Sept. 8, 1970 D. L. THOR 3,527,374

CONTOURED CAP

Filed Dec. 9, 1968

FIG - 1

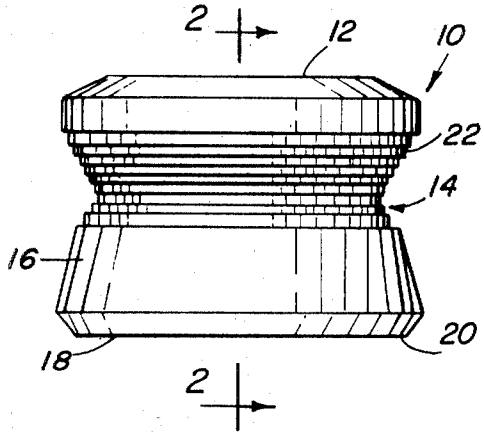


FIG - 2

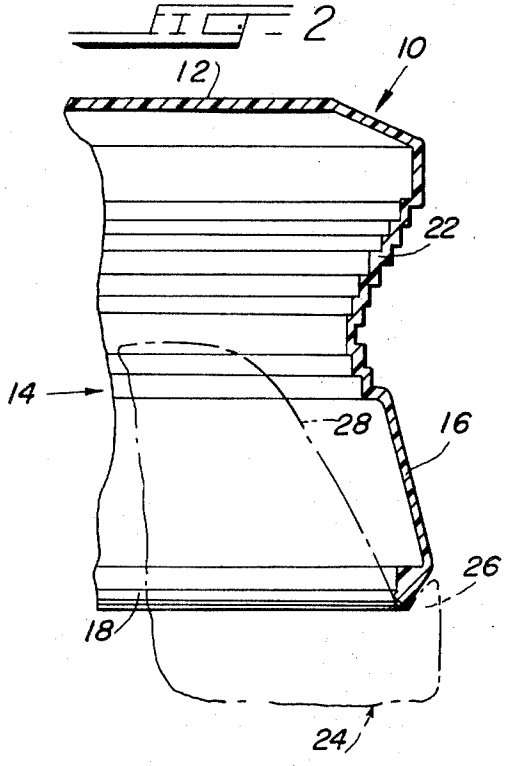
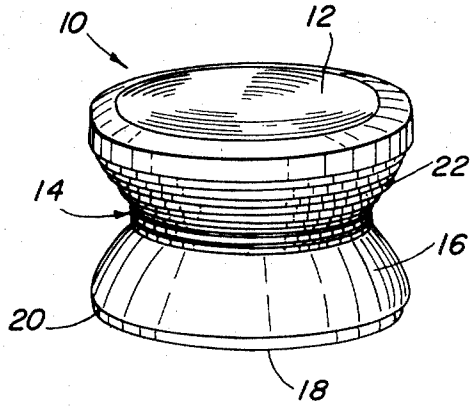


FIG - 3



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CONTOURED CAP

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ABSTRACT OF THE DISCLOSURE

A unitary cap, formed from moldable material, is adapted for use on aerosol container, or the like, and has a top and a skirt integrally formed with the top and depending downwardly therefrom thereby presenting a hollow, tubular member having an open bottom. The skirt has a side wall formed with non-uniform cross-section while retaining substantially uniform thickness of the side wall throughout the skirt.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to contoured unitary caps and, more particularly, to contoured unitary caps having non-uniform interior cross-section of the skirt portions thereof while retaining a substantially uniform wall thickness throughout the skirt.

The prior art

Caps or overcaps adaptable for use with aerosol containers, or the like, protect the dispensing valve or the dispensing nozzle of the container as well as enhance the appearance of the container. Heretofore, aerosol caps formed from moldable material such as plastic, had been limited to a construction whereby the interior cross-section of the skirt of the cap adjacent the closed top thereof was smaller or equal to the interior cross-section of the skirt adjacent the open bottom of the cap. Because of this limitation, if it became desirable to have the exterior skirt cross-section near the top of the cap greater than the exterior cross-section at the open bottom of the cap, the thickness of the skirt side wall had to be increased to provide for the enlargement of the exterior cross-section. Such increase in side wall thickness added material and prolonged the necessary cooling time of a molded cap, thereby increasing the costs associated with the manufacture of such caps. Further, skirt constructions which have greater exterior cross-sections at the top of the cap as compared with the exterior cross-sections at the open bottom, have average side wall thicknesses of over .080". Thus, a considerable amount of material is used in the formation of the caps.

Another limitation of caps used heretofore exists in the area of a cap lock where the cap is locked to the chime of the container. Here, a portion of the cap protrudes beyond the container diameter in the area of the chime and, while in storage or shipment, may contact a cap of adjacent container and cause knockdown of containers. To prevent this occurrence, partitions have to be inserted between individual containers. Also, caps having interior locking features whereby they are locked to the dome portion of a container, leave a dirt-gathering space between the skirt of the cap and the chime of the container. This is due to the limitation of molding caps with cross-sections at their open bottoms substantially equal to cross-sections at their tops so that the chime and a portion of the top of a container are exposed.

SUMMARY OF THE INVENTION

The present invention overcomes the disadvantages

found in the prior art and provides a unitary cap, which requires no assembly since it is formed as a one-piece object, the cap having a top and a skirt depending therefrom to define a hollow, tubular member having an open bottom. The cap of the present invention may be formed with non-uniform interior and/or exterior cross-sections in the skirt while retaining substantially uniform thickness of the side wall of the skirt and thus producing savings of materials. The cap may be contoured in any desired manner, for example, it may have a greater interior cross-section in the area adjacent the closed top rather than in the area adjacent the open bottom of the cap. Likewise, the exterior or interior of the skirt may be formed with raised relief design or lettering without increasing the wall thickness of the skirt side wall and thus saving materials. If spot strengthening, ribs, rings, undercuts or similar configurations are desired, these can be formed without affecting the uniformity of the wall thickness of the skirt.

