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G. A. SCHROEDER

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AEROSOL CONTAINER AND CAP THEREFOR

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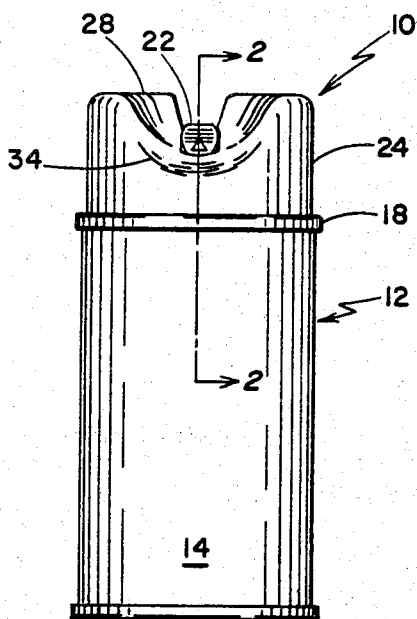


FIG 1

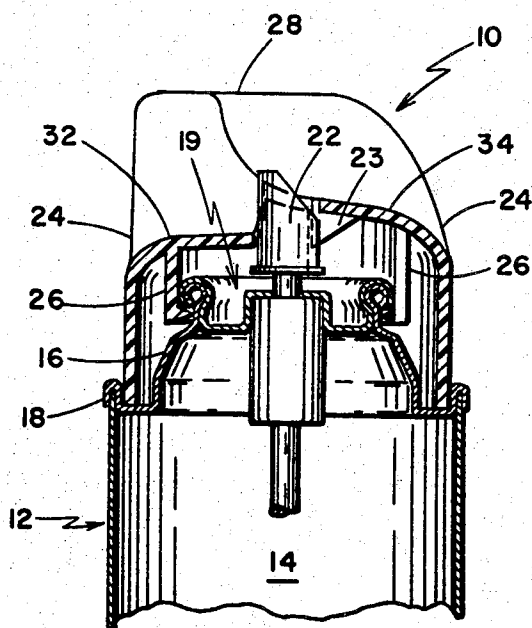


FIG 2

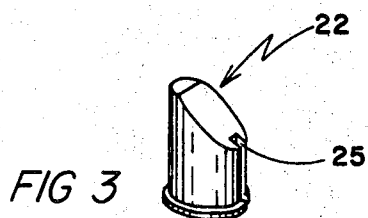


FIG 3

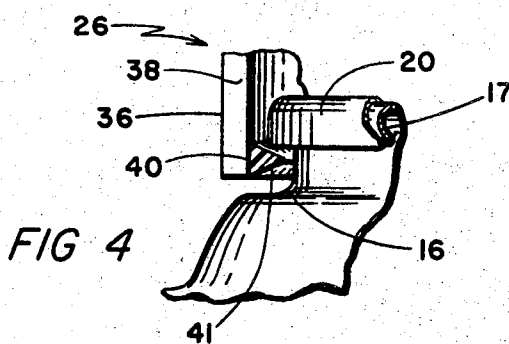


FIG 4

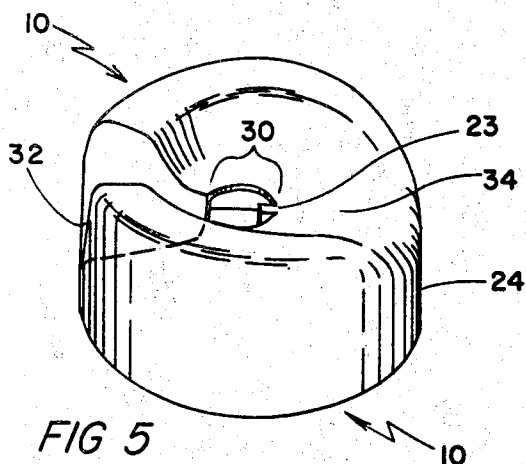


FIG 5

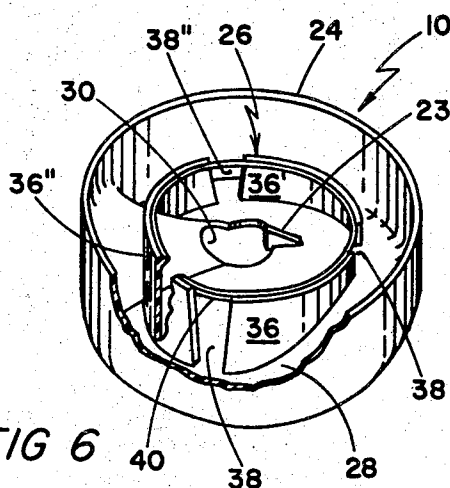


FIG 6

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**AEROSOL CONTAINER AND CAP THEREFOR**  
George A. Schroeder, Addison, Ill., assignor to The  
Gillette Company, Boston, Mass., a corporation of  
Delaware

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## ABSTRACT OF THE DISCLOSURE

A protective cap for an aerosol-type container comprising a generally circular top portion, a cylindrical skirt having one end secured to the top portion and extending downwardly therefrom, and a continuous, radially inwardly projecting annular rib secured to the skirt adjacent the free end thereof, the skirt including a plurality of slots extending radially through the skirt wall and longitudinally from the top portion of the cap to the rib.

