Jan. 3, 1939. S. C. WAITE 2,142,293

DISPENSING CLOSURE

Filed March 22, 1937

Fig. 1.

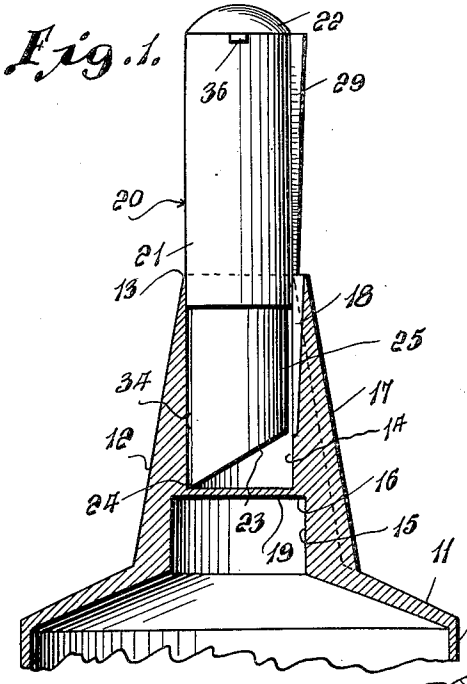


Fig. 2.

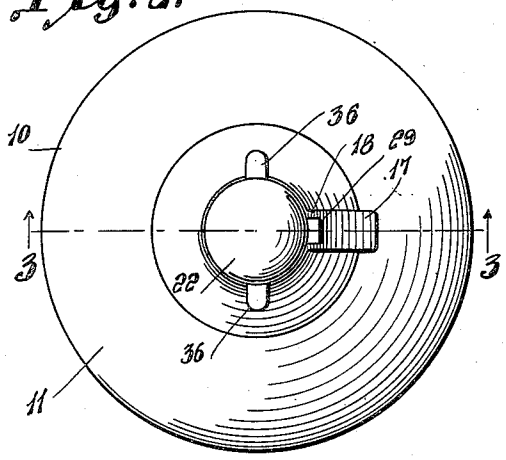


Fig. 3.

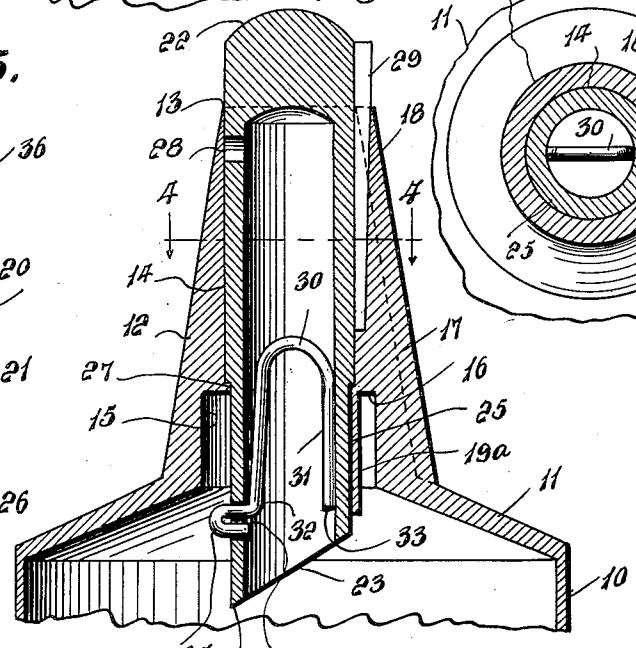
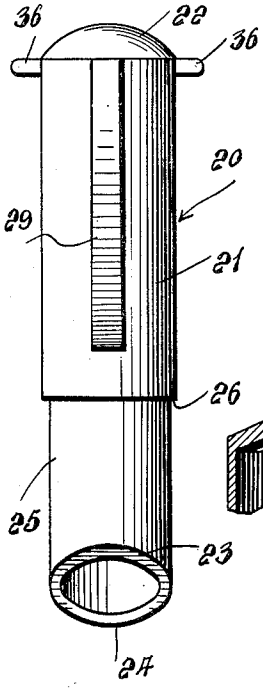


Fig. 4.

