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2,398,505

DISPENSING TUBE

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Fig. 1.

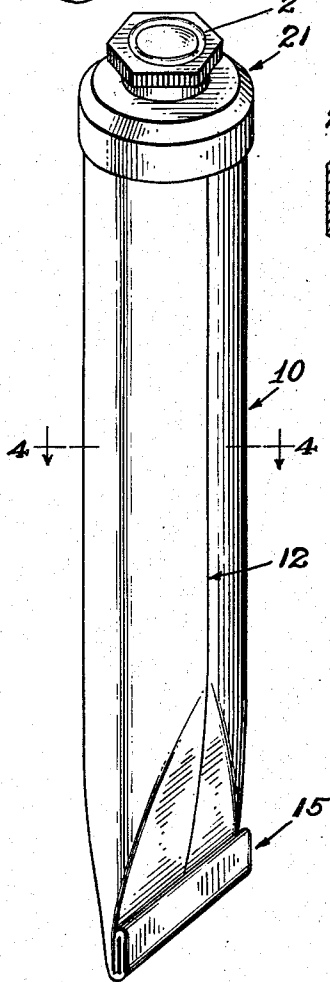


Fig. 2.

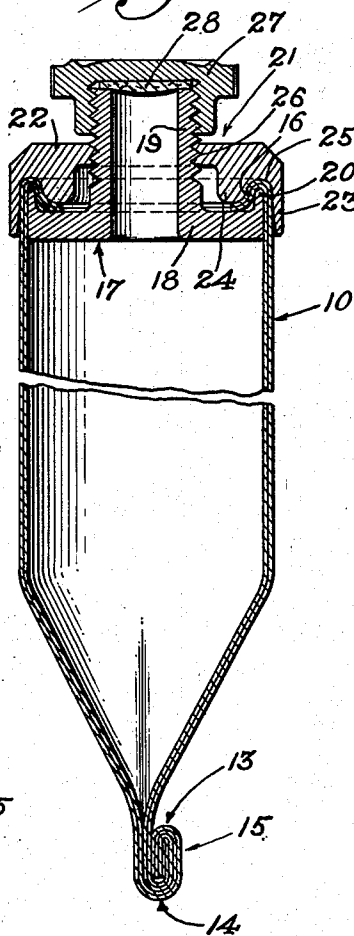


Fig. 3.

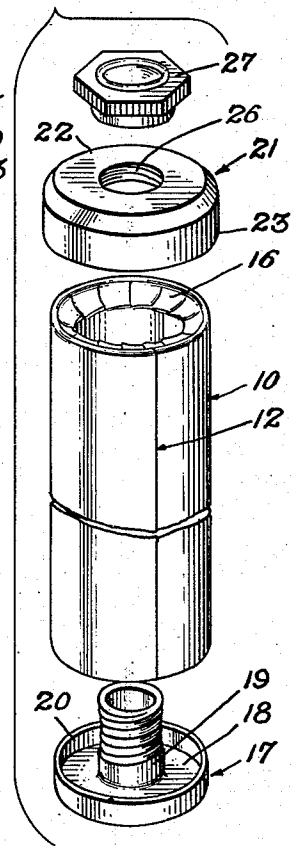


Fig. 5.

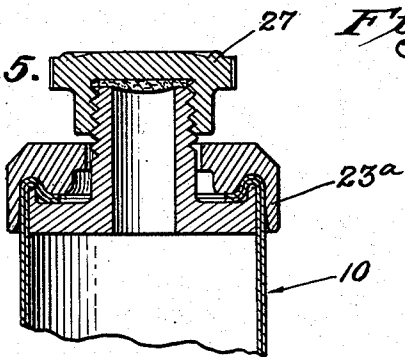
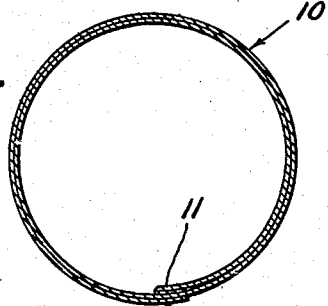


Fig. 4.



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UNITED STATES PATENT OFFICE

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DISPENSING TUBE

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6 Claims. (Cl. 222-107)

The invention relates to dispensing tubes for such soft, creamy substances as tooth paste, cold, vanishing and shaving creams, food pastes and the like, and has as its general aim the provision of such a tube in which the use of metal is entirely avoided without appreciable increase in the cost of manufacture of said tube over that of the common soft metal or tin tubes.

An object of the invention is to provide a new and improved dispensing tube of this character having a flexible tube body fashioned of paper treated to make it moisture proof, chemical and age resistant, non-toxic, free from odor or taste and adaptable for heat sealing, and having on one end of the body a dispensing closure formed of an inexpensive plastic arranged to be quickly and tightly secured to the body.

Another object is to provide an improved tube body for such a device formed of a sheet of paper wound into a tube having several layers or plies which are unconnected except along the margins of the sheet whereby the layers have substantial relative movement and will flex in assembly and in use without rupture.

Another object is to provide a dispensing tube having a novel dispensing closure for one end of the tube body composed of sections adapted to engage and reversely bend a marginal portion of the body interposed between them.

