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AEROSOL CAP AND BUTTON

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2 Sheets-Sheet 1

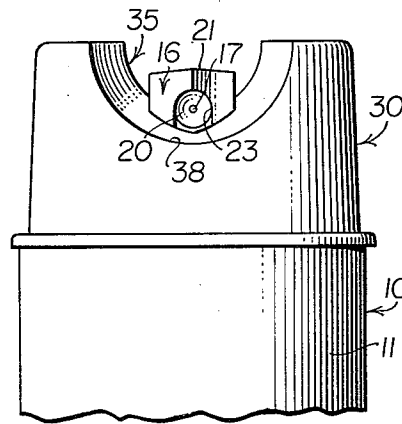
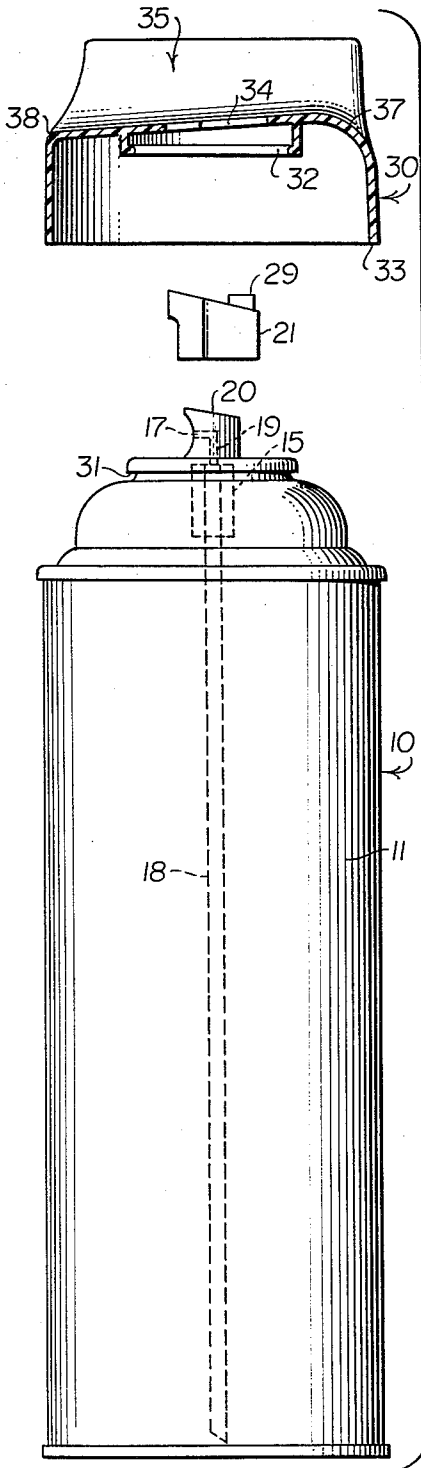


Fig. 2

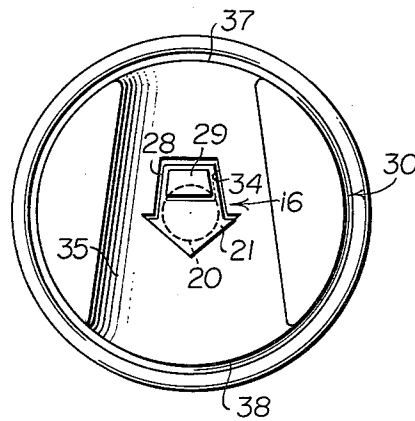


Fig. 3

Fig. 1

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Fig. 4

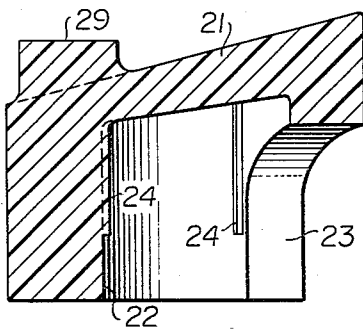
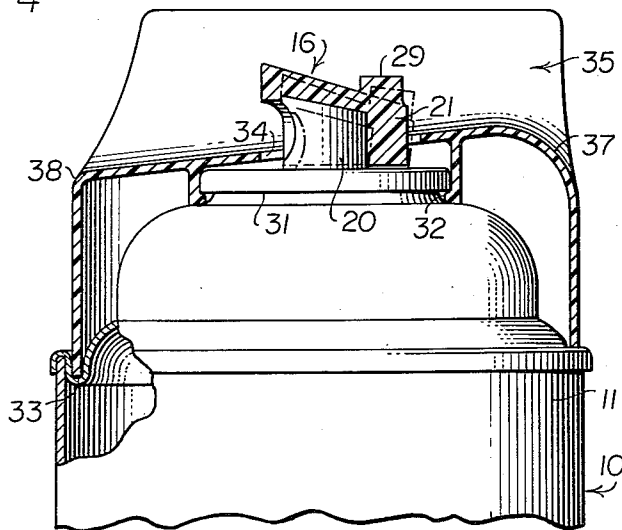


