

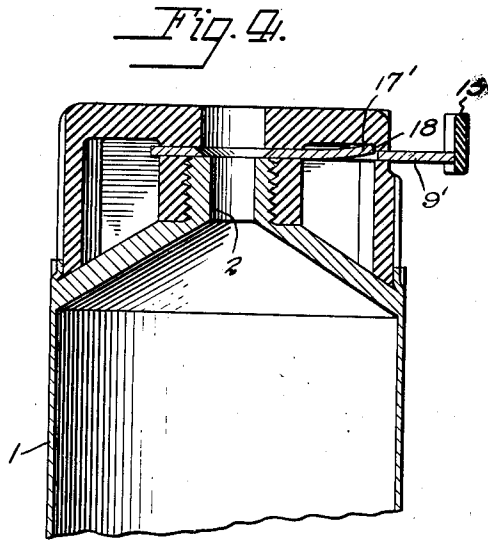
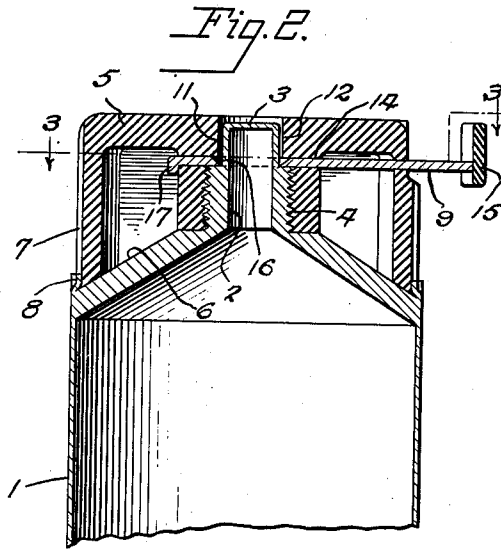
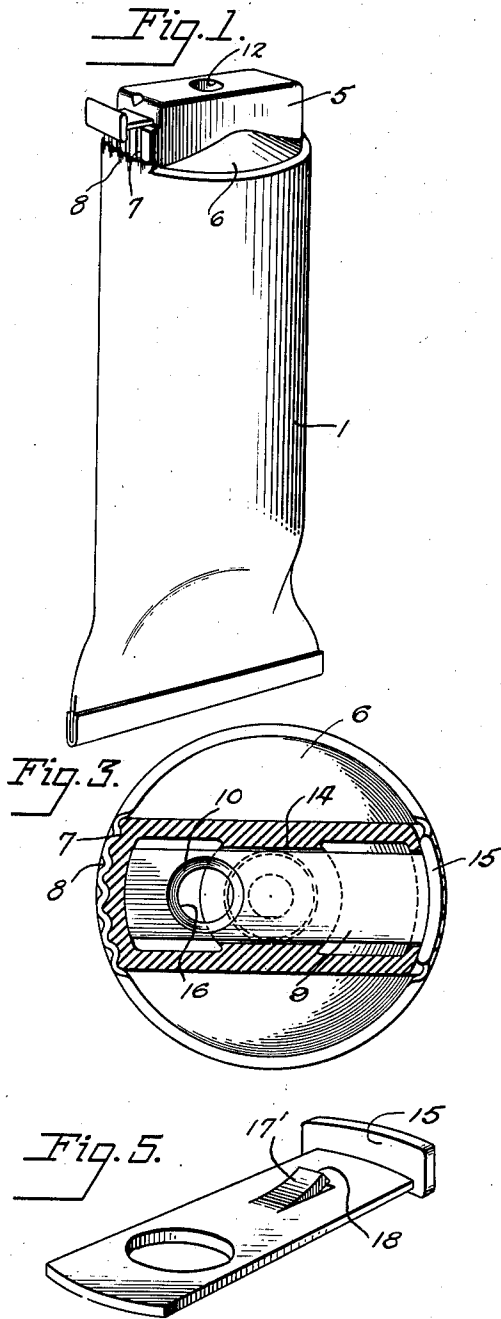
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P. E. LANDRUS

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COLLAPSIBLE TUBE

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Inventor
P. E. Landrus

Mason Fenwick & Lawrence
Attorneys

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COLLAPSIBLE TUBE

Paul E. Landrus, Lexington, Ky.

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4 Claims. (Cl. 221-60)

The invention pertains to collapsible tubes of the type used to contain fluid or semifluid materials. It comprises a cap structure which includes a means to break a seal. The tubes are filled and marketed for use with the outlet duct sealed with the same material of which the tube is made. The element which operates as a closure for the tubes in use operates also to break the seal and remove it from the tube.

