ABSTRACT
A safety cap for aerosol cans incorporating a central integral depending split cylinder having inwardly direct hooked lower edges engageable beneath the valve surrounding bead on conventional aerosol cans. The hook ends of the cylindrical sections are locked beneath the can bead by an encircling ring slid downwardly on the sections. Release of the hooked ends is effected by upwardly sliding the ring and depressing the cap so as to effect an outward flexing of the hooked ends. The ring includes opposed tabs which project through slots within the cap for manipulation purposes with the cap being selectively locked in its downward cylinder section clamping position by a rotational movement thereof.

9 Claims, 7 Drawing Figures
SAFETY CAP FOR AEROSOL CANS

The present invention generally relates to aerosol cans, and is more particularly concerned with the provision of a unique child-proof or safety cap for such cans.

It is a primary intention of the invention to provide a cap or cover which is so constructed as to prevent removal thereof by young children, thereby providing in effect a safety cap such as has become increasingly popular on pressurized containers or in fact containers of any product which might be harmful if freely accessible to children. Much recent legislation has been proposed directed toward requiring such safety means, it being felt that the cap to be described herein will provide the desired safety features and comply with requirements now in effect or contemplated in the near future.

In providing a safety cap, it is also a significant feature of the invention that the cap require no modification of the basic aerosol can itself, the cap being readily mounted on the conventionally constructed can.

Furthermore, the cap, while child-proof or extremely difficult for a small child to operate, can be simply manipulated by an adult for free access to the contents of the can as desired.

Basically, the desired objects are achieved by providing an integral internal depending split cylinder within the cap with each cylinder section terminating in an inverted hook forming lower edge or end. These ends engage beneath the bead surrounding the can valve and are locked therebeneath by a lock ring surrounding the cylinder sections at the lower end thereof. Release of the hook ends is effected by an upward sliding of the ring and a downward flexing of the top of the cap so as to outwardly flex the cylinder sections and hooked ends. Upon a retraction of the hooked ends from the can bead, the cap can be freely lifted from the can.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a perspective view of the top of a capped aerosol can with the cap incorporating the features of the present invention;

FIG. 2 is an exploded perspective view of the two components of the safety cap;

FIG. 3 is a bottom plan view of the cap with the lock ring removed;

FIG. 4 is a plan view of the lock ring;

FIG. 5 is a cross-sectional view through a can mounted cap constructed in accordance with the instant invention with the cap in locked position on the can;

FIG. 6 is a cross-sectional view similar to FIG. 5 with the cap in a released position; and

FIG. 7 is a cross-sectional view taken substantially on a plane passing along line 7—7 in FIG. 5.

Referring now more specifically to the drawings, reference numeral 10 is used to designate a generally conventionally constructed aerosol can incorporating a flanged end portion 12 having a raised central section terminating in an outwardly projecting annular crimped edge or bead 14 which surrounds the central valve and valve actuator 16.

The cap or cover of the present invention, adapted to mount on a conventional aerosol can 10, is generally designated by reference numeral 18. The cap 18 includes a circular slightly domed top 20 having a cylindrical skirt or side wall integrally formed therewith and depending therefrom. This cylindrical side wall is generally designated by reference numeral 22 and terminates in a stepped lower edge portion 24 which seats over and slightly frictionally grips the flanged can portion 12. The cap 18 is of a height so as to position the top 20, when the cap 18 is seated on a can 10, sufficiently above the valve actuator 16 so as to enable a downward flexing of the top 20 without engagement therewith for a purpose which shall be pointed out presently.

Integrally formed with and depending centrally from the top 20 is a split cylinder 26 formed of four arcuate sections 28. Each section 28 includes a stabilizing gusset 30 extending radially inward of the upper portion of the section 28 to the overlying top 20. In addition, each of the sections 28 has, at the lower end thereof, an inwardly directed flange or hook 32 which normally engages under the bead 14 to prevent an upward withdrawal of the cap 18. Release of these inwardly directed hook ends 32 can be effected by a downward pressing at the center of the cap top 20, such normally being designated by a slight depression 34. This downward pressure, as will be appreciated from FIG. 6, causes a resultant outward swinging of the lower hooked ends of the cylinder sections 28 away from the can bead 14 whereby an upward withdrawal of the cap or lid 18 can be easily effected. It is contemplated that the necessity of exerting a downward pressure at the center of the cap top 20 in conjunction with a raising of the entire cap as soon as the hooked ends 32 are freed will make removal of the cap, while quite simple, for an adult, extremely difficult for small children.

As an added safety feature, a locking ring 36 can also be provided. This ring 36 encircles the split cylinder 26 within the cap skirt 22 with the ring 36 including a small internal bead 38 which bears against the cylinder sections 28 for vertical sliding movement therealong in a non-jamming manner.

