

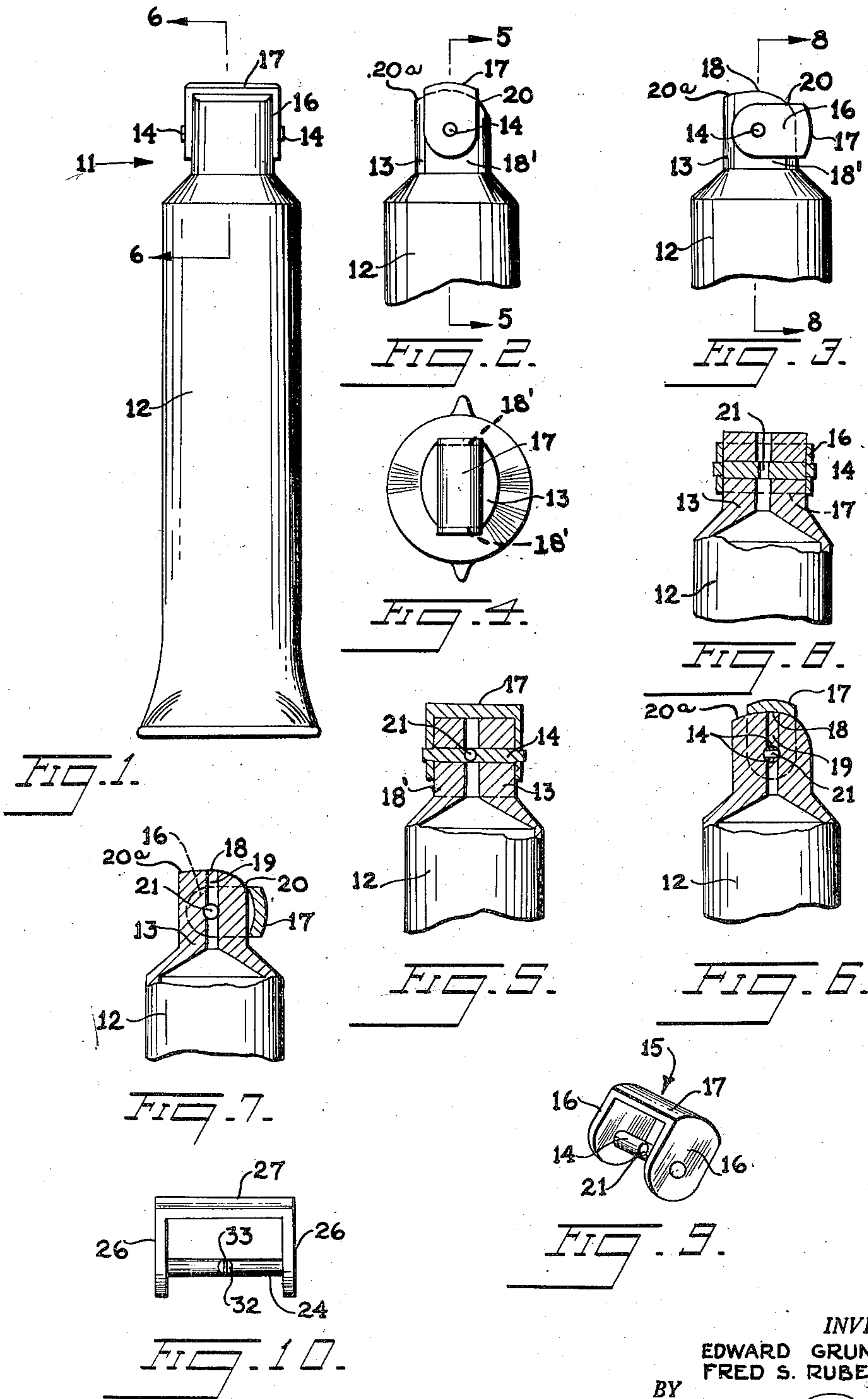
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PIVOTED CLOSURE CAP FOR THE OUTLET OPENING IN A CONTAINER  
NECK, FRICTIONALLY BIASED IN A CLOSED POSITION

