April 15, 1958 J. A. SAFFIR 2,830,730

COLLAPSIBLE TUBES

Filed March 30, 1956

FIG. 3.

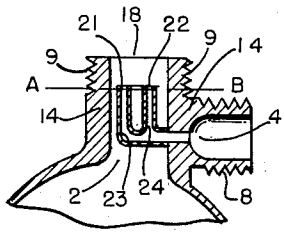
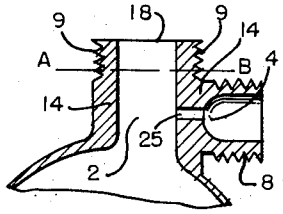


FIG. 4.



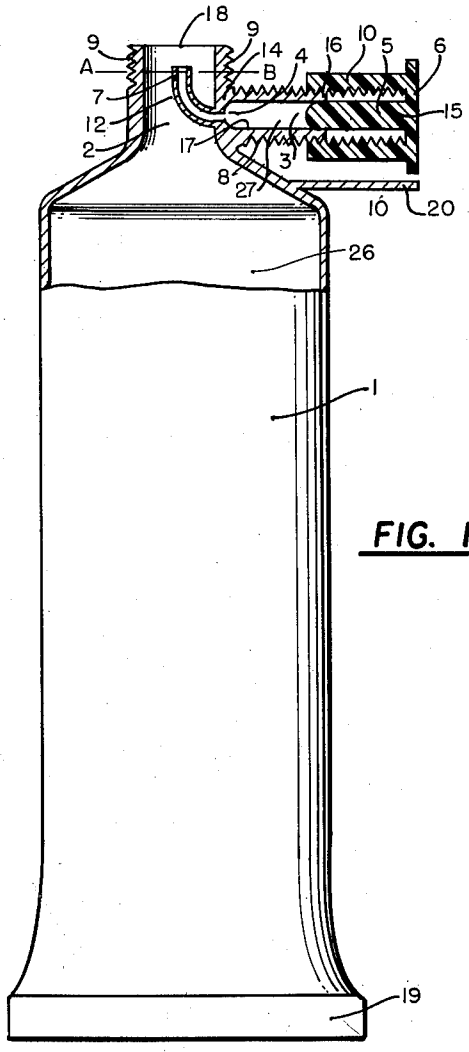


FIG. 1.

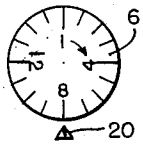


FIG. 2.

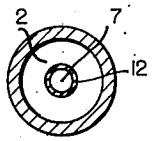


FIG. 5.

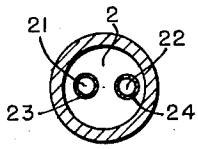


FIG. 6.

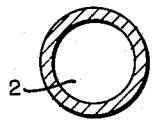


FIG. 7.

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2,830,730

COLLAPSIBLE TUBES

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8 Claims. (Cl. 222—46)

This invention relates to collapsible tubes such as are commonly employed for dispensing toothpastes, cold creams, Vaseline, glues, shampoos, cements, and other semi-solid materials.

An object of this invention is to provide a collapsible tube, capable of extruding a quantity of its contents, with an auxiliary chamber or compartment adapted to function as a dispenser independently and in coordination with the collapsible tube.

Another object is to attain a dispenser combination comprising a collapsible container tube coordinated with an independently operative auxiliary dispensing chamber adapted to add a supplementary substance, in regulated amount, to the portion of the substance in the collapsible tube which is imminently subject to discharge therefrom.

Other objects, advantages and features of the invention will become apparent from the following description, read in conjunction with the accompanying drawings, wherein similar elements are designated by like numerals.