Fig. 5.



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Patented Jan. 3, 1939 2,142,293

UNITED STATES PATENT OFFICE

2,142,293

DISPENSING CLOSURE

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Application March 22, 1937, Serial No. 132,385

10 Claims. (Cl. 221—60)

This invention relates to certain new and useful improvements in dispensing closures.

The primary object of the invention is to provide a dispensing closure especially designed for association with tubes, preferably of the compressible type employed for the dispensing of dental cream, shaving cream and the like, the dispensing closure comprising a hollow plunger forming a closure for the tube when at its limit of inward movement and also forming a dispensing closure when partially moved outwardly of the tube.

A further object of the invention is to provide a dispensing closure of the foregoing character wherein the closure that is in the form of a plunger is provided with a longitudinally extending tapering rib that is receivable in a tapering groove in the neck of the tube to cause a binding action between the closure and tube neck when the closure is at its limit of inward movement for effectively retaining the same in such position.

A still further object of the invention is to provide a dispensing closure for a tube wherein the neck of the tube is normally closed by a puncturable disk arranged adjacent its inner end that is adapted to have a part thereof struck-out by the inner end of the closure with a spring device carried by the closure for limiting outward movement of the closure with the cap restrained from rotation in the tube neck by means of an interlocking wedge connection between the closure and tube neck to prevent complete severance of the struck-out portion of the disk from the tube neck.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing and claimed.

In the drawing:—

Figure 1 is a fragmentary longitudinal sectional view of a collapsible dispensing tube having a sealing disk in the neck thereof with the dispensing closure shown in elevation and mounted in the outer end of the tube neck and also showing the rib and slot wedge connection between the neck and closure;

Figure 2 is a top end elevational view showing lateral handles or finger pieces carried by the dispensing closure to facilitate operation thereof;

Figure 3 is a longitudinal sectional view taken on line 3—3 of Figure 2, showing the spring device carried by the dispensing closure and the rib, wedge and slot connection between the dispensing closure and neck to cause a binding action between the closure and neck when the closure is at its limit of inward movement and also acting to prevent rotation of the closure in the neck;

Figure 4 is a cross-sectional view taken on line 4—4 of Figure 3, showing the external longitudinal rib on the tube neck to facilitate the formation of the internal groove in the neck to receive the wedge rib on the dispensing closure; and

Figure 5 is a side elevational view of the dispensing closure.

Referring more in detail to the accompanying drawing, the reference character 10 designates a collapsible tube having a shoulder 11 and a tapering neck 12 that terminates at its outer end in a substantial knife edge 13. The neck 12 is provided with a cylindrical bore 14 beginning at the outer knife edge 13 thereof and terminating in spaced relation to the shoulder 12, the lower inner end of the neck 12 having an annular cut-away portion 15 defining an abutment shoulder 16. An outwardly directed longitudinally extending rib 17 is formed on the outer side of the neck 12 and extends for the entire length of the neck, and the bore 14 of said neck 12 is provided with a longitudinally extending groove 18 in line with the rib 17 with the groove opening at the upper knife edge 13 of the neck and terminating at its lower end in spaced relation to the abutment shoulder 16, the bottom wall of the groove 18 being inclined upwardly and outwardly. A puncturable closure wall 19 extends across the neck 12 in line with the abutment shoulder 16 for normally sealing the contents of the tube 10.

