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VALVULAR CLOSURE AND CAP FOR COLLAPSIBLE TUBES

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FIG. 1

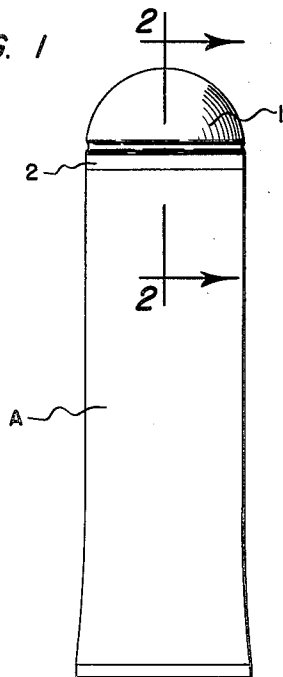


FIG. 2

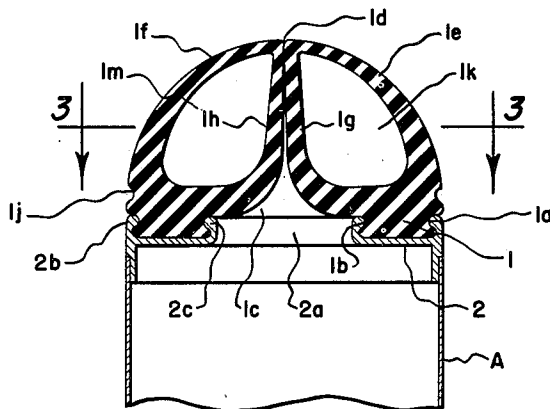


FIG. 3

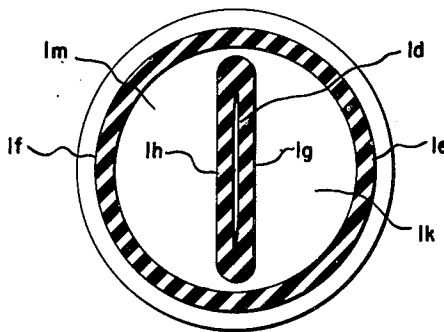
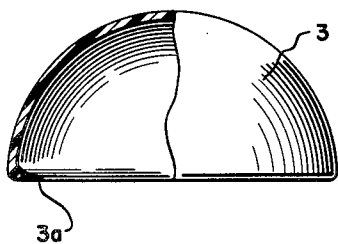


FIG. 4



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VALVULAR CLOSURE AND CAP FOR COLLAPSIBLE TUBES

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4 Claims. (Cl. 222-490)

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My invention relates to an improved dispensing closure and cap for containers of liquid or paste materials which are ejected from the containers under pressure, particularly for use on and the improvement of the disposable collapsible container commonly referred to as a tube, and the objects of my invention are:

First, to provide a cap of this class which will protect the valvular closure and which may be used to cover the outlet opening of the valvular closure preliminary to the disposition of the same in a certain location common to everyday use; and which may be used to re-cap the valvular closure when the container must be packaged in luggage, carried in the pocket, or in similar circumstances where it is desirable to secure the contents against unintentional expulsion;

Second, to provide a cap of this class which is of small cost and disposable when the container is first opened for use, when the contents are to be used under ordinary circumstances;

Third, to provide a valvular closure of this class which is automatically opened by pressure exerted on material within the container, and which automatically closes when such pressure is released, obviating the need of the cap under normal circumstances;

Fourth, to provide a valvular closure of this class, which, when it is used in connection with a tube, simplifies the manipulation required for use of the contents of the tube, requiring only one hand to perform this manipulation, leaving the other hand to hold a brush or apply the contents;

Fifth, to provide a valvular closure of this class which can be washed with hot water and soap, that is therefore more sanitary and more pleasant to use;

Sixth, to provide a closure of this class which may be secured to an ordinary metallic tube or formed as an integral part of a container composed of a suitable synthetic material, thereby imparting to the whole the desirable qualities of the chosen synthetic;

Seventh, to provide a closure of this class which may be used on any container from which the contents are expelled under pressure, and which will act as a sanitary dispensing tip and prevent contamination of the contents; and

Eighth, to provide a valvular closure of this class which is very simple and economical of construction, efficient in operation, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of cer-

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tain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, forming a part of this application, in which:

Fig. 1 is a side elevational view of my valvular closure for collapsible tubes, shown in connection with a conventional collapsible tube; Fig. 2 is an enlarged fragmentary sectional view, taken from the line 2-2 of Fig. 1; Fig. 3 is a plan sectional view, taken from the line 3-3 of Fig. 2; and Fig. 4 is a side elevational view of the cap for my valvular closure for collapsible tubes, showing portions thereof broken away and in section to amplify the illustration.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

The body 1 of my valvular closure for collapsible tubes may be connected to a conventional collapsible tube A by means of the fitting 2, which is provided with an opening 2a extending through the center thereof, and is also provided with a pair of annular opposed beads 2b and 2c, which are crimped into annular recess portions 1a and 1b, externally and internally, respectively, of the body 1 of said valvular closure. The body 1 is provided with an enlarged central opening 1c, which is concentric of the annular groove 1b, and which communicates with the diametrically disposed slit, 1d, shown in Figs. 2 and 3 of the drawings. This diametrically disposed slit 1d, at the outer extremity thereof, is maintained normally in closed position by the resilience of the spheroid sections 1e and 1f of said body 1.

