Nov. 8, 1938. H. S. GISH 2,136,007

COLLAPSIBLE TUBE AND METHOD OF MAKING THE SAME

Filed June 2, 1936

Fig. 1.

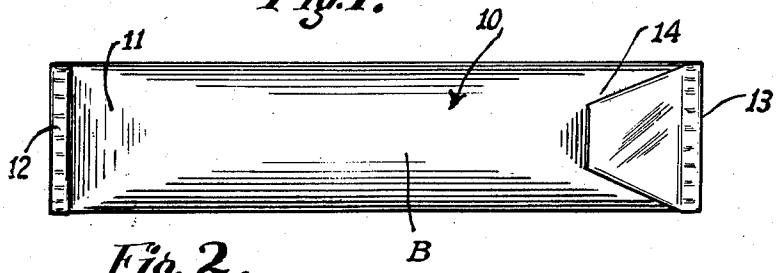


Fig. 2.

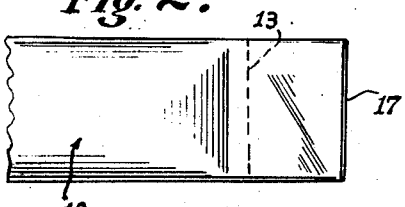


Fig. 3.

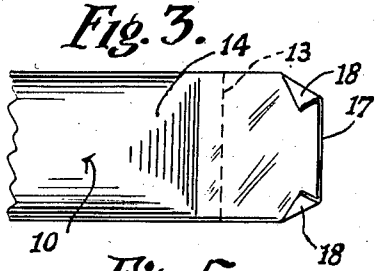


Fig. 4.

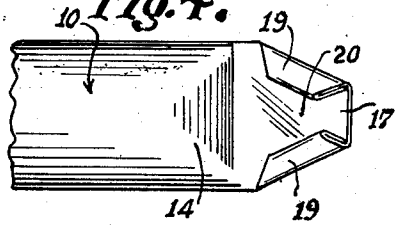


Fig. 5.

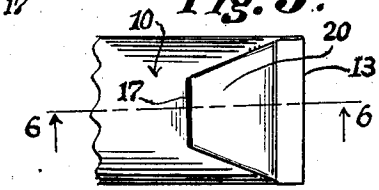


Fig. 6.

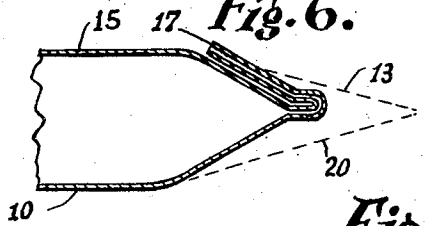
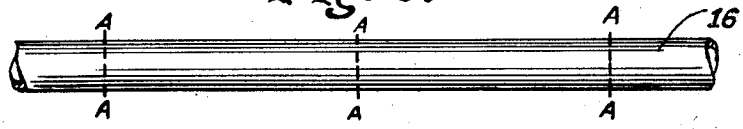


Fig. 7.



INVENTOR.
Harold S. Gish
BY
Fred Bing
ATTORNEY.

Patented Nov. 8, 1938 2,136,007

UNITED STATES PATENT OFFICE

2,136,007

COLLAPSIBLE TUBE AND METHOD OF MAKING THE SAME

Harold S. Gish, Lincoln, Nebr.

Application June 2, 1936, Serial No. 83,090

3 Claims. (Cl. 113—120)

The invention relates generally to collapsible tubes and more particularly to tubes of this character adapted to contain a relatively small quantity of cold cream of the like for individual use.

A more important object of the present invention is to provide a tube of this character and a method of making the same whereby the tube is adapted for economical and rapid manufacture without necessity for expensive machinery.

A further object of the invention is to provide a tube of this character formed entirely from metal of the same thickness, and so constructed as to eliminate heavy shoulders and threaded portions which are expensive to manufacture.

Another object is to provide a tube of this character which is in effect self-opening in use, with the result that the user may simply press the sides of the tube to form the discharge opening.

A further object is to provide a self-opening tube of this character which is so constructed that it may be readily returned to a sealed relationship in the event that the entire contents of the tube is not used in the first opening thereof.

Another object is to provide a tube of this character having a small funnel-like discharge structure at one end thereof.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing, in which:

Fig. 1 is a side elevational view of a collapsible tube constructed in accordance with the present invention, the tube being filled and sealed in the manner in which it is merchandised.

Fig. 2 is a fragmental side elevational view of the tube illustrating the form of one end of the tube in the first step of its manufacture.

Figs. 3, 4 and 5 are similar fragmental views illustrating the tube in successive steps of its manufacture.

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 5.

Fig. 7 is a reduced elevational view illustrating the formation of the individual tubes from an elongated continuous tube of metal which may be formed by extrusion.

