

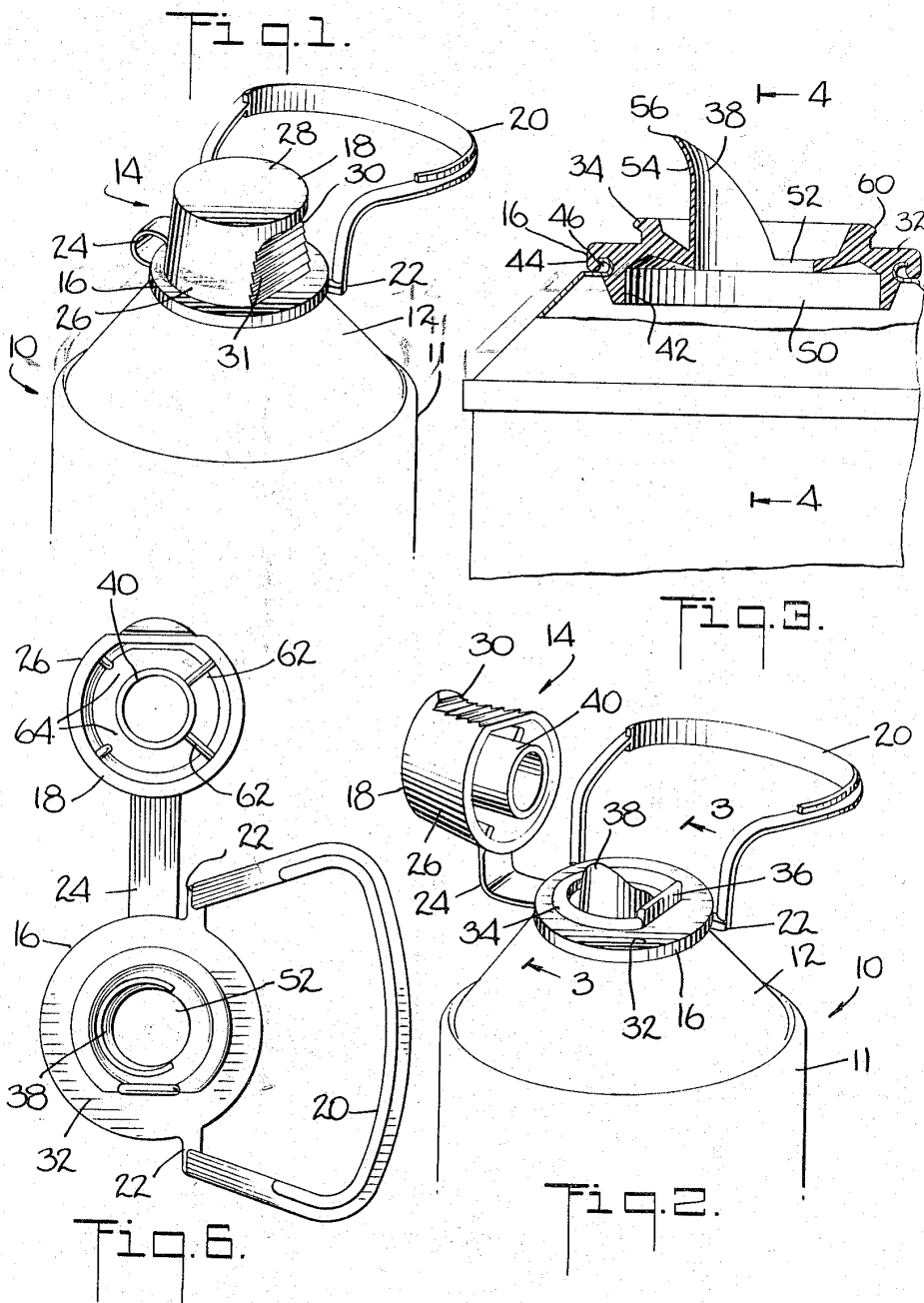
March 7, 1967

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CAPTIVE PLASTIC CLOSURE FOR CONTAINER
WITH INTEGRAL CONTAINER HANDLE

