CHILD PROOF PROTECTIVE OVERCAP FOR AN AEROSOL CAN

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References Cited
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ABSTRACT
A child-proof protective overcap for an aerosol can. The can has a valve stem cap and an actuator nozzle centered therein, the valve stem cap being retained on the can by frictional engagement thereof with an annular lip on the valve mounting seam at the top of the breast portion of the can. The overcap has an inverted cup-shape with a circular, stiffly resilient top and two concentric skirts depending therefrom. The inner skirt extends circumjacent to the valve stem cap and the outer skirt extends into the annular groove at the seam between the body and breast portion of the can. The inner skirt and the valve stem cap have interfitting locking means. The resilient top biases the interfitting means into locking engagement and the locking means are disengagable by flexure of the top of the overcap and axial movement of the inner skirt followed by rotation of the overcap. In the preferred embodiment the interfitting means are bayonet-type lugs and ramps.

8 Claims, 12 Drawing Figures
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CHILD PROOF PROTECTIVE OVERCAP FOR AN AEROSOL CAN

This application is a continuation-in-part of my earlier filed application Ser. No. 72,917 filed Sept. 17, 1970, now abandoned.

BACKGROUND OF THE INVENTION

Many highly corrosive and dangerous products are conventionally packaged in aerosol cans for ease of application of the product and to permit the product to be dispensed as needed under pressure from the aerosol can. Such products include various household chemicals such as insecticides, starches, oven cleaners, and other products such as paints, hair sprays, and the like which may be very harmful, particularly to small children and pets, or may be injurious to furniture, carpets, and the like. Many suggestions have been made for child-proof covers and dispensing means which cannot readily be actuated by a small child and yet which an older child or an adult can operate to discharge the contents of the can.

It is the principal object of the instant invention to provide a child-proof protective overcap for an aerosol can intended to contain dangerous material and the removal of which is beyond the capabilities of a small child.

It is yet another object of the instant invention to provide an overcap for an aerosol can having a permanently retained valve cover comprising directional spray means, the overcap requiring movements of two different types in order to disengage its retaining means so as to make removal of the overcap beyond the capability of a small child.

It is yet another object of the instant invention to provide retaining means for a protective overcap for an aerosol can in which the retaining means comprises cooperating elements formed on the valve cap and the overcap and thus the two caps may be utilized on a conventional aerosol can without requiring modification of the can itself.

DESCRIPTION OF THE FIGURES

FIG. 1 is a fragmentary view in section of the upper portion of an aerosol can equipped with a protective overcap according to the invention;

FIG. 2 is a fragmentary, vertical sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a horizontal, sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a horizontal, sectional view taken along the line 4—4 of FIG. 1;

FIG. 5 is a fragmentary bottom view in perspective of an overcap designed according to the invention;

FIG. 6 is a fragmentary view similar to FIG. 2, but illustrating a modified form of the retaining means,

FIG. 7 is a fragmentary vertical, sectional view similar to FIG. 1 with certain parts broken away and illustrating a second embodiment of an overcap according to the invention;

FIG. 8 is a horizontal, sectional view taken along the line 8—8 of FIG. 7;

FIG. 9 is a horizontal, sectional view taken along the line 9—9 of FIG. 7;

FIG. 10 is a fragmentary, vertical view taken along the line 10—10 of FIG. 7;

FIG. 11 is a fragmentary view similar to FIG. 10 but illustrating the relative position of the elements in their “unlocked” position; and

FIG. 12 is a top perspective view of an overcap according to this second embodiment of the instant invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An aerosol can, generally indicated by the reference number 10 comprises a cylindrical body 11 and, in this instance, a domed breast portion 12 connected to the can body 11 by a seam 13. In this type of aerosol can, the seam 13 and the breast portion 12 define an annular, upwardly open groove 14 therebetween. At the top center of the breast portion 12 there is positioned an axially extending valve mechanism generally indicated by the reference number 15 which is secured in the central opening of the breast portion 12 by a crimped Overseam 16, the seam 16 providing an annular rim which is concentric with the valve mechanism 15 and its valve stem 17.

The valve cover 21 has an annular skirt 24, arcuate side walls 25 and a recessed top 26. The upper end of the button 18 protrudes through the opening 20 above the level of the recessed top 26 for accessibility to the finger of a user. The valve cover 21 has a flared side opening 27 through which the spray from the valve orifice 19 is directed when the can is being discharged.

A protective overcap embodying the invention is generally indicated by the reference number 28 and comprises a top 29, in this instance being shown as flat and circular, from which there depends an outer skirt 30 and shorter inner skirt 31 of smaller diameter. When the overcap 28 is in position on the can 10, the outer skirt 30 abuts a portion of the can itself, in this instance being shown as engaging the bottom of the annular groove 14.