That being the invention expressed in general terms, reference is now made to the drawing for a detailed showing of the preferred embodiment of the invention. In the drawing:

Figure 1 is a perspective view of a collapsible tube embodying the invention.

Figure 2 is a longitudinal section through the tube in its original form before being made ready for use.

Figure 3 presents a horizontal cross section as viewed on line 3-3 of Figure 2, after the tube has been made ready for use.

Figure 4 is a cross sectional view showing a modified form of the invention, and

Figure 5 is a detailed view of the closure vane in the modification shown in Figure 4.

Now referring to the drawing, 1 constitutes a tube constructed of lead or some other soft sectile material. The body of the tube may be of conventional and well-known construction. The outlet duct 2 in the practice of the invention is provided with a seal 3 comprising the same material as the tube and being unitary therewith.

The outlet duct is screw threaded at 4 to receive the cap 5. Other means may be provided to attach the cap to the tube. The cap fits tight against the shoulder 6 of the tube and is notched along its side surfaces at 7. The material from which the tube is made is crimped into notches at 8 after the cap has been placed on the tube to hold it against being removed.

Movable slidingly in the cap is a vane 9 with a hole 10 therein which fits over the outlet projection 11 which includes the seal. The outlet projection 11 extends into the top of the cap at 12, occupying the hole which functions as an outlet for the tube after the seal is removed. The vane 9 rides in guideways 14 in the cap and is capable of being reciprocated back and forth after the extension 11 of the outlet duct has been removed. Grip 15 is attached to the vane for manual operation. When the vane is closed the grip 15 fits into the body of the cap to conform with its contour. The hole 10 in the vane is provided with a knife edge 16 which functions to cut the outlet

duct 2 above the screw threads 4 and below the seal 3, the first time the vane 9 is pushed to the left in Figure 2. This breaks the seal of the duct and opens the tube to enable its contents to be removed. Subsequent backward and forward movement of the vane 9 functions to open and close the duct.

The end of the vane is upset at 17 to prevent it from being withdrawn entirely from the cap when it is moved in the direction to open the duct.

In a modified application of the invention, the vane 9' is provided with an upset projection 17' which engages the inside surface of the cap at the edge 18 to function in the same manner as the upset 17 in the embodiment shown in Figures 1 and 2. The upset projection 17' also functions as a spring to press the vane 9' downwardly to provide a tight fit as a closure for the outlet duct 2.

Having thus described the invention in detail, attention is directed to the accompanying claims. I claim:

1. A container for fluid and semifluid material comprising a collapsible tube, an outlet duct in the tube for extruding its contents, a seal closing the outlet, a closure for the duct, the closure comprising a cap, and a vane movable in the cap transversely of the tube the first time to break the seal and thereafter to open or close the duct.

2. A container for fluid and semifluid material comprising a collapsible tube of sectile material, an outlet duct in the tube for extruding its contents, a seal of the same material as the tube and unitary therewith closing the outlet, a closure for the duct, the closure comprising a cap and a vane movable in the cap transversely of the tube the first time to cut the tubing material to remove the seal, and thereafter in opposite directions to open or close the duct.

3. A container for fluid and semifluid material comprising a collapsible tube of sectile material, an outlet duct in the tube for extruding its contents, a closure for the duct, the closure comprising a cap and a vane movable in the cap transversely of the tube, a passage through the cap registering with the outlet duct, the outlet duct extending into the passage and terminating with a seal, guideways in the cap to guide the vane back and forth across the passage, a knife edge on the vane to sever the duct extension the first time the vane is moved across the passage to remove the seal from the outlet duct, subsequent backward and forward movement of the vane operating to open or close the duct.

4. A container for fluid and semifluid material comprising a collapsible tube of sectile material, an outlet duct in the tube for extruding its contents, a closure for the duct, the closure comprising a cap attached to the tube and a vane 5 movable in the cap transversely of the tube, a passage through the cap registering with the outlet duct, the outlet duct extending into the passage and terminating with a seal, guideways in

the cap to guide the vane back and forth across the passage, a knife edge on the vane to sever the duct extension the first time the vane is moved across the passage to remove the seal from the outlet duct, subsequent backward and forward movement of the vane operating to open or close the duct, and stops in the cap and vane to limit the backward and forward motion of the vane.

PAUL E. LANDRUS.