

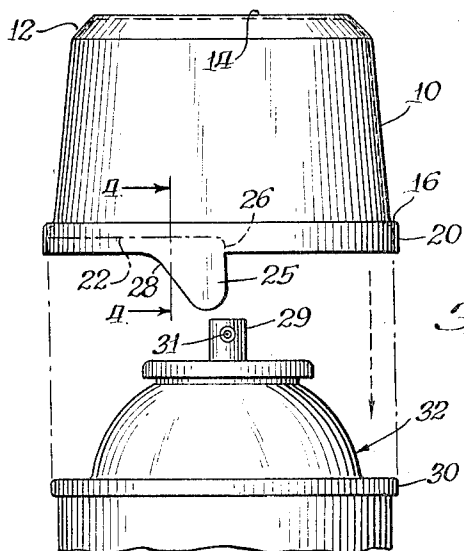
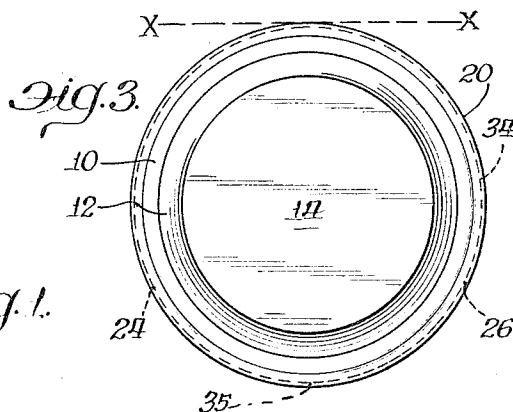
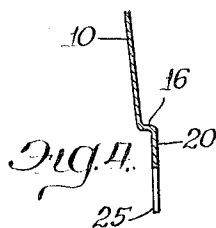
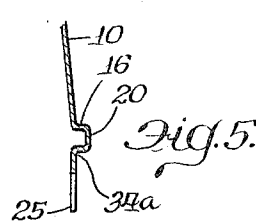
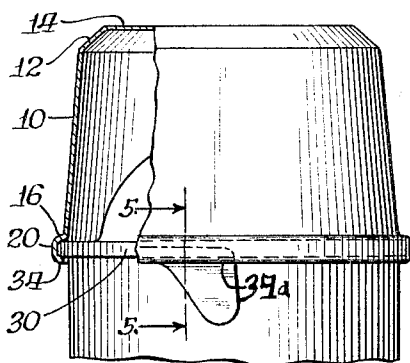
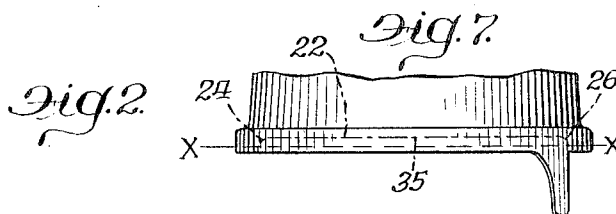
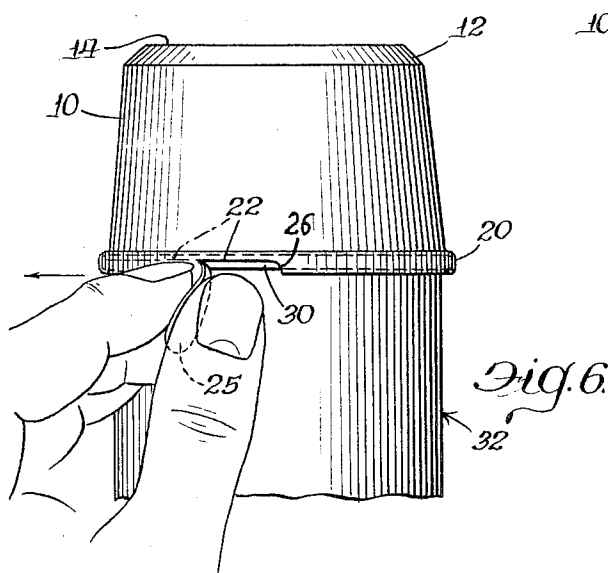
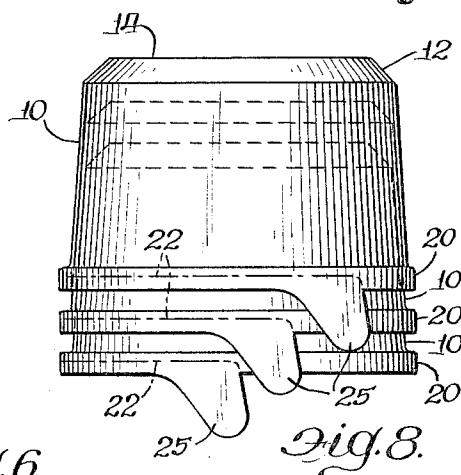
Aug. 16, 1966