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## UNITED STATES PATENT OFFICE

2,544,382

PIVOTED CLOSURE CAP FOR THE OUTLET  
OPENING IN A CONTAINER NECK, FRIC-  
TIONALLY BIASED IN CLOSED POSITIONEdward Grunwald, New York, and Fred S. Ruben,  
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2 Claims. (Cl. 222—558)

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The present invention concerns a pivot closure cap for receptacles and refers in particular to a cap pivotally mounted on a shaft extending laterally of the outlet passage of the receptacle and swingable in an arc substantially parallel to a portion of the receptacle mouth, the shaft being perforated laterally by a hole which forms part of the outlet passage when the cap is in open position, the shaft closing the outlet passage when the cap is in closed position.

An object of the present invention is to provide a cap which constitutes a triple closure on the receptacle of which it is a part.

A further object is that the cap shall be attached to the receptacle so as to be inseparable therefrom in use.

Another object is that the cap, when swung into open position, shall lie closely against the receptacle neck or opening so as not to interfere with the use of the receptacle by catching in nearby objects.

Still another object is that the container and cap may be handled and operated by one hand.

Yet another object is the provision of a cap with means for dispensing paste, such as toothpaste for instance, in a double strip which will tend to lie flat on a toothbrush.

In accomplishing the objects of the present invention, a collapsible tube or container is provided which includes a neck portion having flat sides. A shaft extends through this neck portion of the tube or container and to the projecting ends of the shaft is firmly attached a substantially U-shaped cap. The shaft is formed with a transverse hole which is coincident with the passageway in the neck when the cap is in open position and serves as a rotary valve.

When the cap is in closed position, the valve portion of the shaft blocks the passageway in the neck and the cap closes the mouth of the neck. The outer contour of the neck is conformed to the arc described by the cap in swinging open and the cap lies close to the neck at all times.

In a modified form of the invention, the hole in the pivot shaft is divided in two by a partition. Paste passing therethrough is divided into two strips which lie side by side on a toothbrush or similar surface to which they are applied.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

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In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a front elevation of a collapsible tube embodying the device of the present invention.

Fig. 2 is a side elevation of the same.

Fig. 3 is a similar view with the cap in open position.

Fig. 4 is a top elevation of the device.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is a section on the line 6—6 of Fig. 1.

Fig. 7 is a similar view showing the cap in open position.

Fig. 8 is a section on the line 8—8 of Fig. 3.

Fig. 9 is a perspective view of the cap and pivot shaft.

Fig. 10 is a front elevation of a modified form of cap and pivot shaft.

Referring now in detail to the drawings, the improved closure arrangements 11, includes a collapsible tube 12, such as is commonly used to contain toothpaste, cold cream and the like having a neck 13. A pivot shaft 14 extends transversely through the neck and supports at its ends a substantially U-shaped cap member 15, the latter comprising leg members 16 firmly attached to shaft 14 and the seal member 17 adapted to snugly engage the mouth 18 of outlet passage 19 of neck portion 13. Cap 15 is swingable from a closed position shown in Fig. 2 in which seal member 17 engages mouth 18 and leg members 16 are substantially vertical to an open position shown in Fig. 3 in which mouth 18 is open and seal member 17 lies close to the outer wall of neck 13, leg members 16 being substantially horizontal. Neck portion 13 has a truncated elliptical shape in plan as seen in Fig. 4. Shaft 14 extends between substantially central positions on the flat sides 18' thereof. The top surface 20 of neck portion 13, viewed along a line parallel to the axis of shaft 14 as in Figs. 2, 3 and 7 follows the arc described by seal member 17 swinging on shaft 14.

