

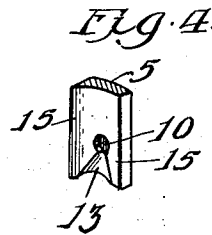
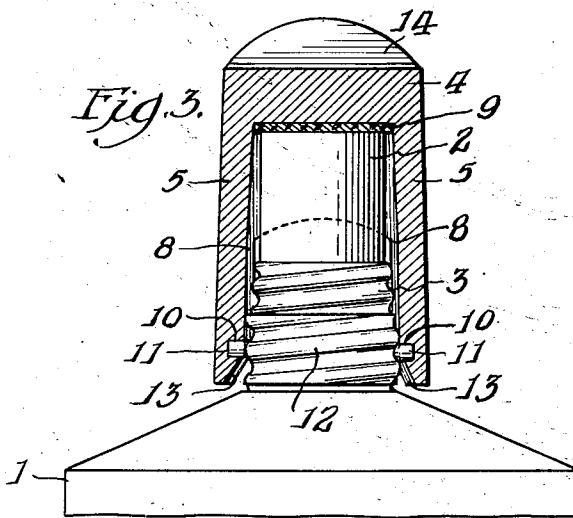
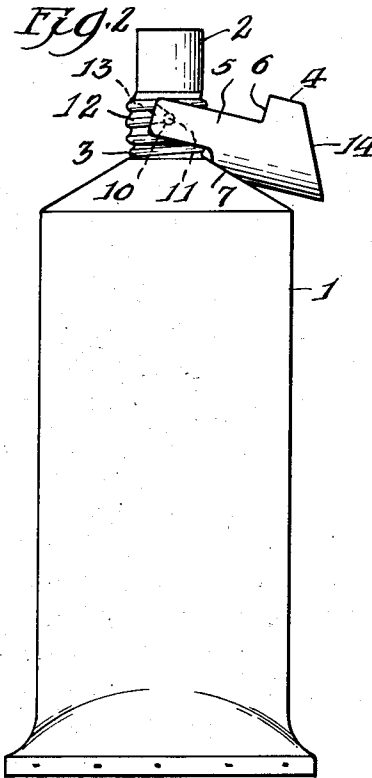
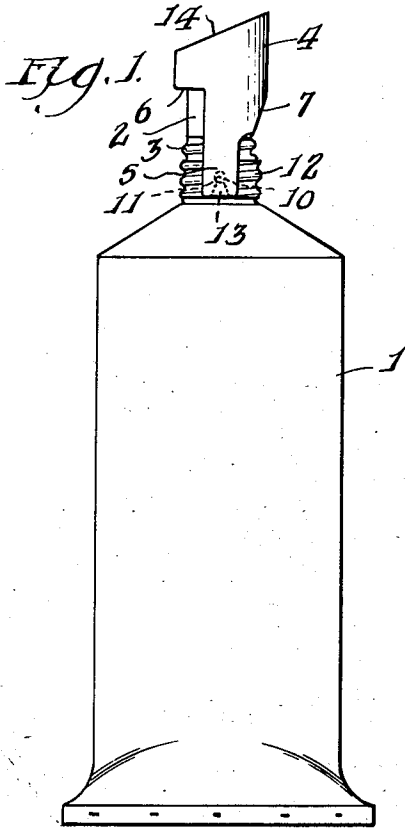
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C. LAING

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PIVOTED CLOSURE FOR COLLAPSIBLE TUBES

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Inventor:
Clayton Laing.

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PIVOTED CLOSURE FOR COLLAPSIBLE
TUBES

Clayton Laing, Chicago, Ill.

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7 Claims. (Cl. 222-558)

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This invention relates to improvements in closures for collapsible tubes; and it has for its objects to provide a closure in which, first, the sealing cap at all times remains secured to the tube; second, the actuating members are always engaged; third, the cap is held in a set position in relation to the tube when open; and with the foregoing and other objects in view, which will appear as the description proceeds, a further and principal object is the attainment of these by providing a construction which can be manufactured and assembled cheaply enough to be of use.

