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AUTOMATIC TUBE CLOSURE

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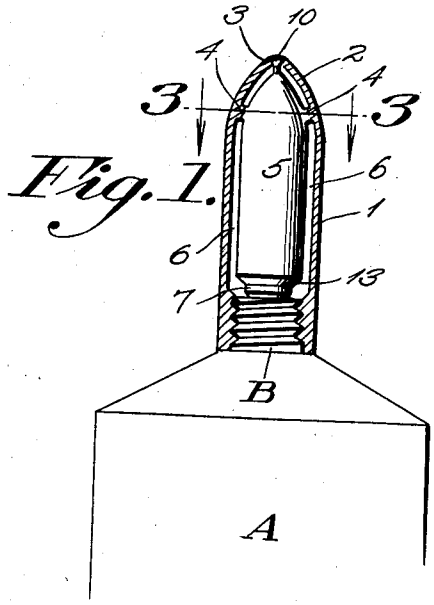


Fig. 1.

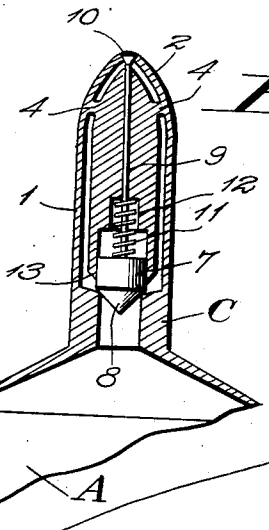


Fig. 4.

Fig. 2.

Fig. 5.

Fig. 3.

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AUTOMATIC TUBE CLOSURE

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3 Claims. (Cl. 221—60)

This invention relates to closures for collapsible tubes used for dispensing pastes, creams and the like, and its general object is to provide an automatic closure including means that normally closes the tube, but is readily moved to open position to allow free passage of the contents of the tube therefrom when pressure is applied to the tube and to closed position when the pressure is relieved, consequently the contents can be freely dispensed and is normally retained sealed in a sanitary and fresh condition.

An important object is to provide an automatic closure for a collapsible tube that includes valve means for sealing the contents thereof and which is urged to closed position and held accordingly by a coil spring that is completely enclosed so that the contents cannot come in contact therewith, whereby proper functioning of the valve is assured.

A further object is to provide a closure that includes valve means which doubly seals the contents, namely at the neck of the tube and at the outlet end of the closure.

Another object is to provide a closure that can be applied to tubes now in general use, or is integral therewith, but in any event the closure is simple in construction, inexpensive to manufacture and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a view partly in longitudinal section of the threaded form of closure, applied to a tube.

Figure 2 is a perspective view illustrating the closure in open position, with the contents of the tube being dispensed therefrom.

Figure 3 is a sectional view taken approximately on line 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is a longitudinal sectional view taken through a closure that is integral with the tube, or formed on the neck thereof to provide a permanent part of the tube.

Figure 5 is a modified form of valve member for use with a neck having an elongated outlet opening or slot.

Referring to the drawing in detail, the letter A indicates the body of a collapsible tube, and B the neck thereof, which as shown in Figures 1 and 2 is of the usual threaded type.

The closure includes a casing 1 which is of elongated tubular shell formation, with a restricted conical outer end 2 provided with an outlet opening 3 centrally therein, while the inner end of the casing is thickened and interiorly threaded for application to the neck, in the detachable form shown. Secured within the casing by webs 4 is a solid member or core 5, that is shaped to follow the shape of the casing, but is spaced therefrom to provide a passageway 6 between the core and the casing, for the contents of the tube from the neck to the outlet opening 3, as will be apparent upon inspection of Figure 2.

