Aug. 21, 1962 P. H. SAGARIN ETAL 3,050,219

LOCKING CAP DISPENSERS

Filed May 29, 1959

FIG. 1

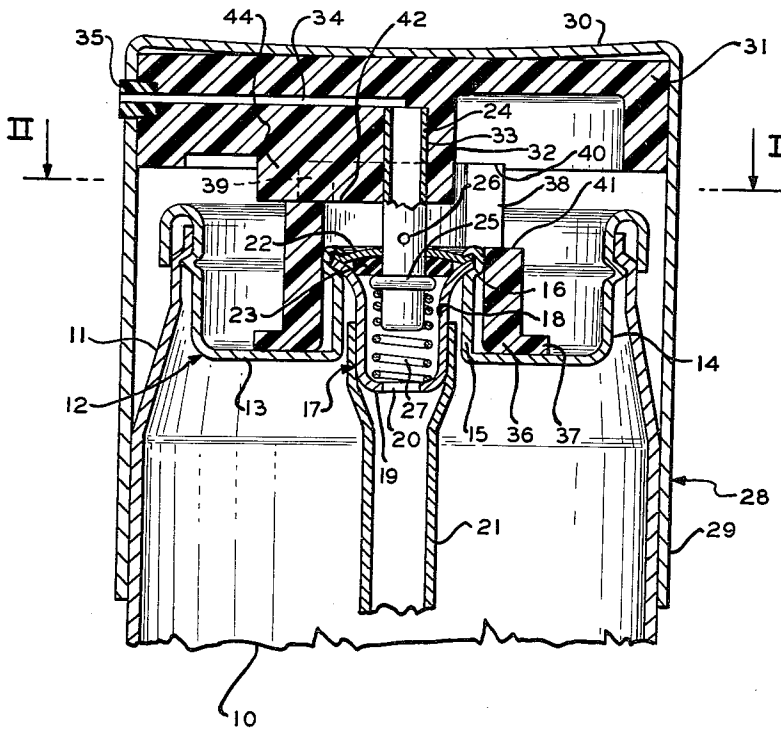


FIG. 2

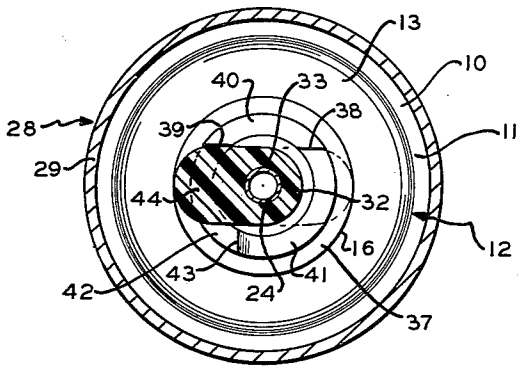
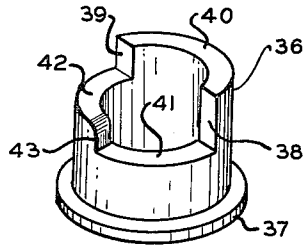


FIG. 3



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LOCKING CAP DISPENSERS

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3 Claims. (Cl. 222—549)

This invention relates to spray dispensers and more particularly to the type utilizing a depressible valve and generally known as aerosol dispensers.

It is common practice with this type of dispenser to provide a hollow valve stem protruding from the top of the container and to provide a button on said stem with a side orifice from which the material in the container is sprayed when the valve stem is manually depressed. There are numerous circumstances resulting in inadvertent depression of the valve stem and loss of contents. For instance, the container may have fallen over and the valve stem depressed by coming against a vertical surface, or when the container stands amongst other articles, an object may be placed innocently on the valve stem resulting in discharge taking place. Most serious, is the possible loss of material during shipment of the containers, and to avoid this loss, it is the general practice to provide a temporary cap which the user may throw away, but which frequently is retained and develops into a nuisance to the user in taking off, holding and replacing.

A further deficiency of the present construction of aerosol dispensers arises from the fact that the stem and button with the discharge orifice is of relatively small diameter and located quite close to the axis and it is therefore difficult to aim the orifice until a spray is discharged and then aim the discharge. According to the present invention, the discharge orifice is located at a distance from the container axis sufficient to enable the user to observe the direction in which it is pointed before depressing the valve to produce the spray.

In its broad aspect, the present invention is directed to means for overcoming the above-mentioned difficulties.

A general object of the invention may be given as provision of protective means for aerosol valves retainable on the containers to overcome inadvertent operation of the valves.

More specifically, an object of the invention is to provide a control element for depressing the valve stem and to provide means by which the control element may be locked against depression.

A further object is to provide a control element that is readily operated from locked to unlocked position and vice versa, but which will not have its status changed inadvertently as from vibration, dropping or other treatment not specifically intended to operate it.

Another object of the invention is to incorporate the control element as a functional part of a container cap to be retained on the container.

Also it may be given as an object of the invention to provide the discharge orifice in the side of the container cap and distant from the axis.

