Nov. 23, 1926.

1,607,993

R. G. F. LOEWY

CONTAINER TUBE

Filed Dec. 11, 1925

Fig. 1.

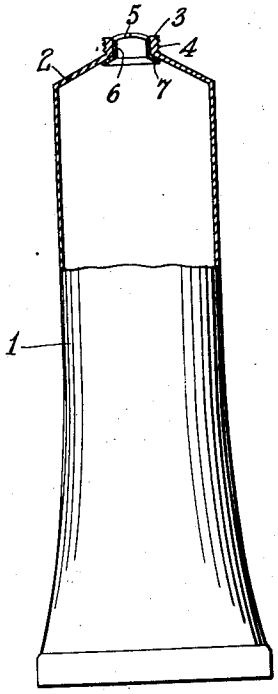


Fig. 4.

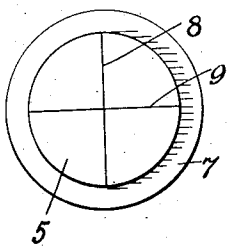


Fig. 5.

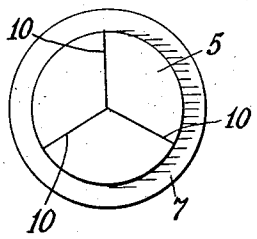


Fig. 6.

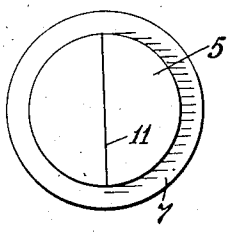


Fig. 2.

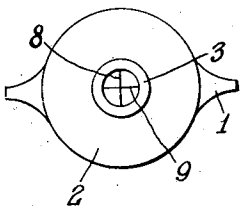
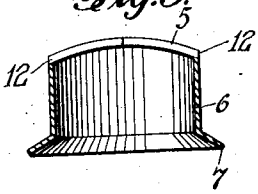


Fig. 3.



INVENTOR

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ATTORNEY

Patented Nov. 23, 1926. 1,607,993

UNITED STATES PATENT OFFICE.

RAYMOND G. F. LOEWY, OF JACKSON HEIGHTS, NEW YORK.

CONTAINER TUBE.

Application filed December 11, 1925. Serial No. 74,695.

This invention relates to a novel and improved closure for use with collapsible container tubes of the type commonly employed to hold materials such as paints, tooth paste and the like. Such tubes are usually provided with rigid necks which are threaded to receive caps. The caps are easily lost and even when not lost are oftentimes not replaced when the tube is through being used. The result is that the material in the tube is wasted, and, furthermore, the portion of the material exposed at the open neck becomes dried, and oftentimes the tube itself is ruptured before the material can be forced out through the neck. Various means have been devised to overcome the above difficulties, but none of them has been entirely satisfactory.

It is the object of my invention to provide a closure for a collapsible container tube which shall be very cheaply and easily made and applied to tubes of standard construction, and which shall automatically close when pressure on the tube is stopped, but which shall permit the material in the tube to be readily forced out through the neck when pressure is applied. This means that it is possible to discard the usual cap, if desired, as it performs no useful function after the tube is once opened for use. At the same time the material in the tube is fully protected by the closure so as to be kept moist and so that it will consequently be in a condition to be readily forced out of the tube when desired.

In the accompanying drawing in which I have shown selected embodiments of my invention:

Figure 1 is a view, partly in elevation and partly in section, of a tube having my invention applied thereto.

Figure 2 is an end view showing the top of the tube of Figure 1.

Figure 3 is a detailed transverse section through a closure, this figure being drawn on a greatly enlarged scale.

Figure 4 is a top plan view of the structure shown in Figure 3.

Figures 5 and 6 are views similar to Figure 4 but showing modifications of my invention.