E. J. McKERNAN

3,266,676

TAMPERPROOF CAP FOR AEROSOL BOMB

Filed March 4, 1964



INVENTOR
Edward J. McKernan
BY
Walter L. Schlegel, Jr.
Att'y

1

3,266,676

TAMPERPROOF CAP FOR AEROSOL BOMB
Edward J. McKernan, 430 James St., Crystal Lake, Ill.
Filed Mar. 4, 1964, Ser. No. 349,203
2 Claims. (Cl. 222—182)

This invention relates to aerosol bombs and more particularly to a novel tamperproof cap which prevents access to the discharge button until the cap is torn and removed from the bomb.

Prior art caps for this purpose have been relatively complicated and expensive in construction, have been difficult to remove, and once removed have not been capable of reinterlocking with the bomb.

It is a well-known problem in the merchandizing of aerosol bombs that prospective customers may accidentally discharge the bomb by depressing the button while examining the bomb to ascertain its contents. Also bombs may be accidentally discharged by impacts against the buttons during shipment or during transfer from a storage area to a display counter.

To prevent such accidental discharge of aerosol bombs, a number of prior art protective caps have been proposed, but all of these have been subject to one or more of the foregoing disadvantages.

Accordingly a primary object of the present invention is to devise a novel tamperproof cap which is simple and economical in construction, is easy to assemble with the bomb, and once removed from the bomb is capable of releasable reinterlock therewith.

A more specific object of the invention is to devise an annular locking flange on the cap, which flange engages the bottom of an annular rib on the bomb and is scored so that the flange may be manually torn loose from the cap around substantially 100° of the rib's perimeter, whereby upon locking of the cap, elastic deformation of the remainder of the flange permits easy removal and reattachment of the cap.

Yet another object of the invention is to devise a cap having its principal wall tapering upwardly at from 2° to 4° to define a frusto-conical structure which nests or stacks with a plurality of such caps in such manner as to facilitate loading them into a machine for automatically assembling them with aerosol bombs.

Still another object of the invention is to define a tab which is an extension of the locking flange and depends therefrom, one side of the tab being defined by one end of the scoring so that a manual pull on the tab is effective to tear the removable segment of the locking flange from the remainder of the cap.

A further object of the invention is to provide a substantially flat top wall at the upper edge of the cap's tapered annular wall, so that the top of said flat wall affords a convenient surface for the application of a sample of paint within a bomb which contains paint as the liquid to be dispensed.

The foregoing and other objects and advantages of the invention will become apparent from a consideration of the following specification and the accompanying drawings, wherein:

FIGURE 1 is a pre-assembled side elevational view of the novel cap and an upper portion of an aerosol bomb to which it may be attached;

FIGURE 2 is a view similar to FIGURE 1 showing the novel cap partly broken away and attached to the aerosol bomb;

FIGURE 3 is a top plan view of the novel cap shown in FIGURE 2;

FIGURES 4 and 5 are sectional views taken respectively on lines 4—4 and 5—5 of FIGURES 1 and 2.

2

FIGURE 6 is a side elevational view of the cap attached to the bomb with a user's hand beginning to pull on the tab to tear off the removable flange segment of the cap which is attached to the tab;

FIGURE 7 is a fragmentary side elevational view of the novel cap taken from the left as seen in FIGURE 1; and

FIGURE 8 shows a stack of the novel caps for insertion into a machine for attaching the caps to aerosol bombs.

Describing the invention in detail and referring first to FIGURE 1, the novel cap comprises an annular frusto-conical wall 10 tapering toward its upper extremity and preferably provided at its smaller-diameter top edge with a continuous turned frusto-conical annular flange 12, the upper smaller-diameter edge of which is integral with a top wall 14, which is preferably flat for the purpose heretofore described.

The lower or larger-diameter edge of the wall 10 is outwardly flared as at 16 to define a skirt or flange, the lower edge of which is connected to a depending continuous annular substantially cylindrical web 20, which is scored as at 22 in a line substantially parallel to the lower edge of the web 20 and approximately mid-way between its upper and lower edges after it has been crimped as hereinafter described.