This invention relates to protective caps for pressurized fluid containers and pertains more specifically to caps arranged to be permanently mounted on conventional containers.

It is a primary object of the present invention to provide a protective cap which is adapted to be permanently affixed to the top of an aerosol-type container in position for protecting the valve thereof against accidental discharge and which does not require removal from the container in order to put the container to use. Other objects include providing a cap which is relatively easy to affix to the container as part of a normal manufacturing process without change in the construction of the container, but which is very difficult to remove therefrom, and which has an outer side wall forming an upward projection of the side wall of the container so that the cap-container assembly presents a pleasing overall appearance.

The invention features a generally cup-shaped, synthetic plastic cap comprising an inner substantially cylindrical, longitudinally slotted, depending side wall or skirt extending downwardly from a top portion of the cap. A continuous, radially inwardly projecting, circular rib is secured to the bottom or free end of the skirt in position for engaging the circumferential bead of a conventional aerosol-type container adjacent the outlet. Preferred embodiments of the invention feature a substantially cylindrical outer side wall having a diameter substantially equal to the outside diameter of the container, and a partially-recessed top portion to facilitate activation of the container's valve and discharge of the pressurized fluid therefrom.

Other objects, features and advantages will appear from the following detailed description of a preferred embodiment of the invention, taken together with the attached drawings, in which:

FIG. 1 is a side elevation of a cap and container constructed according to the present invention;

FIG. 2 is a view in section taken along line 2-2 of FIG. 1;

FIG. 3 is an isometric view of the valve actuator,

FIG. 4 is a view broken away and in section on an enlarged scale similar to FIG. 2;

FIG. 5 is an isometric view of the exterior of the cap; and

FIG. 6 is an isometric view, partly broken away and in section, showing the bottom side of the cap.

Referring more particularly to the drawings, there is shown in FIGS. 1 and 2 a protective cap, generally designated 10, secured in position on the top of a conven-

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tional, aerosol-type, pressurized fluid container 12. Container 12, which is typically made of sheet metal, comprises a substantially cylindrical side wall 14 and a generally conical wall or neck portion 16 secured at its base to side wall 14 forming an annular shoulder 18 and extending upwardly therefrom. The upper end of conical neck portion 16 terminates in a mouth-defining, outwardly rolled annular bead 17 to which is secured the valve assembly 19 spanning the mouth of container 12. The valve assembly is secured within the mouth with its outwardly and downwardly projecting annular lip 20 overlying bead 17 to form a permanent part of the finished container; it includes a conventional upstanding, depressably operable valve actuator 22 through which the spray is delivered.

Cap 10 comprises a pair of spaced, concentric, substantially cylindrical side walls or skirts, designated outer skirt 24 and inner skirt 26, secured to and extending downwardly from a generally circular top portion 28. Outer skirt 24 extends a substantial distance beyond the bottom end of inner skirt 26 and seats upon neck portion 16 of container 12 adjacent its juncture with outer wall 14. The diameter of outer skirt 24 is substantially equal to the diameter of cylindrical outer wall 14 of the container so that outer skirt 24, in effect, forms a continuation of cylindrical wall 14, thereby presenting a cap-container assembly having a pleasing, continuously cylindrical appearance. Inner skirt 26 extends downwardly from top portion 28 to frictionally engage annular lip 20 and fixedly secure cap 10 to the valve assembly and container. Valve actuator 22 extends upwardly through a circular aperture 30 substantially in the center of top portion 28 of cap 10. Segments of top portion 28 on opposite sides of opening 30, designated 32 and 34 respectively, are recessed so that actuator 22 may be depressed and spray or liquid dispensed with cap 10 in place on top of container 12. Actuator 22 and cap 10 may be keyed to each other by means of key 23 and keyway 25 to permit ready mounting of the cap on the container and ready axial movement of the actuator in use while at the same time ensuring that the spray nozzle in the left side of actuator 22, as seen in FIG. 2, remains properly oriented with respect to the recessed portions of the top of the cap. Typically, cap 10 is formed of a tough, hard, extensible, organic plastic material such as polypropylene or polystyrene.

