Oct. 26, 1965 R. G. MOTE 3,213,902

DISPENSER PROVIDING CARTRIDGE RUPTURING MEANS

Filed Oct. 13, 1961 2 Sheets-Sheet 1

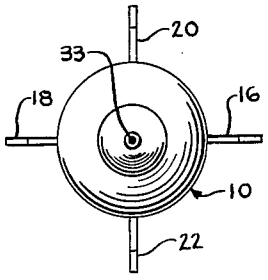

Fig. 2

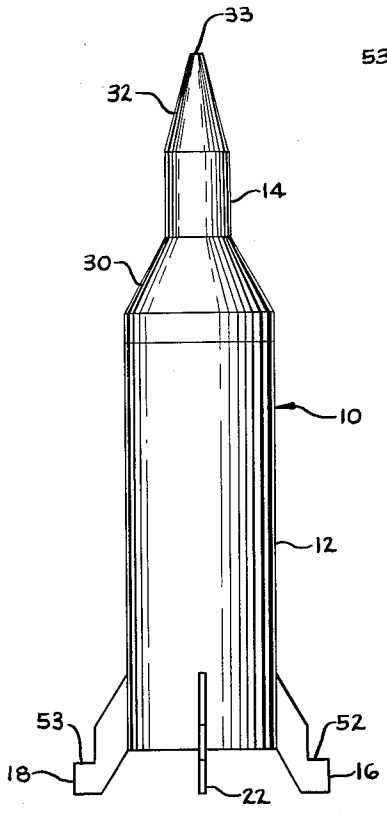

Fig. 1

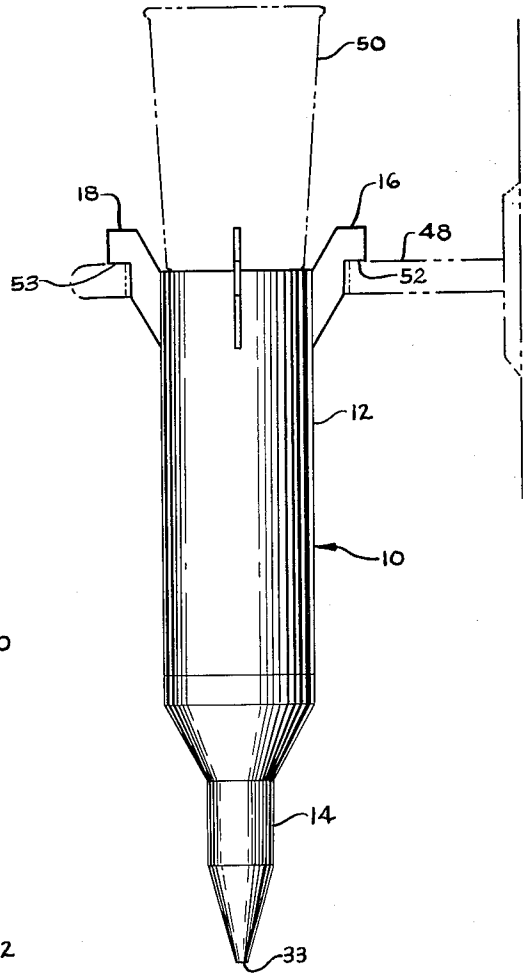

Fig. 3

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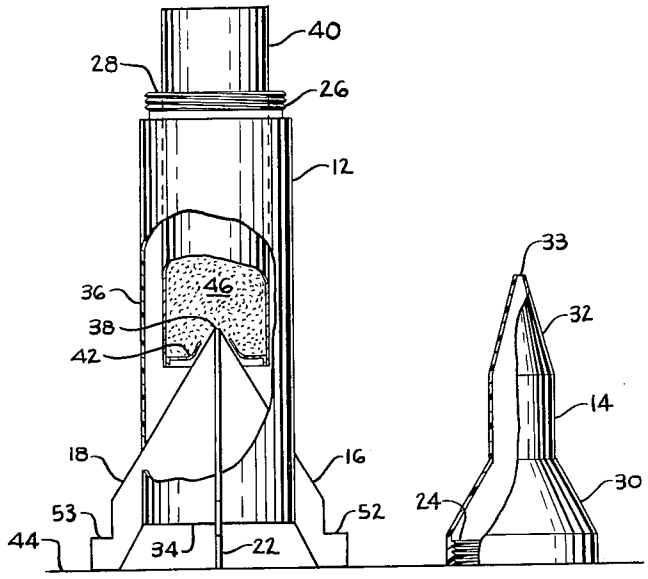

Fig. 4

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DISPENSER PROVIDING CARTRIDGE RUPTURING MEANS

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This invention relates generally to an improved dispenser of the squeeze-to-use type. More particularly, the invention relates to such a dispenser having internal puncturing means whereby it can be readily refilled from specially constructed cartridges having a thin membranous end closure vulnerable to perforation by said puncturing means. The improved squeeze-to-use dispenser of this invention is of particular utility for dispensing powders, especially tooth powders.

