Nov. 14, 1950 D. D. DERRICK 2,530,327

ROLL TYPE COLLAPSIBLE TUBE SQUEEZER

Filed Nov. 18, 1946

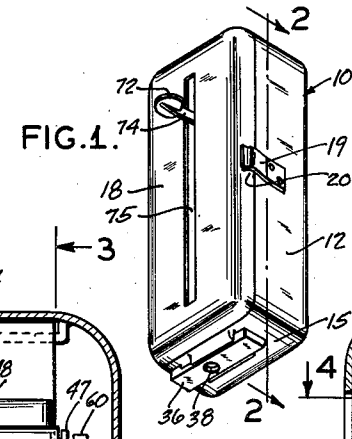


FIG. 1.

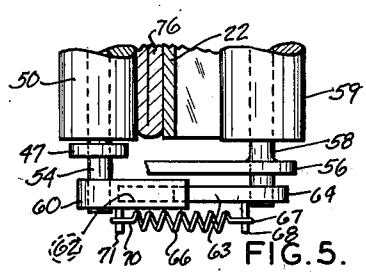


FIG. 5.

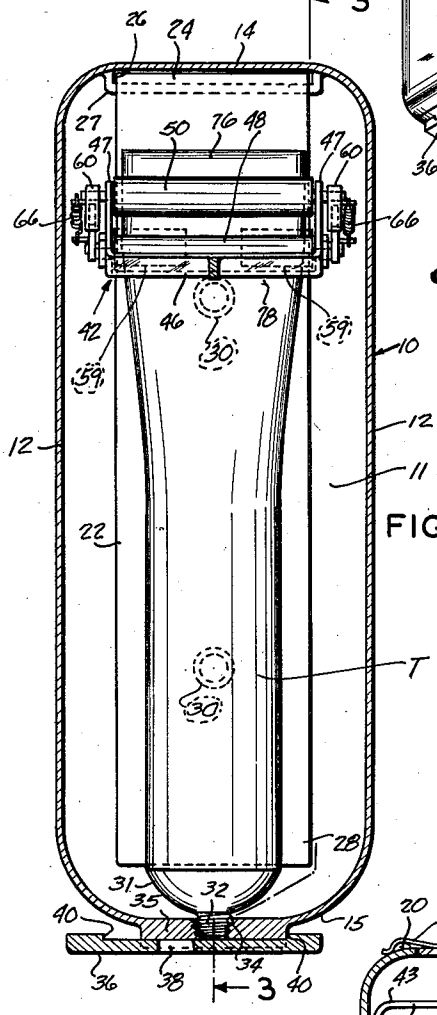


FIG. 2.

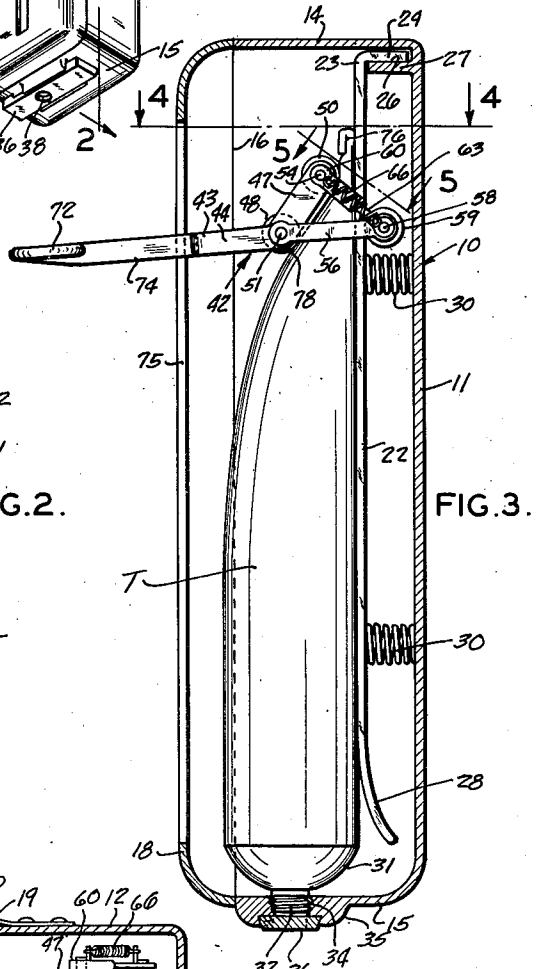


FIG. 3.

