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Lowry

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[54] **SECURITY CAPS FOR CONTAINERS**

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[73] Assignee: **Lowry Development Corporation,** Winchester, Mass.

[22] Filed: **Aug. 6, 1973**

[21] Appl. No.: **386,017**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 284,660, Aug. 29, 1972, abandoned.

[52] **U.S. Cl.** **222/182;** 220/306

[51] **Int. Cl.** **B65d 55/02**

[58] **Field of Search** ..... 222/182, 402.11, 402.12, 222/402.13; 220/60 R, 60 A, 306; 215/9

[56] **References Cited**

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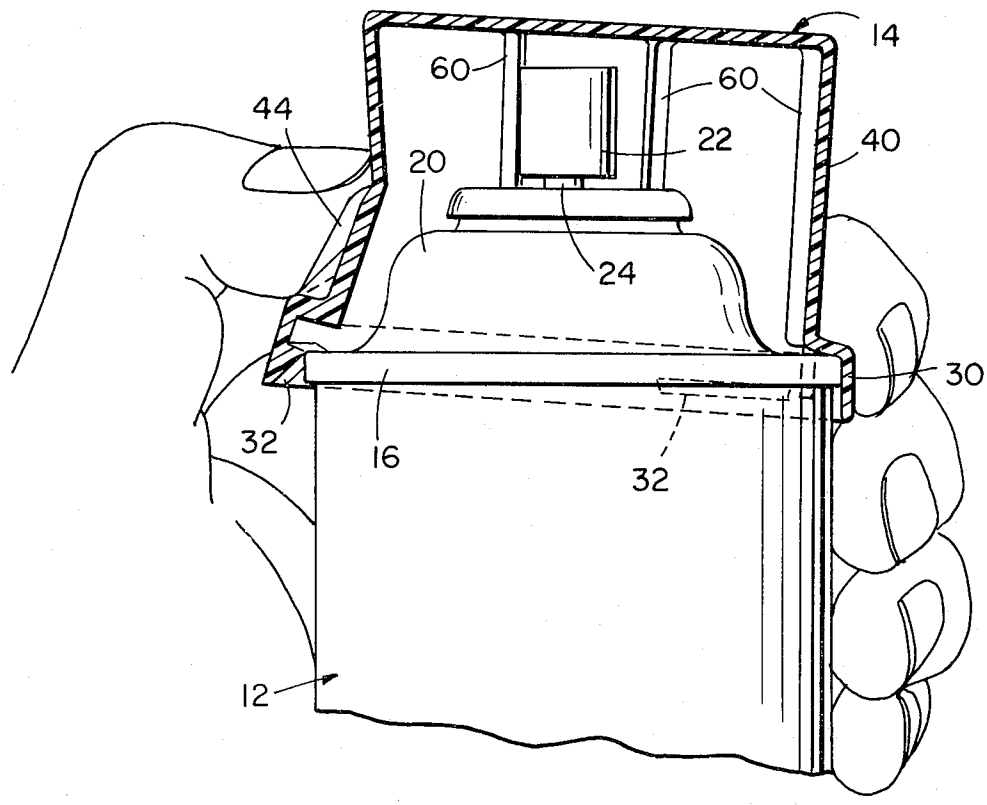
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Primary Examiner—Stanley H. Tollberg

[57] **ABSTRACT**

An aerosol can cap has a stiffened lower front wall surmounted by a flexible wall so that application of thumb pressure against the wall above the stiffened portion distorts the bottom cap skirt moving its front outwardly to release it from engagement with a bead on the top of the can permitting the cap to be hinged upwardly and backwardly off the can. Force applied elsewhere or in other manners to the cap will not release it. The cap is replaceable with hand pressure.