Pursuant to the invention, a supplementary substance may be stored within an auxiliary chamber coordinated with a collapsible tube type dispenser, and when desired, the said supplementary substance may be injected into or admixed with the material in the said collapsible tube, the admixture being desirably with that portion of the material which is in the discharge end of the tube. Thus the inclusion of the supplementary substance may be effected prior to or during the interval that the material within the tube is being extruded therefrom, as by applying pressure thereto. Alternatively the material within the collapsible tube may be dispensed without any addition thereto of the supplementary substance contained within the auxiliary chamber, when no admixture of ingredients is contemplated. Moreover the latitude of the invention embraces the feature of supplying the supplementary substance from the auxiliary dispenser to the material in the collapsible tube dispenser in regulated as well as measured quantity.

As an example, let us say the main compartment of the collapsible tube may contain toothpaste. The auxiliary or storage compartment comprising a supplementary dispenser may be filled with various substances to modify, alter, or otherwise supplement the regular ingredients of toothpaste.

Whenever the teeth accumulate deposits or stains from smoking or other causes, these can be removed or kept to a minimum by the occasional use of a more abrasive cleaner than ordinary toothpaste. A little pumice paste, for example, stored in the auxiliary compartment of the tube, can be introduced as frequently as needed to supplement the regular ingredients of the toothpaste and afford enhanced teeth cleaning effects as well as brighter looking teeth.

Most people recognize the place the fluorides have in preventing decay in the teeth of certain age groups

but they also realize that fluorides should not be used indiscriminately and are even contraindicated, according to many authorities, with respect to very young children, persons in certain physical condition such as those afflicted with arthritis or nephritis, older people, and persons with artificial teeth.

With a quantity of fluoride preparation available in a storage compartment for use only if needed and in measured amounts subject to the control of the user, such a collapsible tube as herein described proves a boon and solves a great problem in preventive dentistry.

The additions of pumice and fluoride to toothpaste are but two simple examples of the many advantages to be gained when a tube of this invention is employed for the dispensing of toothpaste.

As a further illustration, the tube may contain a shampoo with the principal ingredients thereof comprising soap or detergent. Here, other ingredients can achieve better results for the scalp and hair if if were possible to add them to the last wash or rinse-like oil, lanolin, or a coloring substance. By having available "extra" ingredients in the auxiliary compartment for introduction when needed one achieves more beautiful and more satisfactory results from the entire process of shampooing.

This collapsible tube has many uses and the few examples cited above are merely given by way of illustration of the advantages the use of this invention has over the prior art.

Other objects and attendant advantages will be appreciated by those skilled in this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings.

Figure 1 is a front view of the collapsible tube described in this invention with the top portion broken away to reveal the upper interior structure in section.

Figure 2 is a front view of the surface **6** of the piston cap **15** in Figure 1.

Figure 3 is a sectional view of the upper interior structure of a collapsible tube of another form in accordance with this invention.

Figure 4 is a sectional view of the upper anterior portion of a collapsible tube having still another modification.

Figure 5 is a cross section along the lines A—B in Figure 1.

Figure 6 is a cross section along the lines A—B in Figure 3.

Figure 7 is a cross section along the lines A—B in Figure 4.

Similar numerals refer to similar parts throughout the several views.

Referring more particularly to the features of the invention as indicated by the various figures of the drawing which are intended as illustrative and not limiting, the collapsible tube **1** in Figure 1 may be of any conventional type adopted to hold a pasty or heavy liquid substance which can be extruded through its mouth **14** by means of rolling up the sealing strip **19** or just "squeezing" the tube to cause internal pressure and force the contents of the tube **1**—contents being **26**—to flow through the neck **2** and be ejected from mouth **18**.

Normally, a closure cap, not illustrated, fits on the threads **9** of the wall **14** of the tube—to act as a stopper.

The collapsible tube may be made of any suitable material such as tin, lead, or aluminum foil, or any metallic foil having the necessary physical properties. It can also be made of plastic materials such as cellophane, Celluloid or pyroxylin, or even some of the vinyl resins which are soft and flexible. For purposes of illustration a metallic

substance is shown throughout the drawing with the exception of the piston cap **15** which is illustrated in this Figure 1 as being made of synthetic resin or plastic.

