

July 21, 1931.

S. O. LAWRENCE

1,815,319

SEALING DEVICE FOR SOFT METAL TUBES

Filed April 18, 1928

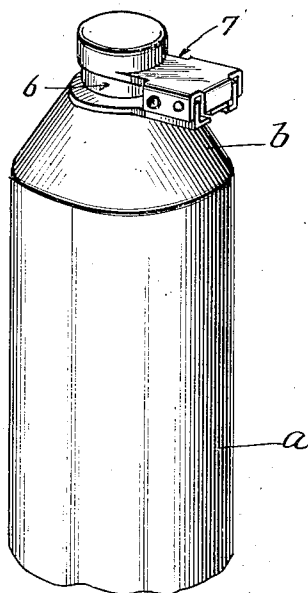


Fig. 1

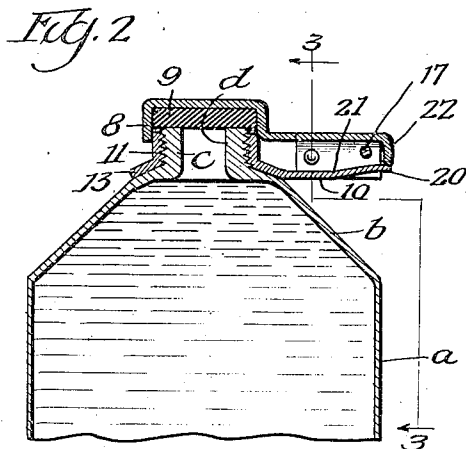


Fig. 2

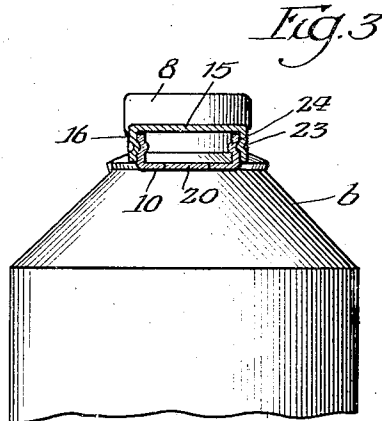


Fig. 3

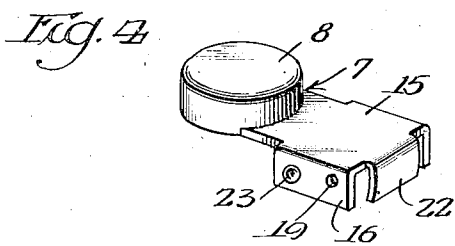


Fig. 4

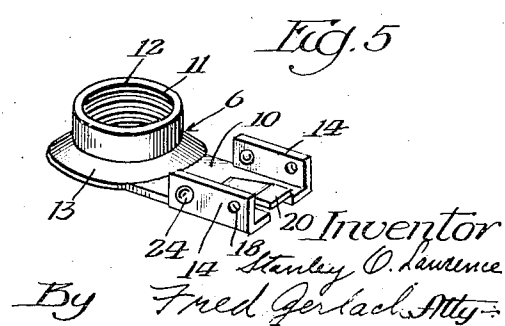


Fig. 5

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SEALING DEVICE FOR SOFT METAL TUBES

Application filed April 18, 1928. Serial No. 270,813.

The invention relates to closures or sealing devices for soft metal tubes, such, for example, as those that contain tooth paste, shaving cream or similar paste-like material.

5 In the use of tubes of this character it frequently occurs that the regular cap which is screw-threaded to the outlet nipple, is inadvertently misplaced or is not used because of the inconvenience and difficulty encountered in the cap-removing and applying operations. This results in the material adjacent the threaded outlet nipple, being exposed to the surrounding air and consequently it hardens or solidifies and prevents the
10 tube from being squeezed in the usual manner to extrude the material.

The primary object of the present invention is to provide a device for sealing or closing tubes which is adapted to be substituted for the regular threaded cap either before or
20 after purchase of the tube and is so readily manipulated into its operative and inoperative positions that the user is not likely to leave the outlet nipple open and permit the material to harden. In general, the device or sealing unit comprises an element which is adapted to be permanently secured to the threaded nipple of the tube and a cap or
25 cover bearing element which is spring-pressed and is hinged to the fixed or anchor-element.

Another object of the invention is to provide a sealing device of the aforementioned character which is formed wholly from sheet metal and is so constructed that it may be
35 manufactured at a comparatively low cost.

Other objects of the invention and the various advantages and characteristics of the present construction will be apparent from a consideration of the following detailed description.

45 The invention consists in the several novel features hereinafter set forth and more particularly defined by the claim at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like characters of reference denote like and corresponding parts throughout the several views:

Figure 1 is a perspective view of a tube provided with a sealing device embodying the invention, the cap-bearing element of the device being shown in its closed or operative position;

Figure 2 is a longitudinal section, made on a slightly larger scale;

Figure 3 is a section taken on the line 3—3 of Figure 2;

Figure 4 is a perspective of the cap-bearing element; and

Figure 5 is a perspective of the anchor-element, that is, the element that is adapted to be substituted for the regular cap and be permanently secured in place.

The invention is exemplified in a device for sealing a paste containing tube, such, for example, as the one illustrated in the drawing which comprises a tubular body member *a*. The latter is closed at its discharge end by means of a tapered or conical wall member *b* having an outlet nipple *c*. The body member is formed of soft pliable metal so that when it is squeezed or pressed together the material therein which may be tooth-paste, salve, shaving cream or any other material of like character, will be extruded through the discharge duct *d* in the usual manner. The nipple *c* is ordinarily sealed by a knurled cap (not shown) which is internally threaded, as well understood in the art, and is connected to an external screw-thread on the nipple.

