

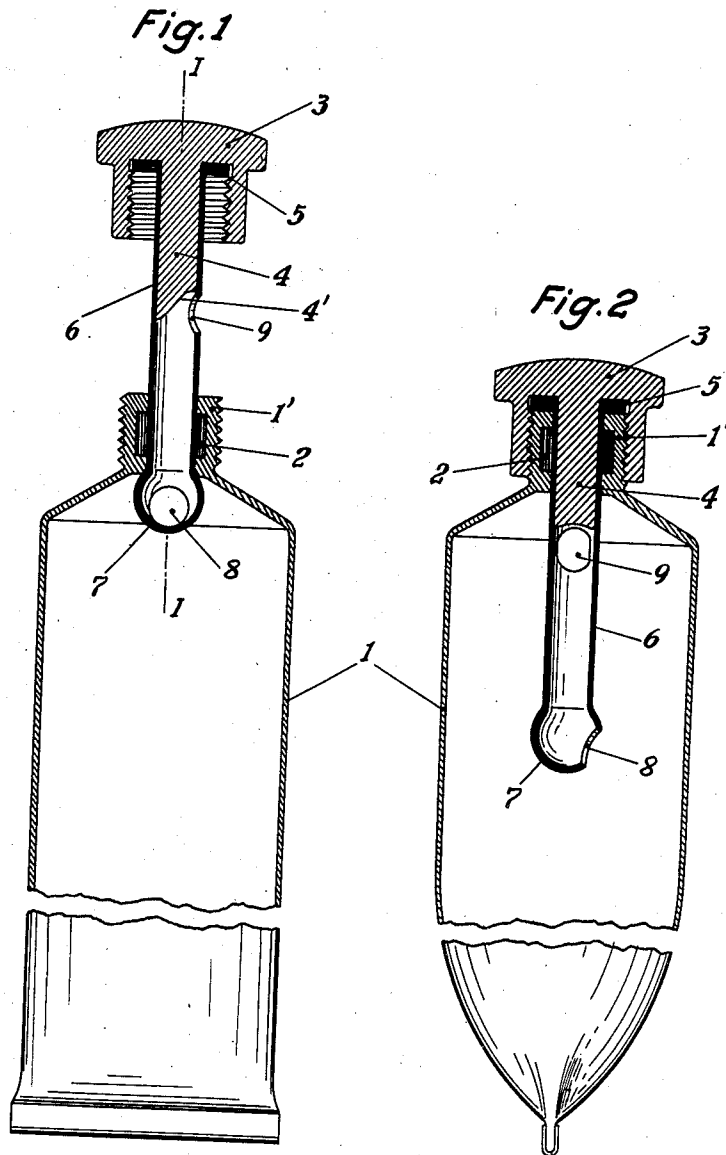
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CLOSURE DEVICE FOR TUBES

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CLOSURE DEVICE FOR TUBES

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The present invention relates to closure devices for tubes and has for its object to provide an improved safety closure device which also enables the contents of the tube to be expelled from the tube without soiling the neck of the tube.

The safety closure device according to the invention comprises a tubular member slidable in the neck of the tube, a closure member secured to the outer end of the tubular member, at least one inlet opening in the tubular member at the end opposite to that at which the closure member is secured, and an outlet opening in the wall of the tubular member at a point intermediate the inlet opening and the closure member.

The tubular member may conveniently be secured to the closure member by positioning it on an inwardly directed pin provided on the latter. The pin preferably terminates in an oblique surface immediately adjacent the outlet opening to facilitate the expulsion of the contents of the tube through the outlet opening.

The length of the tubular member and the position of the outlet opening therein are so determined that when the tubular member has been pushed back into the tube the latter is completely closed even when the closure member has not been secured but merely pushed in against the neck of the tube.

To prevent the closure member with the tubular member from emerging entirely from the tube, that end of the tubular member which is disposed within the tube is provided with a stop preferably in the form of a spherical enlargement which also accommodates the inlet aperture.

In the accompanying drawing, one embodiment of the invention is shown by way of example in the case of a tube with a threaded closure member,

Fig. 1 shows a section through the tube with the closure in the open position,

Fig. 2 shows a section substantially along the line I—I of Fig. 1 with the closure in the closed position.

