Jan. 2, 1934. P. C. WIEGANDT 1,941,520

SELF SEALING TUBE

Filed April 4, 1932

Fig. 1.

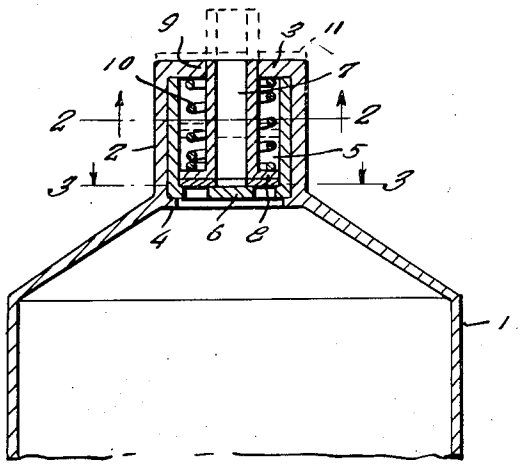


Fig. 2.

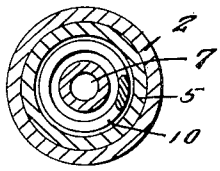


Fig. 3.

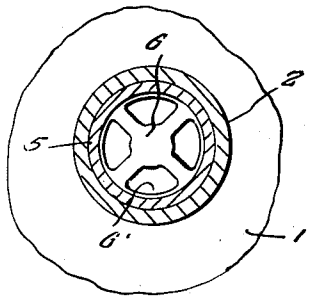


Fig. 4.

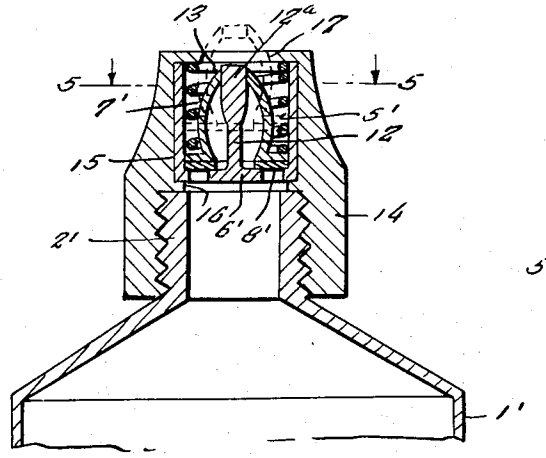


Fig. 5.

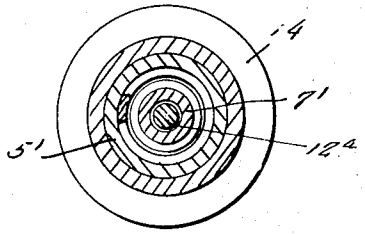
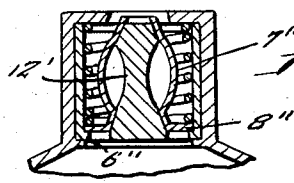


Fig. 6.



Inventor

Paul C. Wiegandt

By Clarence A. O'Brien

Attorney

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UNITED STATES PATENT OFFICE

1,941,520

SELF-SEALING TUBE

Paul C. Wiegandt, Brooklyn, N. Y.

Application April 4, 1932. Serial No. 603,069

5 Claims. (Cl. 221—60)

This invention relates to tubes used for containing paste or cream, as for instance shaving, tooth and other classes of creams, and has more particular reference to flexible tubes now usually provided as containers for such paste or creams.

In accordance with the present invention improved valve or closure means is provided for the tube for normally retaining the tubes in a closed sealed condition against the entrance of air which latter is harmful to the contents of the tube, often resulting in a hardening of the contents or material.

The invention together with its numerous objects and advantages will be best understood from a study of the following description, taken in connection with the accompanying drawing wherein:

Figure 1 is a longitudinal sectional view through the outlet neck of a tube, and illustrating a valve or closure involving the features of the present invention arranged therein.

Figures 2 and 3 are transverse sectional views taken substantially on the lines 2—2 and 3—3 respectively of Figure 1.

Figure 4 is a view similar to Figure 1 and illustrating a slightly modified form of the invention.

Figure 5 is a transverse sectional view taken substantially on the line 5—5 of Figure 4, and

Figure 6 is a view similar to Figure 1 of still another form of the invention.

In the drawing 1 designates generally a flexible tube a portion of which is shown fragmentarily and in section, and 2 designates the outlet neck of the tube.

In the form of the invention shown in Figures 1 to 3 inclusive the neck 2 of the tube has a smooth outer periphery and is provided at its outer end with a wall 3, and adjacent its inner end is provided with an annular flange 4 adapted to be bent into the position suggested in Figure 1 subsequent to the insertion of my improved valve or closure within the neck 2.

In the form of the invention shown in Figures 1 to 3 inclusive my improved valve comprises a cylindrical cage 5 adapted to snugly fit within the neck 2 and is confined therein between the wall 3 and internal flange 4. The upper end of the cage is open, the wall 3 providing a closure for said end. Adjacent its lower end the cage 5 is provided with a valve seat 6 the intermediate portion of which is imperforate and the marginal or peripheral edge portion of which is perforated being provided with a circular series of segmental openings 6*a*. A hollow or tubular valve stem open at its ends is arranged in the cage 5 and at one end is provided with a head 8 adapted to engage the valve seat 6. The upper end of the stem is normally disposed within an opening 9 provided in the wall 3. A coil spring 10 is disposed about the stem 7 and is interposed between the head 8 and wall 3, and acts, as is apparent, to yieldably retain the head 8 against the seat 6.