Tooth powders have enjoyed widespread use for a great number of years. In spite of this relatively long period of use, however, there has been little change in tooth powder packaging techniques since its first days of public acceptance. Thus, tooth powders are presently sold to the consumer in containers much like those in which they were first introduced to the public, these being, for the most part, the small familiar metal cans, usually of oval cross-section, with the conventional bottom-orificed cup appendage on one end through which the powder is discharged. Such containers leave much to be desired.

For one thing, the physical characteristics of tooth powders make then somewhat difficult to pour through orifice openings. Tooth powders are not naturally free flowing but, on the contrary, exhibit a tendency to pack and resist free particulate movement. Consequently, it is usually necessary to shake the can, tap on its sides or otherwise disturb its contents in order to obtain powder from a tooth powder container of the conventional type. This is not only awkward and irritating but wasteful as well, since for obvious reasons such a method is inherently conducive to discharge of excessive amounts of tooth powder.

Since, as everyone is aware from common experience, it is difficult to shake or otherwise discharge the exact amount of tooth powder desired from a conventional container onto a toothbrush, it is customary to first shake the powder into the palm of one hand before transferring it to the brush. This ritual is obviously wasteful of motion, as well as tooth powder, and makes the tooth brushing chore more burdensome than it otherwise would be. While these considerations might, at first thought, appear trivial, when it is remembered that the teeth are brushed at least twice a day, and preferably after every meal or snack (as well as upon first arising in the morning) throughout a person's lifetime, it becomes apparent that they are far from trivial.

I have now invented a novel refillable container with improved dispensing means particularly suitable for use in dispensing tooth powders, whereby the exact amount of powder needed or desired may be easily discharged, in a smooth even flow, directly onto the toothbrush, without the necessity of shaking the container or otherwise overcoming the natural tendency of the powder to resist flow and clog discharge openings.

The conventional metal tooth powder containers in present use are filled only once and discarded when the contents are exhausted. This practice is wasteful and obviously adds to the cost of the product. The novel container of my invention overcomes this cost disadvantage in that it possesses self-contained means for convenient refilling from inexpensive throw-away cartridges of a type hereinafter described.

It is thus a principal object of this invention to provide an improved squeeze-to-use dispenser for tooth powders or the like which is readily refillable from inexpensive cartridges especially designed for the purpose, and also to provide such cartridges.

It is a more particular object of the invention to provide refillable squeeze-to-use dispensers for tooth powders and the like by means of which such difficultly flowable materials can be practically and readily dispensed in the home in the exact quantities needed and with no wasted effort.

It is still another object of the invention to provide a method whereby tooth powders and other difficultly flowable preparations of like nature can be made readily available in squeeze-to-use dispensers from which exact quantities can be taken as needed.

Other objects and advantages of the invention will be apparent from the detailed description thereof which follows:

In its simplest aspect, the squeeze-to-use dispenser of this invention comprises a squeeze-type container fitted at one end with a removable closure having a relatively small discharge orifice therein, and having internally disposed means adapted to puncture and tear thin membranous materials. The squeeze-type container is adapted to receive a specially designed cartridge loaded with tooth powder or other fill material and having an opening covered by a thin sheet of paper or other easily punctured membranous material.

To refill the dispenser, the orificed closure is removed and the cartridge is then inserted in the squeeze-type container with the membrane enclosed opening down. Upon pressure contact with the puncturing and tearing means in the squeeze-type container, the membrane covering the opening in the cartridge case is ruptured. The cartridge is then withdrawn from the squeeze-type container and concurrently its contents are discharged through the ruptured membrane into said container. The orificed closure is then replaced on the dispenser and it is ready for use. The dispenser can be used by turning it upside down and gently squeezing the sides of the container. When this is done there is a steady discharge of the contents of the dispenser through the orifice in its downwardly disposed end.