The valve cover 21 is held in place on the can 10 by the engagement of an inwardly extending lip 32 formed on the bottom edge of the valve cover skirt 24 and frictionally engaged beneath the rim of the valve seam 16.

Retaining means for the protective overcap 28 comprise interfitting cooperating elements formed on the outer surface of the valve cover skirt 24 and on the inner lower edge of the inner overcap skirt 31. These cooperating interfitting elements are illustrated in FIGS. 1—5 as consisting of at least two radially inwardly extending lugs 33 formed on the lower inner surface of the inner skirt 31 and circumferentially extending ramps 34 formed on the outer surface of the valve cover skirt 24. The ramps 34 may also be designated as lug threads and each of them comprises an outwardly extending element having an inclined portion 35, an upwardly extending recess 36 and a stop 37. Such cooperating lugs and ramps may be called "bayonet-type" locking means.

The relative lengths of the inner skirt 31 and outer skirt 30 are such that when the outer skirt 30 is bottomed in the groove 14, the lugs 33 are retained in the recesses 36 by the resiliency of the overcap top 29 as illustrated in FIG. 2. In order to engage the lugs 33 in the respective recesses 36, the user turns the overcap 28 to move the lugs 33 against the inclined portions 35 and presses downwardly on the center of the overcap top 29 to flex the top 29, allowing the inner skirt 31 to move axially downwardly as the lugs 33 progress along
the inclined portions 35 until the lugs 33 snap upwardly into the recesses 36. Conversely, when it is desired to remove the protective overcap 28, it is necessary for the user first to depress the top 29 against its relatively stiff resiliency to lower the lugs 33 at the lower end of the inner skirt 31 below the level of the corners of the inclined portions 35 of the ramps 34. Thereafter, the user rotates the overcap 28 until the lugs 33 are moved outwardly from beneath the recesses 36 and the overcap 28 can then be removed from the can 10.

The embodiment of the invention shown in FIG. 6 illustrates a reversal of the cooperating interfitting elements consisting of ramps 34a formed, in this embodiment, on the inner surface of an inner skirt 31a of an overcap 28a and lugs 33a formed on the outer surface of a valve cover skirt 24a. In this arrangement of the interfitting retaining means, inclined portions 35a of the ramps 34a are inclined upwardly and recesses 36a open upwardly rather than downwardly as is the case of the recesses 36 shown in FIGS. 1-5 inclusive. In this embodiment of the invention, the ramps 34a are rotated with the overcap 28a and the lugs 33a are stationary with the valve cover skirt 24a.

The embodiment of the invention illustrated in FIGS. 7-12 inclusive, comprises a directional valve cover generally indicated by the reference number 41 and an overcap 42. The overcap 42 has an outer skirt 43 and an inner skirt 44. The axial length of the two skirts 43 and 44 is less than that of the embodiment of the invention illustrated in FIGS. 1-6. A top 45 of the cap 42 has a central frusto-conical depressed portion 46 extending inwardly from the diameter of the inner skirt 44 and the lower rim of the outer skirt 43 does not contact a groove 47 at the seam between a can body 48 and its breast portion 49.

In contrast to the earlier embodiment of the invention, a central flat portion 50 of the overcap top 45 is in contact with a flat top surface 51 of the valve cover 41 which extends on three sides of a transverse finger recess 52. The inner skirt 44 is of an axial length such that lugs 53 formed on the inner side of its lower edge are held upwardly in recesses 54 of bayonet type ramps 55 located on the exterior of the valve cover 41, by the engagement of the depressed center 50 of the overcap 42 with the top surface 51 of the valve cover 41.

In order to position the overcap 42 on the can body 48, the cap 42 is pushed downwardly over the valve cover 41 and the lugs 53 are engaged beneath downwardly inclined portions 56 of the ramps 55. The overcap 42 is then rotated and the ramps 55 pull the lugs 53 downwardly pressing the recessed center portion 50 of the overcap top 45 against the top 51 of the valve cover 41 flexing the depressed portion 46 until the lugs 53 engage in the recesses 54. To remove the overcap 42, the outer annular portion of the top 45 is pushed downwardly, flexing the conical depressed portion 46 and moving the lugs 53 below the margins of the recesses 54 so that the cap 42 can then be rotated to the position illustrated in FIG. 11 and removed from the can 48.

Having described my invention I claim:

1. A child-proof protective and replaceable overcap for an aerosol can having a central discharge valve at its upper end, comprising a valve cover retained on said can and surrounding said valve,