Dec. 5, 1944. J. W. MOSSETT 2,364,307

CLOSURE FOR COLLAPSIBLE TUBES

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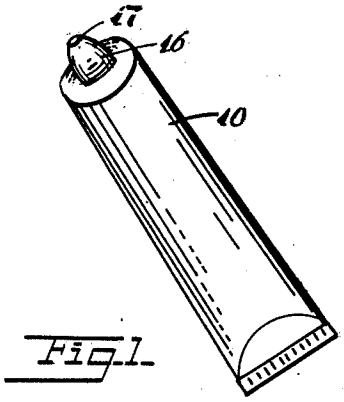


Fig. 1.

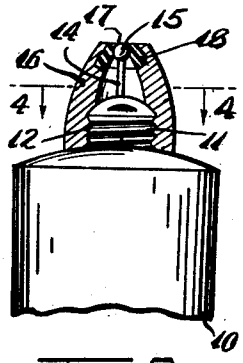


Fig. 2.

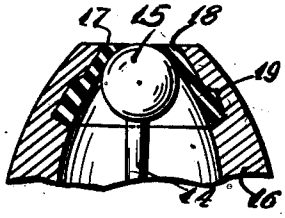


Fig. 3.

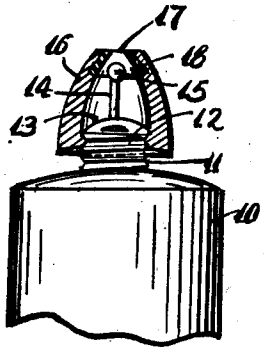


Fig. 5.

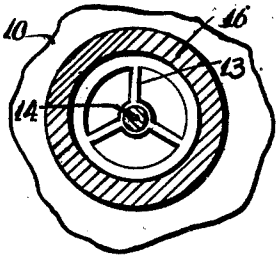


Fig. 4.

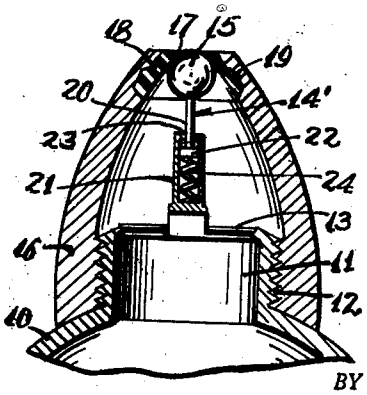


Fig. 6.

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CLOSURE FOR COLLAPSIBLE TUBES

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3 Claims. (Cl. 222—520)

This invention relates to new and useful improvements in a closure for collapsible tubes.

More particularly, the invention proposes a closure which is characterized by the fact that it includes a screw cap and a construction and arrangement which makes it unnecessary to completely remove the screw cap for opening the tube so that its contents may be squeezed out.

This invention is a great improvement over the commercial collapsible tubes which have small threaded necks closed by removable caps which must be fully removed before the contents may be squeezed out through the neck. Many people are too impatient to rescrew the removable caps and often throw them away, leaving the tube open which is highly objectionable.

It is an object of this invention to form the threaded cap with an opening and to provide a valve construction which closes the opening when the cap is tightly screwed down and which allows the contents of the tube to be squeezed through the opening when the cap is slightly unscrewed. With this arrangement it is unnecessary to completely remove the cap. It is therefore a simple matter to give the cap a slight turn to tightly rescrew it when it is desired to close the tube.

Still further the invention proposes a modified form in which the valve is resiliently urged closed so that the cap may be screwed all the way down to have its bottom edge properly engage the shoulder of the tube.

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

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

Fig. 1 is a perspective view of a collapsible tube with a closure constructed in accordance with this invention.

Fig. 2 is a fragmentary elevational view of the tube shown in Fig. 1 with the cap broken to disclose interior parts.

Fig. 3 is a fragmentary enlarged detailed view of the top portion of Fig 2.

Fig. 4 is a fragmentary enlarged horizontal sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a view similar to Fig. 2 but illustrated with the cap partly unscrewed.

Fig. 6 is a fragmentary enlarged sectional view of the top end of a collapsible tube and the closure cap constructed in accordance with a modified form of the invention.

The closure for collapsible tubes, in accordance with this invention, is intended to be used on a collapsible tube 10 of any design and construction having a discharge neck 11 which is formed with external threads 12. A spider support 13 is mounted across the neck 11. An axial stem 14 projects upwards from the spider support 13. A valve head 15 is on the top end of the stem 14.