Referring now to the drawings the numeral 1 designates a collapsible container tube of well-known construction which needs no detailed description. This tube terminates at one end in a breast 2 which is normally of a frusto-conical shape terminating in a rigid neck 3 which is screw threaded at 4 to receive the usual cap, not shown. Disposed in the bore of the neck 3 is my novel and improved closure in the form of a diaphragm 5 extending across the bore of the neck and joined to a tubular portion 6 which fits tightly within the bore. This tubular portion terminates in an annular flange 7 which engages the breast 2 of the tube adjacent the neck. The diaphragm 5 is provided with means to permit forcing of the material in the tube therethrough. This means is preferably in the form of one or more slits made in the diaphragm without removing any substantial portion of the material of the diaphragm. These slits may vary greatly in number and arrangement, and I do not desire to limit myself to any specific arrangement thereof. For the purposes of illustration I have shown a few different arrangements which I have found to be satisfactory in actual use. In Figures 1 to 4 inclusive I have shown the two intersecting slits 8 and 9 extending diametrically across the diaphragm at right angles to each other.

In Figure 5 I have shown the diaphragm 5 as provided with three slits 10 intersecting approximately at the center of the diaphram, while in Figure 6 I have shown one slit 11 extending diametrically across the diaphram 5. The extent of these slits may vary between substantial limits, but I have found it preferable to have them extend completely across the diaphram and through the tubular wall 6 as indicated at 12 in Figure 3. By this arrangement the flaps formed between the slits may bend outwardly more easily as pressure is applied to the tube, and therefore the material will pass more freely through the neck. In all the forms shown it will be noted that the slits are radiating, that is, they lead outwardly from the point of intersection, and in the form shown in Figure 6 the single slit may be considered as two slits radiating outwardly from the centre of the diaphram.

The closure may be formed of any material which is resilient enough to give, when pressure is applied to the tube, and thus to permit the contents thereof to come out and then return to normal position, after pressure on the tube is released. At the same

time the material must have sufficient stiffness and strength, so that it will retain the contents in the tube when pressure is not applied thereto. That is, when the tube is laid aside, the closure must adequately retain and protect the contents. Various materials may be used for the closure. For example, I have found that rubber is quite satisfactory, but the most satisfactory material which I have discovered is that known commercially as soft celluloid although I do not intend to limit myself to that particular kind of substance, it being obvious that other forms of cellulose material may be successfully used. This material is as soft and resilient as rubber, but at the same time has more stiffness and strength, so that it may be made thinner than rubber, whereby it will bend more easily than a closure made of a thicker material, such as rubber.

By the use of a cellulose material such as soft celluloid it is possible to dispose the closure entirely within the bore of the neck and still have it function. That is, the material may be made so thin that it will bend sufficiently without having to project beyond the edge of the neck. The advantage of this construction is obvious in that a shorter cap may be employed than where it is necessary to have the closure projecting from the neck. Moreover, the closure itself requires less material and is also better protected by being completely received within the bore of the neck. In the drawing I have shown the diaphram 5 as being slightly rounded, so as to project a very slight amount from the neck at the center of the diaphram. This form has certain advantages in that it permits the material extruded from the tube to be wiped off, but this form is not deemed essential.

From the above it will be apparent that I have devised a novel and improved closure which may be very cheaply and efficiently made and applied to tubes of standard form. The closure is placed in the bore of the neck before the material is inserted in the tube and is retained in place by the pressure of the material against the flange 7, which pressure forces the flange into tight engagement with the breast 2 and thus prevents displacement of the closure. No other fastening means is necessary, although of course it is obvious that the closure may be cemented or otherwise secured to the tube and neck, if desired. In actual practice, however, I have found that an effective seal is provided by the means which I have disclosed. When the tube is put into use, the usual cap may be thrown away and the tube used in the usual manner. As the material in the tube is extruded, the flaps formed between the slits will give sufficiently to permit the material to pass through the neck but will return at once to the position shown in Figures 1 and 3 upon release of pressure on the tube.

