

[72] Inventors **Derek Bernard Green**
Bedford, N.H.;
Gordon Edwin Kaye, South Salem, N.Y.

[21] Appl. No. **807,618**

[22] Filed **Mar. 17, 1969**

[45] Patented **May 11, 1971**

[73] Assignee **Scovill Manufacturing Company**
Waterbury, Conn.

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Primary Examiner—Donald F. Norton
Attorney—Dallett Hoopes

[54] **AEROSOL VALVE ACTUATOR AND CAP COMBINATION**
4 Claims, 6 Drawing Figs.

[52] U.S. Cl.....**222/402.13,**
222/402.23

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

[50] Field of Search.....**222/402.13,**
402.21, 402.22, 402.23

ABSTRACT: An aerosol valve actuator button is held in preliminary assembly with an overcap so that the button is maintained correctly oriented with respect to features of the cap intended to restrict the operation of the button to one direction only. In the preliminary assembly, the button is in a raised position allowing the cap to be fitted to the container without engaging the valve stem. Downward movement of the button will snap it out of the retaining portion of the cap and seat it on the valve stem.

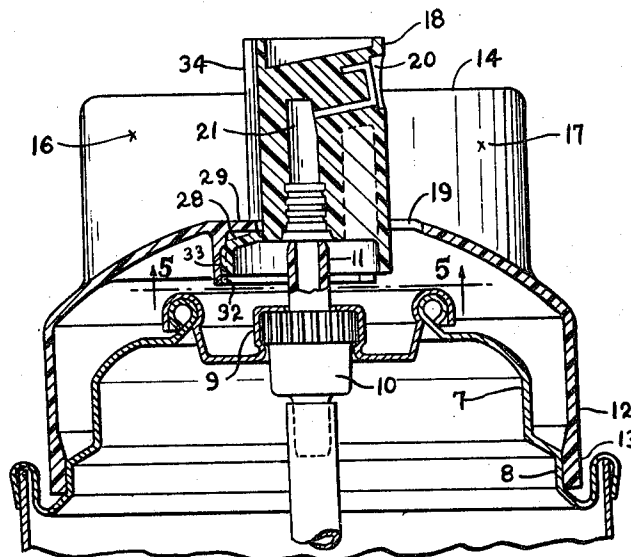


Fig. 1.

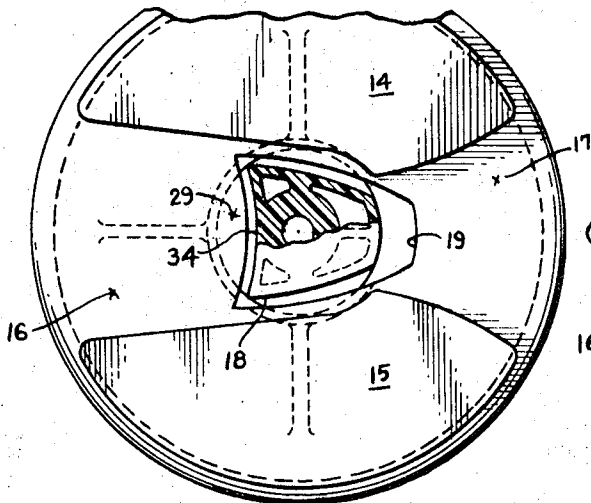


Fig. 4.

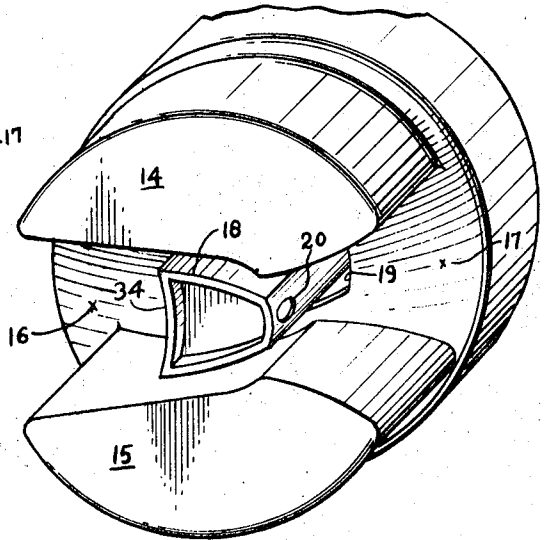


Fig. 2.

