June 19, 1934. W. B. STEWART 1,963,766

COLLAPSIBLE TUBE CLOSURE

Filed May 13, 1933

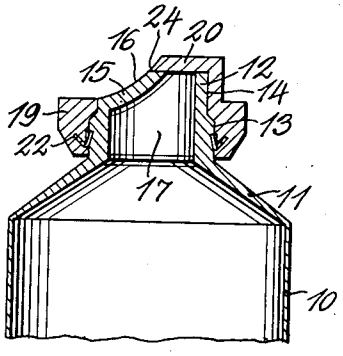


Fig. 1.

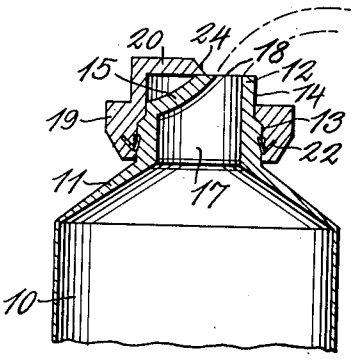


Fig. 2.

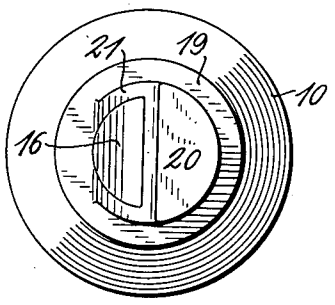


Fig. 3.

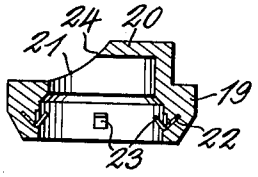


Fig. 4.



Fig. 5.

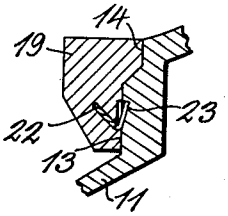


Fig. 6.

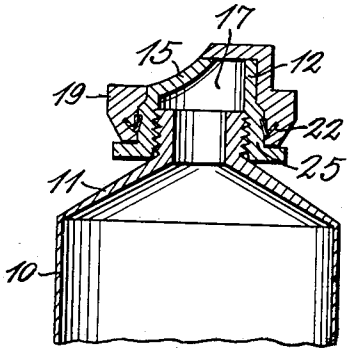


Fig. 7.

Inventor

Walter B. Stewart.

By A. J. O'Brien

Attorney

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COLLAPSIBLE TUBE CLOSURE

Walter B. Stewart, Denver, Colo.

Application May 13, 1933, Serial No. 670,868

7 Claims. (Cl. 221—60)

This invention relates to improvements in dispensing tops for collapsible tubes of the type employed in connection with tooth paste, shaving creams and other merchandise of this type.

The ordinary collapsible tubes that are extensively employed in connection with the dispensing of pastes of different kinds are nearly always provided with a screw cap which must be removed whenever any of the contents of the tube is to be dispensed and these caps often times fall down and get lost and besides this, there is always a considerable amount of waste connected with the use of tubes having closures of the ordinary type. In addition to the waste, the ordinary tubes are so constructed that the dispensing cap or neck can not be kept clean and they therefore become unsanitary.

In my copending application, Serial No. 553,353 (matured into Patent No. 1,914,221 on June 13, 1933), I have shown and claimed a dispensing top which is so constructed it can be readily kept clean and in sanitary condition, and which will also prevent waste of the material.

It is the object of the present invention to produce an improved dispensing top for collapsible tubes that shall be so constructed that the tube itself can be molded with simple molds, with the result that the cost of production of the tube will be lowered.

Another object of this invention is to produce a connecting means between the rotatable cap and the neck of the tube which will permit the cap to be readily rotated but will prevent it from being removed or moved longitudinally thereby assuring that the cap will not become lost and also greatly simplifying the operation of manufacturing the cap.

The invention, briefly described, comprising a dispensing tube having a neck provided with a cylindrical outer surface and a discharge opening located at one side of a diameter. The end of the neck on the other side of the diameter is inclined with respect to the axis of the tube and secured to the neck is a rotatable cap which has an opening that can be brought into and out of register with the opening in the tube by being rotated through an angle of one hundred eighty degrees. The cap has one side cut away in such a way that the cut surface forms an extension of the inclined surface of the neck. Instead of employing a screw threaded connection or providing the neck with a portion of smaller diameter which is engaged by inwardly projecting lugs, the cap is held in place by a plurality of spring tongues which are molded into the material of the cap and which are so positioned and inclined that the cap can be pushed onto the neck with a direct longitudinal movement and then rotated, whereby the tongues will cut a groove in the neck and produce a positive interlock that will prevent the cap from being removed while permitting it to be rotated.