The outer face of the wall 3 is provided with a coating of tinfoil or other suitable sealing material shown in broken line in Figure 1 and designated by the reference character 11, and the same closes the opening 9 and of necessity, the adjacent end of the stem 7, the portion of the sealing material 11 disposed over the openings 9 providing a puncturable or weakened area for the wall 3.

From the description of the invention thus far, it will be seen that normally the valve stem 7 is alined with the puncturable area of wall 3 formed by the sealing material 11 and the imperforate center portion of the valve seat 6 so that the ends of the stem 7 are closed; and the head 8 being engaged with the seat 6, the openings 6*a* of said seat are closed. Thus the tube is in a thoroughly sealed condition.

To effect an initial discharge of material from the tube 1 it is only necessary to compress the tube 1 in the usual manner and the contents thereof will pass through the openings 6*a* to act on the head 8, moving the same against the action of spring 10 off the valve seat 6 causing the stem 7 to puncture the sealing element 11 and to pass therethrough to the dotted line position shown in Figure 1. Manifestly the contents of the tube passing through the openings 6*a* will be forced to discharge from the tube 1 by passing through the bore of the stem 7.

When pressure is released from tube 1 the head 8 will move under action of spring 10 to its seated position thus closing the openings 6*a* and sealing the tube against the entrance of air, dust, dirt and the like.

The form of the invention shown in Figures 4 and 5 differs from that shown in Figures 1 to 3 inclusive, in that the valve seat 6′ is provided with a post 12 that extends outwardly from the center and imperforate portion thereof into the cage 5′ and at its free end is enlarged as at 12*a*. The valve stem 7′ is of somewhat bulbous shape having its upper end turned inwardly to provide a restricted or contracted opening 13 snugly receiving the enlarged end 12*a* of the post when the head 8′ is engaged with the valve seat 6′. In this form of the invention I have also illustrated the adaptability of the invention to a closure cap

14 provided for the flexible tube 1'; the closure cap 14 in the present instance being adapted for threaded engagement with the neck 2' and being provided outwardly from the threaded end thereof with an internal cylindrical chamber 15 within which is snugly fitted the cage 5', the said cage being retained in the chamber 15 against the crown of the cap and internal flange 16, corresponding to the flange 4 of Figure 1.

The crown of cap 14 is provided with an opening 17 to accommodate the upper end of the valve stem 7' when the valve is moved to the open or unseated position as suggested by broken lines in Figure 4. In this form of the invention the enlarged end 12*a* provides a closure for the upper end of the valve stem 7' so that said end of said stem 7' will be closed whenever the head 8' is engaged with the valve seat 6'.

Manifestly a cap such as the cap 14 and equipped with a valve as shown, can be readily applied to the externally threaded neck with which tubes now commonly used are provided. In the form of the invention shown in Figure 6, post 12' is enlarged at its upper and lower ends and reduced intermediate its ends, said upper and lower ends being substantially conical as shown; the hollow valve stem 7'' at each end is contracted and is conical to receive the corresponding end of the post 12' whereby a sealing of both ends of the stem 7'' is effected each time the head 8'' is engaged with seat 6''.

Even though I have herein shown and described the preferred embodiments of the invention, it is to be understood that I am aware that further changes in the modification may be made therein, and accordingly in no wise intend to restrict the invention beyond the requirements of the prior art and scope of the appended claims.

Having thus described my invention, what I claim as new is:

1. A flexible tube comprising in combination, an outlet neck, and a closure therefor comprising a valve including a cage fitting snugly within said neck and having a valve seat provided with a circular series of holes adjacent the peripheral edge thereof, a hollow stem slidably operating within the cage and having an outer end adapted to be projected outwardly through the outer end of said outlet neck and an inner end provided with a head of slightly less diameter than the cage and adapted to engage with said seat to seal the tube and to be moved off of said seat to cause the contents of the tube entering the cage to discharge through said stem; and elastic means urging said head into engagement with said seat.

2. In combination, a cap having an internal chamber and at one end of the chamber being also provided with an opening concentric to the chamber; a valve seat arranged in the chamber and being imperforate at its center and perforated around its periphery, a tubular stem open at its ends and having one of said ends projectable through said opening, and its other end engageable with the imperforate center portion of said valve seat to close the last named end, and also having adjacent said last named end a head normally engaging the valve seat.

3. A valve comprising in combination a cage, a valve seat mounted therein, a post supported on the seat axially of the cage and having a reduced intermediate portion and enlarged end portions, a hollow open ended stem receiving said post and having its ends contracted to snugly receive the enlarged ends of the post and also having adjacent one of its contracted ends a head having sliding contact with the wall of the cage and adapted to engage said seat; and means within the cage normally retaining the head engaged with said seat and the contracted ends of the stem in yielding contact with the enlarged ends of said post.

4. A closure comprising in combination a cage, an apertured wall closing one end of the cage, a puncturable member closing the aperture in said wall, a valve seat in the cage, a valve member having a sliding fit in the cage and engaging said seat and also having means to puncture the aforesaid member upon movement of the valve away from said seat.

5. In a device of the character described, a valve comprising a cage, a wall closing one end of the cage and provided with an aperture, a puncturable member closing said aperture, a valve seat within the cage and having an imperforate center portion and a perforated peripheral portion; a hollow open ended stem alined within the aperture in said wall and with the imperforate center portion of said valve seat, a head on one end of the stem and engageable with said seat; and a spring about the stem between said wall and head.

PAUL C. WIEGANDT.