Jan. 20, 1942. B. FELDMAR 2,270,794

AUTOMATIC CLOSURE FOR COLLAPSIBLE TUBES

Filed Nov. 21, 1939

Fig 1.

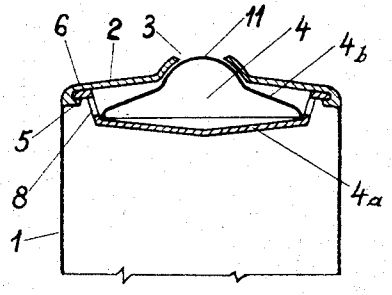


Fig 2.

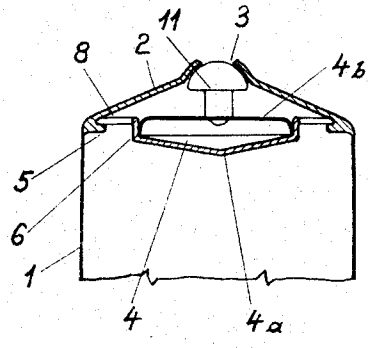


Fig 3.

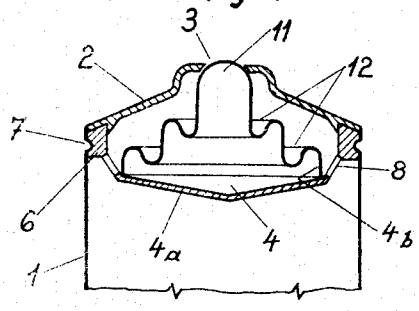
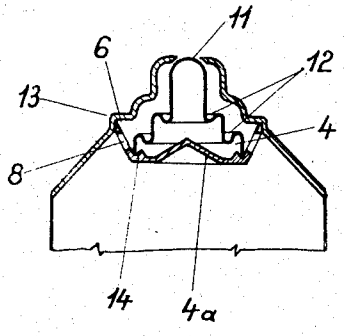


Fig 4.



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AUTOMATIC CLOSURE FOR COLLAPSIBLE TUBES

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3 Claims. (Cl. 221—60)

This invention relates to a dispensing valve control device for collapsible tubes, of the kind which comprises a rigid dish-shaped support provided with apertures in its border and seated upon the inside wall of the tube and behind its discharge head, and which device further comprises a valved disc, disposed within the hollow or cavity of the dish-shaped support and underneath or behind said apertures, and provided with a valve stem which controls the dispensing mouth of the discharge head.

It is an object of this invention to provide a highly simple and efficient control device of this character which makes it possible respectively to open or to close instantaneously the dispensing mouth of the tube when pressure on the tube is exerted or subsequently released.

It is a primary object of this invention to create a simple valve structure without any floating packings, springs, or clamping means, operative between dish-shaped support and valve disc.

It is thus an object of this invention to provide within the cavity of the dish-shaped support the valve disc loosely seated and centered as an elastically resilient means, which under the pressure of the tube contents entering through the apertures into the space between disc and tube head tilts about its annular line of contact with the support, or its bearing edge, and recedes into the circular space between dish-shaped support and disc tapering towards the line of contact between disc and support, or the bearing edge of the disc, and withdraws the valve stem from the dispensing mouth and resumes its original shape and position and closes the dispensing mouth when the pressure upon the tube contents has been released without the necessity of supplemental mechanical means, such as coil springs, or the like.

In the drawing:

Fig. 1 shows a longitudinal sectional view of a collapsible tube head provided with a dispensing valve control device of this invention in which the valve disc is integral with the valve stem both together forming a broad cup with a wide rim.

Fig. 2 shows a similar view of a device in which the valve stem in form of a mushroom is mounted upon the disc of inverted dish-shape.

Figs. 3 and 4 show longitudinal sectional views of two modifications in which the valve disc is formed with annular corrugations.

The body of the tube is designated by 1, the head of the tube by 2, and its dispensing mouth by 3. The automatic dispensing valve control device is arranged within the head of the tube. Its dish-shaped support is designated by 4*a*. The bottom of the support preferably tapers towards its center and thus forms a hollow air space within the support. The support 4*a* is secured to the inside wall of the tube by any conventional or appropriate means, as, for instance, by pressing the rim of the support 4*a* into a flanged recess 5 of the tube head, Figs. 1 or 2, or into a recess 13, Fig. 4, or by pressing the tube wall into a recess 7 of the valve support rim, Fig. 3.

