May 30, 1933. R. G. THOMPSON 1,912,022

DISPENSING CLOSURE FOR COLLAPSIBLE CONTAINERS

Filed Jan. 15, 1932

Fig. 1.

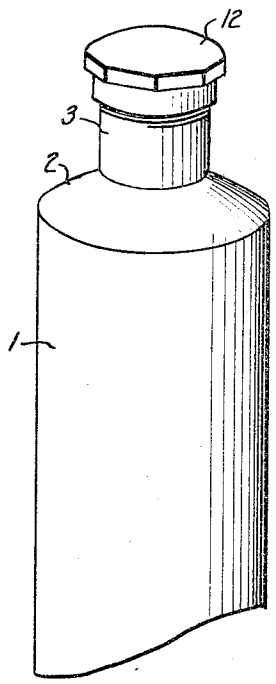

Fig. 2.

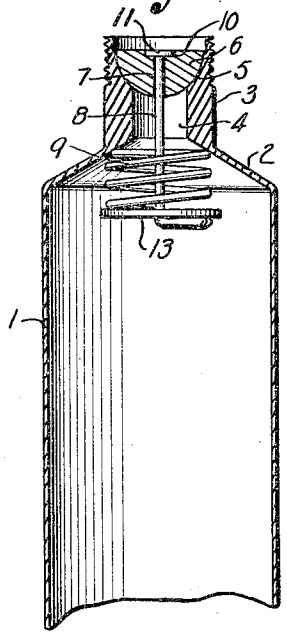

Fig. 3.

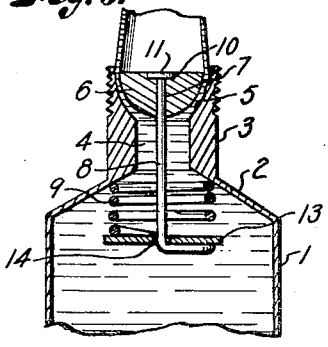

Fig. 4.

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BY
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UNITED STATES PATENT OFFICE

ROY G. THOMPSON, OF KANSAS CITY, MISSOURI, ASSIGNOR OF TWENTY-FIVE ONE-HUNDREDTHS TO SAMUEL EISBERG, TWENTY-FIVE ONE-HUNDREDTHS TO LAWRENCE E. THOMPSON, NINETEEN ONE-HUNDREDTHS TO JACK RIEGER, AND FIVE ONE-HUNDREDTHS TO BUTLER DISMAN, ALL OF KANSAS CITY, MISSOURI

DISPENSING CLOSURE FOR COLLAPSIBLE CONTAINERS

Application filed January 15, 1932. Serial No. 586,835.

My invention relates to a dispensing closure for collapsible tubes and has for its principal object to provide a device of that character whereby viscous content of a tube may be served in limited quantity in response to pressure in the tube and the tube closed automatically to preserve the remaining contents upon release of the extruding pressure.

In accomplishing this object, I have provided the improved details of structure hereafter described and illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of the upper part of a collapsible tube, showing the tube with sealing cap attached and ready for distribution.

Fig. 2 is a central longitudinal section of a part of the tube shown in Fig. 1 with the sealing cap removed.

Fig. 3 is a central longitudinal section of a part of the tube, with its sealing cap removed, illustrating extrusion of the contents from the tube.

Fig. 4 is a perspective view illustrating the tube and its manner of use, the neck of the tube being broken away and the valve shown in open position.

Referring more in detail to the drawing:

1 designates a collapsible tube of the type commonly employed as a service container for tooth paste, shaving cream, paint, or other viscous materials having a frusto-conical dispensing end 2 provided with a neck 3 preferably formed integrally with the body of the container, the throat channel 4 of the neck being of restricted diameter to provide a thick wall in which an outwardly facing valve seat 5 may be formed. The valve seat 5 is preferably inset from the outer end of the neck and concaved to seat a semi-spherical valve 6 with the outer flat face of the valve inset from the end of the neck for a purpose presently described and provided with a central channel 7 for receiving the shank 8 of an expansion spring 9 and provided with a recess 10 in its outer face for seating a retaining head 11 on the end of the spring shank. The coil of the spring 9 is of a diameter to seat against the inner end of the neck 3 and the shank 8 of a length to retain the valve yieldingly to its seat under such tension that it may be unsealed in response to pressure on the body of the tube in accordance with common practice for extruding contents of tubes of this character.

12 designates a sealing cap of ordinary construction having threaded mounting on the neck for retaining contents of the tube until it reaches the consumer and which may be discarded after initial use of the tube or replaced after each servicing operation, at the choice of the consumer. It is advantageous, however, to retain the sealing cap for better preservation of the contents of the tube and particularly for avoiding accidental extrusion of the contents when the tube is liable to accidental pressure, as when it is employed for shaving cream, tooth paste, or the like and carried in a traveling kit.

Some types of plates may harden and tend to cement the valve 6 to its seat so that when pressure is applied to expel the material the pressure acting against the valve may be insufficient to lift it from its seat. In order to overcome this difficulty the lower end of the spring is provided with a disk 13 having a central aperture 14 through which the shank 8 is extended to hold the disk in contact against the end of the spring. The disk thus acts as a piston having an area greater than the valve whereby additional pressure is added to unseat the valve when the tube is compressed.

In assembling the improved closure with the body of the tube, the spring is inserted through the sealing end of the tube and connected with the valved member. The tube is then filled in the usual way and the sealing end closed in accordance with common practice. When the tube is used, pressure on the collapsible wall of the body portion extrudes the viscous content of the tube through the restricted throat of the neck unseating the valve against the tension of the spring to provide an annular channel about the valve through which the contents may pass in substantially cylindrical form as indicated in Fig. 3 of the drawing, the spring being of sufficient tension to yield under the extruding pressure to permit a servicing discharge,

but to reseat the valve and reseal the tube when the pressure is released.

Thus a tube of the character described is automatically closed after each servicing operation to retain the contents in proper condition and the necessity for replacement of the sealing cap obviated, although the usual cap may be employed as an additional safeguard to prevent accidental opening of the valve if desired.

What I claim and desire to secure by Letters Patent is:

1. In combination with a container having a neck provided with an outwardly facing valve seat, a valve plug for engaging said seat, and a spring having a shank extended through the container neck with its outer end attached to said valve plug and having a coil at its inner end located within the body of the container and engaging the inner end of the neck to yieldingly retain said valve plug in its seat.

2. In combination with a container having a neck provided with an outwardly facing valve seat, a valve plug for engaging said seat, a spring having a shank extended through the container neck with its outer end attached to said valve plug and having a coil at its inner end located within the body of the container and engaging the inner end of the neck to yieldingly retain said valve plug in its seat, and a piston member on the inner end of the spring for effecting opening of the valve in response to outward thrust of contents of the container against the piston member.

3. In combination with a container having a neck provided with an outwardly facing valve seat, a valve plug for engaging said seat, a spring having a shank extended through the container neck with its outer end attached to said valve plug and having a coil at its inner end located within the body of the container and engaging the inner end of the neck to yieldingly retain said valve plug in its seat, and a disk on the inner end of the shank engageable with the coil to serve as a piston for effecting opening of the valve in response to outward thrust of contents of the container against the disk.

In testimony whereof I affix my signature.

ROY G. THOMPSON.