Further, the cap may be formed with dissimilar interior and exterior cross-sections thereby permitting unusual contour and design freedom when using the cap to enhance an aerosol container or the like.

Since the skirt of the cap can be made to flare-out immediately above the locking area adjacent the bottom of the skirt, the skirt may be formed wider, narrower, or equal to diameter of the container to provide a flush-fit between the cap and the container without increasing the thickness of the side wall of the skirt.

DRAWING

FIG. 1 is a side elevational view of the cap of the present invention;

FIG. 2 is a sectional view, on an enlarged scale, taken generally along the line 2—2 of FIG. 1 and showing a portion of aerosol container in phantom; and

FIG. 3 is a perspective view of the cap of the present invention.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawing and will herein be described in detail, an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawing, there is shown a unitary cap, formed from moldable material such as plastic or the like, and generally designated **10**. The cap has a closed top **12** and a skirt **14** which is formed integrally with the top **12** and has a side wall **16**, as best seen in FIG. 2. The skirt **14** depends downwardly from the closed top **12** and terminates in an open bottom **18** which may be formed with a variety of locking means **20** whereby the cap is to be releasably secured to a container.

The cap illustrated herein is formed with exterior gripping means **22** which have a functional as well as an aesthetic value. When the cap is placed on a container **24**, gripping means **22** serve a useful purpose in permitting the user to grasp the cap more firmly and to assist him in removing the same from the container.

As best seen in FIG. 2, the thickness of the side wall **16** is substantially uniform throughout the skirt from the area of the skirt adjacent the closed top **12** to the area of the skirt adjacent the open bottom **18**. It will be seen that, in the embodiment illustrated, the smallest interior cross-section of the skirt is formed at approximately midpoint between the top **12** and the bottom **18**. As stated heretofore, a variety of designs and contours is possible whereby the interior and/or exterior cross-sections of the

skirt may be varied as desired without substantially affecting the uniformity of the thickness of the side wall **16**.

The cap of the present invention may be releasably secured to the container in a variety of ways. FIG. 2 illustrates but one way of locking the cap **10** to the top of the container **24**. Here, the bottom portion of the skirt including the locking means **20** is tension-fitted between a chime **26** of the container and the lower portion of a container dome **28**. It can be readily observed that a flush relationship exists between the skirt **14** and the container wall in the area of the lock eliminating the undesirable protrusion discussed heretofore.

The cap may be provided with interior locking means (not shown) extending from the top **12** whereby it may be releasably locked to the top of the dome **28** in a suitable manner.

The thickness of the side wall **16** of the cap of the present invention averages less than .080" in the area of the skirt from immediately adjacent the closed top **12** to the area adjacent the open bottom **18**.

The thickness of the side wall is not affected by provision of ornamental, functional, identifying, or other designs on the exterior of the skirt. The wall thickness at points having ornamentation is substantially equal to the wall thickness at other points of the skirt.

A further feature of the cap of the present invention lies in the fact that the closed top **12** is free from any horizontal mold parting lines extending across the top **12**. The absence of such parting lines makes the top especially suitable for formation of identifying or other ornaments, designs, embossments or application of labels thereon.

I claim:

1. A unitary cap formed from moldable material and adapted to be used for an aerosol container or the like, comprising:

(a) a closed top;

(b) a skirt integrally formed with said top and depending downwardly therefrom to present a hollow, tubular member having an open bottom;

(c) said skirt having a side wall of substantially uniform thickness throughout said skirt;

(d) said skirt having changing interior and exterior cross-sections without affecting the thickness uniformity of said side wall.

2. A cap as defined in claim **1**, wherein the exterior of said skirt is formed with outwardly extending ornamentation the thickness whereof together with the thickness of a portion of said side wall on which said ornamentation is formed being substantially equal to the average thickness of the remaining portions of said side wall.

3. A unitary cap formed from moldable material and adapted to be used for an aerosol container or the like, comprising:

(a) a closed top;

(b) a skirt integrally formed with said top and depending therefrom to present a hollow, tubular member having an open bottom;

(c) said skirt having non-uniform interior and exterior cross-sections with the minimum cross-sections being presented at points substantially mid-way between the top and bottom thereof;

(d) said skirt having a side wall of substantially uniform thickness extending from the area of said skirt immediately adjacent said top to the area of said skirt adjacent said open bottom.

4. A cap as defined in claim **3**, wherein said closed top is free of any horizontal parting lines.

5. A unitary cap formed from moldable material and adapted to be used for an aerosol container or the like, comprising:

(a) a closed top;

(b) a skirt integrally formed with said top and depending downwardly therefrom to present a hollow, tubular member having an open bottom;

(c) said skirt having a side wall of substantially uniform thickness throughout said skirt;

(d) the minimum interior cross-section of said skirt being at points substantially mid-way between said top of the cap and said open bottom of the skirt.

6. A cap as defined in claim **1**, wherein said changing cross-sections are partially defined by convergence of said side wall downwardly from the area adjacent the top of the cap toward the middle of the skirt.

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GEORGE T. HALL, Primary Examiner

U.S. Cl. X.R.

220—24