3,307,752

Filed March 15, 1965

2 Sheets-Sheet 1



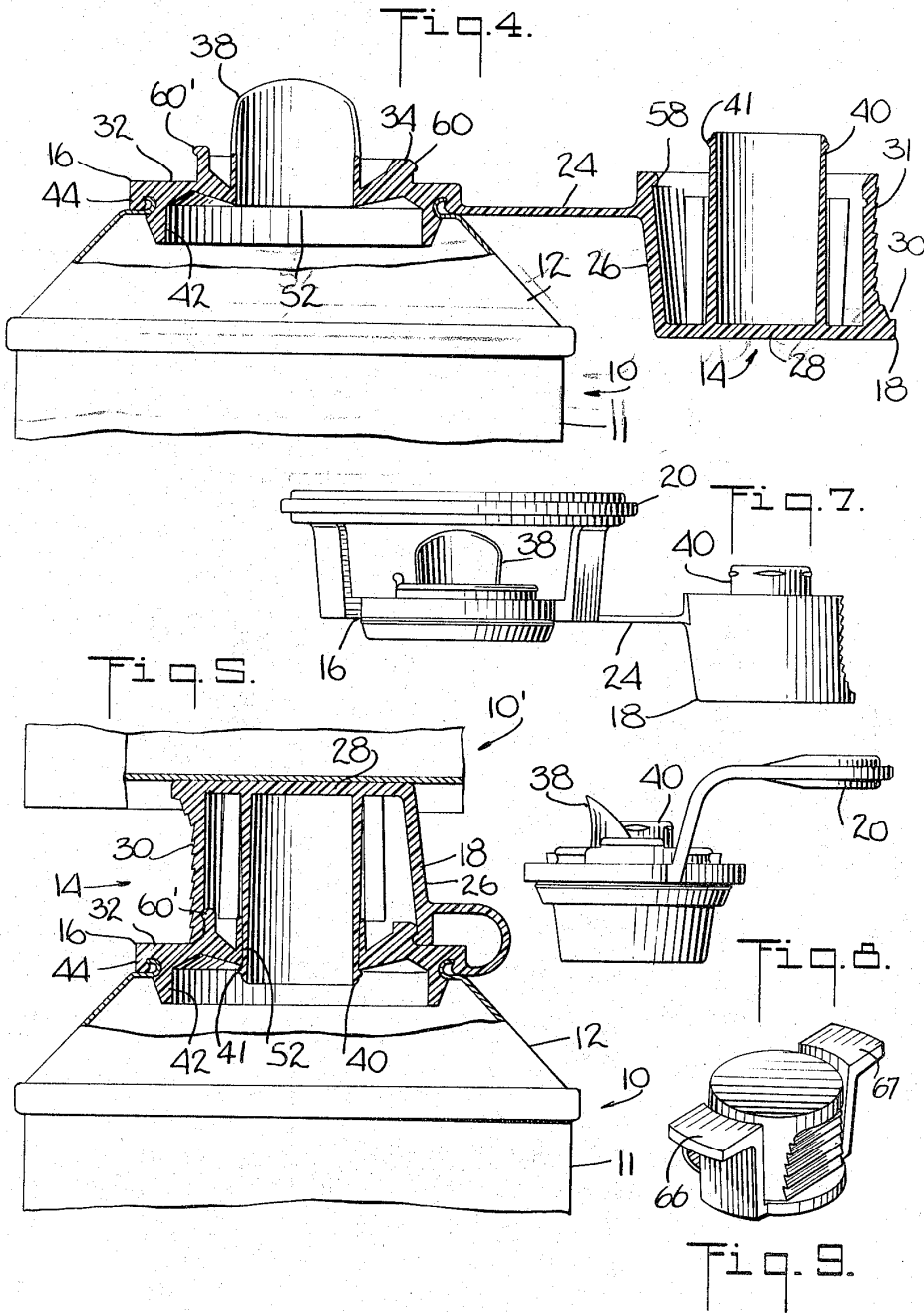
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**CAPTIVE PLASTIC CLOSURE FOR CONTAINER
WITH INTEGRAL CONTAINER HANDLE**
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4 Claims. (Cl. 222-465)

This invention relates to container closures and more particularly it concerns an improved overcap closure arrangement for use with spouted containers.

