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CLOSURE CAP FOR COLLAPSIBLE TUBES

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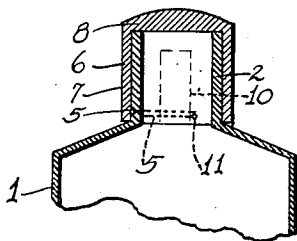


Fig. 1.

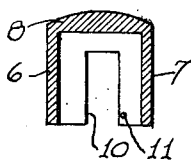


Fig. 2.

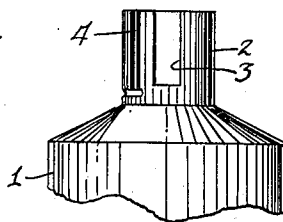


Fig. 3.

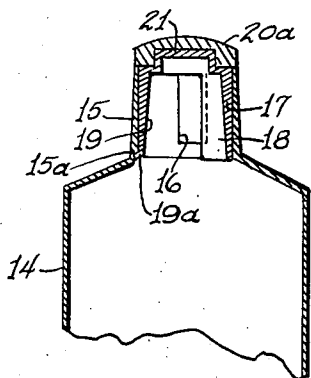


Fig. 6.

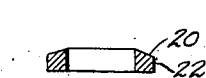


Fig. 7.

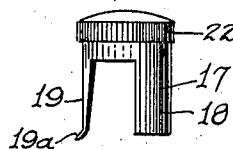


Fig. 8.

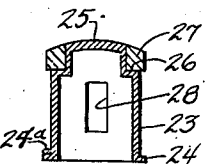


Fig. 11.

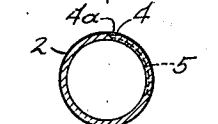


Fig. 10.

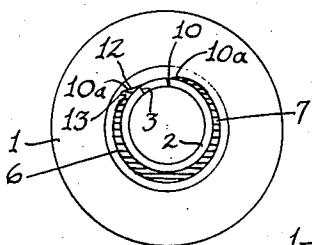


Fig. 4.

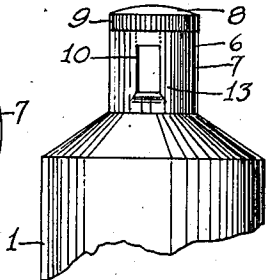


Fig. 5.

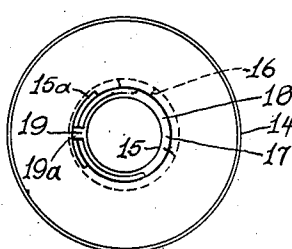


Fig. 9.

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UNITED STATES PATENT OFFICE

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CLOSURE CAP FOR COLLAPSIBLE TUBES

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Application March 14, 1939, Serial No. 261,699

1 Claim. (Cl. 221-60)

My invention relates to improvements in a closure cap for collapsible tubes, and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide a closure cap for collapsible tubes in which the outlet end of the tube is made cylindrical and is provided with an opening in its side. A cap is movable over the cylindrical outlet end and has an opening in its side that will register with the first opening when the cap is rotated into a predetermined position. Novel means is provided for limiting the rotation of the cap from closed to open position.

If desired, the same principle may be used with a cap that fits on the inner surface of the cylindrical outlet opening. In this case, both the cylindrical end of the tube and the cylindrical portion of the cap are provided with cooperating slots that may be brought into registration with each other to permit tooth paste to be squeezed from the tube. Novel means is also used for aiding in severing the ejected portion of the paste from the tube at a point adjacent to the tube opening. The cap has a tapered edge that slides over the opening in the cylindrical end of the tube and acts as a wiper for cleaning the paste from the tube portion.

A further object of my invention is to provide a device of the type described which is extremely simple in construction and durable and efficient for the purpose intended.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claim.