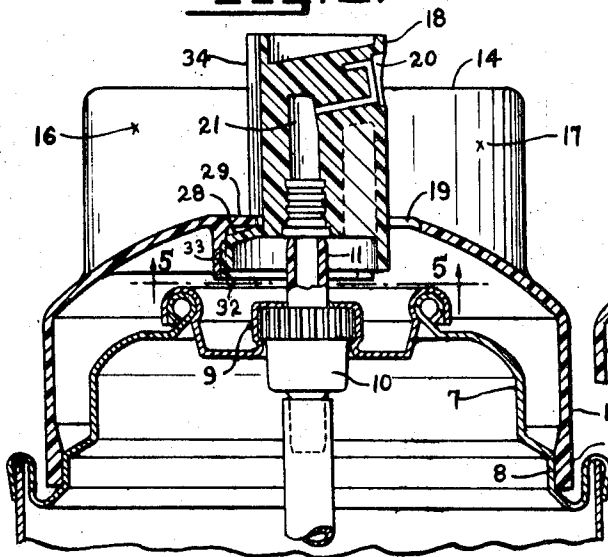


Fig. 3.

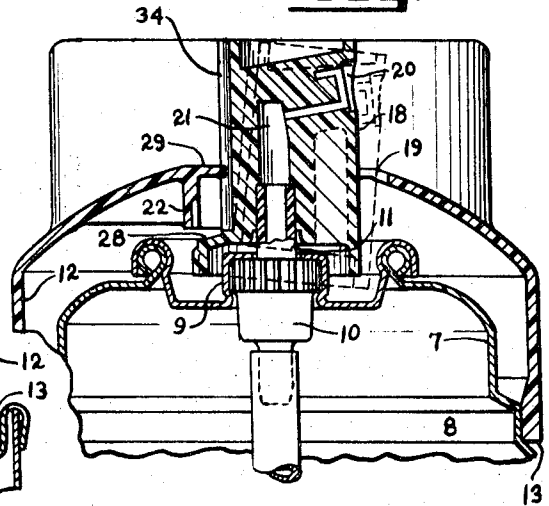


Fig. 5.

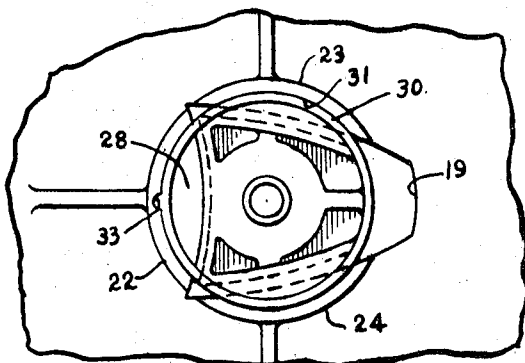
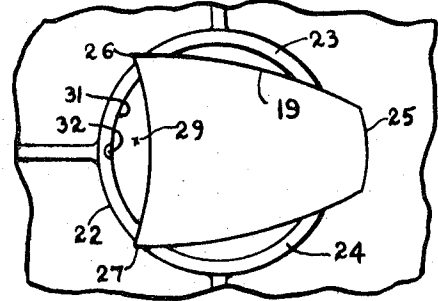


Fig. 6.



INVENTORS
Derek B. Green
Gordon E. Kaye and
BY *Dallas Hooper*
ATTORNEY

AEROSOL VALVE ACTUATOR AND CAP COMBINATION

This invention relates to an overcap and actuator button combination for aerosol valves and is intended primarily for use with a tilt action valve.

The cap includes means for holding the actuator button in position prior to assembly with the container and properly oriented with certain features of the cap which are intended to restrict operation of the button to one direction only. This eliminates the need on the part of the filler for orienting the button and overcap and reduces the final assembly operations from two to one because it is necessary only to engage the outer peripheral wall of the cap on the container.

In the preliminary assembly, the button is held in the cap in a raised position so that it can be fitted to the container with the actuator held immediately above the valve stem. To initiate operation, it is necessary only to push the button down to snap it out of the retaining portion of the overcap and simultaneously seat it on the valve stem. After the button is so released from the cap, it projects through a hole in the top wall of the cap but it is no longer attached to the cap in any way.

Another object of the invention is to maintain the button and cap properly oriented in the preliminary assembly with respect to the finger engaging recess in the top wall of the cap and with respect to the irregularly-shaped hole in the cap so that after release from the cap the actuator can move only in one direction. This, of course, is a safety feature to prevent accidental opening by pressure applied to the orifice side of the button which might lead to possible injury to the operator.

Other objects and advantages of the invention will hereinafter more fully appear. In the accompanying drawings, I have shown for purposes of illustration, one embodiment which the invention may assume in practice. In these drawings:

FIG. 1 is a top plan view of the button and cap combination partially in cross section;

FIG. 2 is a central vertical section showing the preliminary assembly as first fitted to an aerosol container;

FIG. 3 is also a central vertical section showing the button in position for valve operation;

FIG. 4 is a perspective view looking at the top of the cap and button;

FIG. 5 is a cross section on line 5-5 of FIG. 2; and

FIG. 6 is a bottom plan view of the central portion of the cap only.

The top part 7 of an aerosol container adapted to receive my improved cap and button combination has a wall portion 8 for holding the cap and a pedestal portion 9 for holding an aerosol valve 10. These parts may be of conventional construction, it being understood that the valve is of the type adapted to be operated by a tilt action of the hollow valve stem 11.