Certain liquids, such as those of low viscosity and low cohesiveness, exhibit a strong tendency to spill or drip during pouring. For this reason, it is desirable to provide some sort of a pouring spout on the containers in which these liquids are kept.

Unfortunately, the provision of pouring spouts on liquid containers has introduced collateral difficulties of such a nature that the spouts in many cases had to be dispensed with. One such difficulty was due to the fact that the spout, being located along the inner edge of the container opening, made it difficult to design a really effective and easily openable closure for the container. Another difficulty was that the upwardly protruding spout, being of comparatively fragile construction, was easily damaged or distorted when these containers were handled or stacked upon each other as for storage or shipment prior to sale.

In some cases, spouted containers have been provided with closure means such as a removable plug which was wedged into the container opening at the base of the spout. This, however, left the spout exposed and susceptible to contamination. Furthermore, the exposed upwardly protruding spout was left in a position to be crushed by the weight of any containers stacked thereon. Also, the weight of stacked containers very often would wedge the plug into the container opening to such an extent as to cause distortion and loss of the liquid seal.

In certain other cases, container closures of the cap type have been provided. These closures, which resembled an inverted cup, would cover the entire container opening. However, they were unsatisfactory for use with spouted containers for they would allow liquid to flow up and around the spout area and inside the hollow cap, so that when the cap was removed, the problem of dripping and spilling was even greater than before.

I have made possible, through my invention, the provision of a container closure for use in connection with spouted containers without the aforementioned difficulties of the prior art. As a result of my invention, it is possible to provide at very low cost, conveniently useable container closures which neatly seal and protect a spouted container opening without undue distortion due to the heavy loading effects of stacked containers.

In essence, my invention resides in the provision of a specially shaped double walled cap structure which cooperates in a novel manner with the spouted opening of a container. The cap structure includes an outer wall portion which surrounds and encloses the spout, and an inner plug portion which depends within the outer wall portion and which is shaped such that when the cap is in position on the container, the plug enters into and seals the container opening. The plug has essentially the same peripheral dimensions along its length as the container opening so that the sealing effect of the plug is substantially independent of any distortion which the outer portion of the cap may undergo.

According to one feature of my invention, I provide a circumferential ridge surrounding the spout and opening, and a pressure receiving surface immediately surrounding the ridge. This allows the bottom peripheral edge of the wall portion of the cap to be pressed down against the container without distorting the shape of the container

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opening. Also, where the cap is of a resilient plastic material, the ridge may be beaded for a snap type fit with the cap thus providing a positive closure without the complexity and expense of screw threads.

According to another feature of my invention, I have provided as an integral unit, a captive cap and spouted base arrangement which can readily be snapped onto metal or glass containers formed with a simple central container opening. This integral unit may be molded of polyethylene material quite economically and it greatly increases the versatility of conventional metal and glass containers.

In one of its aspects, my invention includes the provision of a specially shaped handle preferably molded as an integral part of the base and captive cap. This handle serves a dual function; first, that of providing a carrying means thus eliminating the need for a waist shaped or small necked container; and secondly, that of providing a front end holding means when the container is tipped for pouring out through the spout.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of the invention.