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

Figure 1 is a perspective view of a material dispensing tube embodying the features of the invention.

Fig. 2 is a fragmentary view in axial section on an enlarged scale through the structure.

Fig. 3 is an extended view in perspective showing the several parts of the tube structure.

Fig. 4 is a transverse sectional view taken substantially along the line 4-4 of Fig. 1.

Fig. 5 is a sectional view showing a modified form of a dispensing closure construction.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail, the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Conditions at the present time make the conservation of metals necessary. Material dispens-

ing tubes of the character to which the present invention pertains have heretofore been constructed almost wholly from metal. The present invention aims at the conservation of such metal.

Referring particularly to the drawing, the body of the tube is a cylindrical member 10 fashioned of a sheet of a dense, high grade paper which has been treated to make it resistant to the conditions it will or may encounter. Thus, one side of the sheet (which will be the inner side when the body is formed) is coated with one or more layers of a material that is age resistant, is chemically inert to the substances to be placed in the tube, is non-toxic, and is free from odor or taste. A Vinylite resin having these properties has been found suitable. The opposite side of the sheet (which in the tube will be the outside) is coated with a suitable water proofing material such as a pyroxylin lacquer. Both the resin and the lacquer are preferably substances which will form a heat seal. A sheet coated as above described will retain its original strength and flexibility, it will not deteriorate with age and will be approved for use in dispensers for foods.

In forming the tube body (indicated at 10) from a sheet of such paper, the marginal edge thereof which is to extend longitudinally of the completed body is folded back, as at 11 (Fig. 4), to locate its raw edge against the inner face of the outside surface of the sheet. The sheet is then wound about a suitable mandrel or the like into cylindrical or other desired form, the dimensions of the sheet being such that at least two layers, plies or wall thicknesses are formed. The overlapping thicknesses along the margins of the sheet are suitably joined as at 12, preferably by heat sealing them together either by one operation after the complete tube has been formed, or by separate operations as each overlap is made. The remaining abutting areas of the sheet are not joined.

This is an important feature since it permits each layer or ply to flex or yield independently to some extent as the tube is squeezed and folded in use, thus tending to eliminate the strains set up as an incident to the distortion of a laminated sheet. Moreover, should rupture of one layer occur in the present tube it will not affect the other layer. Accordingly, a tube formed according to the present invention will possess ample strength and flexibility to withstand the forces to which it will be subjected in assembly and in use. A sheet thus coated is inert to the action of air, moisture and such materials as are dispensed in tubes, and will remain strong and flex-

ible. The non-dispensing end of the tube, which is the end usually closed after the tube has been filled, may be conveniently sealed by collapsing opposite sides of the tube together, then doubling the marginal portion twice as indicated at 13 and 14 (Fig. 2), and heat sealing the doubled areas either simultaneously or individually to provide a permanent closure as indicated at 15 in Fig. 1.

The opposite or dispensing end carries a simple dispensing closure that may be formed entirely of a plastic material by an inexpensive molding process. This closure, in the present instance, is a two-section structure in which the sections are respectively located internally and externally of the tube and are arranged to engage, flex and securely bind therebetween a marginal flange portion at the end of the tube body. Thus, referring to Figs. 2 and 3, a flange 16 is formed at the end of the tube body by crimping the marginal portion of the tube inwardly. The internal closure section 17 is a generally flat disk 18 having a tubular axial stem 19 arranged in assembly to extend outwardly through the tube flange 16. Marginally the disk has an annular flange 20 extending outwardly in the same direction as the stem. The external closure section 21 has a disk shaped base 22 provided with a peripheral flange or skirt 23 dimensioned to fit snugly about the external surface of the crimped end of the tube body. The base 22 has a rib 24 spaced inwardly of the skirt to define therewith a channel 25 for receiving the internal section flange 20 and the thicknesses of the tube flange 16 when doubled thereover. This doubling of the flange may occur when the internal and external sections are assembled and the length of the flange is preferably such that the edge portion thereof will be bound between the axial face of the rib 24 and the opposing surface of the disk 18 (see Fig. 2). To facilitate assembly it may be desirable to at least partially preform the tube flange 16 to its final reverse shape (as shown in Fig. 3) before assembling the closure sections therewith. The body and the closure are accordingly tightly secured together by the reverse bending of the body flange about the inner section flange 20 as well as under the rib 24. It may be here noted that the separation of the layers of the tube body permit the layers to shift or yield relative to each other as the body material is excessively bent and strained during the formation of the reverse bend or bends therein. The body through this area will not, therefore, be liable to break or crack.

As shown in Figs. 2 and 4, the closure sections are secured in assembled relation by providing an internally screw-threaded axial aperture 26 in the external section base 22 for engagement with external screw threads on the stem 19. This arrangement is preferred but it is contemplated that in the smaller sized devices the sections may be assembled by omitting the screw-threaded engagement and, as shown in Fig. 5, dimensioning the skirt 23* to engage the portion of the tube body backed up by the edge of the internal disk with a press fit.