The inner end of the core 5 is also spaced from the outer end of the neck and has a recess therein. Slidably mounted in the recess for fitting association therewith, is a valve member 7 provided with a cone-shaped outer end 8 receivable in the bore of the neck for closing the same, as will be apparent upon inspection of Figure 4. Threadedly secured to the valve member and extending through a bore disposed longitudinally through the center of the core is a stem 9 that is slidably mounted in the bore and which also extends through the outlet opening 3. A conical valve 10 is formed on the outer end of the stem 9 for closing the opening 3 and the opening is of course shaped to provide a seat for the valve for sealing association therewith.

The valve member 7 and the valve 10 are normally held in closed position, and urged accordingly by a coil spring 11 that surrounds the stem 9 and is disposed within a chamber 12 within the core, the chamber being closed by the valve member 7 to prevent any of the contents of the tube from reaching the spring, and interfering with the proper operation of the valve, therefore such operation will be assured. It will be noted that the inner end of the core 5 about the recess is beveled as at 13 to the same degree as the cone-shaped outer end of the valve member 7, therefore allowing free passage of the contents of the tube about the core and to the outlet opening 3.

The closure of the form of Figure 4 is similar in every respect to the form just described, with the exception that the form of Figure 4 does not include threads for threaded connection to the neck of the tube, but is integral therewith, therefore the threads of the neck which for distinction is indicated by the letter C are eliminated and the closure is formed directly thereon to form a permanent part of the tube.

In Figure 5 I have illustrated a modified form of valve member 14 that is designed for use for a neck D that has an elongated opening or slot therein, in that the valve member 14 is provided with a flat inner face to be seated on the flat outer face of the neck D for closing the slot, and the valve member of this form is provided with a stem 15, with a boss 16 about the inner end thereof that acts as a guide to center the spring, which is likewise used in this form for closing and holding the valve member in closed position. A like boss or projection is also formed on the valve member 7, as shown.

From the above description and disclosure of the drawing, it will be obvious that when pressure is applied to the tube A, that the contents thereof will force the valve member of the neck of the tube to open position, and such movement of the valve member will move the valve of the outlet opening to open position, so that the contents of the tube will flow through the passageway 6 and to and through the outlet opening 3, but when the pressure is relieved the valves will automatically close due to the action of the spring 11, therefore it will be seen that the contents can be readily dispensed from the tube, but is normally retained sealed, so as to be free from contamination and in a sanitary and fresh condition.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. A closure for a collapsible tube, comprising an elongated casing connected to the neck of the tube and having an outlet opening in the outer end thereof, a core secured within the casing and spaced therefrom to provide a passageway for the contents of the tube therethrough, valve means within the casing for closing the bore of the neck, valve means for closing the outlet opening, means slidably mounted through the core and connecting the valve means together for movement thereof simultaneously, a spring for urging and normally holding the valve means closed, and said valve means being moved to open position when pressure is applied to the tube.

2. A closure for a collapsible tube, comprising an elongated casing connected to the neck of the tube and having a restricted conical outer end provided with an outlet opening centrally therein, a core secured within the casing and spaced therefrom to provide a passageway for the contents of the tube therethrough, said core having a recess in the inner end thereof, a valve member mounted in the recess for closing the bore of the neck, a stem for the valve and extending through the core, a valve member on the outer end of the stem for closing the outlet opening, a coil spring surrounding the stem and engaged with the first valve member for urging and normally holding the valve members closed, and said valve members being moved to open position when pressure is applied to the tube.

3. A closure for a collapsible tube, comprising a casing connected to the neck of the tube and having an outlet opening in the outer end thereof, a core mounted within the casing and spaced therefrom to provide a passageway for the contents of the tube therethrough, said core having a recess in the inner end thereof and a chamber inwardly of the recess, a valve member mounted for slidable movement in the recess for closing the bore of the neck, a stem formed on the valve member and extending through the core, a conical valve on the outer end of the stem for closing the outlet opening, a coil spring surrounding the stem for urging and normally holding the valve member and the conical valve closed, said valve member and conical valve being moved to open position when pressure is applied to the tube and said spring being mounted in the chamber for disposal out of the path of the contents of the tube.

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