10 Claims, 10 Drawing Figures



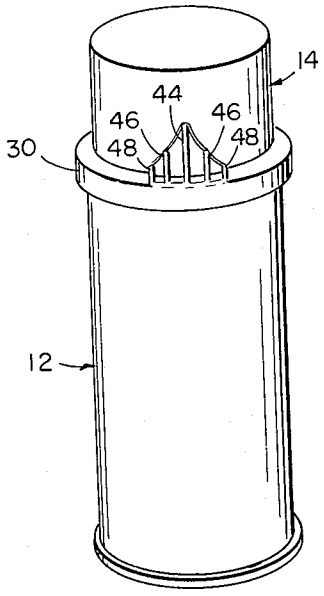


FIG. 1

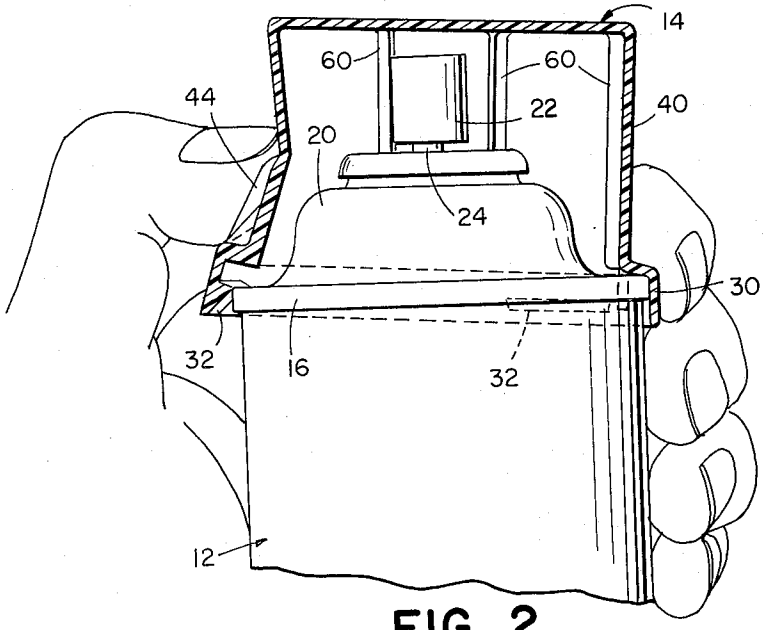


FIG. 2

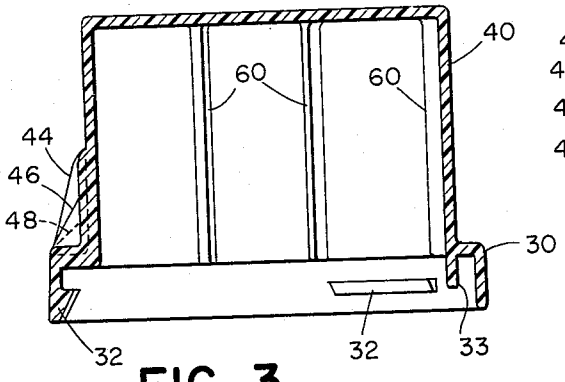


FIG. 3

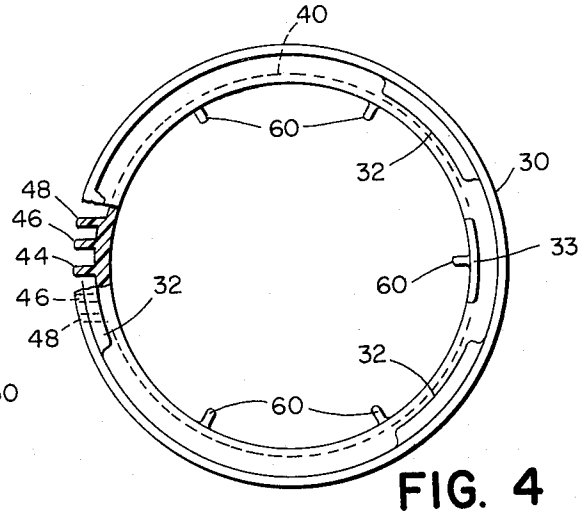


FIG. 4

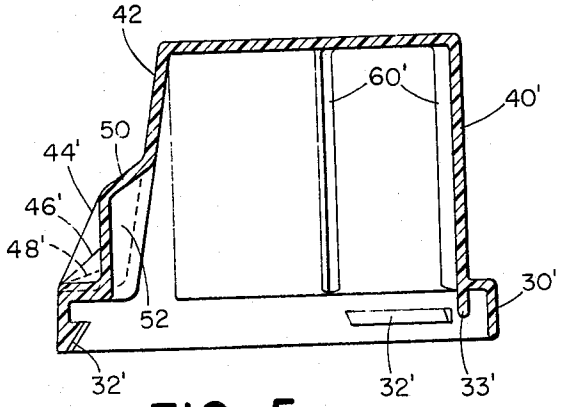


FIG. 5

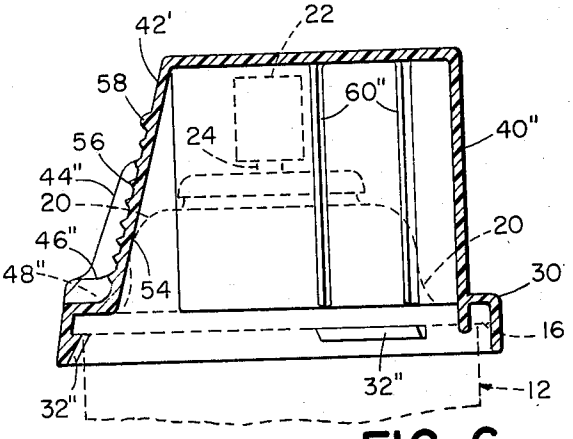


FIG. 6

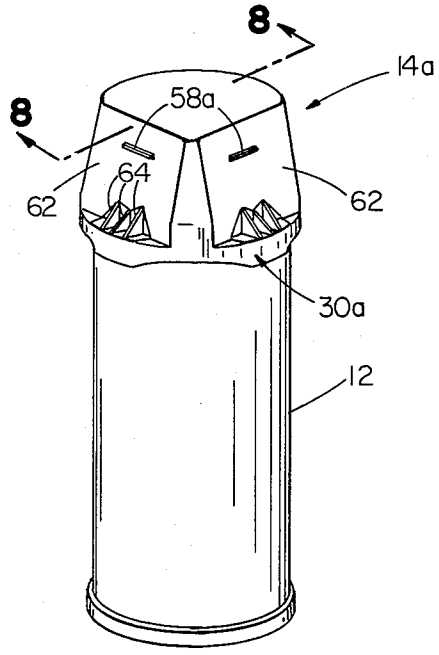


FIG 7

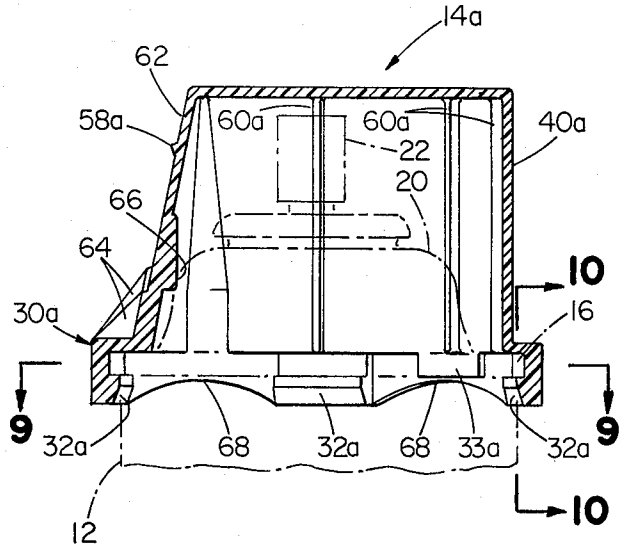


FIG 8

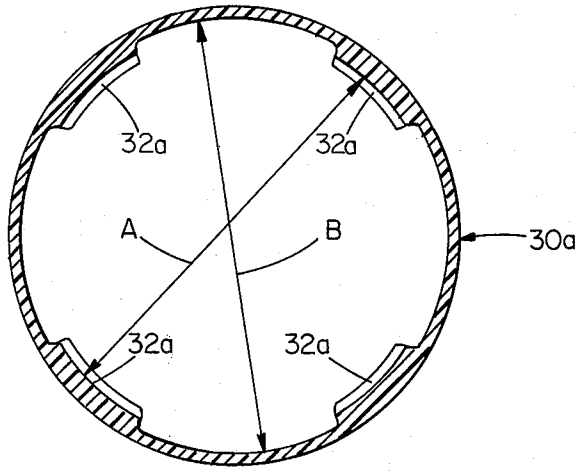


FIG 9

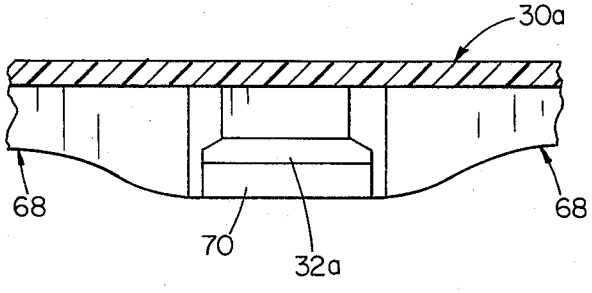


FIG 10

SECURITY CAPS FOR CONTAINERS

This application is a continuation-in-part of my prior application Ser. No. 284,660 filed Aug. 29, 1972, now abandoned.

This invention relates to lock caps for cans, bottles, and other containers.

BACKGROUND OF THE INVENTION

Caps for aerosol cans are generally readily removable by children, giving them access to the conventional underlying spray button whereby the child can waste the contents of the can or cause damage to articles by directing the wrong type of spray onto a type of article which does not tolerate the contents or even harm the child or other persons or animals by subjecting them to a harmful spray either internally or externally.

SUMMARY OF THE INVENTION

