Sept. 11, 1956 H. E. ERIKSEN 2,762,536

DISPENSING CLOSURE FOR COLLAPSIBLE TUBE

Filed Dec. 27, 1954

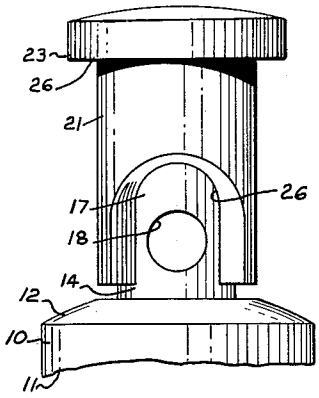


FIG-1

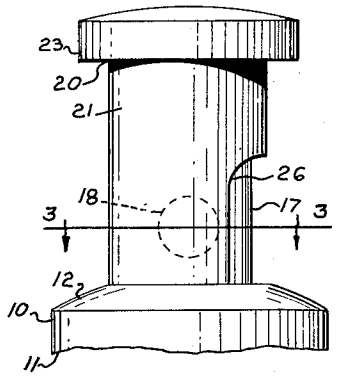


FIG-2

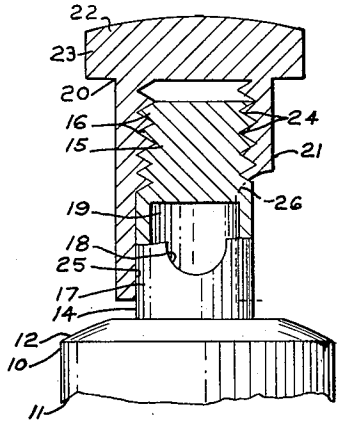


FIG-4

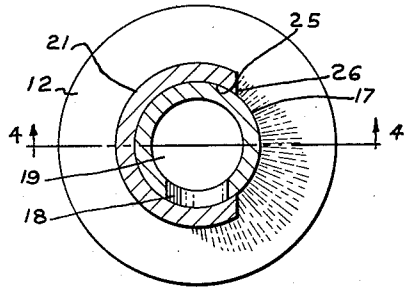


FIG-3

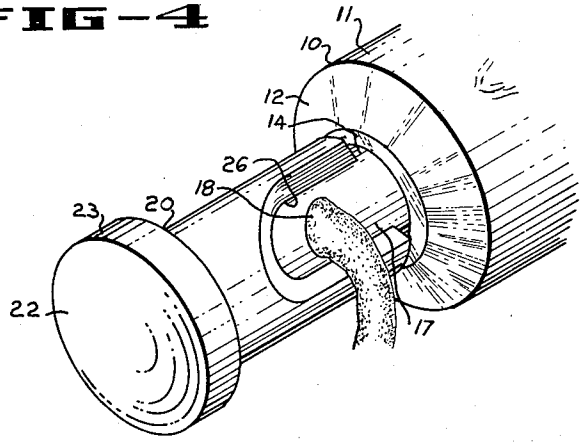


FIG-5

United States Patent Office

2,762,536

Patented Sept. 11, 1956

2,762,536

DISPENSING CLOSURE FOR COLLAPSIBLE TUBE

Harald E. Eriksen, Oakland, Calif.

Application December 27, 1954, Serial No. 477,740

5 Claims. (Cl. 222—519)

This invention relates to dispensing closures for collapsible tubes and more particularly to a closure for a tube adapted to contain a paste or plastic material, such as tooth paste, shaving cream, ointment, paint etc.

It is among the objects of the invention to provide a collapsible tube for holding paste, cream or plastic materials, and a dispensing closure for such a tube including a hollow neck or stem projecting from a thickened end wall of the tube and a closure cap on the stem, which provides for dispensing material from the tube neck without removing the cap from the neck so that the cap will not be accidentally left off of the neck, or lost, leaving the neck open; which provides for complete opening of the dispensing aperture in the tube neck by turning the cap one quarter of a rotation on the tube neck and for completely closing the aperture by turning the cap to the same extent in the opposite direction; which is so constructed that there are no screw threads on the neck or in the cap adjacent the dispensing aperture so that material from the tube will not collect in the csrew threads between the cap and the neck and cause the cap to stick on the neck so that tube damaging force is required to turn it; which is also so constructed that plugs of material from the tube cannot form and harden in an aperture in the cap to interfere with dispensing material through the dispensing closure; which is easy to maintain in a clean condition with no residual material from the tube on the exterior of the neck or cap; and which is simple and economical to manufacture and may be produced by existing tube manufacturing equipment with no additional cost in the manufacture of the tubes and closure caps.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing wherein:

Figure 1 is a side elevational view of an end portion of a collapsible tube with a dispensing closure illustrative of the invention;

Figure 2 is an elevational view similar to Figure 1 but with the tube and closure turned through an angle of ninety degrees from the position shown in Figure 1;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a cross sectional view on the line 4—4 of Figure 3; and

Figure 5 is a perspective view of the dispensing closure and adjacent end portion of the collapsible tube with the closure in dispensing condition.