My invention is illustrated in the accompanying drawing forming a part of this application, in which

Figure 1 is a vertical section through the device;

Figure 2 is a vertical section through the cap taken substantially at right angles to that shown in Figure 1;

Figure 3 is a side elevation of the tube with the cap removed;

Figure 4 is a horizontal section through the cap and tube shown in Figure 1;

Figure 5 is a side elevation of the device shown in Figure 1;

Figure 6 is a sectional view of a modified form of the invention, where the closure cap is mounted inside of the cylindrical tube end;

Figure 7 is a sectional view of a ring used in the modified form;

Figure 8 is a side elevation of the closure cap used in Figure 6, showing the ring and cap in one piece;

Figure 9 is a horizontal section through the

tube shown in Figure 6, and shows a bottom plan view of the neck and closure;

Figure 10 is a horizontal section through Figure 1 and at a lower elevation; and

Figure 11 is a vertical section through another modified form of the device.

In carrying out my invention, I provide a collapsible tube generally indicated at 1 and this tube has a cylindrical end 2, see Figure 3. The cylindrical portion has a longitudinally extending slot 3 in its wall. Figure 3 also shows a longitudinal extending groove 4 in the outer surface of the cylindrical end 2 and paralleling the slot 3. The groove 4 communicates with an annular groove 5 that is deeper than the groove 4.

The cylindrical end 2 is closed by a closure cap 6 and the cap has a cylindrical portion 7 designed to rotatably receive the cylindrical end 2. The outer end of the cap 6 is closed at 8 and has its rim knurled at 9. The cap is provided with a slot 10 preferably of the same width as the slot 3. It will be noted from Figure 2 that an inwardly extending projection 11 is formed on the inner surface of the closure cap 6. When the cap is to be mounted on the cylindrical end 2, the projection 11 is first aligned with the groove 4 and then the cap is moved downwardly into place, the projection sliding along the groove. When the cap is moved entirely into place, the projection 11 will drop into the deeper groove 5 and will hold the cap rotatably in place and prevent it from being withdrawn. The groove 5 is long enough to permit the cap to be rotated from closed position to open position and vice versa. The upper portion of the cap near the slot 10, covers the open end of the slot 3. The slot 3 may therefore have a closed end, if desired.

In Figures 4 and 5 I show the shape of the cap's outer surface adjacent to the opening 10. It will be noted that this outer surface is flattened at 12 and the flattened portion lies substantially flush with the inner edge of the cap opening 10. This provides two tapered side edges 10a to the opening 10 and these edges will act as wipers for keeping the surface of the portion 2 clean from paste. The cap 6 need not be rotated on the portion 2 to sever the ribbon of material from the container. This would require the use of two hands, one to hold the container and the other to rotate the cap. I have provided a simple severing means for the ribbon of material which will function when the container and cap are rotated as a unit. This permits the operator to hold the brush in one hand and sever the ribbon material by rocking the tube and cap about their combined axes with the other hand. The material severing means comprises a lip 13 which extends along one edge of the flattened surface 12, and this lip acts in much the same manner as a knife

edge functions to aid in severing the extruded portion of the tooth paste from the opening when the container is rocked about its axis. The operator merely rocks the tube slightly in a clockwise direction about its longitudinal axis, when looking at Figure 4, to effect this severing action. This rocking movement will bend the extruded ribbon toward the lip 13 and the lip will finally come into contact with the ribbon and its edge will knife through the ribbon to sever it.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The material forming the cap 6 is resilient enough to permit a slight enlargement of the cylindrical portion of the cap when the projection 11 is moved along the groove 4. The cylindrical portion will move back into normal position when the projection 11 reaches the deeper groove 5 and snaps into the groove. In this simple way, the cap is locked to the tube 1 and yet may be rotated through a predetermined arc for opening or closing the tube. The knurled portion 9 provides a surface which may be grasped and turned for manipulating the cap.