Fig. 5

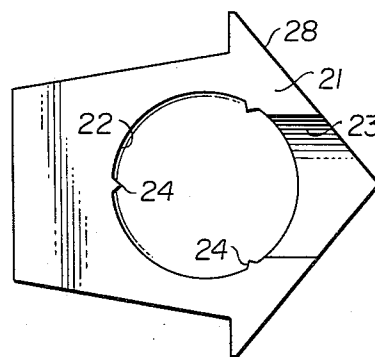


Fig. 6

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AEROSOL CAP AND BUTTON

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7 Claims. (Cl. 222-41)

This invention pertains to material dispensers and more particularly to that type of pressurized dispensers known as "aerosol cans."

In recent years so called aerosol cans have become widely known and have found wide application. These cans usually have a valve with an actuating mechanism at the top of the can. For shipping purposes and for protection against accidental use it is desirable to provide a protective cap which shields the valve actuating mechanism.

In the past these caps have taken a wide variety of forms made out of either plastic or metal. The present invention is primarily directed to a plastic cap.

Prior proposals for caps for aerosol cans have customarily provided some dome-like member which is selectively and removably secured to the top of the can. The cap must be removed before the device can be used.

Removable caps have several inherent disadvantages. They are easily lost. They are easily damaged, especially if they accidentally fall off the can. They are also susceptible to fatigue, especially if made of plastic. After repeated removal and return they tend to become very insecure in their attachment and because of this insecurity highly susceptible to loss and damage.

For these reasons the present invention has as one of its principal objects the provision of an aerosol cap which is permanently connected to the can and which at the same time shields the valve mechanism while permitting facile valve operation.

With previous valve actuating mechanisms discernment of the direction of the vapor emitting port of the valve is not always an automatic thing to the casual observer. It is quite a simple matter to spray oneself with the liquid because the port is directed in the wrong direction.

For these reasons another object of the invention is to provide a cap for an aerosol can, which cap is equipped with a finger receiving recess shaped to a contour which causes the operator to automatically properly grasp the can prior to valve actuation.

To facilitate this assurance of directing the fluid in the proper direction an actuation button is provided for the usual valve actuating member. This button becomes a permanent part of the actuating member. The button fits in a suitable aperture provided in the cap. In the preferred arrangement the actuation button and the cap recess are both shaped in the form of an arrow pointing in the direction of the dispensing port.

It is then, an additional object of this invention to provide an auxiliary, or integrally formed, valve actuating member in the shape of an arrow to indicate the direction of liquid dispensing.

With previous valve actuating members the member is often so shaped and positioned that an emitted stream of fluid will strike a lip of the container cover which surrounds the valve member creating an undesirable fluid collection on the top of can and wasting the dispensed fluid. With the present invention this previous disadvan-

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tage is overcome through the provision of a raised tab formed rearwardly at the top of the valve member cover. Depression of the button will cause simultaneous valve opening and rearward tilting of the button so that the emitted spray always is directed upwardly to miss the can and cover.

This free dispersion of liquid is further facilitated by shaping the finger-receiving recess formed in the cap so that it flares outwardly and downwardly toward the front of the cap.

For these reasons another object of the invention is to provide a novel and improved cap and valve actuating member for an aerosol can which assures proper dispersion of a liquid stream without striking any portion of the dispensing mechanism.

Another object of the invention is to provide a novel and improved cap and valve actuating button which are easily and permanently connectible to an aerosol can and which are so designed and constructed to be readily connected to "standard" styles of production aerosol cans.

An additional object of the invention is to provide a cover of a valve actuating button which cover is formed of a material that is harder than the stem member and which cover includes inwardly directed ribs which bite into the surface of the stem member to rigidly connect the two together and maintain the outlet port in aligned relationship with a dispensing arch formed in the cover.

