Oct. 31, 1961 P. H. SAGARIN 3,006,510

AEROSOL CAP CONSTRUCTION

Filed Oct. 20, 1959

Fig. 1

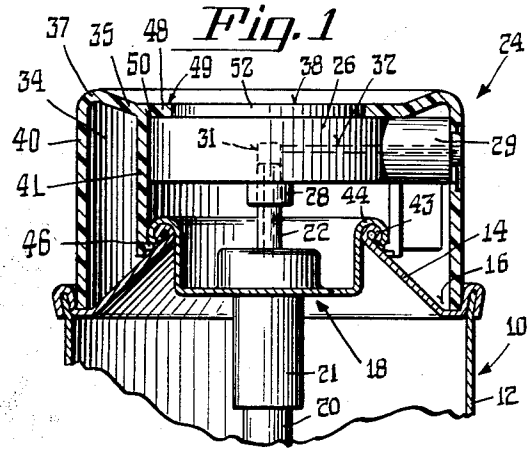


Fig. 3

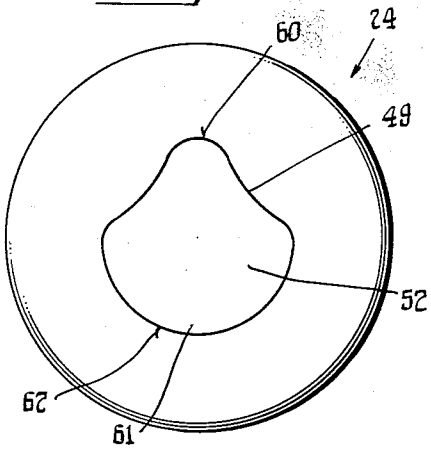


Fig. 2

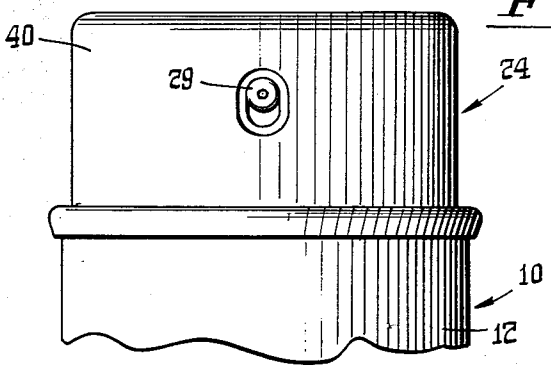


Fig. 4

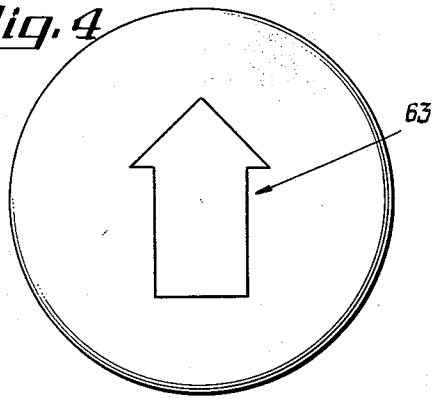


Fig. 6

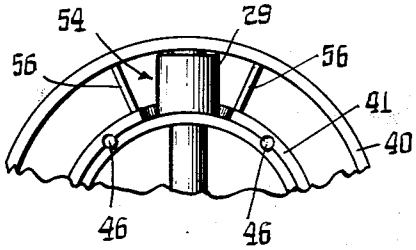
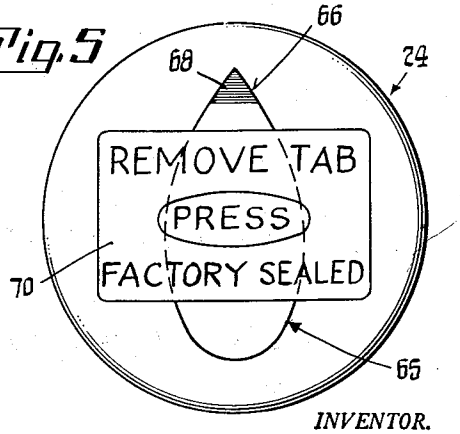


Fig. 5



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AEROSOL CAP CONSTRUCTION

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6 Claims. (Cl. 222—182)

This invention relates to small aerosol devices of the type employing pressurized containers and adapted to be held in the hand, and more particularly to valve actuator and cap structures of such small aerosol dispensers.