A cap 16 is threadedly engaged on the threads 12 of the neck 11 and is formed with an axial discharge opening 17 normally closed by said valve head 15 when the cap is screwed down completely. The parts are so arranged that if the cap is partly unscrewed, as illustrated in Fig. 5, the opening 17 of the cap will be free of the valve head 15 so that the contents of the tube 10 may be squeezed out. A washer 18 is mounted around the edge of the opening 17 and is cooperative with the valve 15 for insuring a proper closure when the cap is fully screwed down. This washer 18 is made from soft and resilient material. The top end of the cap 16 is formed with a recess 19 into which a portion of the washer 18 is forced. The mounting of the washer in the recess 19 serves to support the washer permanently in position.

The operation of the device is as follows:

When the tube 10 is squeezed some of its contents will be forced up between the arms of the spider support 13 and will fill up the inside of the cap 16. If the cap is partly unscrewed as shown in Fig. 5, the contents of the tube may be squeezed out through the openings 17. To close the tube it is merely necessary to turn the cap 16 back to its initial position shown in Fig. 2 in which the opening 17 is closed by the valve 15.

In Fig. 6 a modified form of the invention has been disclosed which distinguishes from the prior form in the construction of the axial stem 14'. This stem is formed from a pair of telescopically engaging sections 20 and 21. The inner section 20 has a head 22 which is engageable with an inturned top end 23 on the section 21 for limiting extension of the sections relative to each other. An expansion spring 24 is housed within the section 21 and acts between the sections for normally urging the section 20 upwards.

In other respects this form of the invention is identical to the previous form and like parts are identified by like reference numerals.

The operation of this form of the invention is as follows:

The spring 24 will resiliently urge the stem section 20 upwards so as to tightly force the valve

head 15 in the opening 17 of the cap 16. The tube may be opened by unscrewing the cap 16 slightly so that the opening 17 is free of the head 15. It is necessary to unscrew the cap 16 a distance sufficient for the head 22 to engage the flange 23 and then some more to free the opening 17. When the cap 16 is screwed tight, the washer 18 will engage the valve head 15 pressing it downwards and partly collapsing the telescopic stem 14' until the bottom of the cap 16 strikes the shoulder of the neck 11 of the tube.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself 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 my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A collapsible tube having an externally threaded discharge neck closed by a threaded cap formed with an axial discharge opening adapted to be closed by a valve head mounted on the top end of a stem projecting from a spider supported across the top of said discharge neck, said stem being formed of telescopically engaged sections, comprising a tubular fixed section attached to said spider and a movable section extending from said fixed section and having said valve head mounted on the top end thereof, resilient means within said fixed section urging said movable section outwards to seat said valve head against the material of said cap surrounding said discharge opening to close it when said cap is screwed down, and means limiting outward movement of said movable section when said cap is unscrewed so that said cap may be moved free of said valve head, opening the passage through said discharge opening.

2. A collapsible tube having an externally threaded discharge neck closed by a threaded cap formed with an axial discharge opening adapted to be closed by a valve head mounted on the top end of a stem projecting from a spider supported across the top of said discharge neck, said stem being formed of telescopically engaged sections, comprising a tubular fixed section attached to said spider and a movable section extending from said fixed section and having said valve head mounted on the top end thereof, resilient means within said fixed section urging said movable section outwards to seat said valve head against the material of said cap surrounding said discharge opening to close it when said cap is screwed down, and means limiting outward movement of said movable section when said cap is unscrewed so that said cap may be moved free of said valve head, opening the passage through said discharge opening, said first means, comprising an expansion spring within said tubular fixed section and operating between the base wall of said fixed section and the inner end of said movable section.

3. A collapsible tube having an externally threaded discharge neck closed by a threaded cap formed with an axial discharge opening adapted to be closed by a valve head mounted on the top end of a stem projecting from a spider supported across the top of said discharge neck, said stem being formed of telescopically engaged sections, comprising a tubular fixed section attached to said spider and a movable section extending from said fixed section and having said valve head mounted on the top end thereof, resilient means within said fixed section urging said movable section outwards to seat said valve head against the material of said cap surrounding said discharge opening to close it when said cap is screwed down, and means limiting outward movement of said movable section when said cap is unscrewed so that said cap may be moved free of said valve head opening, the passage through said discharge opening, said latter means, comprising an enlarged head formed on the end of said movable section within said tubular fixed section, and a shoulder formed on the end of said fixed section to be engaged by said head to limit outward movement of said movable section.

JAMES W. MOSSETT.