An additional object of the invention is to provide a cap and valve actuating button which is connected together for free relative axial movement and in a manner which provides relative rotative movement so that rotation of one will cause rotation of the other to maintain the two in a properly indexed relationship.

A more special object of the invention is to provide an aerosol cap with the previously described finger recess formed in the shape of a segment of a cone to strengthen the cap and thereby provide an extremely strong and rigid plastic cap made with a minimum of material.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a side elevational exploded view partially in section of a pressurized container, a cap, and valve actuation button;

FIGURE 2 is a foreshortened front elevational view of the top of a pressurized container with the cap and actuation button in place;

FIGURE 3 is a top plan view of a pressurized container with the cap and valve actuation button in place;

FIGURE 4 is a sectional view on an enlarged scale with respect to FIGURES 1 through 3 through the cap and valve actuation button and a portion of the vessel showing the actuation position of the button in phantom;

FIGURE 5 is a detailed sectional view on an enlarged scale with respect to FIGURES 1 through 4 of the valve actuation button cover portion; and

FIGURE 6 is a top view on the scale of FIGURE 5 of the valve actuation button cover portion.

Referring now to the drawings, a pressurized container is designated generally at 10. The pressurized container includes a material containing vessel 11 and a valve mechanism 15. The valve mechanism 15 includes the

usual dip tube 18. The tube extends into the vessel 11 to conduct the material to an outlet.

The valve mechanism 15 has a valve actuation button 16 which projects above the top of the vessel 11. The actuation button includes the mentioned outlet in the form of a material discharge port 17. The discharge port 17 is oriented about normal to the axis of the vessel 11 when in its closed position. The button also includes an axially disposed passage 19 which connects the dip tube 18 with the discharge port 17.

If desired the button 16 may be a unitary structure. To facilitate ready modification of presently available commercial structures the preferred and disclosed embodiment includes a stem portion 20 and cover portion 21. The cover portion 21 is formed separately from the stem portion 20 preferably of a high density polyethylene. The stem portion 20 is preferably low density polyethylene. The cover portion 21, as is best seen in FIGURES 5 and 6, includes a stem receiving slot 22 which fits over the stem portion 20. The cover portion 21 is formed with a plurality of axially extending ribs 24 projecting into the stem receiving slot. The high density polyethylene ribs 24 on the cover portion dig into the low density polyethylene stem portion to fix the two together and provide, in effect, a unitary structure.

The cover portion 21 has a discharge arch 23. The arch is positioned around the discharge port 17 to provide communication between the port 17 and the atmosphere.

The top of the valve actuation button 16 is formed in the shape of an arrowhead, designated generally by the number 28. The arrowhead 28 is oriented to point in the direction of discharge from the dispensing port 17. With such an arrangement the direction of discharge from the dispensing port 17 is quickly and easily discernible, and the possibility of a user orienting the dispensing port 17 in the wrong direction is greatly reduced, and in most cases eliminated by a cursory glance at the button.

The valve actuation button 16 has a finger tab 29 formed on its top. The finger tab projects above the surface of the arrowhead 28 and is spaced from the axis of the button 16 and from the point of the arrow. As thus positioned a pressure on the finger tab 29 will cause the button 16 to move both reciprocally along its axis and at the same time tilt slightly backwards raising the angle of the discharge port with respect to a plane normal to the axis of the body 11. The reason for such tilting will be described presently.

The actuation button 16 of the valve mechanism is constructed to permit an aerosol discharge from the port upon its downward reciprocal movement and associated tilting movement. The tilting movement is provided by the inherent resiliency of a portion of the valve assembly. Since the finger tab 29 is spaced from the axis of the valve mechanism, pressure on the tab will cause both axial and tilting movement. The actuation button with the discharge end moved axially and tilted is shown in phantom in FIGURE 4.

The container 10 is provided with a cap 30, preferably formed of high density polyethylene. The cap 30 includes an annular locking flange 32 which engages an annular shoulder 31 formed on the vessel 11, FIGURES 1 and 4. The cap 30 also includes an annular bottom rim 33 which is loosely positioned in an annular recess in the cover of the container 10, FIGURE 4. The cap 30 is forced into locked engagement with the body 10 by exerting a force on the cap 30 to cause resilient deformation around the area of the flange 32. The flange 32 snaps into locking engagement with the annular shoulder 31. As thus positioned, the cap 30 can rotate a full 360° but is constrained from axial movement.

