April 21, 1964 A. K. GRIMSLEY 3,129,839

CONTAINER CAP

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Fig. 1.

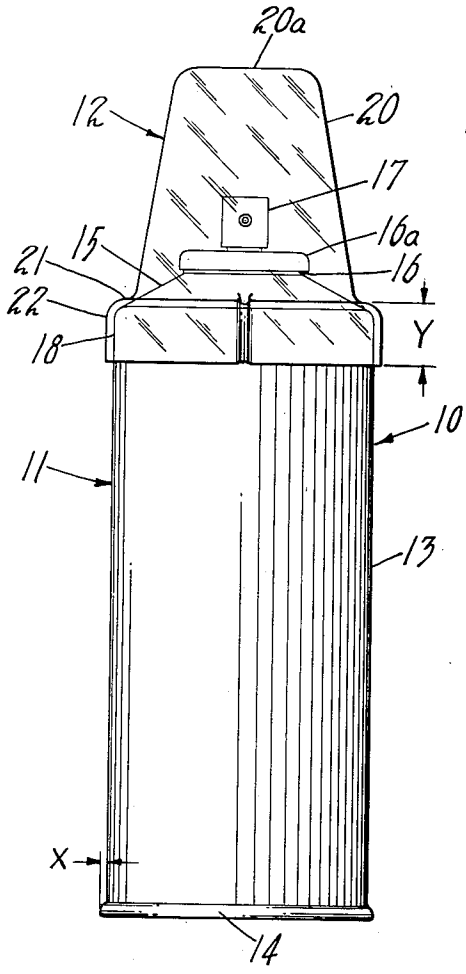


Fig. 2.

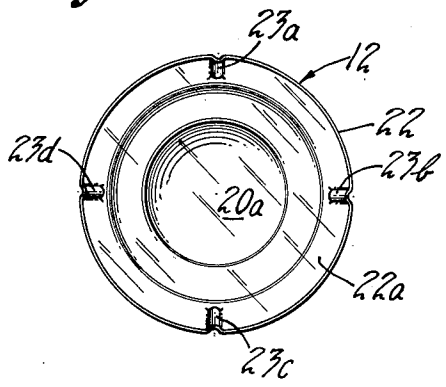
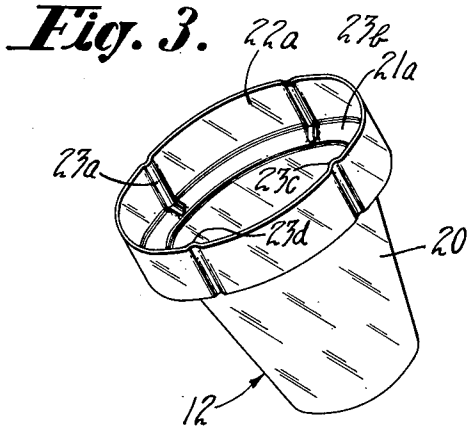


Fig. 3.



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CONTAINER CAP

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The present invention relates broadly to container closures, and is more particularly concerned with a deformable overcap especially suitable for aerosol containers and having among its features the provision of cushioning protection for the shoulders of the container and an encasement of the dispensing valve to prevent inadvertent actuation thereof.

Pressurized containers, whether they be of the side seamed sheet metal type or constituted in part of an extruded metal body, are equipped at the bottom thereof with a protruding peripheral bead formed by seaming a sheet metal closure disc to the can bottom flange. Such containers, when placed side by side in a shipping carton or upon a shelf in a retail outlet, are thereby in abutment only along their bottom seams, with the remainder of the bodies spaced from one another by the radial thickness of the bead. It is thus apparent, particularly when the containers are in transit, that the can bodies will bump one against the other in the region of their shoulder portions. This action results in at least scratching the decorative coating on the body, reducing its commercial appeal, and in many instances causes rather severe denting of the can body. This again detracts from the appearance of the container, and may in some cases actually prevent the container contents from being dispensed in a uniform and free flowing manner.