These containers in which small amounts of tooth paste and the like are sold are used once and discarded. For this reason an improvement to be useful must necessarily meet also an extremely low cost requirement. Heretofore, so far as I have been able to ascertain, no improvement on the common, separate screw-cap has sufficiently met these requirements to come into use.

I attain these objects by mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a side view showing the closure in the closed position;

Figure 2 is a similar view showing the closure in an opened position;

Figure 3 is an enlarged view taken at right angles to Figure 1, in vertical section through the cap;

Figure 4 is a fragmentary perspective view of an arm of the cap.

The collapsible tube 1 is provided with a discharge spout 2, having an enlarged threaded portion 3 at its base. The closure cap 4 is formed of plastic and may be viewed as a bored cylinder from which two opposing portions have been cut away—defining two projections or arms 5, and on one side an annular shoulder 6, adjacent the end of the bore, and on the other a beveled and concave shoulder 7, at a greater distance therefrom. At the end of the bore 8, which toward its end is slightly tapered, is seated a disc 9, of cork or other suitable packing. Adjacent the free ends of the arms and on the inner side, are diametrically opposed recesses 10, adapted to receive the trunnions 11, of the sleeve 12. Between the recesses and the ends of the arms are channels 13, which start adjacent the margin of the recess and flare outwardly. The sleeve 12, which is preferably stamped or rolled from thin tubing and is formed of resilient metal or a resilient plastic, is shaped to engage the threads 3 on the discharge spout, and to present the oppositely disposed trunnion members 11. The outside diameter of the sleeve corresponds to the

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diameter of the bore at the base of the cap. At the outer ends of the cap arms 5 the distance between the walls of the channels 13 is slightly greater than that between the outer ends of the trunnion members or pivots 11 on the sleeve 12.

To assemble the closure; the sleeve 12 is rested on end, the cap 4 is positioned over it with the arms overlapping the trunnions and then forced down. It will be apparent that owing to its resiliency the sleeve will be compressed laterally out of circular shape through pressure exerted against the ends of the trunnions by the converging walls of channels 13, and that these walls will guide the trunnions to the recesses 10, where they will spring into place and permit the sleeve to resume circular shape. The cap and attached sleeve are then positioned over the discharge spout 2, and by rotation of the cap—coacting through the trunnions—the sleeve is caused to travel along the threads of the spout towards its base, carrying the cap downward over the spout and compressing the packing disc 9 tightly against the outer end of the spout.

It will be particularly noted that while the sleeve 12, when free, could be compressed out of shape to engage or disengage the cap, when it is mounted on the spout—which is non-yielding—it is supported thereby and prevented from being so distorted.

To dispense the contents of the tube when filled; the cap is grasped and given a slight rotary motion, which will unscrew the sleeve far enough to permit the shoulder 6 of the cap to clear the end of the spout. The cap is then swung back on the trunnions 11—with the shoulder 7 rested against the shoulder of the tube.

Since the inner concavity of the arms of the cap corresponds to the outer convexity of the sleeve it will be seen that, when the cap is swung back on the trunnions, the arms of the cap, towards their edges 15, will impinge against the sleeve causing the resilient sleeve to be frictionally held against the threads of the spout, and the arms of the cap to be likewise held against the sleeve. Thus, for convenience in dispensing, the cap is prevented from swinging free either around the spout or around the trunnions.

To re-close; the cap is swung up to contact the spout. It will be noted that the longer wall of the cap defined by shoulder 7 prevents the cap from being swung too far and positions the end of its bore over the spout end. Rotary motion applied to the cap completes the re-seal.

I claim:

1. In a closure comprising a spout, a resilient sleeve adapted to be fitted on and secured to the

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spout, a cap adapted to close the end of the spout, arms extending from the cap in opposed relation to each other and pivotally engaging the sleeve said sleeve presenting oppositely disposed trunnions and said cap having complementary opposed recesses adjacent the ends of said arms; means for assembling said cap with said sleeve, before said sleeve is fitted on the spout, comprising converging channel walls extending from the edge of said arms of the cap toward the margin of said recesses permitting the cap to be positioned over the sleeve with the outer ends of said channel walls overlapping the ends of the trunnions on said sleeve whereby when the cap is forced down over the sleeve said channel walls impinge against the ends of said trunnions simultaneously compressing the resilient sleeve out of shape and guiding the ends of the trunnions to a position over and in line with the complementary recesses in the arms of the cap where said trunnions are automatically sprung into engagement with said recesses by the resilience of the sleeve.

