

Oct. 17, 1939.

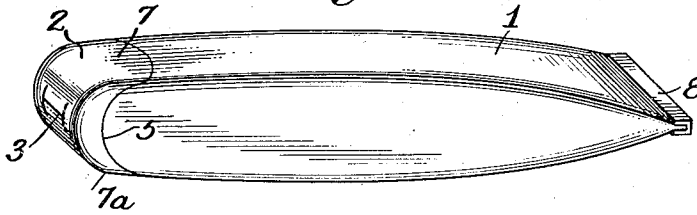
W. F. SMITH

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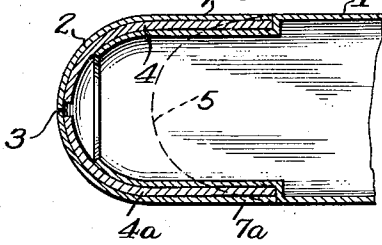
RESILIENT CLOSURE FOR CONTAINERS

Filed March 20, 1937

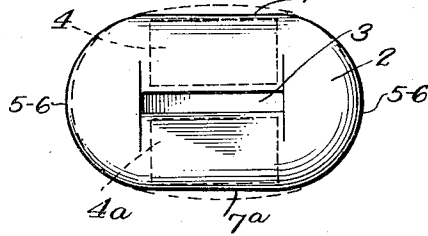
*Fig. 1.*



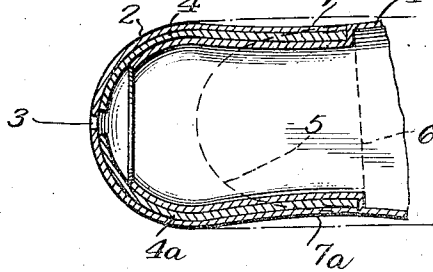
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE

2,176,513

## RESILIENT CLOSURE FOR CONTAINERS

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10 Claims. (Cl. 221-60)

The object of my invention is to provide a resilient closure especially adapted for use in dispensing of tooth paste, shaving cream, glue or other semi-liquid material ordinarily packed in tube containers. It is also adaptable for the dispensing of tooth powders, face powders and similar substances.

More particularly, my object relates to a resilient closure fastened to an ordinary container which will eliminate the following disagreeable conditions prevalent in existing containers, there is no top to lose, no threads to cross and it closes itself immediately after using thus keeping the paste fresh. In the present type of container quick setting paste or glue often "sets" clogging the throat, this necessitates squeezing the tube until the fluid pressure either opens the throat of the tube or the tube breaks, this is eliminated with the resilient closure as the pressure stress exerted by the fingers is transferred directly to the slit when opening and the slit when closed is of such infinitesimal proportions as to be virtually air tight. When applied to a powder container the resilient closure insures increased sanitation and ease of operation with its automatic and quick closing action.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a perspective view of a collapsible metallic tube provided with a preferred embodiment of this invention;

Fig. 2 is a longitudinal central sectional view showing the construction of the resilient closure;

Fig. 3 is a front elevational view showing the slit in the open position; and

Fig. 4 is a longitudinal central sectional view of the resilient closure showing the slit in the open position.

I apply the invention to an ordinary flexible metallic tube 1 adapted to contain tooth paste, shaving cream, or any other article in paste form and designed to discharge it by rolling the tube from the bottom 8 in the conventional manner and by squeezing the resilient closure 2 at points 7 and 7a.

The resilient closure 2 is drawn of thin resilient metal preferable of stainless steel or similar corrosive resisting material with an I shaped slit 3 cut through the metal. On the inside of the resilient metal 2, two pieces of heavier gage metal 4 and 4a are spot welded or fastened in a suitable manner to the resilient metal 2. The function of the pieces 4 and 4a is to force open the slit 3

when pressure is applied at 7 and 7a. Also when the resilient metal 2 springs back when the pressure is released at 7 and 7a the pieces 4 and 4a insure rigidity at the slit and cut off the discharged material cleanly. Also if severe internal fluid pressures accidental or otherwise occur by pressure on the flexible metallic tube 1, the resilient closure 2 closes tighter and the slit 3 reinforced by the pieces 4 and 4a will not allow the contents to discharge.

The curved portion 5 of the resilient closure 2 is so constructed as to allow rolling the flexible metallic tube 1 from the bottom 8 up into the resilient closure 2 to such proximity as to create a minimum of residue loss. The curved portion 5 is omitted and a sidewall 6 is used in the dispensing of tooth powders, face powders, and containers of the flat bottom type which do not roll. All that is required of flat bottom containers to adapt them to the resilient closure is flexibility in the side walls.

