

Sept. 17, 1963

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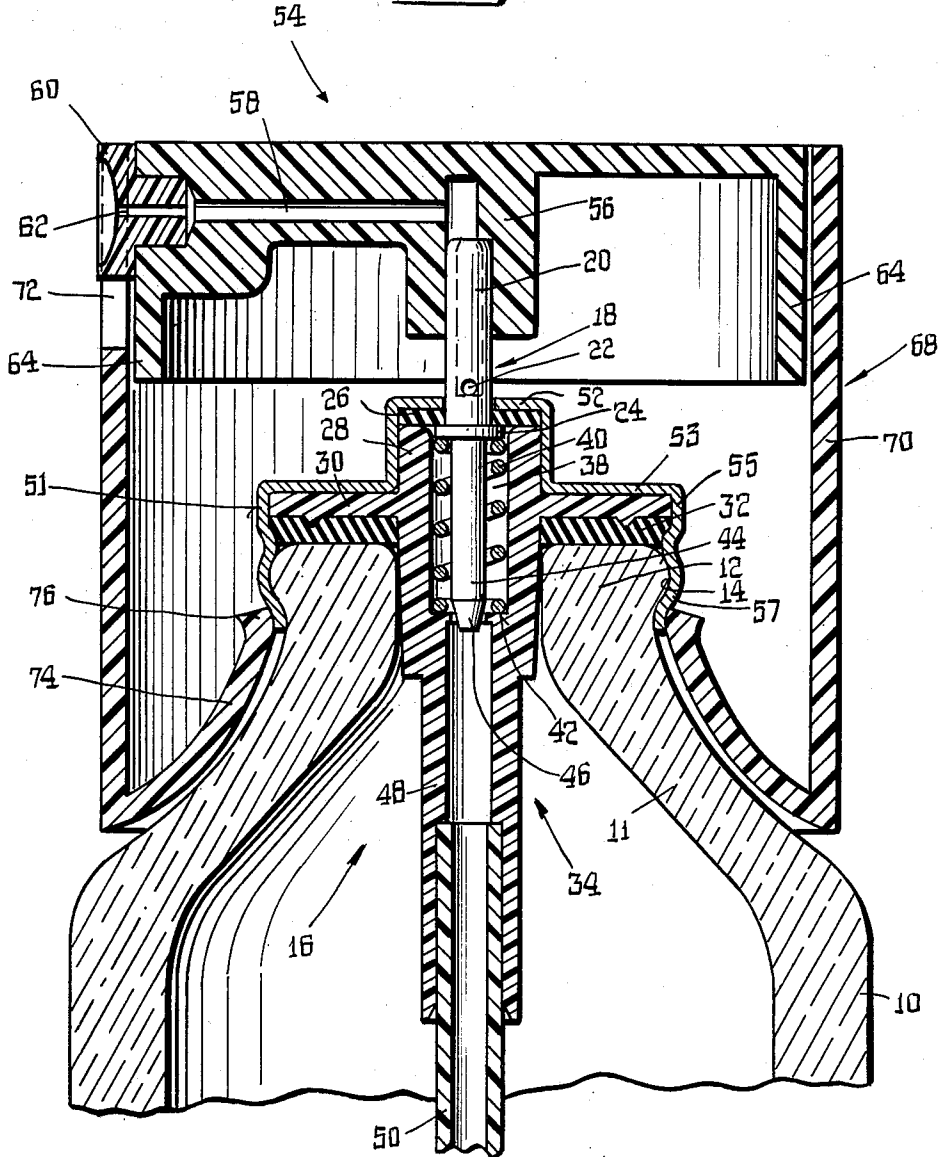
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CAP CONSTRUCTION FOR AEROSOL DEVICES