The invention concerns improvements in the aerosol device described and claimed in my copending application Serial Number 833,100, filed August 11, 1959 and entitled "Aerosol Valve Actuator and Cap Construction."

The aerosol device set forth in this copending application comprises a pressurized container in the form of a small bottle or jar having mounted in its neck portion a manually operable, spring-charged valve including a depress-button type actuator having a side discharge opening or orifice, from which the container contents are discharged when the button is depressed. In the device of this copending application there is provided a novel, guard-type cap construction which does not normally require removal in order to put the dispenser to use, said cap construction having a large, access opening in which the valve button is disposed and having a second and smaller side opening through which the discharge of the contents of the container may take place. The said cap is fixedly carried by the neck portion of the container, and has a top, guard surface surrounding the depress button to prevent inadvertent actuation or depressing of the latter. Also, the orifice portion of the depress button may be readily viewed at the side of the cap, and by giving such portion a different color it is easily observed, thus tending to apprise the used of the direction toward which the spray will issue when the dispenser is placed in use.

One object of the invention is to provide an unmistakable attention-attracting direction indicating means for an aerosol device of the above type, and in effecting this, in accordance with the invention, there is provided an improved, guard-type cap construction which is so organized and arranged that an easily understood indication of the direction of spray will be had at the expansive top portion of the cap, in a location where it may be readily observed and where it is not likely to escape notice.

In carrying out this object the invention provides a cap structure having a depending skirt portion which engages the upper part of the container, preferably at the neck portion thereof, said cap structure further including a relatively large or expansive, annular top surface surrounding and constituting a guard for the depress button of the valve actuator and having a novel central opening or recess of non-circular shape, preferably one which will be readily understood as indicating a given direction, through which access may be had to the depress button. Further, the depress button is given a corresponding shape whereby it may be closely fitted within the top opening of the cap structure, to have substantially a nesting relation with respect thereto. Both the surrounding top surface of the cap structure which provides the guard function and also the manually engageable top surface of the depress button are relatively large or expansive, thereby facilitating the operation of the button when it is desired to put the dispenser to use, while at the same time providing a large and safe rest surface which not only enables several such dispensers to be stacked one upon another without causing actuation of the depress button but also generally facilitates the handling and use of the aerosol device, especially the locating and actuation of the depress button.

Another object of the invention is to provide a novel and improved combination valve actuator and cap construction in accordance with the foregoing, to which a simple and effective seal may be applied for removal by the ultimate consumer, the said seal further insuring against discharge of the contents of the aerosol device and enabling the imprinting of operating or other directions to be made, for the use of the consumer. The above sealing device may be advantageously constituted as an inexpensive label having a pressure-sensitive adhesive, such label being preferably factory-applied to insure against tampering, loss of contents, etc.

A further object of the invention is to provide a novel and improved mammoth-size stationary aerosol cap construction characterized by two annular, concentric side walls or skirts spaced from each other by which a relatively large cap exterior may be had with the expenditure of relatively little material, and whereby a more secure and stable mounting of the cap on the container can be effected through the utilization of both of the said concentric walls.

A feature of the invention resides in the provision of a novel double-walled aerosol cap construction as above set forth, wherein a simplified and effective guide means is provided on one of the walls of the cap to insure proper positioning of the depress button at all times and to facilitate the assembly of the depress button and cap construction, and application of these to the aerosol container.

A still further object of the invention is to provide an improved stationary or normally not removed aerosol cap construction of the type which is frictionally held and retained on the container, wherein a simple yet effective detent means is provided to prevent inadvertent removal or dislodgement of the cap from the container.

Other features and advantages will hereinafter appear.

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

FIG. 1 is an axial sectional view, enlarged, of the improved aerosol valve actuator and cap construction as provided by the invention, mounted on the upper portion of a pressurized container.

FIG. 2 is a fragmentary front elevational view of the cap construction and upper portion of the container of FIG. 1.

FIG. 3 is a top plan view of the valve actuator and cap construction shown in FIGS. 1 and 2.

FIG. 4 is a view like FIG. 3, but showing a modification of the invention.

FIG. 5 is a view like FIGS. 3 and 4, showing yet another modification of the invention.

FIG. 6 is a fragmentary bottom plan view of the cap construction, illustrating a simplified detent means as provided by the invention.