The construction of inner skirt 26, which includes the novel means for permanently engaging the cap and container, is shown in greater detail in FIGS. 4 and 6. As there illustrated, skirt 26 comprises a plurality of circumferentially spaced, axially-extending wall portions 36, 36', 36'' separated and partially defined by a plurality of intermediate, longitudinal slots 38, 38', 38''. Each slot extends radially through the wall of cylindrical skirt 26 and longitudinally (axially) from adjacent top portion 28 of cap 10 to the bottom or free end of skirt 26. A continuous, ring-shaped rib 40 is integral with the inner cylindrical wall surface of skirt 26 adjacent the free end thereof. Rib 40 provides a continuous projection, extending radially inwardly from the circumferential wall portions of skirt 26 in position for snapping over, and securely engaging the lower margin of lip 20. Rib 40 is provided with a lower surface 41 which slopes inwardly and upwardly, serving as a cam surface to engage the upper rounded surface of lip 20 when the cap is applied and to force the rib 40 to elongate in order to pass over the metal lip 20 in response to a downwardly directed force applied axially of the cap and container to the top portion of the former.

In practice, cap 10 is secured to container 12 in one of the final steps in the assembly's manufacturing process. The cap is made from a sufficiently resilient and extensible

material so that, by the simple application of axially-directed force to the top of the cap, rib 40 can be snapped over lip 20 to engage the underside of the lip as shown in FIGS. 2 and 4. Recesses 32 and 34 in the top portion of cap 10 make it unnecessary to remove the cap to depress valve 22 to discharge fluid from container 12. Although slots 38, 38', 38'' in the wall of skirt 26 insure the extensibility of rib 40 necessary to snap the cap into position during the manufacturing and assembling process, the fact that rib 40 is a continuous annulus requiring the application of substantial force to elongate it sufficiently to pass over the projecting part of lip 20, together with the fact that lip 20 has an abrupt lower edge and that outer skirt 24 is a smooth cylinder which cannot readily be grasped in order to exert a pulling force to separate it from the container, makes it extremely difficult for the cap to be removed from the container once it has been applied.

Other embodiments will occur to those skilled in the art and are within the following claims.

What is claimed is:

1. A synthetic plastic protective cap for an aerosol-type container comprising:

a generally circular top portion;

a generally cylindrical skirt having one end secured to said top portion and extending downwardly therefrom; and,

a continuous, extensible, radially inwardly projecting, annular rib secured to said skirt adjacent the free end thereof for engaging an outwardly extending lip on said container,

said skirt including a plurality of circumferentially spaced slots, each of said slots extending radially through the wall of said skirt and longitudinally from adjacent said top portion of said cap to the free end of said skirt.

2. The cap of claim 1 including a second generally cylindrical skirt having a greater diameter than said slotted skirt, secured on said top portion of said cap in substantially concentric relationship with said slotted skirt, and extending downwardly from said top portion beyond said free end of said slotted skirt and adapted to seat on the upper end of said container.

3. The cap of claim 1 in which said rib has a continuous lower face sloping inwardly and upwardly toward said top portion.

4. In combination, a pressurized container comprising: a substantially cylindrical outer wall;

a generally conical neck portion secured to and extending upwardly from said outer wall and terminating in a valve assembly having an outwardly and

downwardly projecting annular lip and including an upstanding valve actuator;

a protective cap for protecting said valve actuator from accidental actuation; said cap comprising

a generally circular top portion having an aperture through which said actuator extends,

a cylindrical skirt secured at one end thereof to said top portion and extending downwardly from said top portion, and

a continuous, extensible, radially inwardly projecting, annular rib secured to said skirt adjacent the free end thereof,

said rib engaging the underside of said annular lip to secure said cap in position on said container,

said skirt including a plurality of circumferentially-spaced slots, each of said slots extending radially through the wall of said skirt and extending longitudinally from adjacent said top portion of said cap to the free end of said skirt.

5. The combination of claim 4 in which said annular lip of said container is outwardly and downwardly rolled and in which said continuous rib has a lower surface sloping inwardly and upwardly toward said top portion to facilitate expansion of said rib to pass over said lip when said cap is subjected to a downwardly directed axial force applied to its top portion.

6. The combination of claim 5 in which said cap includes a second substantially cylindrical skirt secured to said top portion of said cap in substantially concentric relationship with said slotted skirt, said second skirt having a diameter substantially equal to the diameter of said container and extending downwardly from said top portion of said cap beyond said free end of said slotted skirt and seating upon said container adjacent the juncture of said neck portion and said outer wall of said container.

7. The combination of claim 6 in which said top portion of said cap includes a plurality of spaced recessed portions to permit said valve actuator of said container to be finger actuated and fluid dispensed therefrom when said cap is secured in position on said container.

8. The combination of claim 7 in which said actuator is keyed to said cap to prevent rotation of one with respect to the other.

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ROBERT B. REEVES, *Primary Examiner*.

F. R. HANDREN, *Assistant Examiner*.