On one area of the wall **14** of the neck of the tube is attached the auxiliary chamber structure **16**. The coordination of the auxiliary chamber with the collapsible tube may be in any expedient manner, the illustrative attachment of the figures of drawing comprising a preferred integral or unitary association of the discharge end of the auxiliary chamber dispenser with the discharge end of the collapsible tube. The walls **14** of the neck flare out with threaded flanges **8** to form the chamber **3** which stores an extrudable material **27** which can be expelled through the opening **4** by turning the piston cap **15** threadedly coordinated with the aforesaid threaded flanges **8** in the proper direction (as illustrated by arrows in Figure 2).

Continuing with Figure 1, piston cap **15** is provided with threaded walls **10** adapted for receiving the external threads of the said flanges **8**, and a piston structure **5** which fits snugly against the walls **17** of chamber **3**.

The piston cap **15** is advanced by turning in the proper direction and the contents **27** of chamber **3** is forced through the opening **4** and the duct **12** to be expelled at the opening **7** of the duct and so deposited within the neck **2** where it can mix with whatever material is in neck portion **2** at the time.

Upon the compression of the main body of the tube, this deposit from chamber **3** will be forced along the path of emission followed by the contents of the main chamber and be incorporated into the exuded material.

The material from chamber **3** may be colored in some way to be identifiable when expelled.

The end **6** of piston cap **15** has on it a dial configuration to permit control of the amount of material to be extruded from the auxiliary chamber **16**. This is illustrated in Figure 2.

Such a dial may be divided into any number of spaces or turns, with some definite landmark to be used as a guide. Figure 2 illustrates 16 such spaces with the fixed triangular pointer **20** used as indicator and here shown below the number 8 on the circle of spaces.

As an example, if a device of this invention is used in which the main chamber holds 120 grams—about 4 oz.—and there is a channel in its neck ¼ inch in diameter through which a one inch extrusion of paste will weigh about 2 grams—this being the normal channel in most toothpaste tubes and about the normal extrusion length used by most people—and the device is such that it will require six full turns of the piston ejector cap to completely empty an auxiliary chamber holding 3 grams, then one complete turn around the dial in Figure 2 will eject ½ gram into the neck portion **2** in Figure 1 and will add 25% by weight of its substance **27** to the material **26** from the main chamber.

Similarly, in the illustrated dial of Figure 2, a half turn of the dial—from number 1 to number 8—will add 12½% by weight of substance **27** and a quarter turn—from number 1 to number 4—will add 6¼% by weight. Turning 1 notch—1/16 of a whole turn—will add 1 1/16% by weight of the material **27** in the auxiliary chamber.

If one wishes to place a fluoride in the auxiliary chamber for selected use in fluoridating the tooth-paste in the main chamber, one goes about it the same way as illustrated above—except that the fluoride compound in the auxiliary chamber should be of a percentage that is nontoxic.

For example, if stannous fluoride were used, the auxiliary chamber could contain a product of two parts per thousand of stannous fluoride, which amount, should it be used unadulterated, would not be harmful, but which could dilute the toothpaste, if used according to the example given above, to contain as little as two parts per sixteen thousand parts of toothpaste.

Thus, even if the paste from the main tube and the contents of the auxiliary tube were not thoroughly incorporated one into the other, it would not matter as far as toxicity is concerned, although the material will become very well mixed once one starts brushing his teeth with the mixture.

It is understood that the markings on the dial in Figure 2 may be altered in any manner. Also, the size of the main chamber as well as that of the auxiliary chamber is here given as example and each may be altered in any direction.

Figure 3 illustrates a modified form of this device in which there are two ducts **23** and **24** leading from the auxiliary chamber and emptying into the neck **2** from openings **21** and **22**. Multiple ducts and openings are used where better mixing in the neck is desired. Three or four or even more ducts and openings may be used where even more intimate mixing is desired.