The dispensing closure 20 comprises a hollow cylindrical plunger 21 closed at its outer end as at 22 with the inner end bevelled as at 23 forming a lower cutting edge 24. The plunger 21 is annularly reduced adjacent its lower end as at 25 to define a shoulder 26 that is engageable with an abutment shoulder 27 formed at the lower end of the bore 14 when a disk-like portion has been severed from the closure wall 19 of the tube neck, to limit inward movement of the dispensing closure 20 in the neck 12. A lateral dispensing opening 28 is formed in a side wall of the plunger 21 adjacent the closed outer end 22 and when the dispensing closure is at its limit of inward movement within the neck 12, said dispensing opening 28 is closed by the tube neck as shown in Figure 3. A longitudinally extending tapered rib 29 is carried by the outer side of the plunger 21 and extends from the closed end 22 to a point spaced from the shoulder 26, the rib 29 being receivable in the groove 18 in the neck 12 and by its

wedging action in said groove, the plunger 21 is held in binding engagement with the tube neck 12 against accidental movement outwardly of the neck, said wedging action also producing a tight closure seal for the dispensing opening 28 as the rib is carried by the plunger 21 diametrically opposite the opening 28 which causes the side of the plunger 21 provided with said opening to have a tendency to move toward the adjacent side of the tube neck.

When the tube and dispensing closure are prepared for shipment, the dispensing closure is so positioned in the neck 12 of the tube as to locate the rib 29 out of alignment with the slot 18 and in abutting relation to the knife edge 13 of the neck to prevent accidental inward movement of the dispensing closure for puncturing the closure wall 19 in the neck. To puncture an opening in the sealing wall 19, the dispensing closure 20 is located in the bore of the tube neck with the tapering rib 29 registering with the groove 18 and upon inward pressure of the dispensing closure, the lower cutting edge 24 thereof will partially sever a disk from the sealing wall 19 and move such severed disk laterally of the opening cut in said wall as shown at 19a in Figure 3. To prevent complete removal of the dispensing closure from the tube neck, said closure carries a spring device that coacts with the abutment shoulder 16 within the tube neck to limit outward movement of the dispensing closure. As shown more clearly in Figure 3, a wire spring 30 is bent upon itself to provide a pair of legs 31 and 32 with the looped portion of the spring directed toward the closed end 22 of the dispensing closure, the free end 33 of the leg 31 being in flat lengthwise contact with the inner face of the lower reduced end 25 of the plunger 21 while the free end of the leg 32 is angularly and return bent to provide a catch 34 that extends through an opening 35 in the lower end 25 of the plunger 21 diametrically opposite the free end 33 of the leg 31, the catch moving into engagement with the abutment shoulder 16 of the tube neck for limiting outward movement of the dispensing closure. After the dispensing closure has been locked into the tube neck by the spring device, the rib 29 remains engaged with the neck slot 18 at all times and prevents rotation of the dispensing closure within the tube neck so that the catch 34 of the spring device cannot be rotarily shifted for completely severing the struck-out disk 19a from the sealing wall 18. Lateral ears 36 are carried by the outer end of the dispensing closure 20 to facilitate operation of the same.

From the above detailed description of the invention, it is believed that the construction and use thereof will at once be apparent and while there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be undersood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

I claim:

1. In a device of the character described, a tube having a neck, a dispensing closure for the tube slidable in the neck, and a spring device carried by the slidable closure and completely housed therein in spaced relation to the major portion of the contents of the tube and cooperating with the neck to prevent complete removal of the closure from the neck.

2. In a device of the character described, a tube having a neck, a dispensing closure for the tube slidable in the neck, a spring device carried by the slidable closure and completely housed therein in spaced relation to the major portion of the contents of the tube and cooperating with the neck to prevent complete removal of the closure from the neck, and constantly engaging interfitting means carried by the neck and dispensing device to prevent rotation of the dispensing device in the neck.

3. In a device of the character described, a tube having a neck, a dispensing closure for the tube slidable in the neck, a spring device carried by the closure cooperating with the neck to prevent complete removal of the closure from the neck, the neck having a longitudinally extending internal groove and a wedge rib extending longitudinally of the dispensing device and disposed in the neck groove to prevent rotation of the dispensing device in the neck and to effect a tighter seal between the neck and dispensing device when the latter is in its closed position.