The present invention has as an object the provision of a security cap for an aerosol can that will require a certain manipulation to remove the cap so that it can be removed only by an adult who knows the knack and which, therefore, is not susceptible to being removed by uninitiated children. To this end, the cap is so fabricated as to interlock with a standard aerosol can but in such manner as to require both a transverse and upward pressure against a particular site (or sites) on the cap in order to release it from its interlocking attachment to the top of a standard aerosol can. The cap is replaceable with telescoping hand pressure.

BRIEF DESCRIPTION OF THE DRAWINGS

Attainment of the primary object of the invention is best explained by reference to the accompanying drawings wherein

FIG. 1 is a perspective view of one embodiment of a cap of this invention positioned on a conventional aerosol container looking somewhat downwardly on the assembly in the front;

FIG. 2 is a partial enlarged view of the can and cap of FIG. 1 rotated 90° from the position of FIG. 1, showing the cap in cross-section, and showing the position of one hand during application of pressure to flex the cap to distort the skirt during removal of the cap;

FIG. 3 is a cross-sectional view of the cap;

FIG. 4 is partially broken away bottom view of the cap;

FIG. 5 is a cross-sectional view of another embodiment of the cap;

FIG. 6 is a cross-sectional view of a still further embodiment of the cap;

FIG. 7 is a view similar to FIG. 1 of yet another embodiment of a cap;