The convex surface 20 is concentric to the axis of the shaft 14, so that the inner concave surface of the cap or sealing wall 17 will have full contacting engagement therewith, but an additional surface 20<sup>a</sup> is formed on the upper end of the collapsible tube or container, which has a flatter curve than the surface 20, and this acts to prevent complete swinging of the cap from one side of the tube or container to the opposite side, and limits the movement in closing direction so that the cap is held to a closing position over the discharge orifice 19, is frictionally tightened in closing position, so that it will be frictionally locked in sealing position, to pre-

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vent evaporation of the contents of the tube or container.

Shaft 14 is formed with a hole 21 located centrally longitudinally thereof and extending laterally thereof, the radial direction of said hole being such that in the open position of cap 15, as illustrated in Figs. 3, 7 and 8, hole 21 extends parallel with passage 19, forming part thereof for the free passage of the contents of tube 12 or other receptacle to which cap 11 may be applied. Since shaft 14 is firmly connected to legs 16, swinging of cap 15 to the closed position shifts hole 21 out of communication with passage 19 and shaft 14 in such a position that cap 15 blocks passage 19, forming a double seal thereof at top and bottom as clearly seen in Figs. 5 and 6. In such position, the seal member 17 constitutes a third closure of container 12, a triple seal thus being provided.

In a modified form of the invention, shaft 24 of cap 25 is firmly connected to legs 26 and seal member 27, the relation of these members being in general similar to the relation of members in cap 15. The hole 32 extending transversely of the shaft 24 is divided by a partition 33. In this form of the invention, useful principally in connection with semi-solid substances such as pastes and greases, the substance passing through hole 32 will be divided into two strips by partition 33 and in the case of toothpaste, for instance, these two strips will lie side by side on a brush rather than rolling off as a round or cylindrical strip tends to do.

It is to be noted that since the part of this cap which is nearest the contents of the container is never at any time exposed to foreign particles either when open or when closed, a completely sanitary closing means has been shown.

While we have illustrated and described the preferred embodiments of our invention, it is to be understood that we do not limit ourselves to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by United States Letters Patent is:

1. The combination with a container having a neck formed with a discharge passage, a shaft extending across said discharge passage and outwardly of the neck, the neck being formed with flat sides adjacent the ends of the shaft, the shaft having a valve port located in line with the discharge port and closing the discharge port when said valve port is at right angles to the discharge passage, the outer end of the neck having a convex surface concentric to the axis of the shaft and a convex surface extending therefrom which

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is non-concentric to said shaft, and a U-shaped cap having side portions fixed to the outer ends of the shaft to snugly engage the flat sides of the neck and provided with a concave sealing wall connecting said side portions to each other and having a sliding engagement with the concentric convex surface of said neck and adapted to swing to one side of the outer end of the neck to wholly expose the outer end of said discharge passage, and means frictionally locking said cap against movement in the opposite direction to limit the inward movement of the sealing wall of the cap to a closing position over and against said discharge passage, the cap and shaft turning together.

2. The combination with a collapsible tube having a neck formed with a discharge passage, a shaft extending across said discharge passage and outwardly of the neck, the neck being formed with flat sides adjacent the ends of the shaft, the shaft having a valve port located in line with the discharge port and closing the discharge port when said valve port is at right angles to the discharge passage, the outer end of the neck having a convex surface concentric to the axis of the shaft and a convex surface extending therefrom which is non-concentric to said shaft, and a U-shaped cap having side portions fixed to the outer ends of the shaft to snugly engage the flat sides of the neck and provided with a concave sealing wall connecting said side portions to each other and having a sliding engagement with the concentric convex surface of said neck and adapted to swing to one side of the outer end of the neck to wholly expose the outer end of said discharge passage and to be frictionally locked against movement in the opposite direction to limit the inward movement of the sealing wall of the cap to a closing position over and against said discharge passage, the cap and shaft turning together, the valve having a partition dividing the port thereof to cause separate layers of paste to be ejected from said collapsible tube.

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