While I have shown in the drawing and will herein described in detail the preferred embodiment of my invention, it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, nor to the specific steps in the method herein disclosed, but aim to cover all modifications and alternative constructions and methods falling within the spirit and scope of the invention as expressed in the appended claims.

In the preferred form chosen for disclosure herein, the invention is embodied in a relatively small tube adapted for containing a sufficient quantity of cold cream or the like for a single application or use, a suitable size being approximately three-eighths (⅜) inch in diameter and one and one-half (1½) inches long. In Fig. 1 there is illustrated a tube 10 which throughout the major portion of its length is substantially tubular in form with one end tapering as shown at 11 to a folded and crimped edge 12 which seals this particular end of the tube at right angles to the longitudinal axis of the tube. At its other end the tube 10 is also sealed along an edge or line 13 which is substantially at right angles to the axis of the tube 10, it being noted that the portion 14 of the tube adjacent to the end edge 13 tapers down to the straight line edge 13. This formation is clearly shown in Fig. 6 of the drawing.

The present invention has for one of its most important objects, the provision of a collapsible tube which may be formed with a minimum amount of metal, taking into account in this respect the amount of metal which may be lost in the manufacturing operation. In attaining this object the present invention provides a tube which has its entire wall portion 15 (Fig. 6) of the same thickness, and the tube is sealed at both ends by folding and crimping of the metal. By reason of this novel and advantageous formation of the tube 10 it is possible to form the tubes from an elongated stock member 16 such as that shown in Fig. 7 of the drawing, the member 16 being tubular in form and of such a character that it may be readily formed by a simple process of extrusion.

The tubular stock member 16 shown in Fig. 7 of the drawing is substantially three-eights (⅜) of an inch in diameter and in forming the tubes 10 therefrom the member 16 is severed transversally along the lines A—A which are spaced substantially two inches from each other longitudinally of the tube. This excess length in the blanks thus formed is used to close the two ends of the tube.

In the process of forming the tube 10 from the blanks, it is preferable to seal the end 13 as the initial operation, it being noted that the folded and crimped edge 12 may be formed by a simple process after the filling of the tubes. Thus the edges of the tube at the end 13 are pressed together as shown in Fig. 2 of the draw-

ing, after which the metal between the line 13 and the end edge 17 is folded and crimped to form a funnel-like end portion such as that shown in Fig. 4 of the drawing. In reaching this formation different methods of approach may be employed, but in the present instance I prefer to perform a preliminary fold operation as indicated in Fig. 3 where relatively small corners 18 are folded over toward the center line of the tube. From the form shown in Fig. 3 the portions 18 are again folded as indicated at 19 in Fig. 4 so that the funnel-like end formation 20 (Fig. 4) is attained. The portion 20 is then folded along the line 13 to the formation shown in Figs. 1, 5 and 6.

It will be evident that in some aspects of the invention the funnel-like portion 20 may be formed by means other than folding, as, for example, by forming the tube 10 by the usual stamping process, in which case some of the advantages of the present invention would be sacrificed. It would retain, however, the funnel-like characteristics of the discharge end 20 and would operate in the opening of the tube in substantially the same manner.

In the use of the present device, it is simply necessary for the user to press on the tube 10 in the area B (Fig. 1) so as to force the contents into the folded end portion 20, and by this action the end 20 automatically folds outwardly to substantially the position shown in Fig. 4 and in dotted lines in Fig. 6. In this position a convenient discharge opening is provided and it will be evident that the very formation of the tube is such as to teach even the most unmechanical of persons the proper and satisfactory method of resealing the tube.

From the foregoing description, it will be evident that the present invention provides a novel and improved method of making collapsible tubes, and that it provides a tube which is simple and economical in construction and unusually satisfactory and efficient in use.

I claim as my invention:

1. A collapsible tube of the character described, having a cylindrical wall portion formed from relatively soft metal, said wall portion at one end thereof being folded and crimped to form a relatively permanent seal at said end, said wall portion at the opposite end being folded to form a funnel-like discharge end, and said funnel-like discharge end in its entirety being folded back toward the opposite end of said wall portion along a line transverse of said tube located between the widest portion of said funnel-like discharge end and the other end of the tube whereby to provide a semi-permanent seal for said end.

2. A collapsible tube of the character described, having an elongated tubular wall formed from relatively soft metal permanently closed at one end, said wall at the other end being formed to provide a funnel-like discharge portion, said funnel-like discharge portion being pressed flatly together in its entirety, and the flat discharge end thus produced being folded back toward the other end of said wall to provide a semi-permanent seal for said end.

3. The method of making a collapsible tube which consists in forming a cylindrical wall section of a greater length than the proposed final tube-length, pressing the opposed portions of the wall flatly together at one end for a substantial distance from said end, folding over the corners of the flat portions of said wall at said end to form a flat funnel-like discharge end portion terminating in a reduced diameter discharge orifice, and folding said flat discharge end portion in its entirety back toward the opposite end of the wall to seal said discharge orifice.

HAROLD S. GISH.