I am aware that various changes in form and degree and in materials may be made in my invention without departing from the spirit thereof. I, therefore, consider myself entitled to all modifications that may fairly fall within the scope of the appended claims.

I claim:

1. A container tube having a neck at one end thereof, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphram extending across said bore and having a slit therein, a tubular portion joined to said diaphram and fitting the wall of said bore, and means to prevent displacement of said closure.

2. A container tube having a neck at one end thereof, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a slit therein, a tubular portion joined to said diaphragm and fitting the wall of said bore, and means to prevent displacement of said closure.

3. A container tube having at one end thereof a breast terminating in a neck, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphragm extending across said bore and having a slit therein, a tubular portion joined to said diaphragm and fitting the wall of said bore, and an annular flange joined to said tubular portion and contacting with the breast of said tube to prevent displacement of said closure.

4. A container tube having at one end thereof a breast terminating in a neck, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a slit therein, a tubular portion joined to said diaphragm and fitting the wall of said bore, and an annular flange joined to said tubular portion and contacting with the breast of said tube to prevent displacement of said closure.

5. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm extending across said bore and having a slit therein whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slit, the material of the diaphragm on either side of the slit resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slit and retain the contents in the tube, and means for preventing displacement of said closure.

6. A container tube having a neck at one end thereof, said neck having a bore therein,

a closure for said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a slit therein whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slit, the material of the diaphragm on either side of the slit resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slit and retain the contents in the tube, and means for preventing displacement of said closure.

7. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm extending across said bore and having a plurality of radiating slits therein intersecting at a point whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slits, the material of the diaphragm on either side of the respective slits resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slits and retain the contents in the tube, and means for preventing displacement of said closure.

8. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a plurality of radiating slits therein intersecting at a point whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slits, the material of the diaphragm on either side of the respective slits resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slits and retain the contents in the tube, and means for preventing displacement of said closure.

In testimony whereof, I have affixed my signature to this specification.

RAYMOND G. F. LOEWY.

DISCLAIMER

1,607,993.—*Raymond G. F. Loewy*, Jackson Heights, N. Y. CONTAINER TUBE. Patent dated November 23, 1926. Disclaimer filed October 29, 1930, by the patentee.

Hereby enters this disclaimer to the subject-matter of claims 1, 3, 5, 6, 7, and 8, which are as follows:

"1. A container tube having a neck at one end thereof, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphragm extending across said bore and having a slit therein, a tubular portion joined to said diaphragm and fitting the wall of said bore, and means to prevent displacement of said closure."

"3. A container tube having at one end thereof a breast terminating in a neck, said neck having a bore therein, a closure disposed in said bore comprising a resilient diaphragm extending across said bore and having a slit therein, a tubular portion joined to said diaphragm and fitting the wall of said bore, and an annular flange joined to said tubular portion and contacting with the breast of said tube to prevent displacement of said closure."

"5. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm extending across said bore and having a slit therein whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slit, the material of the diaphragm on either side of the slit resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slit and retain the contents in the tube, and means for preventing displacement of said closure.

"6. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a slit therein whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slit, the material of the diaphragm on either side of the slit resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slit and retain the contents in the tube, and means for preventing displacement of said closure.

"7. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm extending across said bore and having a plurality of radiating slits therein intersecting at a point whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slits, the material of the diaphragm on either side of the respective slits resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slits and retain the contents in the tube, and means for preventing displacement of said closure.

"8. A container tube having a neck at one end thereof, said neck having a bore therein, a closure for said bore comprising a resilient diaphragm of cellulose material extending across said bore and having a plurality of radiating slits therein intersecting at a point whereby, when pressure is applied to the tube, the contents thereof may be forced outwardly through the slits, the material of the diaphragm on either side of the respective slits resiliently yielding to permit passage of the contents and upon release of the pressure returning to its original condition to close the slits and retain the contents in the tube, and means for preventing displacement of said closure."

[*Official Gazette November 18, 1930*]