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2 Sheets-Sheet 1

Fig. 1



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Fig. 2

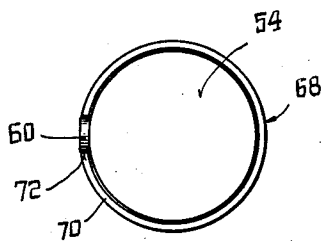


Fig. 3

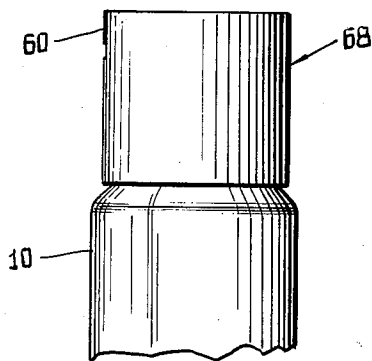


Fig. 4

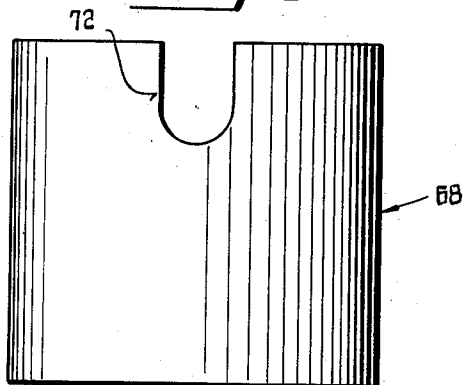


Fig. 5

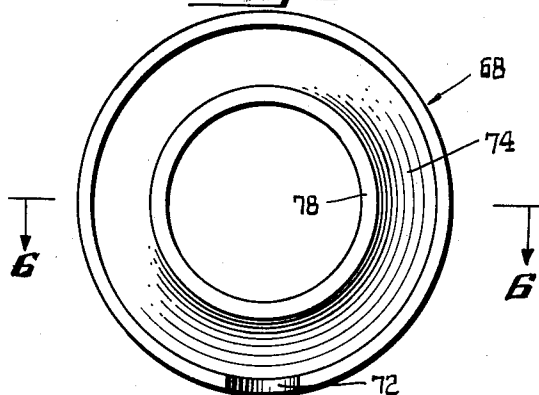
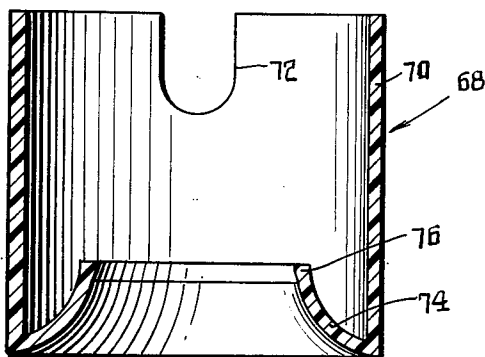


Fig. 6



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CAP CONSTRUCTION FOR AEROSOL DEVICES
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This invention relates to small aerosol devices of the type wherein a hand-held pressurized container has a dispensing cap construction including an operable valve by which the contents of the container may be discharged, and more particularly to the cap constructions of such aerosol devices.

Small hand-held aerosol devices of the kind used for dispensing cosmetic substances such as perfume and numerous other products commonly comprise a pressurized container having a cap or closure construction characterized by a depressible or otherwise operable valve member. Upon actuation of such member the aerosol substance issues from the cap construction, usually in a fine spray or mist.

Recently, particularly in connection with depressible valve operators or members, the valve construction has included a guard means by which inadvertent operation of the valve member is prevented. Such guard means has taken various forms, one which has been found particularly suitable comprising a cap body of relatively large size, which is arranged to surround or encircle the depressible valve operating member and to extend from the top thereof downward to the neck or shoulder portion of the container. The arrangement is such that the valve operating member is accessible mainly from the top, being surrounded and guarded at the sides and bottom whereby it is not easily accidentally operated, as might occur when the aerosol device is carried in a purse or handbag, or is otherwise handled. Essentially it is necessary for the operator or user to intentionally apply pressure to the valve actuator member or depress button in a required downward direction, in order to operate the same and effect dispensing of the container contents.

While persons familiar with such construction may readily correctly operate the dispenser, because of the relative newness of the guard construction many unfamiliar users do not realize that the aerosol device is always ready to operate immediately, and instead mistake the relatively large guard or guarding cap to be a member or closure which must be first removed in order to operate the device. When such an unfamiliar person removes this guard portion of the cap construction it defeats the purpose of the same and undesirably exposes the valve operator member or button from the sides, whereby it is possible to improperly or accidentally actuate the same, thus resulting in unsatisfactory results at times.

The above-mentioned disadvantage and drawback of guard-type cap constructions is obviated by the present invention, and one object of the invention is to provide a novel and improved cap construction for a small hand-held aerosol device, wherein it is not possible for a user unfamiliar with the operation or construction of the device to mistakenly remove the guard portion of the cap prior to placing the device in use.