Having thus briefly described the invention, the same will now be described in detail, and for this purpose reference will be had to the accompanying drawing in which the preferred embodiment of the invention has been illustrated, and in which:

Fig. 1 is a diametrical section through the dispensing end of a collapsible tube showing the same provided with my improved dispensing closure which is shown in closed position;

Fig. 2 is a section similar to that shown in Fig. 1, but showing the cap rotated through an angle of one hundred eighty degrees;

Fig. 3 is a top plan view showing the parts in the position illustrated in Fig. 1;

Fig. 4 is a diametrical section through the cap showing the same as it appears before it is applied to the neck;

Fig. 5 is a sectional view of a resilient metal ring which is embodied in the cap and which is provided with the tongues that serve to interconnect the cap with the neck;

Fig. 6 is a fragmentary section through the neck and cap showing the parts to a larger scale; and

Fig. 7 shows a slightly modified form of the invention which is so constructed that it can be applied to an ordinary tube having the outer surface of the neck threaded.

In the drawing reference numeral 10 designates the wall of an ordinary collapsible tube, one end of which is connected by a frusto-conical portion 11 with the dispensing neck 12. This connection has a cylindrical surface 13 which extends a short distance from the point of connection with the frusto-conical portion and above this another cylindrical surface 14 which is of slightly smaller diameter. Although the drawing shows the two surfaces 13 and 14 of different diameters, this is not necessary as the surface 13 can extend to the top of the neck if desired. One side of the neck has an inclined wall 15 that extends inwardly to a point on the other side of a diameter and the outer surface of this inclined wall forms an inclined surface 16 which may be concave, as shown in the drawing or may be flat, as may be desired. The discharge opening 17 of the neck terminates in an opening 18, which is located on one side of a diameter

as shown most clearly in Fig. 2. Secured to the neck is a cap which has been designated in its entirety by reference numeral 19. The cap is provided with a central opening which has two cylindrical surfaces corresponding in length and diameter with the surfaces 13 and 14 and the cap is so constructed that it can be pushed down on the neck by a straight motion. The cap is provided with a top or end portion 20 and is cut away as indicated in Fig. 4 so as to produce an inclined surface 21, whose shape is such that when the cap occupies the position shown in Fig. 1, the surface 21 will form an extension of the inclined surface 16.

For the purpose of holding the cap in position on the neck an interlocking means has been provided. This means as illustrated in the drawing, consists of a ring 22 of resilient material such as spring steel or spring brass and this ring is provided on its inner surface with two or more tongues 23. When the cap is molded the ring is first slipped over the core which forms the opening in the cap. This holds the tongues in such a position that their inner-surfaces are parallel with the axis of the cap. When the mold is assembled and the bakelite or other material from which the cap is molded is poured into the mold, it will surround the ring 22 and after the material is hardened this ring with the tongues 23 is firmly secured to the cap. The ring is so applied that the tongues point upwardly and inwardly, as shown in Fig. 4 and therefore when the cap is pushed onto the neck, the tongues will bend outwardly into the recesses that they occupy while the cap is molded and will therefore permit the cap to be pushed down until the inner surface of the cap 20 comes into contact with the upper surface of the neck. With the cap in the position just described, it is rotated on the neck with the result that the ends of the tongues cut grooves into the soft material of the neck and occupy a position like that shown in Fig. 6 from which it will be seen that with the tongues extending into the groove, the cap will be securely held in place on the neck in such a way that it can be readily rotated, but cannot be moved longitudinally. When the tube is to be closed the cap is rotated into the position shown in Fig. 1 and when the material is to be dispensed, it is rotated into the position shown in Fig. 2. With the cap in the position shown in Fig. 2, the required amount of paste is extruded after which the cap is rotated upon the neck, whereupon the cutting edge 24 cuts the extruded paste and carries it to the inclined side, whereupon it can be removed by a brush or by the finger. The smooth surface provided by the two inclined surfaces 16 and 21 makes it possible to completely remove all the paste and therefore the dispensing top will always remain clean and besides this, there can be no waste for the reason that there is no place where the material can lodge which cannot be readily reached by the finger or by a brush, and this makes it possible to maintain the dispensing top clean at all times.

The collapsible tubes of the type employed are nearly always made of some alloy, such as lead and tin, which is comparatively soft and this permits the tongues 23 to readily cut a groove in the neck when the cap is rotated. The cap is preferably molded from bakelite or some other phenolac condensation product, but they can also be molded from the same material as is employed in the construction of the tube.

In Figs. 1, 2, 3 and 6, the neck to which the cap is applied has been shown as forming an integral part of the tube, but in Fig. 7 a modification has been shown in which the invention has been modified slightly so that it can be attached to a tube having an ordinary screw threaded connection and the portion corresponding to the neck illustrated in Figs. 1 and 2 is made into a separate part which has a threaded section 25 at its lower end that is of the proper size to receive the threaded neck of the tube and this assembly can therefore be applied to an ordinary tube which will then be converted into a sanitary apparatus having a dispensing top like that shown in Figs. 1 and 2 and described in the above parts of the specification. The assembly shown in Fig. 7 can be sold for use with ordinary tubes and in this way the benefits of this invention can be obtained by those buying products which are dispensed in other types of collapsible tubes.