The scoring at 22 extends in a line substantially 100° around the perimeter of the annular web 20 and extends downwardly at 24 and 26 to intersect the lower edge of the web 20 which is formed with an integral coplanar downwardly extending tab 25 one side of which is partly defined by the scoring at 26. The other side of the tab slopes upwardly at 28 to merge with the bottom edge of the web 20 of which the tab is an extension of the same thickness as best seen in FIGURE 4.

As shown in FIGURE 1, the cap is lowered until the skirt 16 seats on top of an annular rib or seam 30 around the perimeter of an aerosol bomb generally designated 32, having a conventional depressible discharge button 29 with a discharge orifice 31. Under these conditions the lower edge of the web 20 extends below the lower edge of the rib 30, whereupon the web 20 is crimped or bent to define a reentrant flange portion 34 which engages the bottom of the rib 30 as best seen in FIGURE 2. This crimping of the flange is continuous all around the rib 30 and thus defines a seam or bend as at 34a in the tab 25 as best seen in FIGURES 2 and 5.

FIGURE 6 shows the manner in which a user initiates removal of the cap by grasping the tab 25 and pulling it away from scored portion 26 toward scored portion 24 thereby tearing the web 20 and flange 34 along the scoring at 26, then at 22, and then at 24 until the tab and the portion of web 20 and flange 34 attached thereto are quickly and neatly torn loose from the cap around substantially 100° of the perimeter of the annular web 20 and flange 34. Thus the scoring at 22, 24, 26 defines a removable segment of the web 20 and flange 34 which portion is removed by pulling on the tab 25 as heretofore described.

After the tab and the attached part of the web 20 and its flange 34 have been torn loose as heretofore described the cap may be removed by lifting it upwardly to resiliently deform the remainder of the flange 34 beneath the rib 30 sufficiently to release the cap therefrom. This deformation of the flange 34 is very slight and is accommodated by the elasticity of the flange 34, inasmuch as the entire cap is preferably formed of a single segment of metal or plastic which although tearable as above described is sufficiently resilient to permit removal of the cap as hereinafter described without permanent deformation of the flange 34.

This elasticity or resiliency of the flange 34 also permits the cap to be reassembled with the bomb 32 by rocking the cap as hereinafter described until the flange 34 of web 20 is elastically deformed sufficiently so that the cap is snapped back into assembled position and is releasably held in that position by the flange 34 until the cap is again forceably released from the bomb 32 as heretofore described.

It will be understood that this novel feature not only permits repeated removal of the cap and reassembly thereof with the bomb but also prevents accidental loss or removal of the cap due to the releasable interlock between the lower edge of the rib 30 and the flange 34 around substantially 260° of their perimeters.

It will also be understood by those skilled in the art that removal of the flange 34 around 100° of its perimeter accommodates enough rotation of the cap on axis X—X (FIGS. 3 and 7) to permit removal and assembly thereof, without permanent deformation of the remainder of the flange 34, thereby accommodating repeated removal of the cap from the bomb and repeated releasable interlock therewith.

The axis X—X is schematically designated in FIGURES 3 and 7 and is approximately tangential to the annular web 20 at a point approximately diametrically opposite the midpoint 35 (FIG. 7) of the line 22. Thus it will be understood that after the removable segment of the cap defined by the scoring at 22, 24, and 26 has been removed by pulling on the tab 25 to tear said segment from the cap, the latter may be rocked or rotated against the rib 30 on said axis X—X to elevate the recess in the cap resulting from removal of said segment until the remainder of the flange 34 is resiliently deformed sufficiently to release the rib 30. The cap may later be reinterlocked with the rib 30 by reversing the foregoing procedure until the cap snaps back into interlocked position, with the flange 34 releasably and resiliently gripping the bottom of the rib 30.

It will also be understood that, although the positive interlock between the cap and the bomb afforded by the entire flange 34 before said segment is torn away is an important feature of the invention, the cap may be initially formed without said segment and the cap may be initially assembled by snapping it on the bomb as heretofore described.

FIGURE 8 shows a stack of the novel caps to be inserted into a feeding device (not shown) of a machine (not shown) for attaching the caps to aerosol bombs.

It will be seen that the 2°–4° taper of the caps accommodates their stacking or nesting as shown in FIGURE 8 with the top walls 14 spaced from each other and with the lower edge of each web 20 spaced above the web 20 of the cap immediately therebelow. Also the tabs 25 are preferably arranged as shown in FIGURE 8 in such manner that each tab 25 does not overlap the tab of the cap immediately therebelow, whereby frictional resistance to removal of a cap from the top of the stack is minimized.