This is accomplished, in accordance with the invention, by a novel cap body or guard portion which is so arranged as to be interlockingly engaged with the container neck or with components carried thereby, thereby to effectively prevent the unnecessary and undesirable removal of such portion.

In carrying out this organization, in accordance with the invention and as effected in the illustrated embodi-

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ment thereof, the cap body portion which is of annular configuration has an inwardly extending locking flange which is arranged to be pressed and forced over a shoulder of a container neck or an associated component, thereby to lock the body and guard portion in place and prevent its inadvertent removal. As shown herein, the inwardly extending locking flange is of tapering construction or shape and so arranged that efforts to remove the guard member only cause the flange to more tightly grip the cooperable shoulder on the container. Thus, whereas the guard member may be fairly easily applied or assembled to the container and locked in place, the effort required to remove the guard portion is much greater than that involved in assembling it, which constitutes a distinct advantage in rendering the cap construction more effective for the intended purpose.

Another object of the invention is to provide an improved cap construction for aerosol devices in accordance with the foregoing, which is so arranged that it may under any circumstance and without requiring close tolerances be easily and quickly applied or assembled to the aerosol device, eliminating difficult or time-consuming operations or special equipment, tools, special jigs or the like which might undesirably increase the cost of the device.

A still further object of the invention is to provide an improved interlocking guard type cap construction for an aerosol container as above characterized, which does not require alteration of the container or the valve or closure structures associated therewith, whereby it may be applied to existing devices of this type without retooling, modifications or the like.

A feature of the invention resides in the provision of an improved aerosol cap construction as above set forth, wherein the locking type guard is extremely simple in its construction, and may be readily fabricated from simple tools, being especially easily moldable of yieldable or resilient plastic substance.

Another feature of the invention resides in the provision of an improved cap construction of the type outlined, which readily lends itself to use with existing containers and may readily fit into the desired decor or external appearance of the device.

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:

FIGURE 1 is a fragmentary axial sectional view of an aerosol device embodying the invention, this view showing the upper portion of a pressurized container together with a cap construction having a metering type valve, and having the improved, interlocked guard portion or member for the valve operator or depress button.

FIG. 2 is a top plan view of the cap construction as provided by the invention.

FIG. 3 is a fragmentary side elevational view of the upper portion of the aerosol device, showing the cap construction and the shoulder portions of the pressurized container.

FIG. 4 is a front elevational view of the interlocking guard portion or member of the cap construction.

FIG. 5 is a top plan view of the guard member per se, the depress button having been removed to reveal the interior details of the member.

FIG. 6 is an axial sectional view of the interlocking guard member taken on the line 6—6 of FIG. 5.

Considering first FIGS. 1 and 3, the present aerosol device is shown as comprising a pressurized container 10 which may, for example, be constituted as a glass bottle or other rigid or semi-rigid vessel. The container 10 may be of suitable plastic substance as well, as will be readily understood. At its upper end the container 10 has a

neck portion 11 provided with a lip 12 having the usual external detent bead or shoulder 14.

Secured to the neck portion 11 of the container 10 is a valve and closure assemblage designated generally by the numeral 16, such assemblage being of the well-known metering type. The valve assemblage includes a vertically shiftable valve stem 18 having a tubular upper portion 20 provided with a lateral opening 22 communicating with the axial bore of the portion 20. The valve stem has a valve shoulder 24 which is cooperable with a resilient valve disk 26, the latter being seated and sealed against the upper tubular portion 28 of a plastic valve housing which is positioned on the lip portion 12 of the container by means of an external mounting flange 30. A sealing gasket 32 separates the flange 30 from the surface of the container lip and takes up irregularities in the latter whereby an effective seal may be had, as is readily understood.

The valve housing is indicated generally by the numeral 34 and comprises a tubular body portion 36 having a metering chamber 38 in which there is disposed a valve return spring 40, such spring bearing against the valve shoulder 24 at its upper end and against an internal shoulder 42 constituting a second valve seat at its lower end. The valve stem 18 has below the valve shoulder 24 a lower portion 44 which passes through and is disposed within the return spring 40. The lower end or tip 46 of the valve stem is cooperable with the opening defined by the valve shoulder 42 of the valve housing, thereby to constitute a second and lower valve means by which a metering of the contents of the container 10 is had upon the valve stem 18 being depressed, as is well understood in the art.