Figure 4, still another modification, does not have a duct leading into the neck but the substance in the auxiliary chamber empties through the passage **4** which passes through the wall **14** and empties into the neck **2** of the tube at **25**.

Figure 5 is a section through the lines A—B in Figure 1 showing the duct **12** and its opening **7** in the neck **2** of the tube, which duct and opening are usually centered.

Figure 6 is a section through the lines A—B in Figure 3. Here, **23** and **24** are the ducts and **21** and **22** are openings in the ducts. If centered properly this will permit much more mixing than with a single duct.

Figure 7 is a section through the line A—B in Figure 4.

While I have described my invention in accordance with desirable embodiments, it is obvious that many changes and modifications may be made in the details of construction and the combination and arrangement of the parts thereof, without departing from the spirit of the invention as defined in the following claims.

Having thus set forth my invention, I claim:

1. A dispenser combination comprising a collapsible container tube having its discharge opening at a comparatively restricted neck end thereof, said tube having mounted on the exterior thereof an independently operative auxiliary dispensing chamber having an open discharge end, the discharge end of the said auxiliary dispensing chamber being integral with and opening into the said collapsible container tube at the restricted neck end of the latter, and means coordinated with the auxiliary dispensing chamber adapted for discharging its contents into the said discharge end of the container tube, whereby the contents of the auxiliary dispensing chamber may be admixed with the contents of the container tube at the discharge end of the latter.

2. A dispenser combination comprising a collapsible container tube having its discharge opening at a comparatively restricted neck end thereof, said tube having mounted on the exterior thereof a relatively small independently operative auxiliary dispensing chamber having an open discharge end, the discharge end of the said auxiliary dispensing chamber being attached to the said collapsible container tube and opening into the same at the restricted neck end thereof, and means coordinated with the auxiliary dispensing chamber adapted for discharging its contents in regulated amount, whereby the contents of the auxiliary dispensing chamber may be admixed in regulated amount with the contents of the container tube at the discharge end of the latter.

3. A dispenser combination comprising a collapsible container tube having its discharge opening at a comparatively restricted neck end thereof, said tube having mounted on the exterior thereof a relatively small independently operative auxiliary dispensing chamber having an open discharge end provided with a tiny discharge opening, the discharge end of the said auxiliary dispensing chamber being intergal with and opening into the said

collapsible container tube at the restricted end of the latter, and means coordinated with the auxiliary dispensing chamber adapted for discharging its contents in regulated amount, whereby the contents of the auxiliary dispensing chamber may be admixed in predetermined minute quantities with the contents of the container tube at the discharge end of the latter.

4. A dispenser combination as in claim 3, wherein the discharge end of the auxiliary dispensing chamber is provided with at least one duct extending into the restricted discharge end of the collapsible container.

5. A dispenser combination as in claim 3, wherein the discharge end of the auxiliary dispensing chamber is provided with a plurality of ducts extending into the restricted discharge end of the collapsible container.

6. A dispenser combination comprising a collapsible container tube having its discharge opening at a comparatively restricted neck end thereof, an independent auxiliary dispensing chamber external to the collapsible container and having an open discharge end, the discharge end of the said auxiliary dispensing chamber being intergal with an opening into the said restricted neck end of the latter, and means coordinated with the auxiliary chamber adapted for dispensing its contents in measured amount into the contents of the said discharge end of the container tube, said means comprising a piston element coordinated with and adapted for calibrated movement within the said auxiliary dispensing chamber, whereby the contents thereof may be admixed in regulated quantity with the contents of the container tube at the discharge end of the latter.

7. A dispenser combination as in claim 6, wherein the discharge end of the auxiliary dispensing chamber is provided with at least one duct extending into the restricted end of the collapsible container.

8. A dispenser combination as in claim 6, wherein the discharge end of the auxiliary dispensing chamber is provided with a plurality of ducts extending into the restricted discharge end of the collapsible container.

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