A through aperture 34 is formed in the cap 30 and the actuation button 16 projects through it. The aperture 34 is shaped to the configuration of the button 20. Thus, with the arrow-shaped button 20 the cap has an arrow

shaped hole designed to coact with the button and prevent rotation between the two to maintain the two properly oriented.

The cap 30 has a generally frustoconically shaped finger recess 35. The recess 35 is positioned such that the walls 36 defining the recess 35 shield the valve actuation button 16 and project higher than the top of the button. The recess 35 extends from a rounded backwall 37 to an angular frontwall 38 and is outwardly and downwardly flaring generally in the direction that the dispensing port 17 is oriented.

Thus the cap provides protection against discharge by unintentional or accidental actuation of the valve mechanism. Yet, while affording this protection the dispensing need is readily available for intentional use. No cover need be removed to ready the container for use.

Another outstanding feature of this invention is that the cap 30 provides a natural and normal grasping position for the discharge of the material in the container in the intended direction. The rounded backwall 37 forms a smooth and natural feeling finger rest on which the finger of the user normally rests with comfort and ease. On the other hand, the angled front wall 38 and the outwardly and downwardly flaring recess at that end provides an awkward and uncomfortable gripping position for the finger of the user to actuate the mechanism. The natural tendency of the user, when grasping the container, will be to grasp it such that the finger enters the recess 35 near the rounded backwall 37 and rests in the recess while the tip of the finger rests on the finger tab 29. As thus grasped, the dispensing port 17 is oriented away from the hand of the user with the arrow 38 pointing away from the hand of the user and indicating such a direction of discharge. The user will then spray in the intended direction, and not in his own face.

Additionally, this construction of the cap produces a very strong structure. The recess provides, in effect, a reinforcing rib which resists breaking and cracking of the cap.

As was described above, pressure on the finger tab 29 will cause the actuation button 16 of the valve mechanism 15 to move reciprocally along its own axis and also tilt the dispensing port 17 to an angle with a plane normal to the axis of the vessel 11. The material being discharged through the dispensing port 17 will be dispensed in generally a cone-shaped configuration. The tilting of the button 16 directs this cone-shaped configuration of dispensed material away from the cap 30 or other part of the pressurized container. Because of the outwardly and downwardly flaring, frusto-conically cone-shaped configuration of the cap 30 and the tilting of the button 16, the dispensed material from the pressurized container will not impinge against the cap 30 and be lost from its intended use.

As thus formed, a pressurized container is provided which has a valve mechanism and cap which readily and naturally tends to prevent operator error in spraying and in which the dispensing end of the valve mechanism is protected against accidental discharge.

Although the invention has been described with a great deal of particularity, it is believed that it essentially comprises a pressurized container having a valve actuator mechanism which moves axially and tiltably into a discharge position and which mechanism is formed with a visual indicator to quickly indicate the direction of discharge, and in which the valve mechanism is partially enclosed in a cap which protects the valve from accidental actuation and permits an unrestricted dispensing of the material from the container.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to