When the ring 36 is in the lowered position thereof as illustrated in FIG. 5, the ring encircles the cylinder sections 26 at the hooked lower ends thereof whereby an outward retraction of these hooked ends from beneath the bead 14 cannot occur. In order to allow for an outward flexing of the hooked ends 32 it is necessary that the ring 36 be moved to its upper retracted position as illustrated in FIG. 6. In order to allow sufficient clearance between the sections 28 and the ring 36, it is contemplated that the cylinder 26, in its can locking position of FIG. 5, be of a slightly smaller diameter at the upper end thereof, in other words, the outer surfaces of the sections 28 taper slightly inward upward from the lower ends thereof whereby a slight clearance is provided between the outer periphery of the sections and the inner periphery of the ring when the ring is in its upper position so as to allow for the outward movement of the sections as suggested in FIG. 6.

Manipulation of the ring 36 is effected from the exterior of the cap 18 by means of one or more integral outwardly projecting lugs or tabs 40 on the ring 36 with each lug 40 extending through a vertically elongated slot 42 in the cap skirt 22. The height of the slot 42 is such so as to define the desired upper and lower limits.
of movement of the locking ring 36, the two positions thereof being illustrated in FIGS. 5 and 6. For stability and ease of operation, it is contemplated that a pair of diametrically opposed lugs 40, as illustrated, be provided.

As an additional safety feature, a lateral slot 44 can extend from the lower end of the vertical slot 42 whereby a lateral rotation of the lug 40 away from the vertical slot 42 can be effected. In this manner, a release of the ring 36 will require both a rotation thereof and a vertical movement thereof. In order to stabilize the lug in the transverse slot 44, a lug accommodating notch 46 can be provided in the upper edge thereof into which the corresponding lug 40 will be raised, thus requiring yet a further manipulation which while simple for an adult will provide even greater difficulty for a young child.

Finally, should it become desirable to completely release the ring 36 for any reason, the remote end of the transverse slot 44 can have a depending slot 48 communicating therewith, upon movement of each ring lug 40 therein will allow the ring 36 to drop below the split cylinder 26.

From the foregoing, it should be appreciated that a highly unique child-proof safety cap for aerosol cans has been defined. This cap is adapted for use in conjunction with conventional aerosol cans without modification of the cap with the cap presenting a substantially conventional outer appearance. It will also be appreciated that multiple degrees of difficulty in removal of the cap can be provided for as circumstances dictate. Further, in view of the inherent resiliency of the plastic material of the cap, there will be an automatic tendency for the cylinder sections 28 to automatically reengage with the can bead 14 with the locking ring 36 tending to slide down into locked position about the lower ends of the cylinder sections. Re-engagement of the hooked ends 32 with the bead 14 as the cap 18 is being mounted is facilitated by the beveled lower inner peripheral corner 50 of the hooked ends 32 for camming movement over the can bead 14.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. For use in conjunction with an aerosol can incorporating a valve surrounding outwardly projecting bead, a cap and associated locking ring, said cap including a top, a plurality of sections depending from said top and terminating in intumet lower ends engageable beneath the valve surrounding bead of an aerosol can, said sections encircling said bead, said sections being outwardly flexible in a manner so as to outwardly move said intumet ends upon a compression of the cap top inward of said sections and being vertically positionable between a first position surrounding and closely engaging the intumet end portions of said sections and a second position vertically upward therefrom, said ring, in the first position, precluding an outward flexing of said sections, said ring, in said second position, allowing an outward flexing of said sections.

2. For use in conjunction with an aerosol can incorporating a valve surrounding outwardly projecting bead, a safety cap and associated locking ring, said cap including a top, a depending peripheral skirt, a plurality of sections depending from said top inward of said skirt and terminating in intumet lower ends engageable beneath the valve surrounding bead of an aerosol can, said sections being outwardly flexible in a manner so as to outwardly move said intumet ends upon a depression of the cap top inward of said sections, said ring surrounding said sections and being vertically positionable between a first position surrounding and closely engaging the intumet end portions of said sections and a second position vertically upward therefrom, said ring, in the first position, precluding an outward flexing of said sections, said ring, in said second position, allowing an outward flexing of said sections.

3. The cap of claim 2 wherein said sections define a split cylinder, said sections being integrally formed with said top.

4. The cap of claim 2 wherein said ring includes a small internal bead thereabout engageable against said sections.

5. The cap of claim 2 wherein the outer surfaces of the sections taper inwardly to a slight degree upward from the lower ends thereof.

6. The cap of claim 2 including a pair of generally opposed outwardly projecting manipulating lugs on said ring, and a pair of vertical slots defined through the cap skirt, said lugs projecting through said slots whereby a manipulation of said ring can be effected externally of said skirt between the first and second positions of said ring.

7. The cap of claim 6 wherein the lower extent of each vertical slot includes a transverse extension into which the corresponding lug can be moved whereby vertical movement of the ring is precluded.

8. The cap of claim 7 wherein said sections are integrally formed with said top.

9. The cap of claim 7 wherein each transverse extension includes a laterally directed lug retaining notch therein.

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