The stem 19 is closed by a screw cap 27 of suitable form and the stem is of sufficient length to provide clearance between the cap and the external section so that the cap may be fully screwed onto the stem to insure seating of a sealing gasket 28 in the cap against the end face of the stem.

It will be evident from the foregoing that a simple and inexpensive material dispensing tube has been provided which may be manufactured

wholly from non-metallic material. The body is capable of being fashioned, if desired, as a continuous tube cut to proper length and the closure sections can be economically made of an inexpensive plastic. The sections may be quickly assembled for production in quantity on an efficient and economical basis whereby these tubes may be produced at a cost which does not compare unfavorably with the cost of the well known tubes of tin. The strength and flexibility of the paper tube body formed of separated layers permit it to be placed without rupture under heavy strains during the assembly of the closure sections as well as in use.

I claim as my invention:

1. A material dispensing tube comprising, in combination, a tubular body formed of a sheet wound upon itself a plurality of times, said sheet having on its inner surface a flexible coating of a material which is chemical and age resistant non-toxic and free from odor and taste, and having on its outer surface a flexible coating of a water-proofing material, at least one of said coatings being adapted to form a heat seal, the marginal edges of the sheet extending longitudinally of the body and being sealed only to the portions of said sheet adjacent said edges, an intumed flange on one end of said body, an inner closure section having an annular flange abutting said intumed flange adjacent to the wall of said body and an outwardly extending tubular stem, an outer section having an annular skirt adapted to fit about the external surface of said end and a rib spaced inwardly of said skirt to form a channel opposing said annular flange on said inner section, said outer section having a screw threaded aperture therein for engagement with screw threads on said stem to secure said sections together with said intumed flange on said body folded reversely about said annular flange in said channel and extending between said rib and said inner section, and a detachable cap for said stem dimensioned to have spaced relation from said outer section when said cap is fully seated on said stem.

2. A material dispensing tube comprising in combination a tubular body formed of a sheet of flexible material wound upon itself a plurality of times to provide an elongated tube of a plurality of superimposed plies or layers, the free longitudinal edges of the sheet overlapping to provide a relatively narrow zone of a greater number of plies than the remainder of the tubular body, extending longitudinally of the body, said sheet material being treated so as to form a heat seal extending longitudinally of the body only in said relatively narrow zone of additional plies, the remaining overlapping plies of sheet material being loose with respect to one another to permit relative sliding movement therebetween, one end of the tubular body being closed and the opposite end of the tubular body being provided with a pouring spout.

3. A material dispensing tube comprising a sheet of relatively dense paper carrying on its inner face a coating of Vinylite resin, the opposite face of the sheet being coated with a suitable waterproofing material, both said resin and the waterproofing material having the quality of forming a heat seal, said sheet being wound upon itself to form an elongated tube of a plurality of layers, the free longitudinal edges of the sheet overlapping one another with at least one layer of the sheet therebetween, said overlapping edge portions lying adjacent and parallel on opposite

sides of an intervening layer and extending longitudinally of the tube, and said overlapping portions being heat sealed to each other and to the intervening layer to provide an elongated tube, the remaining overlapping plies of paper being loose with respect to one another to permit relative sliding movement therebetween.

4. A tube in accordance with claim 3 wherein the free innermost edge of the sheet is folded back upon itself longitudinally of the tube and within the zone of the overlapping, heat sealed portions.

5. A material dispensing tube comprising in combination an elongated tubular body formed of a sheet of paper wound upon itself to provide at least two superimposed layers, the longitudinal free edges of the paper sheet when in tubular form extending in parallel relation longitudinally of the tube and overlapping each other on opposite sides of an intervening layer of the sheet, the material of the paper sheet being treated so that when the overlapped portions are heated said overlapped portions of the free edges and the intervening layer will provide a heat seal uniting the same together longitudinally of the tube, the remaining portions of the superimposed layers of paper being loose with respect to one another to permit relative sliding movement therebetween.

6. A material dispensing tube comprising in combination an elongated tubular body formed of a sheet of paper wound upon itself to provide

at least two superimposed layers, the longitudinal free edges of the paper sheet when in tubular form extending in parallel relation longitudinally of the tube and overlapping each other on opposite sides of an intervening layer of the sheet, the material of the paper sheet being treated so that when the overlapped portions are heated said overlapped portions of the free edges and the intervening layer will provide a heat seal uniting the same together longitudinally of the tube, the remaining portions of the superimposed layers of paper being loose with respect to one another to permit relative sliding movement therebetween, one end of the tubular body having an intumed annular flange, and a three-part closure therefor including a disc-like member fitting within the flanged end of the tubular member and having a shoulder over which the intumed flange of the tubular member is adapted to be reversely bent, said disc-like member having a central outwardly extending hollow neck, a centrally apertured cap the walls of the aperture of which surround said neck, said cap having a shoulder cooperating with the first mentioned shoulder on said disc, said shoulders being suitably spaced apart to permit the inwardly extending flange to pass therebetween, and said cap and disc forming a tight fit whereby to reversely bend and clamp said intumed flange therebetween, and a cap means closing the tubular neck of said disc.

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