A still further object is to provide a structure usable with valves of present-day manufacture.

Other objects, advantages and novel structural features will hereinafter appear to persons skilled in the art to which the invention more particularly appertains, as the

description proceeds, both by direct recitation thereof and by implication from the context as well as by inclusion in the appended claims.

Referring to the accompanying drawing, in which like numerals of reference indicate the same parts throughout the several views;

FIGURE 1 is a vertical longitudinal sectional view of an aerosol container and valve in connection with which our invention is likewise shown in section;

FIGURE 2 is a cross-section on line II—II of FIG. 1; and

FIGURE 3 is a perspective view of the fixed member for locking the control element against depression.

In the specific embodiment of the invention illustrated in said drawing, the reference numeral **10** designates an aerosol container of appropriate material and here shown as a metal container with a neck **11** converging slightly toward its upper end and receiving therein a valve-mounting **12** which also constitutes a closure for the otherwise upper open end of said neck. The said neck and mounting where in juxtaposition are suitably interlocked for obtaining a permanent and leak-proof retention of the valve mounting by the container. The said mounting **12** is of an annular gutter-shape and therefore provides an annular base or bottom wall **13** from which are upstanding outer and inner peripheral walls **14**, **15** of generally cylindrical configuration. The inner peripheral wall **15** is shouldered outwardly at **16** for reception and retention of an aerosol valve assembly **17** of suitable construction.

As here shown, the valve assembly **17** comprises a hollow housing **18** with a flared upper margin that seats on said shoulder **16** of the mounting inner wall **15**, said housing having a bottom wall **19** with a central perforation **20** by which the fluid contents of the container may pass into the chamber formed by and within said hollow housing. A dip tube **21** depends from said housing **18**, leading from the bottom of the container **10** to said perforation **20** of housing **18**, as usual, to convey the fluid thereto irrespective of the level of the fluid in the container at the particular occasion of use. At the top of said housing **18**, held in place by a metal or other suitable washer **22**, is a valve gasket **23** also of washer shape.

Extending slidably through the central holes of said gasket and washer is a hollow valve-stem **24** which has a peripheral enlargement or bead **25** at a location below said gasket **23** which will act as a stop to limit upward movement of the valve stem by engagement with the under face of valve gasket **23**. Said valve-stem **24** is open only at its upper end and closed at its lower end. Said valve-stem has, however, a lateral port **26** communicating from the exterior to the hollow interior of said valve-stem, said port being at a part of the valve-stem above the enlargement **25** and at a location such that by sliding the valve-stem the port may be brought at one or upper position within the confines of the valve gasket **23** and in another or lower position, below the said gasket. The gasket hugs the valve-stem and constitutes a seal against passage of fluid past the same between it and the valve-stem. It may also be noted that the same gasket likewise effects a seal at its margin where in engagement with the inside of the cylindrical housing. When the valve-stem is depressed, the port **26** is within the housing chamber below the gasket and consequently provides for passage of fluid from the chamber, through said port and out through the upper end of the hollow of the stem. The stem is held

normally upward to close the port by its inclusion within the confines of the gasket **23**, a spring **27** being shown for that purpose situated within said chamber and bearing at one end against the under side of the enlargement **25** and at its other end seating on the bottom wall **19** of said housing. While this particular valve assembly above described will give a continuous flow as long as the valve-stem is held depressed, the invention is not to be understood as confined thereto, but may be utilized just as well with other types of valve assemblies, such as so-called measuring valves, an example of which is illustrated in patent 2,721,010 of Oct. 18, 1955, to Philip Meshberg.

Irrespective of the type of valve employed, the present invention provides means for locking the same from being depressed except when such depression is intentionally desired. In carrying out this essential feature of the invention, a cap **28** is provided with a skirt **29** slidably overlapping the exterior portion of the container at a part thereof below the converging portion and coaxial to said container. Said cap has a top wall **30** giving a construction to said cap having the form of an inverted cup. Retained in said cap against said top wall **30** thereof and having a peripheral contour fitting against the proximate upper portion of skirt **29**, is a control member, preferably of molded material such as polystyrene, which, for distinguishing purposes will be hereinafter identified as a movable control member **31** since it moves with said cap and is in effect a part thereof. Said movable control member has a central hub **32** projecting downwardly from a solid end wall and has a coaxial recess **33** of appropriate size and shape for frictional reception of aforementioned hollow valve-stem **24**. The said movable control member **31** is preferably applied to the valve-stem with a force-fit so as to remain thereon in use. Furthermore, said recess **33** is proportioned in its longitudinal dimension so that it will limit insertion of the valve-stem therein to a predetermined position.

A radially directed outlet passage **34** is provided in said movable control member **31** from the recess **33** thereof to the outer circumference of said member, and this passage is open at the exterior of the cap skirt **29** by protrusion of a suitable boss **35** thereat. Thus, fluid under pressure within said hollow valve-stem will pass therefrom through said passage **34** and be sprayed from said boss which may accordingly be considered a spray nozzle. It may be here noted, that since that boss or spray nozzle is as far distant from the axis of the container as the outside of the container, it is not only readily visible to the user, but is very easily aimed in the direction in which the spray is desired.