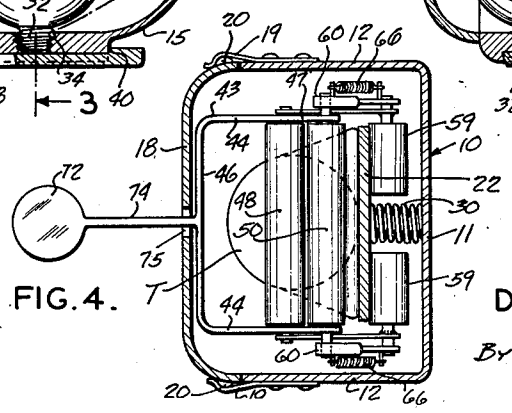


FIG. 4.

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Patented Nov. 14, 1950

2,530,327

UNITED STATES PATENT OFFICE

2,530,327

ROLL TYPE COLLAPSIBLE TUBE SQUEEZER

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Application November 18, 1946, Serial No. 710,529

3 Claims. (Cl. 222—102)

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This invention relates to improvements in tube holders for collapsible tubes of the character generally employed for containing readily dispensable material such as tooth paste, shaving cream and the like, and to novel and effective means embodied in the holder, for collapsing the tube to dispense the contents thereof.

An important object of the present invention is to provide a tube-holding container of an improved character to accommodate a collapsible tube of any of the several sizes and lengths prevailing in the marketing of tooth paste, shaving cream and the like, and which provides means for locating the dispensing neck of the tube in registry with a tube-content discharge opening in the container, and a selectively operable closure for the discharge opening therein.

Another important object of the invention is to provide a collapsible tube container of the character indicated, wherein is embodied novel and effective means for collapsing the tube to eject as much or as little of the contents thereof as may be desired at any one time, the collapsing means being manually operated and of a character to afford a progressively complete collapse of the tube, whereby to assure the dispensing ultimately, of substantially the entire tube content.

A further object is to provide a collapsible tube container and dispensing device of the character indicated, which may be operatively supported on a wall or other support convenient to the use of the device, or which may be readily held in the hand of an operator and manually actuated while so held.

Other objects and advantages of the present invention will appear readily from the following description of a presently preferred embodiment thereof, as such is illustrated by the accompanying drawing, wherein:

Fig. 1 is a perspective elevational view greatly reduced in size, of a dispensing container forming the subject of this invention;

Fig. 2 is a transverse sectional elevation of the device, as taken longitudinally thereof along the line 2—2 in Fig. 1;

Fig. 3 is a longitudinal section in side elevation, as taken along line 3—3 in Fig. 2;

Fig. 4 is a transverse or cross sectional view of the device, as appears from the line 4—4 in Fig. 3, and

Fig. 5 is an enlarged, fragmentary detail view of the tube collapsing means, as such appears from the line 5—5 in Fig. 3.

With reference now to the drawing, the device in its presently preferred embodiment, includes a generally rectangular, box-like housing or casing 10 providing a base or bottom wall 11, opposite side walls 12 and end walls 14 and 15. The casing is open at the side 16 opposed to the bottom wall 11, and this open side is normally closed by a cover or closure member 18. As appears

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from Figs. 1 and 4, closure 18 is releasably retained on the casing preferably by a pair of spring-fingers 19, one secured on each casing side wall 12 and each projecting for snap-engagement over a boss or ear 20 outstanding on the side margin of the closure.