The border of the support is provided with apertures 8 at its edge (Fig. 2), or in proximity thereto, Figs. 1, 3 and 4, through which the tube contents may pass into the head space towards the dispensing mouth 3 of the tube.

Centered within the dish-shaped valve support 4*a* and loosely bearing thereon, is the valve 4 comprising the valve disc 4*b* and the valve stem 11 which controls the dispensing mouth 3. The valve disc is arranged behind or underneath the apertures 8 and forms a wide brim of the valve, the valve stem being mounted upon the valve disc and secured thereto, Fig. 2, or being integral therewith, both together forming a cup with a wide brim, Figs. 1, 3 and 4. Disc 4*b* is of elastically resilient material as thin as possible. From the relatively large width of the elastic brim which width may be increased by annular corrugations 12, as shown in Figs. 3 and 4, a highly effective elastic leverage of the valve results. Sealing between disc 4*b* and support 4*a* may be secured by fitting the disc rim closely into the edge of the dish-shaped support as shown in the drawing.

When pressure is applied to the tube, the pressure of the tube contents which has passed through the apertures 8 into the space between valve disc and tube head will cause the valve disc to tilt about its bearing edge or annular line of contact with its support and to recede within the space formed between dish-shaped support and valve disc and tapering towards said bearing edge or line of contact. The valve stem is thus withdrawn from the dispensing mouth and the tube contents will now be discharged. As soon as the pressure on the tube is released, the valve disc will resume its original shape and will advance the valve stem into its closing position at the dispensing mouth.

What I claim is:

1. A collapsible tube having a discharge head with a dispensing mouth and, interiorly of said tube and in the proximity of said mouth, a dispensing valve control device of the kind which comprises a rigid dish-shaped support with aper-

tures in its border, a seat upon the inside wall of said tube for seating said dish-shaped support, a valve disc disposed within the cavity of said dish-shaped support and underneath said apertures and, mounted upon said valve disc, a valve stem for controlling said dispensing mouth; said valve disc being loosely seated, substantially on an annular line of contact upon said dish-shaped support, both said disc and said support confining between themselves a circular space tapering towards said line of contact, said disc being of resilient material and adapted when the tube and its contents are compressed to tilt by elastic deformation about said line of contact, to recede within said tapering space, and thus to withdraw said stem from contact with said dispensing mouth, and subsequently, when the pressure is released, elastically to resume its original shape.

2. A collapsible tube having a discharge head with a dispensing mouth and, interiorly of said tube and in the proximity of said mouth, a dispensing valve control device of the kind which comprises a rigid dish-shaped support with apertures in its border, a seat upon the inside wall of said tube for seating said dish-shaped support, a valve disc disposed within the cavity of said dish-shaped support and underneath said apertures and, mounted upon said valve disc, a valve stem for controlling said dispensing mouth; said disc forming a wide brim with annular corrugations at the foot of said stem, said valve disc being loosely seated, substantially on an annular line of contact upon said dish-shaped support, both said disc and said support confining between themselves a circular space tapering towards said line of contact, said disc being of resilient material and adapted when the tube and its contents are compressed to tilt by elastic deformation about said line of contact, to recede within said tapering space, and thus to withdraw said stem from contact with said dispensing mouth, and subsequently, when the pressure is released, elastically to resume its original shape.

3. A collapsible tube having a discharge head with a dispensing mouth and, interiorly of said tube and in the proximity of said mouth, a dispensing valve control device of the kind which comprises a rigid dish-shaped support with apertures in its border, a seat upon the inside wall of said tube for seating said dish-shaped support, a valve disc disposed within the cavity of said dish-shaped support and underneath said apertures and, mounted upon said valve disc a valve stem for controlling said dispensing mouth; said disc and said stem being integral with each other and forming a cup with a wide brim, said valve disc being loosely seated by means of its edge upon said dish-shaped support, both said disc and said support confining between themselves a circular space tapering towards said valve disc edge, said disc being of resilient material and adapted when the tube and its contents are compressed to tilt about said valve disc edge, to recede within said tapering space and thus to withdraw said stem from contact with said dispensing mouth, and subsequently, when the pressure is released, elastically to resume its original shape.

BÉLA FELDMAR.