4. In a device of the character described, a tube having a neck, a sealing disk adjacent the inner end of the neck, a dispensing closure having a bevelled sharpened inner end slidable in the neck and adapted to form an opening in the sealing disk when projected inwardly of the neck, means to prevent complete removal of the dispensing device from the neck after puncturing the disk, including a loop spring located entirely within the dispensing closure in spaced relation to the major portion of the contents of the tube and having one end resiliently engaged with the closure and a catch on the other end projecting outwardly of the closure for engagement with the tube neck, and means to prevent rotation of the dispensing device in the neck.

5. In a device of the character described, a tube having a neck, a sealing disk adjacent the inner end of the neck, a dispensing closure having a bevelled sharpened inner end slidable in the neck and adapted to form an opening in the sealing disk when projected inwardly of the neck, means to prevent complete removal of the dispensing device from the neck after puncturing the disk, means to prevent rotation of the dispensing device in the neck, including a tapering groove in the inner wall of the tube neck and a tapering rib on the outer face of the dispensing device receivable in the neck groove.

6. In a device of the character described, a tube having a neck, a sealing disk adjacent the inner end of the neck, a dispensing closure having a bevelled sharpened inner end slidable in the neck and adapted to form an opening in the sealing disk when projected inwardly of the neck, means to prevent complete removal of the dispensing device from the neck after puncturing the disk, including a spring device carried by the dispensing device and engageable with the tube neck, means to prevent rotation of the dispensing device in the neck, including a tapering groove in the inner wall of the tube neck and a tapering rib on the outer face of the dispensing device receivable in the neck groove.

7. In a device of the character described, a tube having a neck, a sealing disk adjacent the inner end of the neck, a dispensing closure having a bevelled sharpened inner end slidable in the neck and adapted to form an opening in the sealing disk when projected inwardly of the neck, means to prevent complete removal of the dispensing device from the neck after puncturing the disk, including a loop spring within the dispensing closure having one end resiliently engaged with the closure and a catch on the other end projecting

outwardly of the closure for engagement with the tube neck, means to prevent rotation of the dispensing device in the neck, including a tapering groove in the inner wall of the tube neck and a tapering rib on the outer face of the dispensing device receivable in the neck groove.

8. In a device of the class described, a tube having a neck and closure disk at the lower end of the neck, a dispensing closure for the tube slidable in the neck and comprising a tubular plunger closed at its outer end with its inner end open and bevelled to facilitate puncturing of the closure disk, a lateral dispensing opening in the plunger adjacent the outer end adapted to be closed by the tube neck, a spring device in the plunger having a catch projecting outwardly thereof for cooperation with the tube neck to prevent complete removal of the plunger from the neck, and a cooperating wedge and groove construction on the neck and plunger to prevent rotation of the plunger in the tube neck.

9. In a device of the class described, a tube having a neck and closure disk at the lower end of the neck, a dispensing closure for the tube slidable in the neck and comprising a tubular plunger closed at its outer end with its inner end open and bevelled to facilitate puncturing of the closure disk, a lateral dispensing opening in the plunger adjacent the outer end adapted to be closed by the tube neck, a spring device in the plunger having a catch projecting outwardly thereof for cooperation with the tube neck to prevent complete removal of the plunger from the neck, a cooperating wedge and groove construction on the neck and plunger to prevent rotation of the plunger in the tube neck, and said plunger adapted to be initially positioned in the neck before puncturing the disk with the wedge and groove construction out of registry to prevent movement of the plunger into the neck for puncturing engagement with the sealing disk.

10. In combination with a dispensing tube having a neck with an internal shoulder and a puncturable closure wall in the neck in the plane of the shoulder, a dispensing closure for the tube slidable in the neck and initially occupying a position outwardly of the puncturable wall and adapted to be forced inwardly of the tube neck to cut a disk from said closure wall and a spring device carried by the dispensing closure interiorly thereof with one end slidably projecting through a wall of the closure for engagement with said shoulder to prevent complete removal of the closure from the tube neck after said wall has been punctured.

SHERIDAN C. WAITE.