My novel dispenser is not limited to use with tooth powder or like material but can also be employed with other materials amenable to the handling and dispensing techniques taught herein. Thus, the dispenser can be used with any substance capable of being unloaded from cartridges of the above-described type in the manner taught. Examples of such substances, other than powders, are liquids such as syrup, honey, liquid soaps, oils and the like.

The discharge streams from my dispenser, even when composed of powders, are smooth and fluid-like, so long as a fairly constant pressure is applied to the container. The streams are easily regulated by simple pressure control and can be readily stopped by merely releasing the pressure. Accordingly, tooth powders can be applied to a toothbrush by means of my dispenser as easily as toothpaste can be applied from a tube. The ease with which tooth powder was found to flow from my dispenser was surprising in view of the well-known tendency of tooth powders to cake and arch and thus resist flow.

Where the orifice opening in my dispenser is sufficiently small, as I prefer it to be (I also prefer it to be a spout orifice as shown in the drawings, described infra), tooth powder will not flow, or pass, through it until pressure is applied to the container walls and hence in the case of tooth powder there is no necessity to cap the opening against loss, as is necessary with toothpaste

tubes and the like. It is, however, within the scope of the invention to furnish a cap, or other closure, for the opening, if desired.

My novel dispenser and its method of use will be more completely understood by reference to the accompanying drawings, of which:

FIG. 1 is a side elevation of a preferred embodiment of a dispenser according to my invention, in upright position;

FIG. 2 is a top view of the dispenser of FIG. 1;

FIG. 3 is a side elevation of the dispenser of FIG. 1 as it would appear in upside down position in a support bracket; and

FIG. 4 is an elevation view, partly in section, of the disassembled parts of the FIG. 1 dispenser in display arrangement, with a refill cartridge in place in the squeeze-type container.

Referring now to FIG. 1, there is shown a fully assembled embodiment of a dispenser **10** according to my invention. The rocket-like appearance of the FIG. 1 embodiment is a preferred design for my dispenser from both functional (as will be apparent from the complete disclosure of my invention to follow) and sales appeal standpoints. However, my improved dispensers are not limited to the FIG. 1 design and there are many other design embodiments within the scope of my invention. The FIG. 1 dispenser has, as its principal parts, a squeeze-type cylindrical container **12**, an end closure with spout discharge orifice **14** (hereinafter referred to as spout cap **14**) and four identical fin-like support members, of which only three, **16**, **18** and **22**, can be seen on FIG. 1, the fourth being hidden from view. Spout cap **14** is connected to container **12** by thread fastenings, as described in greater detail hereinafter, and it is necked down in interrupted stepwise fashion, as shown at **30** and **32**, to form a spout with a relatively small discharge opening **33** in its end.

The four support members extend through the wall of container **12**, for reasons presently made clear. It is not critical to my invention, however, that the support members penetrate the container wall or even that the dispenser have support members at all since it can be made to perform its dispensing function equally well without them. Each of the four support members has an identical notch, two of which are shown in profile at **52** and **53** on FIG. 1, designed to engage the rim of a support bracket of the same type as that commonly used for holding drinking glasses or tumblers. The nature of this engagement is illustrated by FIG. 3, the description of which is to follow.

FIG. 2 is a top view of the FIG. 1 dispenser showing it to be of circular cross-section throughout its length. This is merely a preferred, and not a critical, configuration and there are, as indicated previously, many possible variations of design within the scope of my invention. For example, instead of being round, my dispenser can be of square, oval, hexagonal, or other cross-sectional shape. FIG. 2 shows the manner in which the four previously mentioned support members, **16**, **18**, **20** and **22**, are spaced around the base of the dispenser.

Turning now to FIG. 3, there is shown the dispenser **10** suspended in a support bracket **48** of the type found in many modern bathrooms as drinking glass, or tumbler, holders, by means of the previously described notches in its support members. The support bracket is shown in cross-section in order to best illustrate the way in which the notched support members engage its circular rim.

The above-noted support feature of my invention, while not felt to be critical, is a "fringe benefit" of great usefulness since a convenient means of storing the dispenser in the bathroom, or wherever its use is contemplated, in ready-to-use position is thereby afforded. Depending upon the size of the dispenser, it is possible to utilize existing tumbler brackets for such storage purposes. The dispenser can obviously be used without removal from the support bracket and, furthermore, where the bottom is a flat surface, a suitable object can be safely placed on it since it is stabilized and held level by means of the notches in the support members. In illustration of this, FIG. 3 shows a drinking glass so placed. The drinking glass and support bracket **48** are shown in phantom lines to indicate that those elements do not form a part of the present invention.