Then too, the dispensing valve at the upper end of the can is designed to be actuated with minimum effort, which leads to occasional inadvertent dispersal of the contents. This may occur under many circumstances, as for example if the container while stored on the grocery shelf is handled by curious children.

It is accordingly an important aim of the present invention to provide a protective overcap for a pressurized container effective to guard the container against damage caused in the main by jostling contact.

Another object of this invention lies in the provision of a deformable container closure of general dome-like configuration featuring a depending skirt adapted to embrace the container shoulders to provide cushioning protection therefor.

Still another object of the invention is to provide an overcap of the foregoing character and which is equipped along the inner diameter of the skirt portion with a plurality of circumferentially spaced and generally longitudinally extending raised ribs for frictionally engaging the shoulder of the container to place the skirt in close hugging contact therewith.

A further objective accomplished by this invention is the provision of a cap for use with a metal container having a breast and provided with a shoulder susceptible to damage, the cap including a dome-like portion which is connected to a skirt portion by an integral flange portion adapted to be seated upon the container breast, the skirt portion depending from the flange portion and embracing the shoulder of the container in snug fitting contact therewith.

An even further aim of this invention is to provide an overcap of the character just described, in which the inner surface of the skirt portion has a plurality of circumferentially spaced longitudinally extending ribs frictionally engaging the container shoulder and urging the skirt portion intermediate said ribs into snug fitting contact with the shoulder.

Other objects and advantages of the invention will become more apparent as the description proceeds, particularly when taken in connection with the accompanying drawings.

In the drawings, wherein like numerals are employed to designate like parts through the same:

FIGURE 1 is a side elevational view of a pressurized container mounting thereon an overcap constructed in accordance with the principles of this invention;

FIGURE 2 is a plan view of the overcap in an inverted position, viewing the same upwardly into the dome-like head portion thereof; and

FIGURE 3 is a perspective view of the closure cap of this invention.

Referring now to the drawings, a container assembly embodying the novel concepts of the present invention is designated generally therein by the numeral **10**, and comprises essentially two portions, a container or can **11** and an overcap or closure means **12**.

The container **11** is constituted by a generally cylindrical body **13**, which may be of extruded construction or of the side seam sheet metal type, having a sheet metal closure disc **14** double seamed to the can body bottom flange (not shown) in the manner well known to the art. The container body **13** at the opposite end thereof embodies an integral breast portion **15** terminating in an annular neck bead **16**, the bead having rolled or otherwise provided therein a mounting cup **16***a* supporting a dispensing valve **17** also in known fashion.

The container **11** as illustratively presented herein is intended to be exemplary only, and valving arrangements of different types may be employed. Various can body materials may be utilized, such as lead, aluminum and aluminum alloys, and if cost considerations can be somewhat overlooked, tin and other materials can be used. Further, the details of the interior of the can body, and particular the piston structure, have not been illustrated since they form no part of this invention. However, a commercially successful piston and container combination is shown in Hoffman application Serial No. 722,973, and assigned to the assignee of this application.

Making particular reference now to the bottom closure disc **14**, it may be seen that when the peripheral flange portions of the disc and can body bottom flange received therein are rolled and double seamed, there is produced an enlarged peripheral bead which has a radial thickness relation to the outer diameter of the can body **13** designated at "*x*." The presence of this annular protuberance constitutes a prime cause of damage to the upper end of the container body, particularly during shipment, but also when the cans are loaded side by side on the shelf of a retail outlet.

To explain, when a plurality of containers **11** are placed upright side by side in a shipping carton, they contact or abut along their bottom closures or along the peripheral bead provided thereby. Upwardly or axially from the bead **14**, however, the can bodies **13** are spaced one from another a distance generally equal to "*x*." As a result, the containers collide or bump one against the other with a rocking action and damage the upper regions thereof.

This region is identified in FIGURE 1 by the legend "*y*," and constitutes the shoulder of the container, extending generally from the juncture of the lower end of the breast **15** downwardly therefrom a distance which may be of the order of ½ inch, although this may vary with the height of the container. The container shoulder is designated at **18**, and along this annular band portion the bumping or jostling action described produces at least scratches, but more frequently, visible indentations. Such

markings destroy the commercial appeal of the decorative container, and result in rejections by the customer.