Within casing 10 in overlying adjacence to the bottom wall 11, is a plate member 22 which is supported at its end 23 near the casing end 14, for limited swinging movement toward or from the casing wall 11. Pivotal support of the plate as herein shown, preferably is afforded by a lateral projection 24 at the plate end 23, relatively loosely received in a slot or pocket 26 interiorly of the casing at the juncture of the casing bottom and end walls 11 and 14 respectively, the pocket being formed by a flange 27 integral with the casing. As here preferred, the plate projection 24 is provided by turning the plate end portion 23 so that it extends laterally of the plate in a direction substantially normal to the plane of the plate. The opposite plate end 28 which terminates inwardly from the casing end wall 15 approximately to the extent appearing in Figs. 2 and 3, is rounded or curved inwardly toward casing wall 11, as shown by Fig. 3.

Interposed between the plate 22 and casing wall 11 are a number of coil compression springs 30, there being two such springs shown in the present example, one located a suitable distance inwardly from each end of plate 22 and positioned such that the axis of the spring substantially intersects the longitudinal axis of the plate. The springs preferably are secured to the plate and casing wall in any suitable, well known manner not here thought necessary of illustration, so that they thus serve to hold the plate 22 in its assembly position in the casing. If desired, the manner of spring attachment to either or both the plate and casing wall, may be of a readily detachable character, whereby to permit removal of plate 22 for access to the springs. In assembly, the springs 30 being compression springs, impose a yieldable bias on the plate 22 tending to position the latter pivotally about its end 23, away from the casing wall 11.

The plate 22 as thus arranged in the casing 10, provides an inwardly yieldable support or backing for a collapsible tube T containing tooth paste, shaving cream or other substance to be dispensed therefrom, the tube T being inserted in the casing through the open side 16 upon removal of casing closure 18. Upon insertion, the tube T is arranged lengthwise against plate 22, with the tube neck end 31 adjacent the casing end wall 15 (Fig. 3). The tube then is turned about its longitudinal axis such as to engage the externally threaded neck 32 thereof in a threaded opening 34 provided through an enlarged or thickened wall portion 35 of the casing end wall

15. The wall opening 34 constitutes the discharge mouth of the device, and it is selectively opened and closed by a manually positionable member 36 which in the present example, is of slide-valve character, providing a port 38 for registry with the wall opening 34. Member 36 is slidably received in dove-tailed manner, in a groove or recess extending lengthwise of the casing end wall 15 in the outer surface of the wall portion 35, the member being retained in endwise assembly therein and limited as to its sliding movement, by opposite shoulders 40 formed in the member. Thus as will appear from Fig. 2, the valve member positioned as shown, effectively closes the discharge opening 34, while upon slide displacement thereof to the right as viewed in the figure, the port 38 may be brought into registry with opening 34 to open the latter for the discharge of substance from tube T.

It is to be noted that the threaded opening 34 through wall portion 35, is of tapered character converging toward the outer end of the opening. The degree of taper and the axial length of opening 34 are predetermined so as to be fully adequate for receiving at least in partly-threaded connection therein, any of the several different diameter threaded necks found on collapsible tubes of the sizes prevailing particularly in the retail marketing of tooth paste, shaving cream and the like.

Arranged in casing 10 in cooperative relation with the tube backing plate 22 and operatively guided thereby, is a compressing device indicated generally at 42, for collapsing tube T to discharge its content. Device 42 in its presently preferred construction, comprises a generally U-shaped operating member 43 providing opposite parallel legs 44 spaced apart by the bridge portion 46, to an extent preferably only slightly exceeding the width of the plate 22 (Fig. 4). The end portion 47 of each leg 44 is extended laterally and forwardly from the leg substantially as shown, wherein for example, the angle between the leg and its extension may be approximately 135 degrees. Spanning the legs therebetween, are a pair of cylindrical roller elements 48 and 50, the roller 48 being between the legs at the juncture of the lateral extensions 47 therewith, and suitably rotatably carried by the legs through roller axle projections 51 seated through bearing openings in the legs. Roller 50 is between the outer ends of the leg extensions 47, and is similarly rotatably supported by roller axle projections 54 seated through bearing openings in the leg extensions. At each side of the member 43 is a link element 56 which has one end pivotally retained on the axle projection 51 of roller 48, and supports at its opposite end an axle or shaft element 58 on which is a short roller 59 which rollingly engages the under side of plate 22 along the longitudinal side margin thereof (Fig. 4). The extent of the rollers 59 inwardly of plate 22, is such as to afford adequate clearance of the rollers with respect to the springs 30, as the compressing device is moved along the plate.