Referring now to FIG. 4, as that drawing shows, the spout cap **14** is internally threaded at **24** and the squeeze-type container **12** has an external mating thread section **26** whereby spout cap **14** can be screwed onto the open end **28** thereof. The dispenser is not limited to a threaded fastening as shown, and other means of accomplishing the same result can be employed if desired. For example, the spout cap can be secured to the squeeze-type container by means of a friction fit, a bayonet connection, or any other type of fastening or locking arrangement suitable for the purpose.

As previously indicated, the four support members **16**, **18**, **20** and **22** (of which only **16**, **18** and **22** are visible on FIG. 4) extend through the wall **36** of container **12**. The reason for this is evident from FIG. 4 which shows that the support members form upwardly sloping radial partitions within container **12** which meet at its axis to form an apex **38**. Apex **38** and the sloping partitions forming it constitute a preferred version of the previously mentioned membrane puncturing and tearing means of my invention.

To fill the dispenser **10**, a cartridge **40** loaded with tooth powder or the like, designed to fit into squeeze-type container **12** in the manner shown in FIG. 4 and having at least one end closure of a thin film of easily rupturable material such as paper, cellophane, soft metal or alloy, plastic, rubber, or the like, is inserted into the open end **28** of container **12**. If cartridge **40** has a diaphragm on only one end, the insertion is, of course, made with that end down. The numerical symbols of identity from FIG. 4 are used in the present discussion for purposes of simplification.

Cartridge **40** is inserted into container **12** until the diaphragm end touches apex **38**, and then pushed firmly down upon the apex to rupture the diaphragm **42**, as illustrated in FIG. 4. When the diaphragm has been ruptured, preferably to its maximum, cartridge **40** is slowly withdrawn from container **12** whereby its contents **46** are discharged through the now open lower end into the dispenser. Gentle tapping of the walls of container **12**, or cartridge **40**, during this withdrawing operation facilitates the unloading of the latter.

Other means for rupturing thin membranes or diaphragms may be substituted for the apex arrangement of FIG. 4, if desired. All that is required is that such means be internally disposed, or capable of being so disposed, within the dispenser in such fashion as to rupture the membranous end closure of an inserted cartridge in accordance with the present teachings. Thus, a pyramidal or cone-shaped member, or members, or a pointed stud, or studs, of any other design (of solid or hollow construction) having its base(s) fixedly secured to, integral with, or resting on the bottom of the dispenser (shown at **34** on FIG. 4) would serve as a suitable puncturing and tearing, or rupturing, means for purposes of this invention. While it is preferred that the rupturing means of this invention terminate in at least one point such as apex **38** on FIG. 4, or the point of a cone, it is not essential that this be the case and said means can terminate in any suitable puncturing or cutting extremity or extremities, such as, for example, a sharp chisel-like edge or edges.

Continuing with the discussion in terms of the FIG. 4 embodiment, after container **12** has been loaded with tooth powder, or the like, in the above-described manner, spout cap **14** is screwed in place over the open end **28** of container **12**. The loaded dispenser is then ready for use or it can be stored until needed in upright position

on its support members or in inverted position in a support bracket as shown in FIG. 3.

The various parts of my dispenser, and the refill cartridge used in conjunction therewith, can be fabricated from any materials suitable for the purpose by techniques well known to those skilled in the art. Therefore, there is no necessity to burden this disclousre with descriptions of such known techniques and none have been included herein. However, a few comments about the materials of construction for the parts of my dispenser are felt to be in order.

Squeeze-to-use containers, per se, and the characteristics and materials of construction of their flexible sidewalls, are well known. Such containers possess certain peculiar characteristics quite different from those of conventional containers serving only as packages for various materials. An efficient squeeze-to-use container must have the correct balance between wall flexibility and stiffness to assure proper functioning when in use. The wall material must be sufficiently flexible to partially collapse with a minimum of pressure. However, for the container to have satisfactory recovery (i.e., in order for it to spring back to its normal shape after squeezing) its walls must have a certain amount of stiffness. Moreover, in order to hold up under the repeated flexing it must undergo during its useful life period, the container wall material must have relatively high tensile strength and resistance to fatigue.