Referring first to FIGS. 1 and 2, there is illustrated the upper portion of a pressurized aerosol container which is indicated generally by the numeral **10**, the said container being of the type made from sheet metal, having substantially cylindrical side walls **12**, a conical upper wall **14** constituting a neck portion, and an external annular shoulder **16** disposed at the juncture of the neck portion **14** and the side walls **12**.

Secured to the neck portion **14** and spanning the opening thereof is a manually operable valve assemblage **18** having a dip tube **20** and a valve housing **21**, the said assemblage including an upstanding, operable and depressible valve stem **22**.

In accordance with the present invention there is provided for use in conjunction with the pressurized container **10** and the operable valve stem **22** a novel and im-

proved combination depressible valve actuator and cap construction designated generally by the numeral **24**, which has a number of distinctly desirable features and advantages. The actuator and cap assemblage **24** provides at its top a positive and at all times reliable indication of the direction of the spray, and an indication which cannot be mistaken or go unnoticed by the user of the aerosol device. Moreover, the valve actuator and cap are so constituted that there is minimized the likelihood of inadvertent operation of the actuator, yet when it is desired to use the dispenser the actuator may be readily manipulated or depressed, to discharge the aerosol substance. Further, the actuator and cap construction lends itself readily to use with a removable sealing sticker, which may be advantageously applied at the factory. The cap construction, while frictionally held on the container, is extremely steady and stable, thereby preventing malfunctioning of the manually operable aerosol valve. Also, the cap construction provides a desirable guide means for the depress button or actuator of the valve, and maintains the same properly oriented at all times. Further, a simplified and effective detent means is provided in a molded cap construction, which is at one and the same time both economical to incorporate and effective in operation.

Accordingly, referring to FIGS. 1 and 2, the present improved valve actuator and cap construction is shown as comprising an actuator member in the form of a depress button **26** having a hollow depending boss **28** arranged to be slipped over and to snugly fit the valve stem **22**. The depress button **26** has a side projection **29**, and is provided with a pair of intersecting passages **31** and **32** by which the hollow valve stem **22** may communicate with the side orifice portion of the button constituted by the projection **29**.

The novel assemblage **24** further comprises a relatively large normally fixed and not removed cap structure **34** having an extensive or expansive top portion **35** surrounding the depress button **26** and constituting a guard therefor, by which inadvertent operation of the button is prevented. Preferably the expansive top portion **35** of the cap **34** has a slightly raised and rounded periphery **37** which is disposed at a level slightly above that of the top surface **38** of the depress button **26**.

By such organization, when the cap structure **34** is fixedly mounted on the container **10** there is prevented any likelihood of adjoining flat-surfaced objects inadvertently depressing or actuating the button **26** if they should be accidentally brought close and moved in the direction of the same. Also, by such construction it is possible for a number of aerosol containers to be stacked one on top of the other, without danger of the valve actuator or depress button **26** being undesirably accidentally operated.

The improved cap construction **34** further comprises a pair of annular and concentric, spaced, outer and inner walls **40** and **41** in the form of depending skirts extending from the top cap portion **35**. The outer and inner skirts **40** and **41** are adapted to engage the container **10**, thereby to fixedly mount the cap **34** on the container in a position surrounding the depress button **26** and so as to constitute a guide and also a guard for the said button.

As shown in FIG. 1, the neck portion **14** of the container **10** and the valve assemblage **18** are secured to each other by the provision of beads **43** and **44** respectively, which beads are engaged with each other in sealing relation. The bead **44** is preferably spun in, in effecting the seal, and when this is done there is provided the effect of an undercut wall on the rim of the neck portion **14**.

With such organization the spun-in bead **44** and conical neck portion **14** are frictionally engaged by the lower edge of the inner wall portion or skirt **41** of the cap structure **34**, and such engagement is characterized by a snug fit, whereby the cap structure is firmly mounted on the container.

In addition to the snug frictional fit of the inner skirt **41** with the annular bead **44** of the valve assemblage **21**, there is provided by the present invention a novel and simple detent means on the skirt **41**, arranged to extend into the undercut of the bead **44**. As seen in FIG. 6, the inner skirt **41** has detent portions **46** which have been fused and displaced radially inward at the bottom edge of the skirt. Such portions may be formed by application of a heated tool to the skirt, to melt the plastic material thereof for a short axial distance, approximately one sixteenth of an inch or so. The inwardly displaced portions **46** may be made to snap over the annular bead **44** when the cap structure is initially applied to the container **10**. By such organization an interlocking effect is had, by which the retention of the cap structure on the container is made more secure.