FIG. 8 is a view taken at 8—8 of FIG. 7;

FIG. 9 is a view taken at 9—9 of FIG. 8; and

FIG. 10 is a view taken at 10—10 of FIG. 8.

DESCRIPTIONS OF SPECIFIC EMBODIMENTS OF THE INVENTION

FIGS. 1 and 2 show a conventional aerosol container 12 capped by a novel cap 14 of this invention.

The container 12 is of standard construction and includes a bead 16 extending outwardly around its top periphery surmounted by a permanently fastened closed cover which includes a curved crown portion 20 and a push button 22 on a piston rod 24. All of the container construction other than the cap is standard and conventional.

Referring to FIGS. 2–4, the novel cap 14 of the invention includes a distortable circular skirt 30 which is provided on its inside surface with a series of inwardly-projecting lugs 32 spaced in the embodiment shown at 120° intervals with one bevelled lug at the front. The lugs are of such dimension that when the cap 14 is on container 12 with the skirt 30 is in symmetrical circular position the lugs will be disposed under the bead 16 to lock the cap to the can. Between the lugs there is clearance between the skirt and the outer surface of the bead so that the skirt can be distorted. At the back where a depending inner flange 33 forms a channel straddling bead 16.

Above the skirt 30 the cap includes a rear cylindrical vertical wall 40 of smaller radius than that of the skirt 30.