2. In a closure comprising a spout, a sleeve member adapted to be fitted on and secured to the spout, a cap member adapted to close the end of the spout, arms extending from the cap member in opposed relation to each other for pivotal engagement with the sleeve member one of said members having oppositely disposed trunnions and the other member having complementary oppositely disposed recesses; means for assembling said cap member with said sleeve member comprising providing the recessed member with converging channel walls extending from the margin of the recesses to the edge of said member permitting one member to be positioned over the other with the channel walls of said recessed member overlapping the trunnions of the other member, in combination with at least one of said members being resilient permitting the same to be resistingly sprung out of shape, whereby forcing one member down over the other simultaneously distorts the resilient member or members and guides the ends of the trunnions to a position over and in line with the complementary recesses where the resilient member or members automatically spring back into shape bringing the two said members into pivotal engagement.

3. In a closure comprising a spout, a cap adapted to close the end of the spout, arms extending from the cap in opposed relation to each other adapted to be pivotally mounted on and secured to the spout permitting the cap to be swung to an open position, one of the pivotally engaging members provided with oppositely disposed trunnions and the other with complementary oppositely disposed recesses; means for assembling said pivotally engaging members comprising providing the recessed member with converging channel walls extending from the margin of the recesses to the edge of said member permitting one member to be positioned over the other with the channel walls of said recessed member overlapping the trunnions of the other member, in combination with at least one of said members being resilient permitting the same to be resistingly sprung out of shape, whereby forcing one member down over the other simultaneously distorts the resilient member or members and guides the ends of the trunnions to a position over and in line with the complementary recesses where the resilient member or members automatically

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spring back into shape bringing the two said members into pivotal engagement.

4. In a closure comprising a spout, a resilient sleeve adapted to be fitted on and rotate around the spout, a cap adapted to close the end of the spout, arms extending from the cap in opposed relation to each other and pivotally engaging the sleeve permitting the cap to be swung to an open position; the inner side of the arms of the cap being so shaped that swinging the cap to an open position impinges the arms of the cap against the sleeve and the resilient sleeve against the spout yieldably holding the cap against the sleeve and the sleeve against the spout.

5. In a closure comprising a spout, a sleeve adapted to be fitted on and rotate around the spout, a cap adapted to close the end of the spout, arms extending from the cap in opposed relation to each other and pivotally engaging the sleeve permitting the cap to be swung to an open position; means whereby swinging the cap to an open position impinges the arms of the cap against the sleeve and the sleeve against the spout yieldably holding the cap against the sleeve and the sleeve against the spout.

6. In a closure comprising a spout, a sleeve adapted to be fitted on and rotate around the spout, a cap adapted to close the end of the spout, arms extending from the cap in opposed relation to each other and pivotally engaging the sleeve permitting the cap to be swung to an open position; means whereby swinging the cap to an open position yieldably holds the cap against the sleeve and the sleeve against the spout.

7. A closure comprising an externally threaded spout, a resilient threaded sleeve member adapted to be screwed upon the spout and to be thereby retained in circular shape by the support of the spout, a cap member adapted to close the spout, arms extending from the cap member in opposed relation to each other and pivotally engaging the sleeve member, one of said members having oppositely disposed projecting trunnions and the other having complementary oppositely disposed recesses, the threaded sleeve member by reason of being resilient permitting the cap member to be positioned over and assembled with the sleeve member—before the sleeve member is screwed upon the spout—by said sleeve member being resistingly sprung out of circular shape permitting the projecting trunnions of the one member to be brought into a position directly over and in line with the complementary recesses of the other member, whereby allowing the sleeve member to spring back into circular shape brings the trunnions and the recesses into engagement.

CLAYTON LAING.

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