It will be understood that, although the stack shown in FIGURE 8 is vertical, it may be arranged horizontally or at any desired angularity to accommodate the feeding device (not shown) which feeds caps to the bombs for crimping of the caps thereon.

Thus it will be understood that if the taper of cap walls 10 is 2°, a stack such as heretofore described occupies about one-fifth of the warehouse space required for the same number of prior art cylindrical caps, and if the taper is 4° the stack occupies about one-ninth of the warehouse space required for such prior art caps.

It may also be noted that the lower edge of web 20 may be scalloped if the reflange at 34 is formed by rolling as distinguished from crimping, and it may be further noted that both rolling and crimping are greatly superior to prior art plastic caps which must be made in different sizes to accommodate ribs 30 of different dimensions depending upon the manufacturers of the bomb 32.

Moreover the positive attachment of the novel cap to the bomb 32 assures the customer at a glance that the bomb has not been tampered with; and switching of caps is immediately obvious, whereby fraud upon the seller by switching a cap with a low price stamp thereon for an original cap with a higher price thereon is prevented. Also the top wall 14 affords an excellent surface for embossing of a legend, and the annular wall 10 affords an excellent external surface for decoration.

What is claimed is:

1. In combination with an aerosol bomb having an annular rib adjacent its discharge end, a protective cap for said end formed of relatively thin elastic material having an annular side wall, a top wall connected to the upper edge of the annular side wall, an outwardly flared annular flange extending from the lower edge of the annular side wall and seated on top of the rib of the bomb, and an annular substantially cylindrical web depending from said flange and surrounding said rib, said cap having an extension downwardly projecting from a relatively narrow portion of its lower edge to form a depending tab and having the remainder of its lower edge formed with a reentrant flange radially intumed and bearing against the bottom of the annular rib of the bomb, said web being scored in a line extending at least 100° and substantially less than 180° around its periphery, including the base of the tab, and said web and reentrant flange being scored downwardly from said line at the ends thereof to define a removable relatively short segment of said reentrant flange, one side of said tab being partly defined by one end of the segment whereby when the segment is torn loose from the cap by a pull on the tab removing said relatively short segment of the reentrant flange the cap will remain secured on the bomb by engagement of the remaining relatively long segment of reentrant flange of the cap beneath the rib of the bomb around more than 180° of the periphery of the bomb and the elasticity of the cap material will permit said longer segment of the flange to be temporarily distorted sufficiently to free the cap from the bomb and thereafter permit the cap to be repeatedly remounted on the bomb and removed therefrom.

2. In combination with an aerosol bomb having an annular rib adjacent its discharge end, a protective cap for said end formed of relatively thin elastic material having an annular side wall, a top wall connected to the upper edge of the annular side wall, an outwardly flared annular flange extending from the lower edge of the annular side wall and seated on top of the rib of the bomb, and an annular substantially cylindrical web depending from said flange and surrounding said rib, said web having a coplanar extension downwardly projecting from a relatively narrow portion of its lower edge to form a depending tab, said tab and the remainder of the web's lower edge being radially intumed to form a reentrant flange bearing against the bottom of the annular rib of the bomb, said web being scored in a line extending at least 100° and substantially less than 180° around its periphery, including the base of the tab, and said web and reentrant flange being scored downwardly from said line at the ends thereof to define a removable relatively short segment of said reentrant flange, one side of said tab being partly defined by one end of the segment whereby when the segment is torn loose from the cap by a pull on the tab removing said relatively short segment of the reentrant flange the cap will remain secured on the bomb by engagement of the remaining relatively long segment of reentrant flange of the cap beneath the rib of the bomb around more than 180° of the periphery of the bomb and the elasticity of the cap material will permit said longer segment of flange to be temporarily distorted sufficiently to free the cap from the bomb and thereafter permit the cap to be repeatedly remounted on the bomb and removed therefrom.

5

References Cited by the Examiner

UNITED STATES PATENTS

915,845	3/1909	Freeborn	-----	220—54
1,952,487	3/1934	Biffi	-----	220—54
2,530,124	11/1950	Kieckhefer.		
3,037,672	6/1962	Gach	-----	222—182
3,129,839	4/1964	Grimsley	-----	222—182 X
3,172,557	3/1965	Koenig	-----	220—54

6

FOREIGN PATENTS

1,223,397 6/1960 France.

5 M. HENSON WOOD, JR., *Primary Examiner.*LOUIS J. DEMBO, *Examiner.*A. N. KNOWLES, *Assistant Examiner.*