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DISPENSING TUBE WITH HEAT TRANSFER MEANS
FOR HEATING THE CONTENTS THEREOF
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The present invention relates generally to a dispensing container, such as a collapsible tube, and is more particularly concerned with an improved tube of such construction that a user may quickly heat the portion of the tube contents that are to be dispensed for use. The invention is especially advantageous for use in connection with such unctuous preparations as skin creams, shaving creams, and the like which possess desirable advantages and properties when heated.

Many unctuous preparations possess superior advantages and are more efficacious when heated, particularly in the case of such preparations which are to be applied to skin, hair or scalp which is to be treated. Such preparations are quite generally supplied in collapsible tube containers to permit their being readily dispensed in portions as they are used.

It has heretofore been suggested that such preparations may be chemically or electrically heated, but such means for accomplishing the purpose are uneconomical and present in the case of electrical heating means, a possibility of injury by electric shock, since it is quite customary to apply such preparations in the bathroom where the metal containers and presence of moisture present a hazard in the case of electrical devices; and in the case of chemical heating means, there is the possibility of chemical injury to the user.

Generally stated, the present invention is particularly useful in connection with shaving creams, as an application of cold water or a cold shaving cream has a tendency to make the whiskers stiff and brittle, and also results in a chilling of the face skin tissues so that the shaving under such conditions is very hard upon the person following such procedure, and is unsatisfactory. In order to overcome somewhat this condition, warm water is applied to the face, but even such precaution is ineffectual when a cold shaving cream is applied, as the skin is soon chilled. For best results, the heat must be retained on the face while shaving, and by applying a shaving cream which has been pre-heated, the shaving operation is facilitated and a feeling of comfort and well being follows.

With the foregoing in mind, it is an object of the herein described invention to provide a novel collapsible tube of unique construction in which heating of that portion of the tube contents at the dispensing end of the tube may be facilitated and augmented in a safe, economical and rapid manner, prior to removal from the tube; and in which the required heat may be supplied from ordinary heated tap water.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations on the scope of the invention defined in the appended claims.

Referring to the drawings, which are for illustrative purposes only:

Fig. 1 is a view in elevation of a collapsible dispensing tube embodying the features of the present invention;

Fig. 2 is a top view of the same, portions being cut away to disclose interior construction thereof, as seen from line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view, taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 2, but disclosing a modified construction;

Fig. 5 is a fragmentary view having a cut-away portion to disclose structural features of another modification; and

Fig. 6 is a sectional view of the same, taken substantially on line 6—6 of Fig. 5.

Referring now to the drawings, there is shown for illustrative purposes a collapsible tube constructed of flexible or deformable material such as any one of the various metals conventionally utilized for such purpose. This tube comprises a hollow body 10 which is closed at its bottom edge 11 in any conventional manner such as by flattening and folding upon itself or by providing the bottom edges with a U-shaped clamping member 12 which holds the edges together and reinforces this end of the tube according to well known practice.

The other end of the hollow body is fabricated to provide a dispensing end by being associated with an end wall 13 of substantially truncate conical formation. As shown in Fig. 3, this end wall is increased in thickness towards its reduced end, where the wall terminates in an upstanding tubular neck portion 14 which is threaded or otherwise arranged to receive a detachable closure cap 15.

The tube construction thus far explained is conventional, and although admirably suited for dispensing unctuous preparations, attempts to heat the tube contents before using by immersion in hot water have proved very unsatisfactory. This has resulted primarily in the case of preparations having a low heat conduction characteristic, and further due to the inability to heat the innermost parts of the tube contents
disposed at the tube center in the flow path to the neck portion of the tube. The length of time which would be required to heat the inner portions of the tube contents, especially in the case of shaving creams, would take so long as to render such method of heating impractical.

In order to quickly heat the inner portions of the tube contents at the dispensing end of the tube, a tubular member 18 is provided at the dispensing end of the tube, which extends through the flow path in the movement of the contents towards the neck portion. The ends of the tubular member communicate with the exterior through openings 11 and 15, respectively, lying in the surface of end wall 17, although it is contemplated that such openings may be placed in the wall portion of the hollow body 18.

As shown in Figs. 1 and 2, the tubular member 18 is of generally triangular cross section with more or less rounded corners, the tubular member being so disposed that a base wall 19 thereof extends generally in a transverse direction of the tube and side walls 22 and 24 converge upwardly towards the entrance to the neck portion 14. With such an arrangement, the tube contents in flowing towards the neck portion are forced to move outwardly in lateral directions by the wall 18, which may be slightly convexed, into side flow paths or channels 22 and 24 cooperatively formed by the respective side walls 20 and 21 and the end wall 17. The contents as they move around the tubular member 18 are thus forced into relatively thin layers so that heat from a heated fluid applied to the outer surface of end wall 17 and the inner surface of the walls of the tubular member 18 will be rapidly and quickly conducted to the adjacent contents so as to raise the temperature and cause heating thereof.