A specific embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawings, forming a part of the specification wherein:

FIG. 1 is a perspective view illustrating the top portion of a container outfitted with a closure cap arrangement according to the present invention;

FIG. 2 is a view similar to FIG. 1 but illustrating the closure cap arrangement in opened condition;

FIG. 3 is an elevational view, partially in section, taken along lines 3-3 of FIG. 2;

FIG. 4 is an elevational view, partially in section, taken along lines 4-4 of FIG. 3;

FIG. 5 is a side elevational view similar to FIG. 4 but showing the cap in closed condition and illustrating the relationship of stacked containers outfitted with this cap;

FIG. 6 is a bottom plan view of a closure cap arrangement representing one embodiment of the invention;

FIG. 7 is a rear elevation of the embodiment shown in FIG. 6;

FIG. 8 is a side elevation of the embodiment shown in FIG. 6;

FIG. 9 is a perspective view illustrating a T-bar handle arrangement.

In FIG. 1 there is shown a container 10, having a cylindrically shaped side wall 11, and an upwardly slanted top wall 12. The container 10 is typical of many glass or metal containers used in connection with the retail merchandising of various liquids such as floor wax or liquid cleansers. On the top of the container 10, I provide a novel cap arrangement, indicated generally at 14. This novel cap arrangement is formed of a plastic material such as polyethylene and includes a circular base 16, fitted onto the top wall 12, a cup-shaped overcap 18. In a preferred embodiment handle 20 is generally U-shaped. In this embodiment handle 20 is affixed to and may be integrally molded with the base portion 16 at outwardly protruding lugs 22 located at its periphery.

In still another embodiment (not shown) handle 20 is affixed to base portion 16 by means of a single outwardly protruding lug. Also, the overcap 18 is permanently connected to the base portion 16 via a strap hinge 24 which likewise may be integral with the base 16.

The cup-shaped overcap 18 includes a generally cylindrical and slightly tapered outer wall 26 which terminates at a flat top wall 28. These walls serve to support the weight of other containers which may be stacked upon the container 10.

The overcap 18 is undercut as at 30 and has its undercut surface formed with serrations or ribs as at 31. This provides an effective thumb grip for lifting up and opening the overcap from the base 16.

In the preferred embodiment handle 20, as can be seen in FIG. 2, extends upwardly from the lugs 22 for a short distance and then outwardly away from the overcap 18 so that its maximum height does not exceed that of the overcap. This permits stacking of these containers without undue interference from or to their respective handles. Also, this handle configuration enables the containers to be grasped quite readily both for pouring and for carrying.

FIG. 2 shows the container 10 with its overcap 18 in opened position, so as to expose the internal elements of the circular base 16. On the upper side of the base there is provided a horizontal annular pressure receiving surface 32 and a locking and reinforcing rib 34 which extends upwardly from the inner edge of the pressure bearing surface 32. The rib 34 is dimensioned to fit closely within the outer wall 26 of the overcap portion 18. Thus, it is provided with a flattened region 36 which accommodates the undercut thumb grip portion 30 of the overcap. Immediately within the reinforcing rib 34 there extends an upwardly protruding spout 38 designed to provide proper control of liquid flow out of the container. The precise shape of the spout will, of course, depend upon the nature of the liquid in the container. However, in all cases its most important feature will be that it protrudes up and out from the top of the container so as to keep the liquid being poured from dripping down over the walls of the container.

My overcap 18, as can be seen, is hollow and open at its bottom; and it is provided with a centrally depending tubular shaped plug element 40. This plug element, as will be seen more fully hereinafter, fits down inside of the spout 38 to seal the container when the overcap 18 is in closed position as in FIG. 1. At the same time, the spout 38 extends up into the cap between the plug element 40 and the outer wall 26.

As shown in FIGS. 3 and 4, the circular base 16 is of integral construction and is provided with annular downwardly depending inner and outer skirts 42 and 44 which are shaped to define a locking groove 46. The top wall 12 of the container is bent back as at 48 around a central opening 50 to form a semi-circular channel which cooperates with the locking groove 46 to secure the base 16 to the container 10.