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without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A pressurized container comprising, a material containing vessel, a material dispensing valve assembly in communication with the interior of said vessel, said valve assembly having a resilient portion and an actuation button above the portion, said button projecting from the top of said vessel, said button including a discharge port oriented substantially transversely to the axis of the valve assembly, said valve mechanism being reciprocally movable along its axis, said button including a finger tab, said finger tab being spaced from the axis of said valve assembly, said finger tab including a surface on a side of the axis of the valve assembly remote from the discharge port, and a cap carried by said vessel, said cap having a finger recess formed therein and surrounding said actuator button, said button and said discharge port being disposed above the surrounding bottom portions of said recess, said recess flaring generally outwardly and downwardly in the direction of orientation of the discharge port, said cap and said button being formed with cooperating surfaces which prevent relative rotation so as to maintain said discharge port of said button in said direction of orientation, said cap including an endless side wall, said recess extending centrally across the top of said cap and intersecting said side wall, said valve assembly being actuatable upon reciprocal and tilting movement of said button whereby when a force is applied to said finger tab said actuation button assembly moves axially and tilts to dispense material from the vessel.
2. In combination with a pressurized container having an actuating stem projecting therefrom and an outlet opening, a cover for said stem comprising:
 - (a) a molded one piece member having walls defining a longitudinally disposed bore extending from the bottom of the cover to a termination spaced from the top thereof;
 - (b) said cover having a transverse opening extending through said wall and communicating with the bore;
 - (c) said stem being telescoped into the bore and the openings being aligned and in communication with one another; and
 - (d) said cover including means maintaining the cover telescoped over the stem and locking said cover and stem against relative movement.
3. In combination with a pressurized container having an actuating stem projecting therefrom and an outlet opening, a cover for said stem comprising:
 - (a) a molded one piece member having side walls and a top wall defining a longitudinally disposed bore extending from the bottom of the cover to a termination spaced from the top thereof;
 - (b) said cover having a transverse opening extending through said side walls and communicating with the bore;
 - (c) said stem being telescoped into the bore and the openings being aligned and in communication with one another;
 - (d) said side walls including a plurality of longitudinally extending circumferentially spaced teeth projecting inwardly and engaging said stem whereby to maintain the stem and cover telescoped together to prevent relative movement; and
 - (e) a finger tab projecting above said top wall,
 - (f) said finger tab being laterally offset from the longitudinal axis of said stem.
4. In combination, a pressure container including a dip tube, a button stem on one end of said dip tube above said container, said stem having a transverse outlet opening, and a button cover for said stem, said cover comprising a molded one-piece member having side walls and a top wall, said side walls and top wall defining

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a cavity substantially the shape of said stem, said stem being disposed in said cavity, said side walls having an arch-like opening terminating below said top wall, said arch-like opening being positioned around said outlet opening, said cover including means locking said cover and said stem against relative movement, and a finger tab projecting above said top wall, said tab being offset laterally from the longitudinal axis of said stem and at the edge of said cover opposite said arch-like opening.

5. The combination as claimed in claim 4 wherein said cover has an arrow-shaped configuration, the point of said arrow-shaped configuration being located over said arch-like opening.

6. A pressurized container comprising:

- (a) a vessel;
 - (b) a valve assembly,
 - (c) said valve assembly including a stem projecting above said vessel and having a transverse discharge outlet,
 - (d) a one-piece cover surrounding said stem,
 - (e) said cover including means locking said cover and stem against relative movement,
 - (f) said cover having a side opening registering with said discharge outlet,
 - (g) a finger tab on the top of said cover off-set laterally from the longitudinal axis of said stem; and,
 - (h) a cap for said container,
 - (i) said cap including an endless tubular side wall projecting upwardly from the top of said container in axial alignment therewith,
 - (j) connection means attached to said side wall and securing said cap to the container while permitting relative rotation thereof,
 - (k) a top wall peripherally connected to said side wall including an elongated recess extending thereacross,
 - (l) means within said cap defining an axially disposed opening communicating with said recess,
 - (m) said one-piece cover and stem extending through said axially disposed opening so that said discharge outlet is above the bottom of said recess,
 - (n) said recess being disposed generally symmetrically about a plane located by the axis of said outlet and the container axis such that said recess extends from a front intersection to a back intersection with said tubular side wall,
 - (o) said recess flaring upwardly on either side of said plane above said cover,
 - (p) said recess being canted with respect to the container and cap axis so that one of said intersections is closer to said container top than the other and so that said front intersection is below said back intersection; and,
 - (q) said cap and said cover including coating surfaces preventing relative rotation while permitting relative reciprocation.
7. A pressurized container comprising:
- (a) a vessel;
 - (b) a valve assembly,
 - (c) said valve assembly including a stem projecting above said vessel and having a transverse discharge outlet,
 - (d) a cover in surrounding engagement with said stem,
 - (e) said cover having a side opening registering with said discharge outlet; and
 - (f) a cap for said container,
 - (g) said cap including an endless tubular side wall projecting upwardly from the top of said container in axial alignment therewith,
 - (h) a top wall peripherally connected to said side wall and including an elongated recess extending thereacross,
 - (i) said recess being disposed generally symmetrically about a plane located by the axis of said outlet and the container axis and extending from a front

- intersection to a back intersection with said tubular side wall,
- (j) said recess flaring upwardly on either side of said plane,
- (k) said recess being canted with respect to the container and cap axis so that one of said intersections is closer to said container top than the other and so that said front intersection is below said back intersection; and,
- (l) said top wall of said cap having an aperture through the bottom of said recess,
- (m) said cover and said stem extending through said aperture above the surrounding bottom portions of said recess.

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