Applicant has effectively solved this problem by provision of the overcap 12, which not only provides the requisite cushioning protection, but also encases the valve 17 to prevent inadvertent actuation thereof, as well as incidentally improving the total appearance of the assembly 10. The overcap 12 as illustrated is transparent merely to facilitate the instant description, and in a final package is colored to harmonize with the decoration selected for the container 11.

The overcap is desirably vacuum formed, thereby reducing the cost thereof, and exemplary materials are cellulose acetate, polyethylene or any other plastic sheet material having "elastic memory," that is, the property of continuously attempting to return to its original shape after forcible deformation. In this manner, as will be more fully described, the overcap is at all times in gripping relation with the container 11 so as to preclude its accidental dislodgment therefrom.

The closure means or overcap 12 embodies a dome-like head or upper portion 20 having a configuration substantially that of a frustum of a cone and closed at one end by a top wall 20*a*. The downwardly divergent head portion 20 terminates in a generally radially outwardly directed flange or ledge portion 21, and as appears, the latter portion may have a slight slope so that when the overcap 12 is properly seated as shown, inner surface 21*a* of the ledge or shelf portion 21 lies flush against the lower peripheral margin of the container breast 15 along its juncture with the container shoulder 18.

Depending vertically from the overcap flange 21 and essentially parallel to the longitudinal axis of the overcap is a skirt portion 22, shown as embracing the container shoulder 18 and therefore having a length substantially corresponding to the height of the shoulder, and likewise, to the length of the dimension "y" or "annular damage band area."

The skirt portion is of course integral with the flange or ledge portion 21, and has an inner diameter slightly less than the outer diameter of the container shoulder portion 18 so as to be in close hugging contact therewith at all times when located in embracement, as shown. In this manner, the property of elastic memory is utilized and the overcap skirt is continuously drawing itself against the container shoulder in opposition to the forces which caused its deformation as the overcap was forced onto the container.

Preferably, however, the skirt portion 22 along inner surface 22*a* thereof is provided with a plurality of circumferentially spaced ribs 23*a–d* which frictionally engage the container shoulder 18 at two pairs of diametrally opposed locations thereon to urge the skirt portion 22 intermediate the ribs into snug fitting contact with the shoulder 18. To explain further, the inner diameter of the skirt portion as measured between diametrally opposed ribs 23 is preselected to be less than the diametral dimension of the container shoulder 18. Thereby, when the overcap is forced downwardly upon the container, the ribs or raised surfaces 23 frictionally rub against the container shoulder continuously during their travel thereon, and, by reason of their dimensioning in a diametral direction as compared with the container shoulder diameter, the ribs cause what may be considered a tensioning or tightening of the skirt between the ribs so that there is effectively complete gripping between the skirt and shoulder entirely around the can circumference.

In this manner, a firm hugging contact between the container shoulder and overcap skirt is provided which resists accidental dislodgment of the overcap and further, prevents the ingress of substantial volumes of air into the overcap, reducing drying of the container contents in the orifice of the dispensing valve 17. As well, with the overcap in position as shown, inadvertent actuation of the valve is prevented, and as an incidental benefit, the general appearance of the assembly 10 is enhanced.

The ribs 23 are illustrated as four in number and spaced 90° from one another, although of course this can be varied. Further, the ribs are shown as extending slightly into the flange or ledge 21, but here again, this is not at all times required. It is important to note, however, that the overcap skirt portion 22 protects the container in the critical shoulder area susceptible to damage. The thickness of the skirt material is calculated to be substantially that of the dimension "*x*", representing the radial thickness of the container bottom bead. In this manner, when the containers are clustered in side by side relation they contact at both the top and bottom thereof, and the mentioned rocking or jostling is prevented. Further, the ribs are somewhat compressible or deformable so that a good degree of cushioning protection is provided.

Various changes and modifications may of course be effected without departing from the novel concepts of this invention.

I claim:

1. A one-piece exteriorly stepped thermoplastic cap for use with a deformable container having a peripheral bead at one end, a smoothly rounded breast adjacent the opposite end thereof, and a smooth-surfaced shoulder between said ends susceptible to damage; comprising a generally dome-shaped head portion, a ledge portion integral therewith and extending generally radially outwardly and downwardly from said head portion for engagement with the container breast, and a cushioning skirt portion depending from said ledge portion and embracing the container shoulder in close hugging contact therewith, said skirt portion being so dimensioned relative to the container shoulder so as to be readily slidable thereon and yet resistive to accidental dislodgment therefrom.

2. A one-piece exteriorly stepped thermoplastic cap for use with a deformable container having a peripheral bead at one end, a smoothly rounded breast adjacent the opposite end thereof, and a smooth-surfaced shoulder between said ends susceptible to damage; comprising a generally dome-shaped head portion, a ledge portion integral therewith and extending generally radially outwardly and downwardly from said head portion for engagement with the container breast, and a cushioning skirt portion depending from said ledge portion and embracing the container shoulder in close hugging contact therewith, said skirt portion being so dimensioned internally relative to the outer diameter of the container skirt so as to be readily slidable thereon and yet resistive to accidental dislodgment therefrom, the wall thickness of said skirt portion being substantially equal to the radial thickness of the container bead so that when a plurality of containers are located side by side they contact at their beads and against the cap skirt portions.

3. A one-piece exteriorly stepped thermoplastic cap for use with a deformable container having a peripheral bead at one end, a smoothly rounded breast adjacent the opposite end thereof, and a smooth-surfaced shoulder between said ends susceptible to damage; comprising a generally dome-shaped head portion, a ledge portion integral therewith and extending generally radially outwardly and downwardly from said head portion for engagement with the container breast, a cushioning skirt portion depending from said ledge portion and embracing the container shoulder in close hugging contact therewith, and rib means formed on the interior of said skirt portion at circumferentially spaced locations therealong for frictionally engaging the container shoulder and urging said skirt portion intermediate said rib means into snug fitting contact with said shoulder.

4. A one-piece exteriorly stepped thermoplastic cap for use with a deformable container having a peripheral bead at one end, a smoothly rounded breast adjacent the opposite end thereof, and a smooth-surfaced shoulder be-

tween said ends susceptible to damage; comprising a generally dome-shaped head portion, a ledge portion integral therewith and extending generally radially outwardly and downwardly from said head portion for engagement with the container breast, a cushioning skirt portion depending from said ledge portion and embracing the container shoulder in close hugging contact therewith, and a plurality of circumferentially spaced and longitudinally extending ribs formed on the inner surface of said skirt portion and extending from said ledge portion to the peripheral margin of said skirt for frictionally engaging the container shoulder and urging said skirt portion intermediate said rib means into snug fitting contact with said shoulder.

5. A container assembly, comprising a container having a body with a shoulder at one end, first and second wall means closing opposite ends of said body, said first wall means providing a peripheral bead with the container body, dispensing means supported by said second wall means; and a one-piece exteriorly stepped thermoplastic cap seated upon said container body at said one end thereof, said cap comprising a head portion surrounding said dispensing means, a ledge portion integral therewith and extending generally radially outwardly and downwardly from said head portion for engagement with said second wall means of said container body, and a cushioning skirt portion depending from said ledge

portion and embracing the container shoulder in close hugging contact therewith, said skirt portion being so dimensioned relative to the container shoulder so as to be readily slidable thereon and yet resistive to accidental dislodgement therefrom.

6. A one-piece exteriorly stepped thermoplastic cap for use with a metal container having a smoothly rounded breast and provided with a smooth-surfaced shoulder susceptible to damage, comprising a dome-like portion, a generally radially outwardly and downwardly directed flange portion connected to said dome-like portion and adapted to be seated upon the breast of the container, a skirt portion integral with said flange portion and depending therefrom for embracing the shoulder of the container in snug fitting contact therewith, and means on the inner surface of said skirt portion providing a plurality of circumferentially spaced raised ribs frictionally engaging the container shoulder and urging said skirt portion intermediate said ribs into snug fitting contact with said shoulder.

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