The base 16 itself has a central opening 52 located within its locking and reinforcing rib 34. The spout 38 rises upwardly from the edge of this base opening and out over the rib 34. In order to ensure freedom from dripping, etc. I make the spout 38 at least semi-circular at the opening 52 and provide a slightly accentuated curve 54 and a tapered lip 56 toward its upper edge.

The spout obviously is incapable of supporting any appreciable loads and would be crushed or severely distorted should one attempt to stack other containers on it. Because of my novel arrangement, however, such crushing is avoided even though very heavy loading forces are imposed on the container.

The annular pressure bearing surface 32 of the base 16 is located outside the rib 34, while the spout 38 and central opening 52 are located inside the rib. It will be noted also, that the pressure bearing surface 32 is lo-

cated nearly directly above the inner and outer skirts 42 and 44 so that loading forces imposed on the overcap 18 are transmitted directly through the outer regions of the base 16 to the upper wall 12 of the container 10 thus bypassing the region of the central opening 52 and the spout 38. This arrangement, in cooperation with the reinforcing rib 34 prevents these loading forces from distorting the central opening and spout even though these loading forces may cause buckling of the container 10 or the overcap 18.

As can be seen in FIG. 4, the plug element 40 of my overcap 18 extends somewhat beyond the open edge of the outer wall 26 of the overcap 18. Also the circumferential configuration all along the length of the plug element conforms closely to the configuration of the central opening 52 in the base 16. The end of the plug 40 is provided with a bead 41 which locks under the wall forming the central opening 52. Thus, when the plug element is fitted into this opening, it provides a positive liquid seal; and this seal is essentially unaffected by any vertical movements which the plug element might undergo as a result of exceptionally heavy loads on the overcap 18.

The intercooperation of the various elements which form the base 16 and overcap 18 can be seen in the partial section view of FIG. 5. Here the overcap 18 is shown in closed position on the base 16 and while at the same time being subjected to the loading effects of another stacked container 10' placed on top of the container 10. As shown, the upper container 10' rests on the top wall 28 of the overcap 18. The weight of this upper container is resisted solely by the outer wall 26 of the overcap 18 and not by the plug element 40. This is because the plug element, being at most of a very slight taper, is free to move with respect to the base opening 52 whereas the outer wall 26 is restrained by the pressure bearing surface 32 which in turn is supported by the top wall 12 of the container 10. Since the downwardly loading forces are thus bypassed around the plug 40 and central opening 52, they will undergo no distortion and the seal between them will remain intact even under relatively heavy loads. Further, even if the loading forces increase to a point where the outer wall 26 begins to buckle, the seal between the plug element 40 and the central opening 52 remains unaffected, for the plug element merely becomes pushed slightly further into the opening.

It will, of course, be appreciated that at this same time, the spout 38 is itself isolated from these loading forces by virtue of this novel arrangement of element, since the spout extends up between the plug 40 and the outer wall 26 of the overcap without contacting any part of the overcap.

In order to maintain a positive snap fit connection between the overcap 18 and the base 16, I provide a slight protrusion 58 around the inner periphery of the lower edge of the overcap outer wall 26 and a corresponding mating protrusion 60 about the reinforcing and locking rib 34. I have found that the effectiveness of the snap fit connection is improved without appreciably increasing the difficulty of removing the cap by making the flattened region 36 of the reinforcing and locking rib 34 somewhat higher than the remainder of the rib, and by positioning its locking protrusion 60' near its upper edge.

FIGS. 6, 7 and 8 serve to illustrate the overall configuration of the cap arrangement 14.

As shown in FIG. 6, the overcap 18 is provided with a plurality of reinforcing ribs 62 which extend radially between the plug element 40 and the outer wall 26. Certain of these ribs have portions thereof cut away as at 64 so as to provide room for the spout 38 when the overcap is in closed position.