When the cap is in open position and is being used, the flat surface 12 is placed a short distance above the tooth brush bristles and then the tube is squeezed for forcing the desired amount of tooth paste therefrom. While the operator squeezes the tube, he also moves it along the bristles causing the material to lie in a proper manner on the brush. After a sufficient quantity of material has been forced from the tube, the tube is rocked slightly about its longitudinal axis in a clockwise direction when looking at Figure 4. The lip 13 cooperates with the adjacent edge of the opening 3 and acts as a knife edge for cutting through the ribbon of paste to sever the portion of the tooth paste already expelled from the tube. The cap may now be rotated into closed position. Figure 5 illustrates the lip 13 as extending through a greater distance than the opening formed by the combined slots 3 and 10. The ends of the lip 13 are inclined at an angle as at 13a and extend toward the tube opening.

In Figures 6 to 9 inclusive, I show a modified form of the invention in which the cap is placed on the inside of the tube neck. The tube 14, shown in Figure 6, has a neck portion 15 with an opening 16 in its wall. A closure 17 is disposed in the neck 15 and has an arcuate portion 18, see Figure 8, for closing the opening 16. A spring arm 19 has an angularly bent portion 19a designed to bear against the wall of a recess 15a in the neck 15. When the closure 17 is placed in the neck, the spring arm 19 is flexed inwardly a slight distance during the time the portion 19a slides along the inner surface of the neck. When the cap has been moved into proper position, the portion 19a will spring outwardly into the recess or groove 15a and this will hold the cap against being withdrawn. A cup-shaped member 20a of the shape shown in Figure 6, is placed over a central projection 21 on the cap and is permanently secured to the cap. The member bears against the rim of the neck 15 and holds the cap against inward movement. The outer periphery of the member may be knurled as at 22, see Figure 8, in order to aid in rotating the closure. A ring 20 shown in Figure 7, may take the place of the cup-shaped member 20a, if desired.

The operation of this form of the device is substantially the same as the other. The cap 17 may be rotated for causing the portion 18 to uncover the opening 16. The tooth paste may now be forced from the tube. The neck 15 will have the flat portion adjacent to the opening and also the lip. After a sufficient quantity has been ejected and severed, the closure 17 may be actuated to close the opening 16. The groove 15a is of a sufficient length to limit the rotation of the cap between open and closed positions. It is possible for the device to be used in dispensing powders as well as a paste and where a powder is to be dispensed, it is not necessary that the container be collapsible.

It is possible to form the groove 4 with a slight lip on one side and then when the cap 6 is moved into place, this lip will be bent into the groove and act as a stop for preventing the cap projection 11 from again passing along the groove. In this simple way, the cap is permanently secured in place. The lip 4a is shown in Figure 10 and is indicated as being bent into the groove 4 by the cylindrical cap portion 7. The same figure also shows the groove 5 as being deeper than the groove 4.

In case it is desirable to make the cap out of a material that lacks spring qualities such as lead, I provide a cap of the shape shown in Figure 11. The cap 23 has a cylindrical portion with a flanged lower edge 24 and a central projection 25 closing the cap top. The cap is inserted into the container neck from the bottom and the flange 24 rotatably bears against the neck bottom. The flange carries a projection 24a that is received in the recess 15a to limit the rotation of the cap or closure in the neck. The shoulder 26 of the cap lies flush with the rim of the neck and a ring 27 is placed over the projection 25 and rides on the neck rim for preventing the closure from moving into the container. The closure has an opening 28 adapted to register with the neck opening 16.

In Figure 6, the member 20a has a closed top to cover the central projection 21 on the cap. It is possible to place the ring 20, shown in Figure 7, on the projection and have the projection show through the opening. The form of closure shown in Figure 8 illustrates the member 20a as integral with the cap and not as being secured thereto after the cap is made.

While I have shown only the preferred forms of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claim without departing from the spirit of the invention.

I claim:

In a dispensing device for a collapsible tube containing a plastic material, a cylindrical member having a longitudinally extending slot therein, the outer surface of the member disposed near the slot being flattened to materially lessen the thickness of the longitudinal edges bordering the slot and to define two longitudinally-extending flattened surfaces bordering the slot, and a lip formed along the outer longitudinal edge of one of the flat surfaces for aiding in severing the dispensed material at a point near the slot when the cylindrical member is rotated for causing the lip to cut through the material extruded through the slot.

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