The lower portion of the front wall is stiffened by the inclusion of a central vertical rib 44 flanked by pairs of smaller ribs 46 and 48 and the thickness of the wall beneath these ribs may, if desired, be increased to add further stiffness to the lower portion of the front wall.

When then the cap is in position on the container and pressure is applied preferably with both thumbs to the upper portion of the front wall 42, the front wall will deflect as indicated in FIG. 2 distorting the skirt 30 and flexing it outwardly in front to move front lug 32 over and off the container bead 16. When the cap has been brought further upwardly from the position shown in FIG. 2, it can be moved backwardly to lift the flange 33 and free the back two lugs 32 from beneath the bead 16. The flange 33 thus acts as a stop to hold the cap from moving backwardly until it has been raised in front high enough to clear button 22.

FIG. 5 shows a modification of the cap wherein the front portion of the cap instead of being cylindrical as in FIGS. 1–4, is flat and in the form of a transverse inclined wall 42 which is interconnected with the lower cylindrical portion of the cap in front on the outside of which the ribs 44′, 46′ and 48′ are located. In this form of device the interconnecting portion 50 forms an inside hollow 52 which aids in giving clearance when the cap is hinged backwardly with the flange 33′ bearing against the bead 16 at the back of the can. This transverse flat wall could also be vertical.

In the form shown in FIG. 6 the cap again merges in front into a flat inclined wall 42′ so dimensioned that the stiffened portion in front bears on its inner surface against the curved crown 20 of the can 12 so that when thumb pressure is exerted inwardly against the upper front cap portion 42′, a camming action takes place in the vicinity of 54 to aid in moving the lug 32″ outwardly to free it from the bead 16.

In order to form a better grip for the thumbs, the front wall in FIG. 6 is preferably roughened as by ridges 56 and is surmounted by a cross rib 58 which acts as a push rail and as a stop should the thumbs slip during the removal operation. This feature may be incorporated in the other embodiments if desired.

The rear cylindrical portions 40, 40′, 40″ are provided with one or more vertical ribs 60, 60′, 60″ to stiffen the rear portions of the caps sufficiently so that inward and upward pressure on those portions of the caps does not suffice to flex the skirts outwardly in the manner that the front of the skirts may be flexed outwardly due to the distortion of the skirts when pressure

is applied by the thumbs to move the stiffened portions of the fronts of the covers away from the beads **16** to be snapped free and clear upwardly off the beads.

In the embodiment of FIGS. **7–10**, the cap **14***a* is provided with two flat, inclined walls **62** in the front portion of the cap body which merge with the cylindrical rear wall **40***a*. The walls **62** lie in planes which intersect in approximately a right angle (e.g., lines perpendicular to the planes intersect in an angle of 94° in one presently preferred design). The lower portion of each wall **62** is stiffened by the provision of ribs **64** integral with both the respective wall **62** and the skirt **30***a*. A cross rib **58***a* on each wall **62** acts as a push rail and thumb stop. A camming surface **66** protrudes from the inner surface of each wall **62** for contact with container crown **20**.

The skirt **30***a* has four lugs **32***a*, two of which are centered on walls **62** and the other two of which of symmetrical arrange in the rear portion of the skirt. A flange **33***a* is provided which is identical to flange **33** described above. As best seen in FIG. **9**, the skirt is of reduced thickness between adjacent lugs **32***a*. As best seen in FIGS. **8** and **10**, the lower edge of the skirt includes recesses or scallops **68** extending between adjacent lugs.

In operation, this embodiment requires two hands for successful removal of the cap (a thumb pressing on each face **62** in the manner described above) and thus is even more "child-proof". The scallops **68** minimize the opportunity for removing the cap by prying under the skirt. The reduced thickness of the skirt permits accomodation of a range of bead **16** diameters, the additional clearance allowing the skirt to pull in (i.e., essentially form the chord of a circle) between lugs when an oversize bead is encountered. In a preferred embodiment, the inner diameter of the skirt (see B in FIG. **9**) is 2.790 inches, the outer diameter of the skirt is 2.870 inches, and the diameter of the reference circle (see A in FIG. **9**) defined by bosses **69** (which are integral with lugs **32***a*) is 2.690 inches.