The handle 20 is arranged to extend back in a direction away from the spout 38. This enables it to be used both for carrying the container 10 and for supporting the

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upper end of the container when pouring liquid out through the spout.

FIG. 9 illustrates another handle arrangement wherein the wing protrusions 66 and 67 respectively are located adjacent to the overcap 18 to provide a T-shaped handle arrangement. This handle arrangement is particularly suited for carrying container 10.

It will be seen that the cap lends itself to integral construction and that it may easily be molded of a plastic material such as polyethylene; thus providing a considerable improvement to the characteristics of metal and/or glass containers without appreciably increasing their cost.

Although a particular embodiment of the invention is herein disclosed for purposes of explanation, further modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains. Reference should accordingly be had to the appended claims in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. A cap arrangement comprising, a base made of a plastic material said base including means for securing it to a container opening, said base further being formed with a central opening leading into such container, a plastic spout integral with said base and rising upwardly from the edge of said central opening, said base being formed with a horizontal annular pressure bearing surface surrounding said spout and central opening, a locking rib protruding upwardly from said base along one edge of said pressure bearing surface, a hollow cup shaped plastic overcap having a generally tubular upstanding outer wall and a horizontal top wall, the lower peripheral edge of said outer wall being shaped to rest upon said pressure bearing surface and to frictionally engage said locking rib in a snap fit to secure said overcap on said base, and a plastic handle of generally U-shaped configuration and attached at its ends to points along the edge of said base, said handle rising upwardly from said base to the height of said overcap, and then horizontally away from said cap to provide full finger access without interference with movements of said overcap.

2. A cap arrangement comprising, a base made of a plastic material said base including means for securing it to a container opening, said base further being formed with a central opening leading into such container, a plastic spout integral with said base and rising upwardly from the edge of said central opening, said base being formed with a horizontal annular pressure bearing surface surrounding said spout and central opening, a locking rib protruding upwardly from said base along one edge of said pressure bearing surface, a hollow cup shaped plastic overcap having a generally tubular upstanding outer wall and a horizontal top wall, the lower peripheral edge of said outer wall being shaped to rest upon said pressure bearing surface and to frictionally engage said locking rib in a snap fit to secure said overcap on said base, and a pair of oppositely disposed handle members, said members being attached at their ends to the edge of said base at oppositely disposed points respectively, each of said handle members rising upwardly and

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flaring outwardly to provide finger access without interference with movement of said overcap.

3. In combination, a base having a central opening therethrough and adapted to form the top opening of a container, a spout formed about at least a portion of the periphery of said central opening and extending upwardly therefrom, said base being formed with an annular pressure bearing surface encircling said central opening and said spout in a plane below the outer edge of said spout, a cup shaped overcap having a lower peripheral edge shaped in accordance with said pressure receiving surface, said overcap having an internal height greater than the height of said spout above said pressure bearing surface, and a plug element depending centrally from the inside top of said overcap, said plug element being of a length and outer contour such that it enters into said central opening when the peripheral edge of said overcap is located on said pressure bearing surface, means for positively securing and sealing said overcap with respect to said base.

4. In combination, a base having a central opening therethrough and adapted to form the top opening of a container, a spout formed about at least a portion of the periphery of said central opening and extending upwardly therefrom, said base being formed with an annular pressure bearing surface encircling said central opening and said spout in a plane below the outer edge of said spout, a locking rib protruding upwardly from said base along one edge of said pressure bearing surface, a cup shaped overcap having a lower edge shaped in accordance with said pressure receiving surface, a protrusion on the inner periphery of the lower edge of said overcap and a mating protrusion on said locking rib, said overcap having an internal height greater than the height of said spout above said pressure bearing surface, and a plug element depending centrally from the inside top of said overcap, said plug element being of a length and outer contour such that it enters into said central opening, and a sealing and locking bead disposed towards the end of said plug for locking under the periphery of said central opening when the lower edge of said overcap is located on said pressure bearing surface.

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