Materials of construction fitting the above requirements have been drawn almost exclusively from the known classes of organic plastics. In this respect, polyethylene and plasticized polyvinyl chloride plastics have been used to a large extent in the manufacture of squeeze-to-use containers and such plastics are excellently suited for use in the squeeze-type containers of my invention. The selection of suitable plasticizers, where necessary, optimum container wall thicknesses, and other details pertinent to the manufacture of squeeze-to-use containers present no difficulties to those skilled in the art and hence need no further consideration here.

The various parts of my dispenser other than the flexible side walls of the squeeze-type container member can be made of many types of materials, depending upon the properties desired in a particular part. Thus, plastics of varying hardnesses; metals; fiberboard; wood; etc., are all suitable for use in the fabrication of parts for the numerous possible modifications of my dispenser. There are numerous ways known or obvious to the art for assembling a number of separate elements into the major parts of my dispenser, or of molding or otherwise integrally forming such major parts, hence such methods form no part of my invention.

The refill cartridges of this invention are preferably of cylindrical form and, as previously indicated, can have one or both ends enclosed by a thin membranous sheet of paper or other material easily ruptured by the rupturing means of my dispenser. However, since it is only necessary that one end of such a cartridge be ruptured for purposes of refilling the dispenser, it is preferred that only one end of the cartridge be vulnerable to such rupture. This cartridge construction (a rupturable diaphragm on only one end) makes for safer packaging, since there is less chance of accidental rupture, and in some instances, depending at least in part upon the materials from which the diaphragm and cartridge case are made, lower packaging costs.

My refill cartridges are normally useless once emptied and hence should preferably be of relatively inexpensive construction. For this reason, the preferred cartridge case materials are low cost cardboards or other cheap and readily available materials. It is within the scope of my invention, however, to employ more expensive cartridge case materials such as metals, plastics, etc. Here, as in the case of the dispenser and its parts, the methods of manufacture of cartridges suitable for my

invention are known to those skilled in the art. Hence such methods form no part of my invention.

It will be apparent, from the foregoing description, that many embodiments of my invention exist and that dispeners and refill cartridges varying as to noncritical features and construction materials in many ways but still within the spirit and scope of my invention can be prepared by following the teachings herein.

I claim:

1. A refillable squeeze-to-use dispenser comprising: a cylindrical squeeze-type container with a flexible cylindrical wall; a removable end closure for said container having a centrally disposed, integral spout with a discharge orifice in the end through which the contents of said container are discharged when the assembled dispenser is held in discharge position and its flexible cylindrical container wall is squeezed; a plurality of flat, fin-like, radial support members fixedly secured to and evenly spaced around the outside of the periphery of said squeeze-type container adjacent the end opposite the discharge end, said support members extending through the cylindrical wall of the squeeze-type container; and internally disposed means for puncturing a thin membrane, said means comprising a plurality of radial partitions within said squeeze-type container coextensive with said support members and forming an apex pointing toward the discharge spout at the axis of said squeeze-type container.

2. The dispenser of claim 1 in which the outer edges of the fin-like support members are notched in such fashion as to engage the circular rim of a tumbler-type support bracket and provide upside-down support for said dispenser.

3. A squeeze-to-use dispenser comprising:

(a) a cylindrical squeeze-type container with flexible walls;

(b) a removable spouted end closure in such combination with said container that any contents of the latter are discharged through the spout in said end closure when the dispenser is held in discharge position and its flexible container walls squeezed;

(c) a plurality of radial, fin-like external dispenser support members attached to and extending through the wall of the squeeze-type container; and

(d) means suitable for rupturing a thin membrane fixedly secured within said squeeze-type container, said means comprising internal extensions of said plurality of radial, fin-like external dispenser support members extending through the wall of the squeeze-type container;

(e) said internal extensions of said external dispenser support members meeting at the axis of said squeeze-type container to form an apex there at pointed toward the aforesaid spouted end closure of said dispenser.

4. In a squeeze-to-use dispenser comprising a squeeze-type container having a flexible wall and an open end, a removable closure mounted on the open end of said container, said closure containing a discharge orifice through which contents of said container are dispensed by squeezing said flexible wall, means secured to said flexible wall providing puncturing means directed towards said open end, whereby a loaded cartridge having a frangible wall can be inserted through said open end into engagement with said puncturing means for deposit of the contents of said cartridge into said container and subsequent discharge of said contents through said orifice.

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