Frictionally or otherwise fixed in the gutter-like valve mounting **12** is what is herein termed a fixed control member **36** which, like the movable control member **31**, may be of molded material such as polystyrene. This fixed control member is of generally cylindrical contour with a lower end flange **37** that seats on the base or bottom wall **13** of said mounting **12**, and is longitudinally hollow and of appropriate internal dimension to snugly and frictionally fit on the said inner peripheral wall **14** of said mounting at the outside of the shouldered portion **16** thereof. If desired, cement may be included between said wall **14** and the fixed control member **36** to assure immobility and retention of said member in place.

Said fixed control member provides a stepped arrangement at its upwardly directed end such that a somewhat less than semi-cylindrical portion composes the part thereof representative of maximum length of said member, one adjacent approximate quadrant thereto of the annular wall of said member making a deep step and the other approximate quadrant making a step of intermediate depth. Explained somewhat more in detail, a chordal plane interrupts the continuity of the cylindrical configuration and outer arcuate end **40** of the fixed control member with longitudinal riser edges **38**, **39** of the wall thickness in said plane facing in the same general direction but at opposite sides of the axis. One of these riser edges, namely **38**, is deeper longitudinally of said member than the other said riser edge **39**, and terminates at the lowest quadrant arcuate level **41**, whereas the other said riser edge **39** terminates at the intermediate quadrant arcuate level **42**. Perpendicular to said chordal plane of riser edges **38**, **39** is a riser edge **43** from one quadrant level **41** to the other quadrant level **42**. Otherwise expressed, there are three arcuate levels **40**, **41** and **42** with a deep riser edge **38** between the two most remote levels **40**, **41** and located in a chordal plane, and part way around there is another riser edge **43** from the lowest level **41** to the intermediate level **42** and then at the other end of that level there is a short riser edge **39** located in said chordal plane at the opposite side of the axis from the first or deep riser edge **38**.

It is now appropriate to say that the movable control member **31** is formed with an integral vane **44** projecting radially from said hub **32** and downwardly from the solid end wall of said member. This vane **44** has an amplitude of revolution in the present showing of 180° and is stopped at opposite ends of its swing by chordal riser edges **38**, **39** which may therefore appropriately be termed stops. For approximately half of that amplitude of swing, the lower edge of said vane **44** rides on the arcuate quadrant intermediate level **42** and the arrangement is such that when the vane is held at that level, the valve-stem **24** is at its outermost position and cannot be depressed due to engagement of the vane **44** on said intermediate quadrant level **42**. However, by rotating the cap **28** so as to bring said vane **44** into registration with the lowermost quadrant **41**, the cap and valve-stem are in operative position and it is then possible to depress the vane to the lower level **41** and in so doing the valve-stem **24** is depressed and discharge of the container contents as a spray from nozzle **35** will result. Release of the depressive force on the cap enables spring **27** to lift the valve stem and cap and stops the flow and returns the vane to the level of the intermediate quadrant. The cap may then be rotated to position the vane **44** over said intermediate quadrant **42** thereby locking the movable control member **31** from movement axially and consequently locking the valve-stem from being again depressed until the movable control member is intentionally rotated back to the above described operative position. It thus will be seen that a two-member control element is provided interposed between the container and cap which locks the cap against depression at one position of rotation thereof and which permits depression of the cap at another position of rotation, and then only can the valve-stem be depressed.

We claim:

1. In combination with a container having a tubular upper portion and a bearing means thereon, and having a depressible valve and hollow valve-stem carried by said upper portion, said stem protruding at one end of said portion, a depressible cap comprising a thin inverted cup which is devoid of locking devices, said cap overlying the valve-stem and being rotatable on and having guided non-locking engagement with the exterior of said container upper portion and on and with the bearing means thereof whereby an operative bearing is had for the cap on the container exterior, said upper container portion, cap and bearing means being so constituted that the cap is at all times freely slidable and has unobstructed movement on the container portion and bearing means; means interposed between said container and cap and including a member having a discharge passage and nozzle communicating with the said valve stem, for preventing depression of said cap in one position of rotation thereof whereby the cap is inoperative to depress the valve stem, and for enabling depression of said cap to be effected in another, operative position of rotation thereof to enable said depression to be effected, said interposed means comprising a second member cooperable with the first-mentioned

member, said members constituting a two-piece assemblage which is wholly contained within and wholly concealed by said cap, said depression-preventing means further including mutually engageable lugs on said members, the lug on the nozzle-carrying member extending radially from the axis of said member; and stop means on said second member cooperable with said radially-extending lug, limiting turning of the nozzle-carrying member to movement between its said operative and inoperative positions.

2. The combination of claim 1, wherein the cap and

first-mentioned member are interlockingly connected to prevent relative turning therebetween.

3. The combination of claim 2, wherein there is a nozzle piece disposed in said cap and first-mentioned member, effecting the said interlocking connection.

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