Particular attention is called to the method of interlocking the cap on the neck as this simple expedient obviates the necessity of forming the neck and the cap with screw threads and therefore greatly simplifies the molds employed in the production of these articles.

The cylindrical section 13 is made smaller than surface 14 for the purpose of providing space for the tongues when the cap is first applied and prevent the tongues from marring the surface at the top of the neck.

The tongues can, of course, be secured to the neck instead of to the cap but as this is merely a reversal, it has not been shown.

Having described the invention what is claimed as new is:

1. A dispensing top for collapsible tubes comprising, in combination, a neck having a cylindrical outer surface, the neck having a discharge opening whose outer end is located at one side of a diameter, the end of the neck having that portion of its surface on the opposite side from the discharge opening inclined to the axis of the cylindrical outer surface, a cap having an apertured top and depending cylindrical wall forming a recess therein for the reception of the tubular neck of a container, resilient tongues attached to the inner surface of the cylindrical wall with their free ends extending inwardly and inclined upwardly within the recess, whereby when the cap is placed on the neck and rotated thereon the tongues will cut a groove in the material of the neck thereby producing an interlock which holds the cap against longitudinal movement while permitting it to rotate on the neck, the end of the cap being cut away on one side of a diameter in such a way that the cut surface thereof will form an extension of the inclined surface of the neck in one rotary position of the cap.

2. A dispensing top for collapsible tubes comprising, in combination, a neck having a cylindrical outer surface, the neck having a discharge opening whose outer end is located at one side of a diameter, the end of the neck having that portion of its surface on the opposite side from the discharge opening inclined to the axis of the cylindrical outer surface, a cap having an apertured top and depending cylindrical wall forming a recess therein for the reception of the tubular neck of a container, a plurality of resilient tongues attached to the inner surface of the cylindrical wall, the inner ends of the tongues being upwardly and inwardly inclined whereby

when the neck is inserted into the cap, the tongues will bend inwardly and permit the neck to enter the cap, and when the cap is turned on the neck, the ends of the tongues will cut a groove in the outer surface of the neck, thereby producing an interlock that will prevent the cap from being removed from the neck while permitting it to rotate thereon, the end of the cap being cut away on one side of a diameter in such a way that the cut surface will coincide with the inclined surface of the neck when the cap occupies a predetermined rotary position.

3. A tube for paste and analogus material having a neck at one end, the outer surface of the neck being cylindrical, the neck having a discharge opening located on one side of a diameter, a rotary cap mounted on the neck and provided with an aperture in its top adapted to be carried into and out of register with the discharge opening in the neck for opening and closing the latter, the cap having a depending cylindrical wall forming a recess therein for the reception of the tubular neck of a container, and interlocking means for holding the cap against removal while permitting it to rotate on the neck, said means comprising a plurality of resilient tongues embedded in the inner surface of the cylindrical wall and inclined upwardly and inwardly whereby they will permit the neck to be inserted into the cap and whereby when the cap is turned on the neck, the tongues will cut a groove in the surface of the latter to form an interlock that will prevent the cap from being removed while permitting it to be rotated.

4. In a dispensing device comprising, a tubular neck of comparatively soft material which is provided with a dispensing opening on one side of a diameter, an apertured cap for the end of the neck, the cap having a depending cylindrical wall forming a recess therein for the reception of the tubular neck of a container, and means for securing the cap to the neck so that it may be turned on the neck while holding the cap against longitudinal movement, said means comprising a resilient tongue attached to the inner surface of the cylindrical wall of the cap and projecting inwardly towards the center and towards the closed end of the cap whereby the neck can be inserted into the cap and whereby when the cap is rotated on the neck, the tongue will cut a groove in the soft material of the neck whereby an interlock between the cap and the neck is obtained.

5. In combination, a container having a tubular dispensing neck whose outer surface is cylindrical and which has a dispensing opening in its end and to one side of a diameter, a cap having an apertured top and depending cylindrical wall forming a recess adapted to receive the tubular neck and a resilient tongue having one end embedded in the inner surface of the cylindrical wall for penetrating the cylindrical surface of the neck to hold the cap in place thereon, the free end of the tongue extending inwardly towards the axis of the recess and upwardly towards the top thereof.

6. In a device of the class described, in combination, a collapsible container having a tubular dispensing neck with a cylindrical outer surface and an eccentrically located dispensing opening in its end, a cap having an apertured top and depending cylindrical wall forming a recess for the reception of the neck, the cap having attached to the inner surface of the cylindrical wall a resilient tongue whose free end normally projects into the opening and upwardly towards the top, but which can be bent to lie flush with the inner surface of the recess whereby the neck can be inserted into the recess and whereby the tongue will interlock with the surface of the neck when force is applied tending to remove the cap.

7. An article of manufacture comprising, a cap having an apertured top and depending cylindrical wall forming a recess, and a plurality of spring tongues attached at one end to the inner surface of the cylindrical wall of the cap, the free ends of the tongues projecting into the recess, the tongues being normally inwardly and upwardly inclined.

WALTER B. STEWART.