The sections 1e and 1f of the body 1 are externally spheroid and provided with outside wall portions which diverge in thickness from the extremity of the slit 1d toward the base of the body 1, which is secured to the collapsible tube A. At opposite sides of the slit 1d the sections 1e and 1f are provided with wall portions 1g and 1h, respectively, which diverge in thickness from the outer extremity of the slit 1d inwardly toward the base and toward the enlarged opening 1c.

It will be noted that, discounting any elastic pressures, the portion of the slit at the outer extremity 1d is in a collapsed condition.

When the valvular closure is formed the width of the slit 1d will be proportionate to the viscosity of the material that it is intended to dispense through it. When the material is very thin or volatile, the width may be so reduced as to be

imperceptible, the opening *1d* appearing as a constricted perforation as though made with a pin.

It will be noted that the areas *1k* and *1m*, intermediate the outer spheroid walls of the sections *1e* and *1f* and the walls *1g* and *1h*, respectively, are areas of elastic pressure, and are represented as void spaces, and may be filled with a compressible fluid for increasing the compressive force of the sections *1e* and *1f*, tending to force the walls *1g* and *1h* at the outer extremity of the slit *1d* together.

It will be noted that the slit *1d*, as shown in Fig. 2 of the drawings, diverges inwardly to the opening *1c*, and forms a transition with the circular in cross-section opening *1c* near the annular groove *1b*. It is to be here noted, however, that the base connection of the body may be varied, as desired, for adapting the same to various containers or collapsible tubes, and that the void sections *1k* and *1m* may be provided with a compressible solid, if desired.

When pressure on the tube is released, there is no longer any force applied to hold the slit *1d* in distended position, and elastic pressure contained within the areas *1m* and *1k* will be sufficient to then impel the walls *1h* and *1g* toward each other with sufficient force to expel all residual material from enough of the outer extremity of the slit *1d* to allow contact of the walls in that area, thereby assuring a good closure.

The body *1* is provided with a cover *3*, which is provided with an annular bead *3a*, engageable with the annular recess *1j*. Thus, the cover *3* prevents inadvertent dispensation of the contents from the slit *1d* during packaging or transportation.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a valvular closure of the class described, a body member having a substantially spheroid outer surface, provided with a diametrically disposed slit therein, extending from the middle thereof a short distance in opposite directions, substantially less than the radius of said body member, said body member of resilient material, said slit extending therethrough, said body member having a base portion, and a collapsible tube secured to said base portion having its interior communicating with said slit, said body member provided with wall portions on each side of said slit, said body provided with void spaces intermediate said wall portions and the outer spheroid portions thereof said wall portions and said outer spheroid portions composed of resilient material integral with each other and disposed externally of said tube.

2. In a valve and closure of the class described, a body member having a substantially spheroid outer surface, provided with a diametrically dis-

posed slit therein, extending from the middle thereof a short distance in opposite directions, substantially less than the radius of said body member, said body member of resilient material, said slit extending therethrough, said body member having a base portion, and a collapsible tube secured to said base portion having its interior communicating with said slit, said body member provided with wall portions on each side of said slit, said body provided with void spaces intermediate said wall portions and the outer spheroid portions thereof, said wall portions on opposite sides of said slit and the outer spheroid wall portions of said body member diverging in thickness away from said slit at its outer extremity toward said base said wall portions and said outer spheroid portions composed of resilient material integral with each other and disposed externally of said tube.

3. In a valve and closure of the class described, a body member having a substantially spheroid outer surface, provided with a diametrically disposed slit therein, extending from the middle thereof a short distance in opposite directions, substantially less than the radius of said body member, said body member of resilient material, said slit extending therethrough, said body member having a base portion, and a collapsible tube secured to said base portion having its interior communicating with said slit, said body member provided with wall portions on each side of said slit, said body provided with void spaces intermediate said wall portions and the outer spheroid portions thereof externally of said tube, said wall portions on opposite sides of said slit and the outer spheroid wall portions of said body member diverging in thickness away from said slit at its outer extremity toward said base, said body member having an annular groove in its outer surface near said base and a cap of conforming shape to the outer surface of said body member having an annular bead resiliently engageable with said annular groove.

4. In a valve and closure of the class described, a body member having an external spheroid portion and a base portion, a container secured to said base portion, said body having a slit extending from the outer spheroid surface thereof through said body member and communicating with the interior of said container, said body member of resilient material having inner wall portions at opposite sides of said slit tending to intimately engage each other, said body member having outer spheroid inner wall portions spaced from and integral with said walls at opposite sides of said slit, providing voids therein, said voids adapted to be inflated to a pressure greater than atmospheric.

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