The applying of the cap construction **34** is done, of course, with the push button **26** in place within the cap, as seen in FIG. 1, and it will be appreciated that prior to this operation the push button **26** will be retained in the cap against dropping out by the detent portions **46**, thus facilitating the aforesaid applying of the cap construction.

Preferably, in accordance with the invention the outer skirt or wall **40** is also arranged to engage and to abut the annular shoulder **16** of the container **10**, thereby to provide added stability to the mounting of the cap structure. It will be observed that the outer wall has an appreciable diameter, whereby the abutting engagement of the bottom edge of the said wall with the container shoulder **16** firmly positions the cap structure and prevents any tendency for the same to tilt or shift out of proper alignment or coaxial relationship with the container and valve stem **22**.

Extending radially inward of the inner annular wall **41** of the cap structure **34** is an inner peripheral portion **48** of the top wall **35** of the cap structure, said portion **48** being in the nature of a flange which is arranged to engage the body portion and external shoulder **50** on the depress button **26**, thereby to limit upward axial movement of the button. Disposed within the inner peripheral portion **48** of the cap top **35** there is a raised portion **52** of the button **26**.

It will be seen from FIG. 1 that the inner wall **41** of the cap structure constitutes a guide or bearing for the depress button **26**. A further or additional guide is provided for the depress button, especially the lateral projection or orifice portion **29** thereof, in the form of a cut **54** (FIG. 6) located in the inner annular wall or skirt **41** of the cap portion. The orifice portion **29** is accommodated in the said cut, as seen in this figure.

To strengthen and provide dimensional stability to the cap structure, two webs **56** are provided, extending between the outer wall **40** of the cap and the edges of the cut **54**.

It will be now understood that by this organization an effective guide is provided for the depress button **26** by the cap **34**, permitting vertical movement thereof and at the same time restricting any appreciable lateral or angular movement. The mounting of the cap **34** by means of the large-diameter wall portions **40** and **41**, providing great stability to the cap, makes for smooth operation of the button **26** constituting the valve actuator, inasmuch as these parts are prevented from becoming misaligned with respect to each other and the container **10**.

It will be further understood that in the above construction the depress button **26** and the cap structure **34** may be advantageously fabricated of a suitable plastic material or substance, as for example a thermoplastic synthetic formulation.

In accordance with the present invention, the access opening defined by the flange **48** of the cap **34** and the raised portion **52** of the depress button **26** are made to

have a special non-circular configuration and to closely fit each other, the configuration being such as to indicate one particular direction laterally of the cap, in which the spray will be directed. That is, the configuration is oriented with respect to the orifice **29** and so constituted as to indicate the location of the orifice, from which the aerosol substance will be discharged. As seen in FIG. 3, the configuration given to the access opening **49** and the raised portion **52** is characterized by a prominent projection **60** which is positioned immediately above or adjacent the orifice **29**. The said configuration may include a semi-circular portion **61** bounded by a circular edge **62** as seen in FIG. 3. By the provision of such generally non-circular configuration the user will be apprised of the location of the orifice **29**, and will immediately know the direction in which the spray will be discharged.

Further direction-indicating configurations may be utilized in place of that shown in FIG. 3. For example, the configuration of an arrow **63** is shown in FIG. 4. That is, the access opening in the cap and the raised portion of the depress button have similar, arrow-like shapes of substantially the same size.

In FIG. 5 an oval configuration **65** is shown, having a pointed end **66** which may be colored or otherwise shaded as indicated at **68** to attract the user's attention to the directional characteristic, indicating the direction of the spray.

Further, in accordance with the invention, a removable sticker or tab **70** having a pressure sensitive or equivalent adhesive may be applied to the expansive top surfaces of the cap and depress button, as shown in FIG. 5, the said sticker having certain information intended to be read by the user of the aerosol device. The sticker **70** may, for example, state that the aerosol device is "factory sealed." It may also have the instruction "removable tab" and may further carry the word "press," disposed above the center of the depress button to indicate the operation which is necessary to put the dispenser to use. The relatively large or expansive surfaces of the cap and depress button make it feasible and desirable to use such a sticker, as illustrated in FIG. 5.