As can be understood, the caps may be molded in one piece using a plastic such as high density polyethylene or polypropylene that is capable of flexing when subjected to hand pressure in the thickness used on the front.

The lugs are preferable bevelled (as at surface **70** in FIG. **10**) to permit snap-on replacement of the caps with telescoping hand pressure.

I claim:

1. A cap for an aerosol container having a bead around its top outer periphery comprising
- a hollow cap including
- a bottom skirt depending from a superimposed body portion,
- a plurality of inwardly-extending spaced lugs on said skirt for engaging the bead on said container
- one of said lugs being disposed at the front of said cap, the lower portion of the front wall of said cap above said front lug having one or more vertical stiffening ribs extending upwardly from said skirt to a point spaced downwardly from the top of the cap, said ribs being on the outside of said front wall, the upper portion of said cap above said stiffer portion being more flexible than said stiffer portion and adapted to be deformed when inward pressure is exerted against said upper portion to distort said skirt to move said front lug radially outwardly,
- said cap being removable backwardly and upwardly off said container after said front lug has been so moved outwardly, followed by exertion of upward pressure on said front wall to raise said front lug free and clear of said container bead.

2. A cap for an aerosol container having a bead around its top outer periphery comprising
- a hollow cap including
- a bottom skirt depending from a superimposed body portion,
- a plurality of inwardly-extending spaced lugs on said skirt for engaging the bead on said container
- one of said lugs being disposed at the front of said cap, the lower portion of the front of said cap above said front lug being stiffer than the remainder of said body portion, the upper portion of said cap above said stiffer portion being more flexible than said stiffer portion and adapted to be deformed when inward pressure is exerted against said upper portion to distort said skirt to move said front lug radially outwardly,
- the cap having a back cylindrical portion which merges forwardly into a flat transverse front wall, the flat transverse front wall being inclined,
- said cap being removable backwardly and upwardly off said container after said front lug has been so moved outwardly, followed by exertion of upward pressure on said front wall to raise said front lug free and clear of said container bead.

3. A cap as claimed in claim **2** where the inside surface of said flat front wall bears against a curved cover of one of said containers so that when pressure is exerted against the upper portion of said front inclined wall, the lower portion of the front wall is cammed outwardly to move the front lug radially outwardly.

4. A cap for an aerosol container having a bead around its top outer periphery and an upstanding inner crown-shaped cover comprising
- a hollow cup-shaped cap including
- a bottom skirt depending from a superimposed body having a cylindrical back portion of relatively smaller radius than that of said skirt merging forwardly into an inclined flat transverse wall, the inside surface of said wall being adapted to bear against the curved cover on said container,
- a plurality of inwardly-extending spaced lugs on said skirt for engaging the bead on said container,
- a first lug being disposed below said flat wall,
- said flat wall being adapted to be flexedly cammed about the surface of said container crown when inward pressure is exerted against said wall above the point of contact of said wall with said crown to distort said skirt to move said first lug radially outwardly, and
- said cap being removable backwardly off said container, after said first lug has been so moved outwardly, followed by exertion of upward pressure on said flat wall to raise said first lug free and clear of said container bead.

5. A cap as claimed in claim **4** having at its back an inner depending flange which forms with said skirt a channel whose sides straddle the bead on said container and acts to prevent backward motion of said cap off said container until the front of the cap is raised upwardly off the container.

6. A cap as claimed in claim **4** wherein there are first and second such flat walls in the front portion of said

body, said first lug disposed below said first wall, a second lug being disposed below said second wall.

7. A cap as claimed in claim **6** wherein said first and second walls lie in planes which intersect in approximately a right angle.

8. A cap as claimed in claim **4** wherein the lower edge of said skirt is recessed between adjacent lugs.

9. A cap as claimed in claim **8** wherein each recess is arcuate.

10. A cap as claimed in claim **4** wherein each said lug is integral with a boss on the inside surface of said skirt, said bosses defining a reference circle having a diameter approximately 0.1 inch less than the inner diameter of said skirt, whereby a range of container bead diameters may be accomodated.

* * * * *