The valve housing 34 has a lower, tubular depending portion 48 in which there is carried the usual syphon tube 50.

The resilient valve disk 26 is retained in position against the upper end of the valve housing 34, and the latter is secured to the neck portion 12 of the container 10 by a fastening collar in the form of an annular clamping cap structure 51 having a top wall 52 engaged with the valve disk 26, a shoulder portion 53 engaged with the mounting flange 30 of the valve housing 34, and a large-diameter, generally cylindrical portion 55 having a grooved formation or bead 57 which is engaged with the detent bead 14 of the container lip 12. The large-diameter portion 55 is crimped or spun under the detent bead 14, as is readily understood, to permanently secure the closure and valve assemblage in place.

When the valve stem 18 is depressed or shifted vertically downward as seen in FIG. 1, the tip 46 thereof will engage the valve seat at the shoulder 42, thereby closing off the lower portion of the metering chamber 38, and continued downward movement of the valve stem 18 will locate the lateral opening 22 which is in the upper portion of the stem below the resilient valve disk 26 whereby such valve opening is in communication with the metering chamber 38. The pressurized contents of the metering chamber 38 will then pass through the lateral opening 22 upward through the bore 20 in the upper portion of the valve stem, and will be discharged in the usual manner.

As shown in FIGURE 1, the valve stem 18 carries a manually engageable operator or depress button 54 having a central hollow boss 56 frictionally engaged with the upper portion 20 of the stem 18. The button 54 has a lateral discharge channel 58, and carries an orifice member 60 provided with an orifice 62 communicating with the channel 58, whereby the aerosol substance passing upward through the hollow upper portion 20 of the stem will be directed and ejected horizontally as a spray from the orifice member 60. Valve operators or depress buttons of this general type are well known in the art, as is also the operation thereof.

The depress button 54 has a depending skirt or flange

portion 64 which provides a guide means and tends to prevent tilting of the button by its engagement with a cap body member or guard member arranged to surround the button 54 and permit access to the latter only at the top surface thereof.

In accordance with the present invention there is provided a novel and improved cap body and guard member which is indicated generally by the numeral 68, such member surrounding the depress button 54 and being securely affixed to the neck portion of the container 10 or to a component associated therewith, by which the guard member is prevented from being removed except with the use of appreciable force, greatly in excess of that normally required to operate the aerosol device.

As illustrated herein the guard member 68 is interlockingly engaged with the neck and lip portion 12 of the container 10, although it should be understood that this is not to be taken in a limiting sense, since the guard member may, in accordance with the invention, be interlockingly engaged with any suitable means on or affixed to the container. The guard member 68 comprises essentially, in the illustrated embodiment of the invention, an annular or cylindrical structure or body 70 closely but loosely fitting around the depending skirt 64 of the depress button 54. The guard member 68 has in its upper edge a clearance notch 72 in which the orifice member 60 is disposed, such clearance notch and orifice member being readily visible to a user and indicating the direction in which the spray will issue from the device.

At its lower portion, the guard member 68 has an inwardly extending annular locking flange or skirt 74, which is shown in FIGS. 1 and 6 as extending upward and being generally of conical configuration. The locking flange 74 has an upper annular edge 76 which is out-turned a slight extent as shown, and is adapted to engage the detent shoulder 14 of the container or more specifically the similarly shaped bead portion of the retainer cap 51.

The upper annular edge 76 of the locking flange 74 is preferably somewhat smaller in diameter than the large-diameter portion 55 of the clamping cap structure 51, and the guard member 70 is preferably molded of a flexible and resilient plastic substance such as polyethylene or a similar formulation whereby the flange 74 is yieldable and stretchable to an extent, and will tend to return to its initial position upon removal of any distorting force. Thus, the guard member 68 as above constructed may be easily and quickly applied to the assemblage of container and valve means. It is only necessary to force the guard member 70 downward and to cause the locking flange 74 to be expanded and forced over the large-diameter portion 55 of the clamping cap 51 whereby the upper edge 76 of the locking flange will snap behind or under the detent bead portion 57 of the clamping cap. The parts will then have the positions shown in FIG. 1. Thereafter, the depress button 54 is simply applied to the assemblage by setting it within the guard portion 70 and pressing it downward over the valve stem 18 to the position shown. The assembly of the interlocking guard and the depress button is thus quickly effected by merely a pushing or downward pressing operation, in each instance.