It will now be understood from the foregoing that I have provided an improved valve actuator and-cap construction having a number of advantageous features. The said construction unmistakably and positively indicates in an attention-arresting manner to the user the direction of the spray as it will issue from the container. Also, it provides a large supporting surface for a removable seal, and enables an especially smooth and easy action of the valve to be had. The cap structure **34**, being normally fixedly carried by the container **10**, constitutes a reliable guard as well, to prevent inadvertent actuation of the valve and discharge of the contents of the container.

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. In an aerosol dispenser, a manually operable valve construction carried by a container, said construction including an upwardly extending, accessible and depressible actuating part having a side nozzle; and a fixed cap surrounding said depressible part and having a top wall provided with a recess to provide access thereto, said cap being mounted on the container and having guard portions surrounding said recess which are at least as high as the said depressible part to prevent accidental or inadvertent actuation of the part by contact with a broad-surfaced exterior object, and said cap having a pair of annular and concentric, spaced walls in the form of depending skirts at least one of which engages the container for support of the cap, said walls having aligned openings receiving the side nozzle of the actuating part and the top surfaces of the depressible part and of said top wall constituting substantially continuations of each other and together forming the top surface of the dispenser.

2. The invention as defined in claim 1, in which the inner of said annular walls has a cut in it the edges of which constitute a guide receiving the said nozzle.

3. In an aerosol device, in combination, a container having a dispensing opening and an undercut neck surrounding said opening; a valve actuator movably carried by the container and disposed at the said dispensing opening thereof; a depress button connected with said valve actuator and disposed beyond the neck of the container; and a molded plastic cap extending around said depress button and having a portion bordering the latter, said cap having a depending skirt defining a bore-like bearing for the button and terminating in an annular rim, said skirt surrounding and engaging the outside of the said neck portion of the container whereby the cap is supported thereby on the container, the rim of the skirt having a plurality of widely spaced fused and displaced detent portions engaged with the undercut of the neck to frictionally retain the cap in place, said detent portions preventing the button from dropping out of the bearing prior to assembly of the cap to the container.

4. In an aerosol dispenser, the combination of a manually operable valve construction adapted to be carried by a container, said construction including a molded plastic cap having a recess in its top; a valve-actuating button carried in said recess; cooperable bearing means on said button and cap, mounting the button for slidable operating movement with respect to the cap; and detent means on the cap and engageable with the button, including inwardly projecting portions of the cap, carried by the bearing means thereof and extending inwardly of said means, normally retaining the button in the cap against inadvertent removal therefrom while permitting the button to have its full operating movement.

5. In an aerosol dispenser, a manually operable valve construction carried by a container, said construction including an upwardly extending, accessible and depressible actuating part having a side projection provided with a discharge channel; and a fixed cap surrounding said depressible part and having an opening to provide access thereto, said cap being mounted on the container and having guard portions surrounding said opening which are at least as high as the said depressible part to prevent accidental or advertent actuation of the part by contact with the broad-surfaced exterior object, and said cap having a pair of annular and concentric, spaced walls in the form of depending skirts at least one of which engages the container for support of the cap, said walls having aligned side openings and said projection passing through at least one of the said two aligned openings.

6. The invention as defined in claim 5, in which the inner of the annular walls has a cut in it, the edges of which constitute a guide receiving the said projection, and in which there are webs joining the edges of the cut of the inner wall to the said outer wall.

References Cited in the file of this patent

UNITED STATES PATENTS

2,658,714	Fooshee	Nov. 10, 1953
2,693,983	Howell	Nov. 9, 1954
2,706,660	Johnson et al.	Apr. 19, 1955
2,761,594	Stroh	Sept. 4, 1956
2,811,289	Davis et al.	Oct. 29, 1957
2,966,283	Darvie	Dec. 27, 1960
2,969,895	Rucki	Jan. 31, 1961

Disclaimer

3,006,510.—*Philip H. Sagarin*, Bridgeport, Conn. AEROSOL CAP CONSTRUCTION. Patent dated Oct. 31, 1961. Disclaimer filed Apr. 12, 1963, by the assignee, *Valve Corporation of America.*

Hereby enters this disclaimer to claim 4 of said patent.

[*Official Gazette June 25, 1963.*]