Some changes may be made in the construction and arrangement of the various parts of my invention. For example, the flexible metallic tube 1 can be affixed to the exterior of the resilient closure 2 instead of the interior as shown on the drawing, also the resilient closure may be fastened to the paste container or powder container by welding, soldering, bending or a plastic adhesive, without departing from the real spirit and purpose of my invention and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. The combination of a collapsible metallic tube with one end of the tube sealed and a convex-concave resilient metal closure, for the other end, having a longitudinal valve slit in the end of the closure; a transverse slit at each end of the longitudinal valve slit; a curvilinear sidewall extending from each transverse slit to the end of the resilient closure adjacent the collapsible tube; a rigid element, within the closure on each side of the longitudinal slit, affixed to the inside of the closure wall with each of said elements having a width substantially the same as the length of the longitudinal slit and having a length with one end substantially coincidental with the longitudinal slit and the other end substantially coincidental with the end of the resilient closure adjacent the collapsible tube with said rigid elements being adapted to cause the longitudinal valve slit to open upon the application of digital pressure.

2. The combination of a collapsible metallic tube with one end of the tube sealed and a convexo-concave resilient metal closure, for the other end, having a longitudinal valve slit in the end of the closure; a transverse slit at each end of the longitudinal valve slit; a curvilinear sidewall extending from each transverse slit to the end of the resilient closure adjacent the collapsible tube; a fluted portion on each side of the longitudinal slit having a width substantially the same as the length of the longitudinal slit and having a length with one end substantially coincidental with the longitudinal slit and the other end substantially coincidental with the end of the resilient closure adjacent the collapsible tube with said fluted portions being adapted to cause the longitudinal valve slit to open upon the application of digital pressure.

3. The combination of a collapsible tube with one end of the tube sealed and the other end of the tube provided with a convexo-concave closure of resilient material having curvilinear sidewalls; a longitudinal valve slit in the top of the closure abutted by a transverse slit on each end; and a portion, each side of the longitudinal slit adjacent to each of the transverse slits and extending beyond the termination of said slits a distance of the plano-surface, substantially reinforced by a metallic element integrally affixed thereto.

4. The combination of a collapsible tube with one end of the tube sealed and the other end of the tube provided with a convexo-concave closure of resilient material having curvilinear sidewalls; a longitudinal valve slit in the top of the closure abutted by a transverse slit on each end; and a portion, each side of the longitudinal slit adjacent to each of the transverse slits a distance of the plano-surface, substantially reinforced by a plurality of flutes.

5. The combination of a collapsible tube with one end of the tube sealed and the other end of the tube provided with a convexo-concave resilient closure having curvilinear sidewalls; a longitudinal valve slit in the top abutted by a transverse slit on each end; and a portion, each side of the longitudinal slit adjacent to each of the transverse slits and extending beyond the termination of said slits a distance of the plano-surface, substantially reinforced.

6. The combination of a container for powders with one end of the container sealed and a convexo-concave resilient metal closure, for the other end, having a longitudinal valve slit in the end of the closure; a transverse slit at each end of the longitudinal valve slit; a rigid element, within the closure on each side of the longitudinal slit, affixed to the inside of the closure wall with

each of said elements having a width substantially the same as the length of the longitudinal slit and having a length with one end substantially coincidental with the longitudinal slit and the other end substantially coincidental with the end of the resilient closure adjacent the container with said rigid elements being adapted to cause the longitudinal valve slit to open upon the application of digital pressure.

7. The combination of a container for powders with one end of the container sealed and a convexo-concave resilient metal closure, for the other end, having a longitudinal valve slit in the end of the closure; a transverse slit at each end of the longitudinal valve slit; a fluted portion on each side of the longitudinal slit having a width substantially the same as the length of the longitudinal slit and having a length with one end substantially coincidental with the longitudinal slit and the other end substantially coincidental with the end of the resilient closure adjacent the container with said fluted portions being adapted to cause the longitudinal valve slit to open upon the application of digital pressure.

8. The combination of a container for powders with one end of the container sealed and the other end of the container provided with a convexo-concave closure of resilient material; a longitudinal valve slit in the top of the closure abutted by a transverse slit on each end; and a portion, each side of the longitudinal slit adjacent to each of the transverse slits and extending beyond the termination of said slits a distance of the plano-surface, substantially reinforced by a metallic element integrally affixed thereto.

9. The combination of a container for powders with one end of the container sealed and the other end of the container provided with a convexo-concave closure of resilient material; a longitudinal valve slit in the top of the closure abutted by a transverse slit on each end; and a portion each side of the longitudinal slit adjacent to each of the transverse slits a distance of the plano-surface, substantially reinforced by a plurality of flutes.

10. The combination of a container with one end of the container sealed and the other end of the container provided with a convexo-concave resilient closure having a longitudinal valve slit in the top abutted by a transverse slit on each end; and a portion, each side of the longitudinal slit adjacent to each of the transverse slits and extending beyond the termination of said slits a distance of the plano-surface, substantially reinforced.

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