With continued reference to the drawing the collapsible tube 10, may be of usual or well known construction having a thin, tubular wall 11 and a thickened end wall 12 provided centrally thereof with an outwardly extending, tubular or hollow neck 14 and the tubular wall, end wall and neck are usually integrally formed of a suitable material such as a soft metal or metal alloy or plastic material.

In the conventional collapsible tube construction the

neck is provided with a bore extending entirely therethrough and with external screw threads and a hollow, internally screw threaded closure cap is threaded onto the neck to close the outer end of the bore of the neck and must be completely removed to condition the closure for the dispensing of material from the tube through the neck. Such an arrangement is unsatisfactory because the accumulation of material from the tube on the outside of the neck and cap provides an unsightly appearance and unsanitary condition and clogs the screw threads rendering the removal and application of the cap sufficiently difficult to frequently cause damage to the tube. It is also unsatisfactory because, when the caps have to be completel yremoved, they are frequently lost, leaving the closure in a permanently open condition with highly undesirable results, particularly if such an unclosed tube is packed in luggage or carried in clothing or a hand bag.

A modified arrangement has been proposed for the purpose of eliminating some of the above noted disadvantages and difficulties, such modified arrangement providing a restricted aperture in the screw threaded side of the neck and a corresponding restricted aperture in the side of the cap movable into and out of registry with the aperture in the neck by turning the cap on the neck. While this modified construction reduces the likelihood of losing the cap by making it unnecessary to remove the cap completely from the neck, it has other disadvantages which have, so far, rendered it commercially unacceptable.

With the dispensing apertures in the screw threaded portions of the neck and the cap, material from the tube is forced between the neck and cap threads where it has a tendency to dry out and harden making it difficult if not impossible to turn the cap on the neck by finger pressure. The material also hardens in the aperture in the cap, providing a plug which interferes with the dispensing of material from the tube through the cap and neck apertures when these are brought into registry, and the material is also smeared on the outside of the cap where it hardens and frequently discolors, providing an unsightly appearance and unsanitary condition.

In the arrangement of the invention the outer end of the neck 14 is closed by an end wall 15 and the screw threads 16 extend from the outer end of the neck only part way of the length of the neck leaving between the screw threads and the tube end wall 12 a neck portion 17 having a smooth outer surface of cylindrical shape. The dispensing aperture 18 is provided in this smooth portion of the neck and communicates with the interior of the tube through the hollow interior 19 of the neck.

The cap 20 has a hollow or tubular skirt portion 21 of cylindrical shape closed at one end by an end wall 22 surrounded by a knurled or ribbed bead 23. Internal screw threads 24 are provided in the portion of the cap skirt 21 adjacent the end wall 22 and engage with the screw threads 16 on the neck while the portion 25 of the cap skirt near the open end of the skirt has a smooth internal surface of cylindrical shape which closely receives the cylindrical portion 17 of the neck.

A notch 26 of inverted U-shape is provided in the smooth portion of the cap skirt 21 and opens to the open end of the skirt. When the cap is threaded onto the neck and turned so that the aperture 18 is substantially centered in the notch, as shown in Figures 1 and 5, the notch extends beyond the side of the aperture remote from the tube end wall 12 and the sides of the notch are spaced from the adjacent sides of the aperture so that a material portion of the area of the cylindrical portion 17 of the neck around the aperture 18 is exposed. Preferably the notch extends in width for ap-

proximately one-fourth of the circumferential extent of the cap skirt and the side edges thereof are somewhat beveled to lie approximately in the plane of a chord of the circumference of the skirt touching the side edges of the notch.