1 is the normal tube with the usual threaded neck 1' which, however, is provided with an internal groove to receive a packing 2. The closure member 3 is in the form of the customary screw cap and has a pin 4 which is directed towards the neck 1 of the tube and is provided with an oblique end face 4'. The closure member 3 is provided with a packing 5 to form a seal with the end of the threaded neck. Secured on the pin 4 is a tubular member 6 which is slidable in the neck 1'. The packing 2 serves to guide the

tubular member 6 and to form a seal between it and the neck 1'. At its lower end the tubular member 6 is provided with an inlet aperture 8, while a slot 9 constituting the outlet aperture is provided in the wall of the tubular member 6 immediately adjacent the oblique end face 4' of the pin 4.

Before the tube 1 is filled and closed the tubular member 6 is inserted through the neck 1' of the tube from the inside and is fastened on the pin 4 of the closure member 3. To prevent the tubular member 6 from being withdrawn completely from the tube it is provided at its inner end with a spherical enlargement 7 with at least one inlet aperture 8 through which the contents of the tube 1 pass into the tubular member 6. The provision of the slot-shaped outlet aperture 9 in the tubular member 6 immediately in front of the oblique surface 4' on the pin 4 ensures that in the discharge of the contents of the tube there is no dead angle in which some of the contents can be trapped and perhaps decompose and thereby affect detrimentally the keeping properties of the contents as a whole.

Also by the arrangement of the delivery point in the tubular member as described and illustrated any entry of air into the tube during or consequent to the removal of the contents is avoided, even though the tube is not completely closed but the closure member is merely pushed down against the neck of the tube.

Further advantages of the safety tube closure as described and illustrated are as follows:

(a) The closure member 3 when opened remains connected with the tube 1 by means of the tubular member 6 so that it cannot be lost,

(b) Whether the closure member 3 is in the fully closed position or is merely pushed in as far as is permitted by the neck 1', the outlet slot 9 is displaced into the interior of the tube so that drying of the material at the outlet slot is avoided,

(c) When the closure member 3 is fully closed there is a double seal with respect to the interior of the tube.

I claim:

1. A tube closure device comprising a tubular member sliding in the neck of the tube, a closure member secured to the outer end of the tubular member, the inner end of the tubular member being closed, said tubular member having an inlet opening formed in the side wall thereof adjacent the inner end and an outlet opening in the tubular member intermediate the inlet opening and the closure member.

2. A tube closure device comprising a tubular

member sliding in the neck of the tube, an annular packing accommodated in an internal groove in the neck of the tube and embracing the tubular member, a closure member secured to the outer end of the tubular member, at least one inlet opening at the inner end of the tubular member, and an outlet opening in the tubular member intermediate the inlet opening and the closure member.

3. A tube closure device comprising a tubular member sliding in the neck of the tube, a closure member secured to the outer end of the tubular member, a spherical enlargement at the inner end of the tubular member, closing said inner end thereof, an inlet opening in the side of said enlargement, and an outlet opening in said tubular member intermediate the inlet opening and the closure member.

4. A tube closure device comprising a tubular member sliding in the neck of the tube, means limiting the extent to which the tubular member can be drawn out of the tube, a closure cap secured to the outer end of the tubular member, a spherical enlargement closing the inner end of the tubular member and provided with a lateral inlet opening in the side wall thereof, and an outlet opening in the tubular member at a point which lies within the tube when the tubular member is pushed into the tube until the cap encounters the neck, but which lies outside the tube when the tubular member is drawn out of the tube to its maximum extent.

5. A tube closure device comprising a screw

cap adapted to be brought into threaded engagement with the neck of the tube, a pin integral with the cap and projecting therefrom so as to pass into the neck of the tube when the screw cap is in threaded engagement with the neck, an inclined face formed at the end of said pin, a tubular member mounted on the pin and projecting beyond the end thereof and slidable in the neck of the tube, a packing accommodated in an internal groove in the neck and forming a seal between the tubular member and the neck, an opening in the tubular member immediately adjacent the inclined face at the end of the pin, a spherical enlargement at the end of the tubular member within the tube, and at least one opening in the spherical enlargement, the whole being arranged so that when the cap is unscrewed and the tubular member withdrawn to the full extent determined by the spherical enlargement, the aperture immediately adjacent the inclined face lies outside the tube clear of the neck thereof so that by applying pressure the contents can be expelled through the tubular member without soiling the neck, whereas when the tubular member has been pushed into the tube as far as is permitted by the screw cap without threaded engagement thereof with the neck, the said aperture immediately adjacent the inclined face lies within the tube.

6. A device according to claim 5, in which the inlet opening is provided in the side of said spherical enlargement.

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