The cap which is molded from plastic material has an outer peripheral wall 12 with a bead 13 which fits tightly around the wall portion 8 of the container to hold the cap permanently in place. The top wall of the cap has flat portions 14 and 15 flanking a pair of recesses 16 and 17. The recess 16 is of sufficient dimensions to accommodate the finger of an operator but the recess 17 is somewhat narrower, intended to prevent normal access by a finger but sufficient to allow lateral flow of the material when the valve is opened. An actuator button 18 projects upwardly through a hole 19 in the cap and in the preliminary assembly shown in FIG. 2, the button is in a raised position extending above the flat wall sections 14 and 15. The button 18 has a side delivery orifice 20 and a vertical bore 21 into which the valve stem 11 is adapted to fit in fluidtight engagement.

The actuator cap has means to hold the actuator button in a preliminary assembly as seen in FIGS. 1, 2 and 5. The retaining portion of the overcap is in the form of three depending flange segments 22, 23 and 24 in cylindrical arrangement around the hole 19 which extends vertically through the cap. As seen in the bottom plan view of FIG. 6, this hole is somewhat pear-shaped with its forward end 25 as well as the

rear, corner portions 26 and 27 cutting through or extending between the three flange segments 22, 23 and 24. The button 18 has a laterally extending portion 28 which projects under the depressed portion 29 of the top wall of the cap. The portion 28 has a cylindrical outer surface 30 which is sized to fit tightly within the interior cylindrical surfaces 31 of the flange segments 22, 23 and 24. The engagement between the vertical cylindrical surface of the portion 30 of the button and the flange segments on the cap can be solely friction, or there may be provided a bead around the bottom edges of the flange segments so that the cylindrical portion 30 of the button may be snapped into or out of place. In order to maintain the button in proper orientation with respect to the cap, at least one of the retaining flange segments on the cap is provided with a vertical groove 32 cooperating with a vertical bead 33 on the button.

The forward end 25 of the hole 19 through the cap, provides a substantial clearance on the orifice side of the button as can be plainly seen in FIGS. 1 and 2. This will accommodate the required lateral movement seen in FIG. 3 in dotted lines, to operate the tilt action valve when lateral force is applied by a finger in the recess 16 against the vertical back face 34 of the button. This face 34 is preferably concave and the hole 19 is shaped so that there is only a small clearance between the face 34 and the cap, on the side of the button opposite the orifice 20, so that the cap wall portion 29 acts as a stop to prevent opening of the valve if lateral pressure is accidentally applied against the orifice side of the button.

The subassembly of the cap and button held together as above described, can be applied to the container by the filler with the button in proper orientation in relation to the hole 19 and the recesses 16 and 17, and with the button out of contact but in vertical alignment with the valve stem 11. After the container is filled, the filler places the preassembly on the container and then pushes down the button 18 to snap it away from the cap and simultaneously seat it on the valve stem. This position is shown in FIG. 3 in full lines and the dotted lines indicate the position of the button when the valve is open.

We claim:

1. In combination:
 - a. an aerosol container having a valve stem projecting therefrom;
 - b. a cap having an outer peripheral wall provided with means for securing the cap to said container, said cap having a top wall with an opening extending vertically therethrough;
 - c. an actuator button having a side delivery orifice and a vertical bore into which said stem is adapted to fit, said button projecting through said hole in the cap and having a portion which extends laterally below said top wall, said laterally extending portion having a vertical outer cylindrical surface;
 - d. means for retaining said actuator button in a preliminary assembly with said cap in such position that when said cap is initially fitted to the container, said valve stem will be aligned with said vertical bore but out of contact with the button; said means comprising flange means depending from said top wall in frictional engagement with said cylindrical outer surface of the button; and
 - e. interfitting vertically extending rib and groove means on said flange means and cylindrical surface to maintain the desired orientation of said button with respect to the cap.
2. The combination defined in claim 1 wherein said flange means is a plurality of flange segments in cylindrical arrangement said segments being adapted to grip around a major portion of said vertical outer cylindrical surface of the actuator button and wherein said vertically extending hole in the cap is of noncircular shape with some portions of the hole extending between said flange segments.
3. The combination defined in claim 1 wherein said top wall of the cap is shaped to provide:
 - a. a radially outwardly opening recess on that side of said button opposite said orifice, said recess being of sufficient

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- dimensions to accommodate a finger for lateral thrust against said button; and
 - b. a radially outwardly opening recess on the orifice side of the button which is narrow enough to prevent normal access by a finger to the orifice side of the button.
4. The combination defined in claim 3 wherein said opening

in the cap is so sized and shaped in relation to the button as to prevent any substantial lateral movement of the button such as is required for the tilt actuation of said valve stem except in the direction of said side delivery orifice.

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