With the construction just described, the tube contents at the dispensing end of the tube may be quickly heated prior to removal from the tube simply by immersing the dispensing end of the tube in a basin of hot water, or by directing a stream of hot water from the usual hot water faucet onto the exterior surface of end wall 17 and through the channel formed by the tubular member 18. Although only two openings 17 and 18 are illustrated, it is contemplated that additional openings might be provided without departing from the present invention.

Referring to Fig. 4, a slightly modified construction is illustrated. In this modification, instead of constructing the tubular member 18 so as to have a uniform area, the tubular member as indicated by the numeral 18' is of tapered construction. In this arrangement one of the openings, namely, the opening 17' is made larger than the other opening 18' in order to restrict the flow of heated fluid therethrough from opening 17' to opening 18', thus augmenting transfer of heat through the wall of tubular member 18' to the adjacent contents within the dispensing end of the tube.

A further modification is disclosed in Figs. 5 and 6. In this arrangement, instead of providing a fluid flow channel through a tubular member as explained in the above arrangements, a rib or bar 24 is positioned within the end wall 13 with its ends integrally formed with the end wall material or connected by suitable bonding therewith. In the arrangement illustrated, the bar 24 is disposed edgewise and extends through the flow path of movement of the tube contents towards the neck portion 14 during the dispensing operation. The bar 24 thus acts as a heat conductor to carry heat to the innermost portions of the tube contents at the dispensing end and when the dispensing end is placed in a stream of hot water, the heat will be conducted by the bar and by the cooperation of end wall 13 to the inner and outer portions of the adjacent tube contents.

Although only one bar is shown in Figs. 5 and 6, it is contemplated that additional bars may be provided without departing from the present invention.

I claim as my invention:

1. A collapsible dispensing container for uncuous preparations, comprising: a hollow body having a dispensing end wall of substantially truncate conical formation terminating at its reduced end in a closable neck portion; and a tubular member terminating at its ends in openings formed in said end wall and defining a transverse fluid flow channel adjacent the said dispensing end, said member having a heat transfer wall for cooperating with said end wall to deflect the contents in their movement towards said neck portion and form the contents into a relatively thin layer between said walls.

2. A collapsible dispensing container for uncuous preparations, comprising: a hollow body having a dispensing end wall of substantially truncate conical formation terminating at its reduced end in a closable neck portion; and a tubular member terminating at its ends in openings formed in said end wall and defining a transverse fluid flow channel adjacent the said dispensing end, said member having a heat transfer wall for cooperating with said end wall to deflect the contents in their movement towards said neck portion and form the contents into a relatively thin layer between said walls.

3. A collapsible dispensing container for uncuous preparations, comprising: a hollow body having a dispensing end wall of substantially truncate conical formation terminating at its reduced end in a closable neck portion; and a tubular member extending through the flow path of the container contents in their movement towards said neck portion, said tubular member terminating in end openings of different size in said dispensing wall of the container.

4. A collapsible dispensing container for uncuous preparations, comprising: a hollow body having a dispensing end wall of substantially truncate conical formation terminating at its reduced end in a closable neck portion; and a tapered tubular member extending through the flow path of the container contents in their movement towards said neck portion, said tubular member terminating in end openings of different size in said dispensing wall of the container.

5. A collapsible dispensing container for uncuous preparations, comprising: a hollow body having a dispensing end wall of substantially truncate conical formation terminating at its reduced end in a closable neck portion; and a heat transfer member connected at its ends to said end wall and extending into the flow path of the container contents adjacent the entrance to said neck, whereby the inner and outer portions of the contents at said neck entrance will be rapidly heated upon the application of a heated fluid to the dispensing end of the container.

6. In combination with a collapsible dispensing container for uncuous preparations, said container having a hollow body including a dispensing end wall terminating in a closable neck portion: a tubular member supported by the dis-
pensing end wall and extending through the interior of said hollow body, said member having exteriorly communicating openings in said end wall for the circulation of an externally applied heated fluid.

7. In combination with a collapsible dispensing container for unctuous preparations, said container having a hollow body and a tubular dispensing end wall terminating in a closable neck portion: a tapered tubular member supported by the container extending through the interior of said hollow body adjacent said dispensing end wall, said member having exteriorly communicating openings in said end wall for the circulation of an externally applied heated fluid.

8. In combination with a container for an unctuous preparation, arranged to apply a pressure to force the preparation from the container, such container having a hollow body and a tubular dispensing end wall; a transverse tubular member having its ends secured in the end wall and having entrance openings in said wall, said tubular member extending into the flow path of movement of the container contents to a point of ejection, whereby the preparation within the tubular dispensing end wall and surrounding said tubular member may be quickly heated by an externally applied heated fluid.

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