The link and short roller at each side of the compressing device, are yieldably connected to the roller 50 through the axles 54 of the latter, by means including telescoped members comprising a cylinder-like member 60 having one end pivotally secured on roller axle 54 and providing an axial bore 62 therein receiving a rod or piston 63, the latter at its end 64 being suitably pivotally retained on the axle 58 of roller 59 (Fig. 5). A tension spring 66 is secured at one end 67 to a pin 68 outstanding on rod 63, and at its opposite end 70 to a like pin 71 outstanding on member 60, the spring thus holding the cylinder and piston elements in telescoped assembly and tending at all times, to draw them together such as to dispose the piston 63 to substantially its full extent in the bore 62 of cylinder element 60. The telescoped members 60 and 63 greatly enhance the structural stability of the compressor device, these cooperating with the links 56 and guide rollers 59 in contact with plate 22, to prevent turning or twisting of the device relative to the tube T and the plate 22.

The compressing device 42 is manually operable in a manner presently to be described, by a handle or finger piece 72 located externally of the casing closure 18, on an arm 74 extending inwardly of the casing through a slot 75 longitudinally in closure 18, to connection with the bridge 46 of member 43.

Turning now to the operation of the device, upon releasing the casing closure 18 from the snap-fingers 19 and displacing the same preferably longitudinally and rearwardly of casing 10 as permitted by the slot 75 through which the handle arm 74 projects, whereby to expose the open side 16 of the casing, the tube T is entered in the casing against the backing plate 22. The tube T is urged inwardly, the backing plate yielding toward casing wall 11 to an extent depending upon the size of the tube, until the tube neck 32 is aligned with casing opening 34, when the tube may be moved forwardly and turned to screw-seat the tube neck 32 in the threaded opening 34. In so doing, the somewhat flattened tail end 76 of the tube T is brought into flat seating on the plate 22, whereupon the compressor device initially disposed near the plate end 23, is displaced forwardly until the roller 50 rides up and over the tail end of the tube T. Thus in the initial condition of the device as indicated in Figs. 2 and 3, which holds the tube against plate 22, the roller 50 bears against the tube tail end 76 under a pressure determined by the near-maximum extension of the springs 66 obtained in the relative positions of the compressor parts as shown. In this position, the roller 48 bears upon the inclined portion 78 of the tube adjacent the tail end 76 thereof, while the compressing device as a unit, is held in such position by the spring and link connections with the rollers 59 engaging the underside of plate 22. Now when it is desired to dispense some of the tube content, the slide-valve 36 is manually shifted to bring the port 38 in registry with the casing discharge mouth 34. Following this, the compressing device is manually actuated through the finger piece 72, to rock the U-shaped member 43 forwardly of the tube T, as in the direction of the casing end wall 15. At the same time, the compressing device as a unit is urged forwardly on the tube T, the rollers 59 guiding the device along the plate 22. The combined effect of rocking and forward displacement of the compressor, is such as to cause a partial collapse of the tube portion 78 by the roller 48 and a substantially complete collapse or flattening of the tube body immediately adjacent the tube tail end 76. As this occurs, the tube content is displaced therein to eject a portion of the content outwardly from the tube neck through the casing discharge mouth 34 and valve port 38. It is to be observed that by backward rocking of the member 43, the roller 50 may be brought to bear with considerable force upon the portion of the tube rearwardly of the roller 48, to complete the

collapse of such tube portion and in doing so, to cause displacement of any remaining portion of the tube content therein toward the body of substance in the as yet uncollapsed part of the tube T. Accordingly from the foregoing, it will be now appreciated that by rocking the compressing device both forwardly and rearwardly, while urging the same as a unit, forwardly over the tube T along the plate **22**, the tube may be readily and easily completely collapsed progressively from the tail end **76** to the neck end **31** thereof, thus assuring an ultimate complete discharge of all but a very small or insignificant part of its content. This result may be further assured by manually urging the member **42** inwardly of the case (through the finger piece **72**) as the device is operated, to press the roller **48** against the collapsible tube.

