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2,880,913

TUBES FOR DISPENSING PASTES, CREAMS AND THE LIKE

Filed Aug. 6, 1957

2 Sheets-Sheet 1



FIG. 4

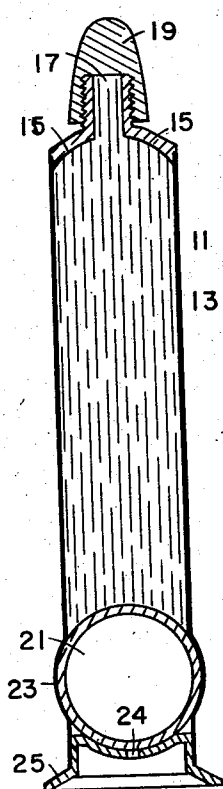


FIG. 1

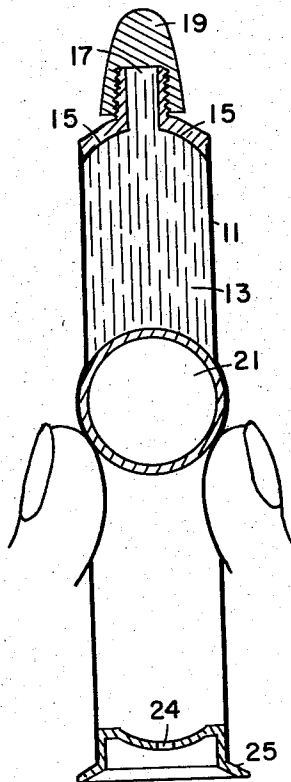


FIG. 2

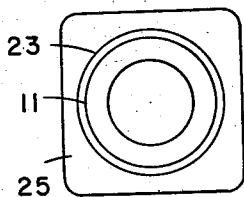
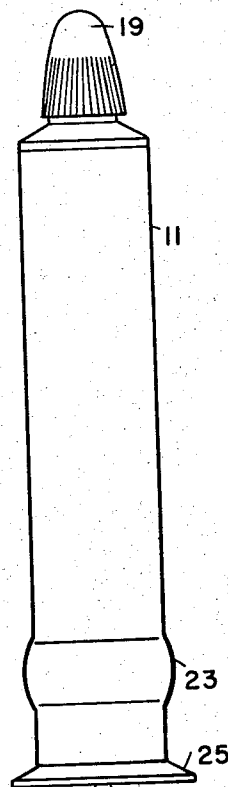


FIG. 3

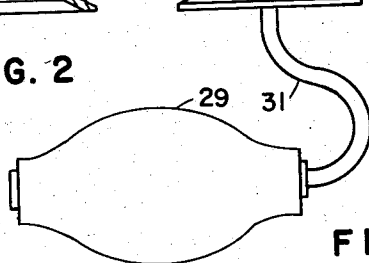


FIG. 5

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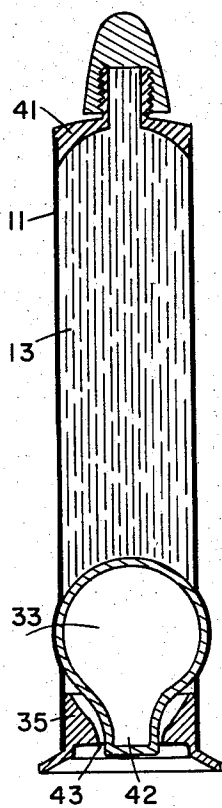


FIG. 6

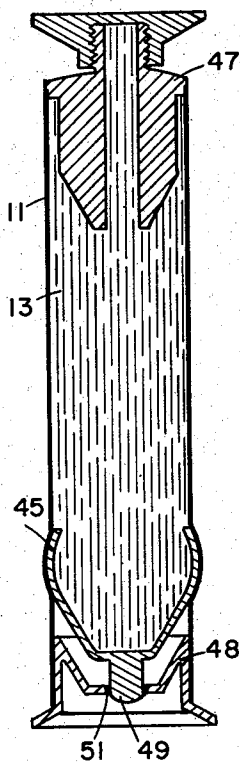


FIG. 7

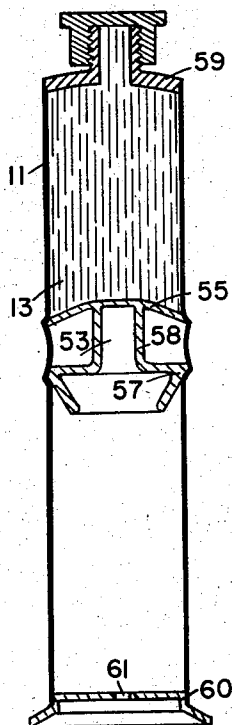


FIG. 8

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TUBES FOR DISPENSING PASTES, CREAMS AND THE LIKE

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Claims priority, application France May 31, 1957

5 Claims. (Cl. 222-214)

This invention relates to tubes for dispensing pastes, creams and the like. More particularly, this invention relates to means to empty deformable tubes having a tendency to regain their original shape even when nearly empty.

The principal object of this invention is to provide simple means to empty deformable tubes containing pastes, creams and the like.

Another object of this invention is to provide a deformable tube which contains the means used to empty it.

A further object of this invention is to provide a tube with means to prevent its contents from coming into contact with air after it has been partly emptied.

In accordance with the illustrated embodiments of this invention, there is provided a tube of deformable material containing a driving element such as a ball or piston having a cross-sectional area which is larger than the cross-sectional area of the tube. This driving element is used to push the paste out of the tube.