With this arrangement, when material is dispensed from the aperture **18** the adjacent surface of the neck can be wiped clean and none of the material will be left on the cap skirt. When the tube dispenses shaving cream, for example, all residual cream can be easily wiped from the exterior of the neck by the fingers receiving the cream and, when it dispenses tooth paste, all residual paste can be wiped away by the tooth brush and at no time will there be any plug of material in the cap opening or any material smeared on the outside of the cap. Also, as the inner cylindrical surface of the cap skirt has a close fit with the outer cylindrical surface of the portion of the neck receiving the aperture, when the aperture is covered by the unnotched portion of the cap skirt, a substantially airtight closure for the tube is provided. As it is necessary to turn the cap through only one quarter of a rotation to cover and uncover the aperture, the cap will not be removed from the neck and left off or lost and, as engagement of the open end of the cap skirt with the outer surface of the tube end wall **12** immediately surrounding the neck, provides a closing stop for the cap, the cap is firmly held in aperture covering position.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. In combination with a collapsible tube having an end wall, a dispensing closure comprising a hollow neck projecting from said end wall and having an outer screw threaded portion and an inner smooth portion of cylindrical shape provided with an aperture communicating with the interior of the tube through the hollow interior of said neck, and a cap having a skirt portion of cylindrical shape closed at one end by an end wall and provided interiorly with screw threads adjacent said end wall, said cap being threaded onto said neck and said skirt portion having adjacent the open end thereof a smooth internal surface closely receiving the smooth external surface portion of said neck and having in the portion thereof provided with said smooth internal surface an opening materially larger than the aperture in said neck and movable into registry with the aperture in said neck while said cap remains threaded onto said neck.

2. A dispensing closure for a collapsible tube having an end wall comprising a hollow neck projecting outwardly from said end wall and having exteriorly thereof a screw threaded portion and a smooth portion of cylindrical shape, and provided with a dispensing aperture in the smooth portion thereof, and a cap having a tubular skirt portion provided with internal screw threads and a portion having a smooth internal surface, and an end wall closing one end of said skirt portion, said cap being threaded onto said neck so that the internally smooth portion of said skirt closely receives the externally smooth portion of said neck and said skirt having in the internally smooth portion thereof an opening movable into and out of registry with the aperture in said neck when said cap is turned on said neck while remaining in screw threaded engagement therewith, the end of said skirt remote from the end wall of said cap engaging the end wall of said tube to provide a stop for said cap when said cap is turned in a selected direction relative to said neck to move the aperture in said cap out of registry with the aperture in said neck and thereby close said neck aperture.

3. A dispensing closure for a collapsible tube having an end wall comprising a hollow neck projecting outwardly from the end wall of said tube and having exteriorly thereof a screw threaded portion and a smooth portion of cylindrical shape, and provided with a dispensing aperture in the smooth portion thereof, and a cap having a tubular skirt portion provided with internal screw threads and a portion having a smooth internal surface, and an end wall closing one end of said skirt portion, said cap being threaded onto said neck so that the internally smooth portion of said skirt closely receives the externally smooth portion of said neck and said skirt having in the internally smooth portion thereof an opening movable into and out of registry with the aperture in said neck when said cap is turned on said neck, the open end of said skirt contacting the end wall of said tube to provide a stop for movement of said cap relative to said neck when the opening in said skirt has been moved away from the aperture in said neck.

4. A dispensing closure for a collapsible tube having an end wall comprising a hollow neck projecting outwardly from said end wall and having exteriorly thereof a screw threaded portion and a smooth portion of cylindrical shape, and provided with a dispensing aperture in the smooth portion thereof, and a cap having a tubular skirt portion provided with internal screw threads and a portion having a smooth internal surface, and an end wall closing one end of said skirt portions, said cap being threaded onto said neck so that the internally smooth portion of said skirt closely receives the externally smooth portion of said neck and said skirt having in the internally smooth portion thereof an opening movable into and out of registry with the aperture in said neck when said cap is turned on said neck, the opening in said skirt having an area materially greater than the aperture in said neck so that material can be wiped clearly from said neck when said opening is in registry with said aperture and no residual material will remain in said opening.

5. A dispensing closure for a collapsible tube having an end wall comprising a hollow neck projecting outwardly from said end wall and having exteriorly thereof a screw threaded portion and a smooth portion of cylindrical shape, and provided with a dispensing aperture in the smooth portion thereof, and a cap having a tubular skirt portion provided with internal screw threads and a portion having a smooth internal surface, and an end wall closing one end of said skirt portion, said cap being threaded onto said neck so that the internally smooth portion of said skirt closely receives the externally smooth portion of said neck and said skirt having in the internally smooth portion thereof an opening movable into and out of registry with the aperture in said neck when said cap is turned on said neck, the screw threads on said neck and in said cap being spaced from the aperture in said neck and the opening in said cap so that said screw threads will remain free of material issuing from said aperture.

References Cited in the file of this patent

UNITED STATES PATENTS

1,227,638	Maker	May 29, 1917
1,869,594	Johnston	Aug. 2, 1932