It has been found that with the above construction the guard member 68 is securely retained in place at all times and is prevented from being removed either as an incidental or intentional operation since there is required an extremely strong removing force, together with appropriate tools to effect such removal. Thus, the average user, if he or she is unfamiliar with the construction and operation of the aerosol device and wrongly attempts to remove the guard member 70 by mistaking for a removable cap, will positively not be able to do so. Therefore the user will know that it should be possible to operate the aerosol device by some other methods, the obvious one being merely to depress the valve actuator button 54. Accordingly, there is prevented improper

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operation of the device, and a more satisfactory use is had as a consequence.

It will be understood that the construction of the guard member 63 is extremely simple, and that such member may be easily and economically molded in simple molding equipment. As already pointed out above, the assembly or application of the guard member 63 and the depress button 64 respectively may be quickly and easily effected. The increased cost involved in the provision of the interlocking means for the guard member is virtually negligible, and by its use there is had a much more satisfactory product, of distinct utility.

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

What is claimed is:

1. In an aerosol device, in combination, a stationary detent part comprising an outwardly-facing shoulder means on the neck of an aerosol container, a guard-type cap construction comprising an annular guard member; a movable and depressible valve actuator disposed within said guard member and arranged to be accessible from the top thereof for operation, said member surrounding the sides of the actuator and extending upward substantially to the same level as the actuator top, thereby to prevent inadvertent operation of the actuator; and locking means comprising a movable part carried by the guard member for interlocking engagement with the said stationary detent part of the aerosol device, to retain the member on said device against incidental removal, said locking means including a supporting means for the movable part which tends to shift said part toward and hold it more tightly engaged with the stationary outwardly-facing shoulder means when force is applied to the guard member to remove the latter, said locking means comprising an inwardly extending flange secured to the lower portion of the guard member and having an inner edge engageable with said shoulder means, said flange extending upward as well as inward and having substantially a conical configuration.

2. A cap construction as in claim 1, in combination with a pressurized container, said stationary part being rigid on said container.

3. The invention as in claim 2, in which there is a discharge valve assemblage carried at the mouth of the container, and in which the stationary part comprises a component of said assemblage.

4. The invention as in claim 3 in which the stationary part comprises a fastening collar secured to the container and constituting an outer component of said assemblage.

5. A cap construction as in claim 1, in which the an-

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nular guard member has an open-ended notch in its upper portion, and in which the valve actuator has an orifice disposed adjacent the said notch, for discharging the aerosol substance therethrough.

6. In an aerosol device, in combination, a stationary detent part comprising an outwardly-facing annular bead on the neck of an aerosol container; a guard-type cap construction comprising an annular guard member; a movable and depressible valve actuator disposed within said guard member and arranged to be accessible from the top thereof for operation, said member surrounding the sides of the actuator and extending upward substantially to the same level as the actuator top, thereby to prevent inadvertent operation of the actuator; and locking means comprising a movable part carried by the guard member for interlocking engagement with the said stationary detent part of the aerosol device, to retain the member on said device against accidental removal, said locking means including a supporting means for the movable part which tends to shift said part toward and hold it more tightly engaged with the stationary detent part when force is applied to the guard member to remove the latter, said locking means further comprising an inwardly extending flange secured to the lower portion of the guard member and having an inner edge engageable with the underside of the annular detent bead, said flange extending upward as well as inward, and having substantially a conical configuration.

7. A cap construction as in claim 6, in which the guard member is formed of resilient plastic, said locking flange being expansible within limits to enable it to be snapped over and around said stationary part.

8. A cap construction as in claim 6, in which the flange is elastic and expansible to enable it to be forced around and over said annular bead.

9. A cap construction as in claim 8, in combination with said aerosol container, said container having a discharge valve assembly including a fastening collar affixed to said container neck, said collar comprising the said stationary bead.

10. The invention as defined in claim 9, in which the fastening collar has a depending skirt constituting the external bead against which the elastic flange presses.

References Cited in the file of this patent

UNITED STATES PATENTS

2,577,245	Tuttle et al.	Dec. 4, 1951
2,691,466	Efford et al.	Oct. 12, 1954
2,706,660	Johnson et al.	Apr. 19, 1955
2,757,964	Both et al.	Aug. 7, 1956
2,887,273	Anderson et al.	May 19, 1959