Other and incidental objects of this invention will be apparent from a reading of the following specification and an inspection of the accompanying drawings in which:

Figure 1 is a cross-sectional view of a tube in accordance with this invention, the tube being shown filled with paste and the driving element being shown as a ball;

Figure 2 shows the tube of Figure 1 after it has been partly emptied;

Figure 3 is a top view of the tube of Figure 1;

Figure 4 is a cross-sectional view of a cap suitable for use with the tube of this invention;

Figure 5 shows a modification of the tube of Figure 1 in which the ball inside the tube is moved by means of compressed air coming from a rubber bulb; and

Figures 6, 7 and 8 show modifications of the tube of Figure 1 in which the driving elements are pistons having various shapes.

Referring now to Figure 1 there is shown a tube 11 made of deformable material, such as a soft synthetic plastic, and containing a paste or cream 13. The tube 11 comprises shoulders 15 surrounding an orifice 17 closed by a cap 19. A ball 21 is positioned inside the tube 11. Solid cork is a suitable material for the ball 21 which has a diameter greater than the inside diameter of the tube 11 and causes the walls of tube 11 to bulge outward as shown at 23. A hole or vent 24 is positioned at the bottom of the tube 11. The shoulders 15 have the same curvature, inside the tube 11, as that of the ball 21 which comes to rest against them when the tube is empty. The base 25 of the tube 11 is preferably of a size and shape such that the tube 11 can be stood on it vertically when it is not in use.

In order to empty the tube 11, it is pinched by the user just below the ball 21 as shown in Figure 2. Since the diameter of the ball 21 is greater than the inside diameter of the tube 11, the ball 21 remains wherever it has been pushed forward, the empty portion of the tube 11 regaining its initial shape and size. This is because the de-

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formation of the tube is within the elastic limit of the material of the tube. Furthermore, the ball 21, because of its size, forms a seal with the interior walls of the tube 11 so that none of the paste or cream 13 seeps back of the ball 21 into the empty portion of tube 11. When the tube is empty the ball 21 sits against the shoulders 15. Air fills the empty portion of tube 11 through the vent 24 and thus allows the tube 11 to regain its initial shape.

Figure 3 shows the walls of the tube 11 and the bulge 23 due to the ball 21 the diameter of which is larger than the inside diameter of tube 11. The cap 19 may be replaced by the cap 27 of Figure 4 which has a large flat surface and which may be used as a base to stand the tube 11 on end when not in use.

Figure 5 shows an embodiment of the invention in which the ball 21 is pushed toward the cap end of the tube by means of compressed air coming from a rubber bulb 29 through a hose 31 connected to the base 25 of tube 11.

In the embodiment of Figure 6, the tube 11 contains, instead of the ball, a pear-shaped piston 33. The maximum diameter of the piston 33 is greater than the inside diameter of the tube 11. The inside face of the base 35 is shaped like the lower face of the piston 33, and the shoulders 41 are shaped like the upper face of the piston 33, thus leaving little or no waste space for the paste or cream 13. The stem 42 of the piston 33, which goes through the hole 43 at the base of the tube when the piston is at its initial position, is used to start emptying the tube, which is then emptied by exercising finger pressure below the bulge in the tube's walls.

In Figure 7 the tube 11 is provided with a hollow piston 45. Here again the maximum outside diameter of the piston 45 is greater than the inside diameter of tube 11. The shoulders 47 inside the tube 11 are shaped so as to make a fit with the hollow piston 45, and the shape of the inside face of the base 48 matches that of the lower part of the piston 45, thus leaving very little waste space for the paste or cream 11. The piston 45 is provided with a stem 49 which protrudes through the hole 51. The tube is started by pushing the stem 49, and then further emptied like the tubes of the preceding figures.

In Figure 8 the tube 11 is provided with a piston 53 comprising two plates 55 and 57 connected together by cylindrical walls 58. The plate 55 is slightly convex and fits against the shoulders 59 when the tube 11 is empty. The lower plate 55 is provided with an inwardly flaring conical base to facilitate pushing the piston 53 forward by means of finger pressure. The base 60 of the tube is provided with a hole or vent 61.

In all the above described embodiments of the invention the ball or piston used to push the paste or cream 13 is more rigid than the tube 11 itself.

It is to be noted that the ball and pistons of the above described tubes prevent the paste or cream 13 from coming into prolonged contact with air and thus from drying out after tube 11 has been partly emptied.

I claim:

1. A tube for dispensing pastes, creams and the like, said tube comprising a hollow body of deformable, elastic material having an orifice at one end thereof, and a base at the other end thereof, and a driving element inside said hollow body, said driving element having a cross-sectional area which is larger than the cross-sectional area of the tube in an amount wherein the deformation of the tube is within the elastic limit of said material.

2. A tube for dispensing pastes, creams and the like, said tube comprising a hollow body of deformable, elastic material having an orifice at one end thereof and a base at the other end thereof, said base having a hole therein, a driving element inside said hollow body, said driving element having a cross-sectional area which is larger than

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the cross-sectional area of the tube in an amount wherein the deformation of the tube is within the elastic limit of said material.

3. A tube for dispensing pastes, creams and the like, said tube comprising a hollow cylinder of deformable, elastic material having an orifice at one end thereof and a base at the other end thereof, and a ball inside said hollow cylinder, the diameter of said ball being greater than the inside diameter of said cylinder in an amount wherein the deformation of the tube is within the elastic limit of said material.

4. A tube for dispensing pastes, creams and the like, said tube comprising a hollow body of deformable, elastic material having an orifice at one end thereof and a base at the other end thereof, a driving element inside said hollow body, said driving element having a cross-sectional area which is larger than the cross-sectional area of the

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tube in an amount wherein the deformation of the tube is within the elastic limit of said material, and means to move said driving element.

5. A tube according to claim 4 wherein the means to move said driving element comprise an elastic bulb connected to the base of said tube.

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