The sealing device which forms the subject matter of the present invention is adapted to be substituted for the regular tube-cap and operates to facilitate sealing and unsealing of the tube. This device consists of an element 6 which is more or less an anchor member, and an element 7 which is pivotally connected to the so-called anchor-element and includes a cylindrical cap 8. The latter is adapted to fit over the outer end of the nipple *c* and has secured to the inner part thereof a disk 9 of cork or rubber to form a seal for the contents of the tube. Both elements are made from sheet-metal strips and are preferably stamped or punched into their proper shape. The anchor element 6 comprises a substantially flat tongue 10 and an attaching

member whereby the sealing device may be connected to the nipple. This attaching member consists of a ring 11 which has an internal screw thread 12 and an outwardly flared skirt 13. The latter is connected to the lower end of the ring and is shaped to conform to the upper end of the wall *b*. The ring 11 is connectible to the nipple *c* by means of the interengaging screw-threads and is adapted to be rotated to jam the skirt 13 into locking engagement with the adjacent or contiguous part of the tube in order to prevent undesired removal of the device from its operative position. The tongue 10 is connected to the marginal part of the skirt and projects laterally therefrom so that it is positioned outwardly of the ring 11. The outer or distal end of the tongue is shaped to form a pair of pivot ears 14. These ears project upwardly from the side edges of the tongue which are substantially parallel.

The cap bearing element 7 comprises a flat tongue 15 which overlies the tongue 10 and is connected to the lower end of the cap 8. The sides of this tongue 15 are provided with downwardly extending pivot ears 16 which lap the ears 14 and are connected thereto by a pivot pin 17 so that the element 7 may be swung to and from the nipple *c* to bring the cap 8 into and out of its operative or sealing position. This pin is arranged at the extreme outer end of the two elements and substantially in the plane of the outer end of the nipple so that the cap may be swung with ease and will seat properly. The pin 17 extends through holes 18 and 19 which are formed in the ears 14 and 16 respectively. When the tube is to be used, the element 7 will be swung upwardly. In this position the cap 8 will be entirely free from the nipple *c* and the tube may be squeezed to extrude or force the material through the outlet duct *d*. When it is desired to seal the tube after use the element will be swung downwardly until the cap is seated on the outer end of the nipple. In this position the disk 9 forms a seal which prevents the material from being exposed to the surrounding air. To maintain the cap in its closed position under sufficient pressure to effect a hermetical seal between the disk and nipple, a spring strip 20 is provided. This strip is sheared from the central portion of the tongue 10 and the outer end thereof is bent upwardly as at 21, so as to be in a position to cooperate with a depending lug 22 which is formed by bending downwardly the outer end of the tongue 15. This lug is disposed outwardly of the pivot-pin and extends between the two ears 16. When the cap bearing element 7 is in its operative position the lower end of this lug engages the rear end of the spring strip. In this manner the force of the spring strip is applied to press the cap 8 into sealing relation with the nipple

of the tube. When the element 7 is swung upwardly into its inoperative position, the lug 22 is shifted so that the outer face bears against the flat outer end of the strip 20, with the result that the force of said strip is applied to hold the cap-element open. The lug 22 and strip 20 exemplify spring means formed integrally with the elements 6 and 7 respectively for holding the cap 8 in its two positions.

To lock the two elements together so that they will not be accidentally displaced when in the position shown in Figures 1, 2 and 3, the inner ends of the ears 16 are struck inwardly to form studs 23 which are positioned to fit into corresponding sockets 24 formed in the inner ends of the ears 14. These stud and socket connections are readily engaged and disengaged due to the resiliency of the ears and do not lessen in a material way the ease with which the device may be manipulated.

In use, the device is applied to a tube after the regular cap has been removed, by rotating the ring 11 into interlocking engagement with the threaded nipple *c*. As previously pointed out, when it is desired to use the contents of the tube it is only necessary to swing the cap-bearing element 7 upwardly. As soon as the lug 22 passes out of dead center relation with the strip 21, during the initial part of the swinging operation, the strip presses said lug in the direction of rotation and snaps the element into its upright or completely inoperative position. To close the tube the element 7 is snapped back to its normal or operative position.

The sealing device disclosed herein may be manipulated much more readily than the standard type of tube-cap and since it consists essentially of but two sheet metal elements, the manufacturing may be done at a reasonable cost.

It is to be understood that the device may be applied by a purchaser to any tube having a nipple provided with a standard thread or it may be applied by the manufacturer in lieu of the knurled cap. In the latter case it becomes a part of the tube. It is also to be understood that the invention is not to be limited or restricted to the specific details set forth since these may be modified within the scope of the appended claim, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

A sealing device for a container having a discharge nipple, comprising an elongated element formed of sheet metal and provided at one end thereof with an upwardly extending pivot ear and at its other end with means whereby it may be removably secured to the nipple, a second elongated element formed

also of sheet metal and provided at one end with a depending pivot ear adapted to lap the pivot ear of the first mentioned element and at its other end with a cap for closing the open end of the nipple, a pivot pin extending through the ears, and a stud and socket connection between said ears for locking the two elements together when the second element is positioned so that the cap is adjacent the securing means of the first mentioned member and against the nipple.

Signed at Chicago, Illinois, this 14th day of April, 1928.

STANLEY O. LAWRENCE.

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