The curved end **28** of the plate **22** in approaching the wall **11** effectively prevents separation of the rollers **59** from the plate, the rollers riding thereover into abutment with the wall **11** and hence stopped from rolling off the plate end. Moreover, the curved plate end **28** serves a further function, in that when the compressing device attains this end of the plate in the progressive collapsing of the tube, the roller **48** in particular is lowered and brought to bear on the uncollapsed part of the tube in the zone of the tube end **31**. Rocking of the compressing device then will effect through roller **48** as assisted by roller **50**, a final collapse at least in major part, of the tube end **31**, thereby squeezing out the little remaining content of the tube.

The tube container and collapsing device as now described, may be readily mounted in operative position on a wall or other support, as through mounting means (not shown) engaged with the casing wall **11** or the sides or end walls thereof. If preferred, as when it is desired to transport the device from place to place for use on the spot, it may be held in the hand of an operator and actuated to dispense the tube content in the quantity needed.

Having now fully described the invention in respect to a single, presently preferred embodiment thereof, it is to be understood that alterations or modifications may be made in the parts and operative relationship thereof without departing from the spirit and full intended scope of the invention as hereinafter claimed.

I claim:

1. In a device of the character indicated, a holder for a collapsible tube having a discharge opening, a tube support carried by the holder for receiving the tube thereon, and means movable along said support and cooperating therewith for collapsing the tube to eject its contents through the tube discharge opening, said means comprising an operating member, a guide therefor including roller means engaging said support, relatively spaced pressing rollers carried by said member and each engageable with the tube, a pair of elements one telescoped in the other, connecting said guide and one of said pressing rollers, and a spring connected to said telescoped elements, effective therethrough for yieldably urging said one of the pressing rollers into firm pressing contact with the tube.

2. In a device of the character indicated, a casing for receiving a collapsible tube having a discharge neck, the casing providing an opening through a wall thereof, adapted for receiving the discharge neck of the tube, a support for receiving the tube thereon, said support being swingably mounted in the casing and serving to hold the tube in position with the tube discharge neck in said casing opening, and a tube compressor carried by and movable along said support, adapted for collapsing the tube progressively along the tube length, to eject the tube content through the tube discharge neck and outwardly of the casing through said casing opening, said compressor comprising an operating member having means extending externally of the casing for manual actuation thereof, guide rollers engaging said support, link elements pivotally connecting the guide rollers to said operating member, a pair of tube press rollers carried by the operating member for engagement with the tube, and a yieldable connection including telescoped members, between each of said guide rollers and one of said press rollers, operable to urge the latter into firm pressing contact with the tube.

3. In a device of the character indicated, a casing for receiving a collapsible tube having a discharge neck, said casing providing bottom, side and end walls, a removable closure for said casing, the casing further providing an opening through one end wall thereof, adapted for receiving the discharge neck of the tube, a plate affording a tube support, swingably mounted in the casing inwardly adjacent the casing bottom wall, means yieldably urging said plate away from the casing bottom wall, said plate serving to hold the tube in position with the tube discharge neck in said casing opening, a tube compressor carried by and movable along said plate, adapted for collapsing the tube progressively along the tube length, to eject the tube contents through the tube discharge neck and outwardly of the casing through said casing opening, said compressor comprising an operating member having relatively spaced, substantially parallel legs each terminating in a leg extension at an angle thereto, a tube press roller carried by the member between said legs and engageable with the tube, a second tube press roller carried by said leg extensions therebetween and engageable with the tube, a pair of guide rollers engaging said plate, a link pivotally connecting each guide roller to one of said legs, telescoped elements connecting said guide rollers and said second tube press roller, spring means connected between said telescoped elements and tending to draw them into substantially full telescoped relation, thereby serving to urge said second tube press roller into firm pressing contact with the tube, said casing closure having an elongate slot therein, and means connected to said operating member and extending outwardly of the casing through said closure slot, for manual actuation of the compressor.

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