The upper ribs 54 will then be in engagement with the top of the cap and will be positioned in the detents 23 between the ramps 21 which serve as stops. The lower ribs 56 will engage the sleeve 20 on the inside of the cap. This is the locked position of the nozzle 44 and in such position the nozzle cannot move outwardly or inwardly relative to the cap and this locks the dispensing nozzle 44 against any relative reciprocal movement so that the discharge nozzle 14 cannot be pressed inwardly to open same. To place the nozzle 44 in an operative position it is merely necessary to rotate the nozzle 90° from the last described position so that the ribs 54 and 56 are in alignment with the communicating slots 19 in the cap, and in this changed position the nozzle may be operated by pressing the lever inwardly.

As is clear from the foregoing, with the ribs 54 and 56 of the nozzle positioned out of alignment with the communicating slots 19, no amount of manual pressure against the lever 24 will cause it to operate and no movement can be imparted to the valve stem when thus locked. The nozzle is thus locked against movement when the containers are shipped and also when it is de-

sired to lock same to prevent the accidental operation of the unit by manual pressure against the lever.

FIGS. 12 and 13 show a modified cap and only that portion which is modified will be described, it being understood that in all other particulars it remains substantially similar to what has been previously described. In the modification, the cap 60 is shaped to provide an inner annular wall 62 provided at the bottom thereof with an inwardly extending annular lip 64. The inner wall 62 has spaced vertically extending reinforcing ribs 65, similar to the ribs 40. The cap is also provided with an outer wall or skirt 66 which extends exteriorly of the inner wall 62. The inner wall 62 is positioned so that the lip 64 thereof engages the bead 13 of the container in the same manner previously described. However, the outer wall or skirt 66 extends downwardly over the upper or dome portion 68 of the cap and covers same, as best seen in FIG. 12, and the skirt does not lock with any portion of the dome-shaped surface, the cap being non-detachably secured and retained on the container by engagement of the lip 64 of the inner wall 62. In all other respects the cap is similar to that previously described and operates in the same manner.

What is claimed is:

1. Means for actuating the valve stem of an aerosol container for dispensing the material within the container, said means comprising a nozzle positioned on the valve stem of the aerosol container and a separate cap, said cap having a central opening through which a portion of said nozzle extends, said cap having means for securing same to the container, said cap being molded of a plastic material and having a slot in the side thereof, a lever molded and integrally formed with said cap of plastic material and hingedly connected by said plastic material to the side of said cap adjacent said slot with a portion of said lever extending into the interior of said cap through said slot and engaging means adjacent the lower end of said nozzle and with a portion of said lever extending outwardly of the cap for manual engagement so that when pressed inwardly the lever will through engagement with said nozzle means actuate the valve stem to open said valve stem to permit the material to be dispensed through said nozzle, said cap having an opening communicating with said central opening, said nozzle having means which pass through said communicating opening when the nozzle is actuated to operate said valve stem, said nozzle adapted when rotated so that when said last mentioned nozzle means is out of alinement with said communicating opening the nozzle will be locked against reciprocal movement relative to the cap to thereby prevent the lever from actuating said nozzle.

2. A structure as set forth in claim 1 in which the lever has means engaging the cap to limit the outward hinging movement of said lever.

3. A structure as set forth in claim 1 in which the last mentioned nozzle means includes a rib which when alined with the communicating opening in the cap permits the nozzle to be moved relative to said cap but which when rotated out of alinement with said communicating opening will prevent relative movement be-

tween said nozzle and said cap.

4. A structure as set forth in claim 1 in which the central opening of the cap has centering means extending into the interior of said cap adjacent the top thereof and in which the nozzle is provided with an upper rib and a lower rib in vertical alinement so that when said ribs register with said communicating opening the nozzle may be moved relative to said cap but when rotated and positioned out of alinement therewith will be prevented from reciprocal movement relative to said cap.

5. A structure as set forth in claim 1 in which the nozzle is provided with a pair of upper ribs and a pair of lower ribs in vertical alinement with the upper ribs but spaced therefrom, which ribs when alined with a pair of communicating openings in the cap permits the nozzle to be reciprocally moved relative to said cap but which when said nozzle is rotated approximately 90° relative to said communicating openings will cause said ribs to engage the cap and prevent relative movement of said nozzle with respect to said cap.

6. A structure as set forth in claim 1 in which the cap has stop means engaged by the nozzle means to lock the last mentioned nozzle against reciprocal movement.

7. A structure as set forth in claim 6 in which the last mentioned nozzle means are ribs and in which the stop means are spaced ramps extending upwardly of the top of the cap.

8. A structure as set forth in claim 1 in which the lever comprises a pair of spaced side walls connected by a rear cross wall and in which the cap has an opening into which extend said side walls so that the side walls extend into the interior of the cap.

9. Means for actuating the valve stem of an aerosol container for dispensing the material within the container, said means comprising a cap and a separate nozzle reciprocally movable with respect to said cap, said cap having means for securing same to the container, said cap being molded of a plastic material and having a central opening at the top thereof through which a portion of said nozzle extends, with the material to be dispensed through the nozzle from the top of the cap, said cap having a slot in the side thereof, a lever molded and integrally formed with said cap of plastic material and hingedly connected by said plastic material to the side of said cap adjacent said slot, said lever when integrally molded with said cap extending horizontally and radially of the longitudinal axis of the cap and entirely outside of said slot, said lever for operating position adapted to be moved from its horizontal to a vertical position so that a portion of said lever extends into the interior of said cap through said slot and a portion of said lever extends outwardly of the cap for manual engagement, said nozzle positioned on the valve stem and having means engaged by said lever when in vertical position for depressing said nozzle to operate the valve stem, said nozzle and cap having cooperating means continually formed therewith for locking said nozzle against reciprocal movement.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,739,941

Dated June 19, 1973

Inventor(s) Efrem M. Ostrowsky and William G. Crowle

Assignee: Federal Tool & Plastics, a Division of VCA Corporation

It is certified that error appears in the above-identified patent
and that said Letters Patent are hereby corrected as shown below:

Correct the spelling of last name of inventor from

"Ostrwosky" to --Ostrowsky--.

Correct spelling of assignee from "UCA" to --VCA--.

Signed and sealed this 1st day of January 1974.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,739,941 Dated June 19, 1973

Inventor(s) EFREM M. OSTRWOSKY, ET. AL.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet [73], "UCA Corporation" should
read -- VCA Corporation -- .

Signed and sealed this 20th day of November 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents