Oct. 23, 1956 J. W. SOFFER 2,767,888

SHIELDS AND CAPS FOR CONTAINERS

Filed March 17, 1954 2 Sheets-Sheet 1

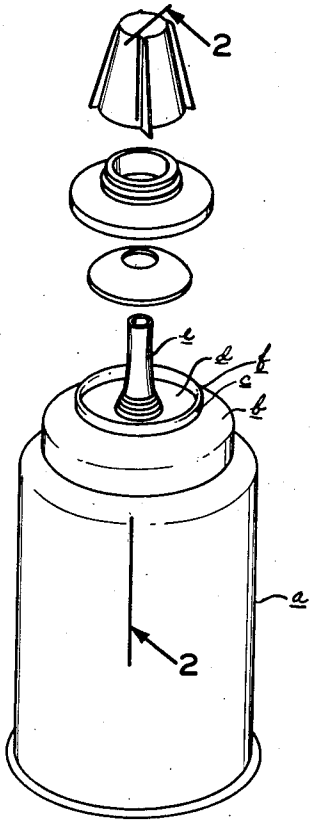

FIG. 1

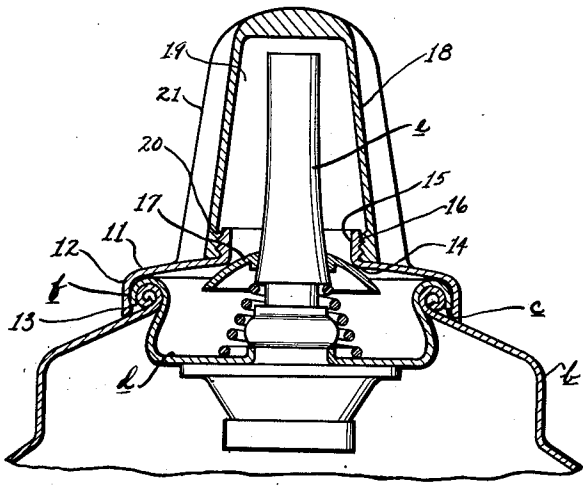

FIG. 2

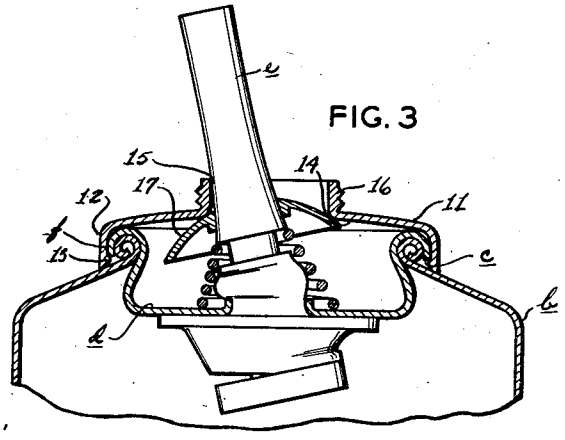

FIG. 3

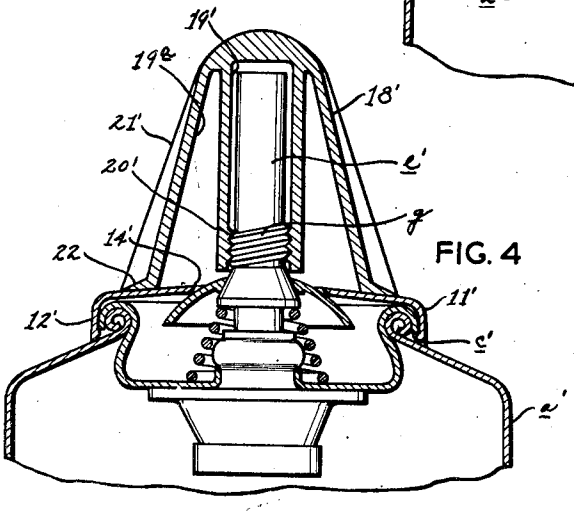

FIG. 4

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Oct. 23, 1956 J. W. SOFFER 2,767,888

SHIELDS AND CAPS FOR CONTAINERS

Filed March 17, 1954 2 Sheets-Sheet 2

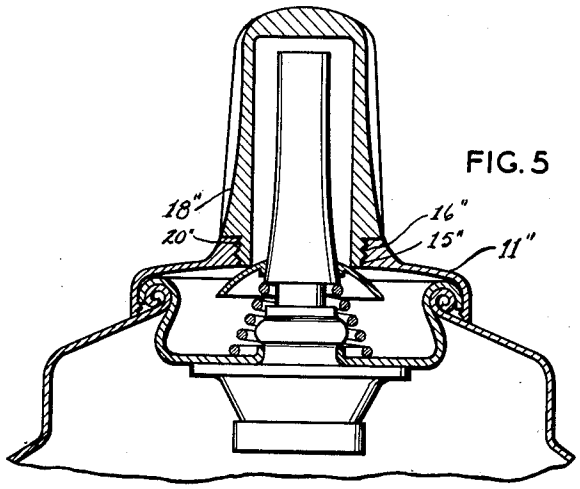

FIG. 5

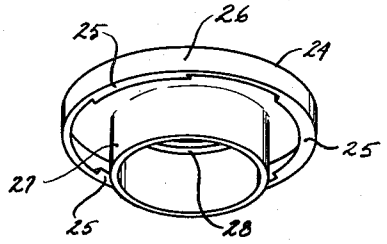

FIG. 7

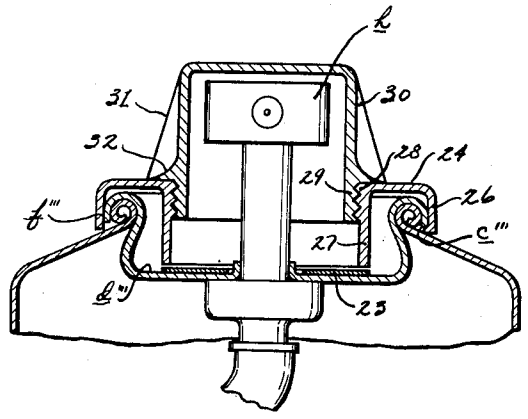

FIG. 6

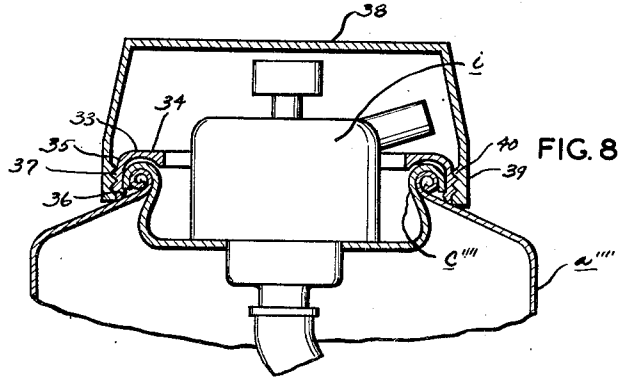

FIG. 8

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SHIELDS AND CAPS FOR CONTAINERS

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Application March 17, 1954, Serial No. 416,908

8 Claims. (Cl. 222—182)

This invention relates to top shields and attaching caps for metal containers, and particularly for so-called single-use dispensing containers adapted to dispense foams or sprays under gas pressure.

The usual procedure for sealing such containers is to fill the liquid content thereof into the container when open; then the container top, in which a valve is mounted, is crimped or seamed sealedly onto the container mouth; and finally gas is inserted through the valve and mixed with the liquid contents. It has not proved feasible, from the standpoint of manufacturing costs and techniques, to form screw threads on the exterior of such metal containers. Can seaming and crimping equipment apply heavy pressures around the edge to be sealed; formed threads are likely to be in the way and subject to damage. If relatively inexpensive threads were to be formed into the metal tops of such containers, they would lack sufficient precision and accuracy to permit screw caps to be readily affixed and removed.

The tops of such dispensing containers usually have sheared edges; and no finishing operation is applied after the seaming or crimping. As a result, the container rim presents a sheared edge which lacks the smoothness of the finished container, and which may be subject to rusting.

The purposes of the present invention include the provision of a snap-on annular rim shield to serve as a supplementary top to be closed by a valve protecting cap, to cover sheared sheet metal edges and improve the appearance of a container of the type described; to conceal container top parts which give a mechanical appearance or are likely to rust; to permit inexpensive variation of basic design, so that one basic structure may give an individual appearance to each of a variety of different brands of products; to permit the attachment of ornamental caps in a variety of convenient ways; and, when used with tilt-stem valves, to restrict the permissible degree of tilt.

In the accompanying drawings:

Figure 1 is an exploded perspective view, partly from above, of the elements of the present invention, together with a dispensing container of the type described.

Figure 2 is an enlarged, assembled sectional view taken along line 2—2 of Figure 1, further showing a cap element mounted in place.

Fig. 3 is a sectional view similar to Figure 2, the cap being removed and the valve stem being tilted.

Figure 4 is a sectional view similar to Figure 2, showing a modified embodiment of the present invention, the cap engaging with screw threads on the valve stem.

Figure 5 is a sectional view similar to Figure 2, of a further modified form of invention, the annular shield member being provided with internal threads.

Figure 6 is a sectional view similar to Figure 2, of a still further embodiment, the annular shield having a depressed center ring and retentive teeth.

Figure 7 is a perspective view partly from beneath the annular shield member of Figure 6, showing the retentive teeth thereof.

Figure 8 is a sectional view of an additional modified form of invention, the annular rim shield having screw threads molded onto its outer diameter.

Figures 1 and 2 show a disposable low-pressure container *a* of the seamless wall type, its upper side *b* being reduced in diameter to a lipped mouth *c*, onto which a container top *d*, mounting a tilt stem valve *e*, is crimped internally. The outer edge *f* of such container top *d* is presented at or slightly below the mid-point of the lipped mouth *c*. Such outer edge *f*, being normally a sheared edge, is frequently not as smooth as is desired for the packaging of products such as lathers, cosmetics, etc. If the container top *d* has been coated or finished prior to shearing, it is apparent that the outer edge *f* may become rusted; and in any event it may become rough-ended during the crimping or seaming process.

To overcome this undesirable possibility, and bring about the other advantages of the present invention, I provide a molded plastic annular shield, generally designated **11**, of a somewhat domed shape and having an outer rim **12** of a depth slightly greater than the depth of the lipped mouth *c*, and having retention means, such as a retentive bead **13**, molded internally to the lower edge of the rim **12**, to snap over and grasp the lipped mouth *c*, as shown in section in Figure 2. The annular shield **11** extends inward to cover the lipped mouth *c* and partially cover the container top *d*, and terminates along a preferably circular inner edge **14** having an upward-extending flange **15** molded along its outer side with the shield screw threads **16**.

The retentive bead **13**, which is molded integrally with the lower edge of the rim **12**, extends inward therefrom enough to grasp the lipped mouth *c*. Molded plastic material of the hard, structurally elastic type is utilized; and the rim **12** exerts a tension force against the sheared outer edge *f*. This prevents both axial removal of the shield and any twisting force which may be applied to it. The otherwise undesirable roughness of the outer edge *f*, against which the bead **13** presses, as shown in Figure 2, cooperates with this tension force in holding secure against such removal or twist.

Before the annular shield **11** is snapped into place on the container mouth *c*, a somewhat convex washer **17** is press-fitted over the tilt stem valve *e*. The washer **17** has an outer diameter substantially less than the inner diameter of the lipped mouth *c* and substantially greater than the inner diameter of the circular inner edge **14** of the shield **11**. The purpose of the convex washer **17** is to serve as a screen, so that the container top *d* and the spring mechanism at the base of the tilt stem valve *e* is concealed from view.

Figure 3 shows such tilt stem valve *e* in tilted position, with the side of the stem *c* contacting the upward-extending flange **15**. In this position the convex washer **17** moves within the somewhat domed body of the annular shield **11**, and serves its screening purpose regardless whether the valve *e* is tilted or erect. It is to be noted that the upper edge of the shield flange **15** restricts the permissible degree of tilt of the valve stem *c*. Such tilt restriction may be of importance wherever it is desired to restrict the rate of flow of the container contents, or where excessive tilting would result in leakage around the valve stem.

In order to protect the valve *e* from inadvertent contact, and to preserve its spout clean and dust-free, I provide a cap **18** having a cavity, generally designated **19**, of adequate size to accommodate the valve *e*. Molded within the lower edge of the cap **18** are screw threads **20**, adapted for engaging the shield screw threads **16**. The cap **18** may be equipped along its sides with a plu-

rality of twist fins **21**, which, when the cap **18** is screwed in place, preferably extend down to a point adjacent the upper surface of the annular shield **11**.

Referring to Figure 4, there is shown a similar container *a'*, in the top of which is mounted a tilt stem valve *e'* onto the outer surface of which are molded the stem threads *g*. For such a valve, there may be utilized an annular shield **11'** having an outer rim **12'** which retentively grasps a lipped mouth *c'* of the container *a'*, the shield **11'** extending inward to a circular inner edge **14'**. In this embodiment I provide no flange for the inner edge **14'**, which itself serves as a tilt-restrictor. A cap **18'** having a relatively narrow inner cavity wall **19'**, is provided with integral cap threads **20'** molded along its lower edge for mating engagement with the stem threads *g*. An outer cavity wall **19***a* skirts annularly around the inner cavity wall **19'**. Utilizing this embodiment, when the cap **18'** is screwed tightly in place, it locks the tilt stem valve tightly in closed position, remedying any displacement of the valve parts which may have theretofore occurred. The exterior surface of the outer cavity wall **19***a* is equipped with external twist fins **21'**, which, in this case, may terminate in a bottom radial flange **22** extending therefrom a sufficient distance outward to bear sealedly against the upper surface of the annular shield **11'**.

Figure 5 shows another embodiment modified from that shown in Figures 1 and 2 in the following respects: the annular shield **11''** is provided with an upward-extended flange **15''** having shield screw threads **16''** molded on the inner side thereof. These are adapted for mating with exterior cap screw threads **20''** molded on the outer surface of a cap **18''** along its lower edge. This construction improves the appearance of the assembly when the cap is removed, because the screw threads **16''** of the shield **11''** are substantially concealed.

The present invention is adapted for use with valves of the type which open by being axially depressed, such as a button-type valve and plunger *h*, shown in Figure 6. Since such valves do not tilt, there is no need for tilt restriction. However, for the purpose of improving the appearance of the container when in use, a colorful molded plastic top-concealing washer **23** may be mounted in place before the button element is mounted to the button-type valve and plunger *h*.

An annular shield **24** is then sprung in place over the lipped mouth *c'''*. The annular shield **24** is shown in perspective in Figure 7, where it is viewed somewhat from below. Instead of any retentive bead, such as the retentive bead **13'** of Figure 2, the annular shield **24** is here equipped with a plurality (say three) spaced undercut teeth **25** molded integrally along the inner side of the lower edge of outer rim **26**. The teeth **25** may extend inward somewhat more than such a retentive bead **13**, because when the shield **24** is pressed over the container mouth *c*, the teeth will exert an outward camming force on the rim **26**, which deforms elastically to permit the passage of the teeth **25** over the lipped mouth *c'''*. The teeth **25** are held in tension by the rim **26** elastically against the sheared edge *f'''* of the container top *d'''*. Such tension prevents both the axial removal of the annular shield **24** and its twisting on the lipped mouth *c'''*.

The shield **24** extends inward to a downward-extending inner rim **27** having screw threads **28** molded on the inner surface thereof. These threads are adapted for mating engagement with the external molded cap screw threads **29** of a cap **30**. The cap **30** has twist fins **31** which terminate along the cap side wall in a radial flange **32** above the upper margin of the cap screw threads **29**. The cap radial flange **32** may be contoured so as to slope gradually toward and seem to merge into the upper surface of the annular shield **24**.

Certain types of dispensing valves currently in use, such as the side spout valve *i*, shown in Figure 8, occupy

substantially all the space within the lipped mouth, designated *c''''* of the container *a''''* therein shown. For use with such a valve, I provide an annular lip-covering shield **33** having a relatively narrow annular body **34** adapted to cover the lipped mouth *c''''*; further having a downward-extending outer rim **35** which retentively grasps such lipped mouth by means of a retentive bead **36** molded within the outer rim **35** adjacent its lower edge. In order to leave adequate space for such side spout valve *i*, an external screw thread **37** is molded integrally with the outer side surface of the outer rim **35**. A cap **38**, having a skirt **39** of sufficiently large inner diameter to encompass the outer rim **35**, is provided with screw threads **40** molded on the inner surface of the skirt **39**.

The several embodiments of the present invention here shown each provide a convenient top shield member which snaps over and grasps the lipped top of a container, defying not merely axial removal but also twisting. Unless the grasp was positive and secure, the structures shown would be entirely unworkable. Not only must this grasp offer greater resistance to twisting than do the mating screw threads by which the cap is attached to the shield; it must be sufficient to resist all manual effort to turn the shield, so that the shield becomes in effect a permanent part of the container.

Edge roughness, which is an otherwise undesirable characteristic of seamed or crimped cans, is here taken advantage of. I find that the seaming or crimping operation produces such an increased coefficient of surface friction that, under the elastic tension in the shield, rim resistance to twisting is very great. If the container edges were perfectly smooth, the success of the present invention would not be achieved.

While teeth such as the broad teeth **25** shown in Figure 7 may be successfully utilized, fuller advantage of the surface friction around the seamed or crimped edge may be taken by having the retention means, which are in frictional contact, extend around a major part of the circumference of the seam. In either event, by utilizing the ordinarily undesirable edge roughness, I provide a simple inexpensive shield member which snaps permanently to the container top and cannot be removed axially nor twisted.

In addition to serving as a threaded base for the removable cap, the shield may serve a variety of other purposes, such as ornamenting the container and restricting the degree of permissible tilt of a valve of the tilt-opening type. Various types of valves, which may be utilized on the same basic container, each have different clearance requirements. The annular shields herein shown are adapted for ready modification to serve the clearance requirements of each type; and appropriate caps may be readily affixed to and removed from the shields.

The ornamental possibilities of the present invention are commercially important. A variety of alternate cast or molded materials may be employed, such as hard rubber. Changes in color and contour may be readily made so as to lend individuality to each brand of product packed in the container. Thus, by slight modifications in form and color, the same container, valve, and basically similar shield and cap, may be utilized to present competitive products each in a highly individualistic form.

The present invention is capable of many variations and modifications without departing from the inventive principles disclosed; for example, bayonet-type fastenings might be used for cap retention instead of screw threads. Accordingly, the present invention should not be construed narrowly, but instead as fully co-extensive with the inventive principles disclosed and with the claims hereof.

I claim:

1. A shield and cap assembly for metal containers of the type having a rimmed mouth terminating in a protruding sheared sheet metal edge and a dispensing valve

mounted in such mouth, comprising a molded plastic annular shield member having a perimeter rim adapted to fit over the rimmed mouth of such container, the said perimeter rim having a retention means molded integral with and inside the said rim adjacent to its lower edge and held against such sheared edge by the said rim, whereby to resist removal therefrom and twisting thereon, the said shield member further having an annular body portion tending inward from the upper margin of the shield rim to a central circular opening, and being adapted to protectively cover such rimmed container mouth around such dispensing valve, the said assembly further comprising a molded plastic closure cap having a top, a side wall enclosing a cavity adapted to accommodate such dispensing valve, a lower cap margin adapted for close fit against the annular shield adjacent its central opening, and screw threads adjacent said lower cap margins adapted to hold said cap in secure closed contact with said shield member.

2. A shield and cap assembly as described in claim 1, the retentive means of the shield member being a bead extending inward from the lower margin of said rim and held by its elasticity in grasping contact with the entire perimeter of such sheared edge.

3. A shield and cap assembly as described in claim 1, the retentive means of the shield member being a plurality of teeth extending inward at spaced intervals and adapted to be pressed securely against such sheared edge by the elasticity of the shield rim.

4. A shield and cap assembly as described in claim 1, the central circular opening of the shield member having a flange and threads molded thereon for engaging the closure cap.

5. A shield and cap assembly as described in claim 1, the central circular opening of the shield member having an inner flange extending inward within the container mouth, and threads molded therein for engaging the closure cap.

6. A shield and cap assembly as described in claim 1, such dispensing valve having a tiltable stem, the central circular opening of the shield member being concentric with such tiltable stem and its edge being positioned at an angle with reference to the tilting thereof as to limit the permissible degree of tilt to a predetermined desired maximum.

7. A shield and cap assembly as described in claim 1, such dispensing valve having a tiltable stem, the shield member being somewhat domed, in combination with a convex washer having a central opening press-fitted to such tiltable stem, and an outer diameter larger than the central circular opening of the shield member and smaller than the inner diameter of the mouth of such container, whereby the container top and any valve mechanism beneath said washer are concealed from view regardless whether such tiltable stem is erect or tilted.

8. A shield and cap assembly for metal containers of the type having a circular top wall joined to a sidewall in a turned joint and having a dispensing valve centrally mounted in such top, said assembly comprising a molded annular member having a perimeter rim adapted to fit over the turned joint of such container and having integral molded, inward-protruding means adapted to grasp over and be presented in surface contact against such joint, the said annular member further having a central circular opening adapted to permit such dispensing valve to protrude therethrough, and having molded screw threads for mounting a cap, said assembly further comprising a molded closure cap having a top, a sidewall enclosing a cavity adapted to accommodate such dispensing valve, a lower cap margin adapted to fit against the annular member as a closure therefor, and screw threads adjacent said lower cap margin for permitting such cap to assume a closed position in contact with said annular member, the said inward-protruding means being presented in surface contact with such portion of the perimeter of such turned joint as to provide surface friction thereagainst sufficient to prevent manual twisting of the cap.

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