

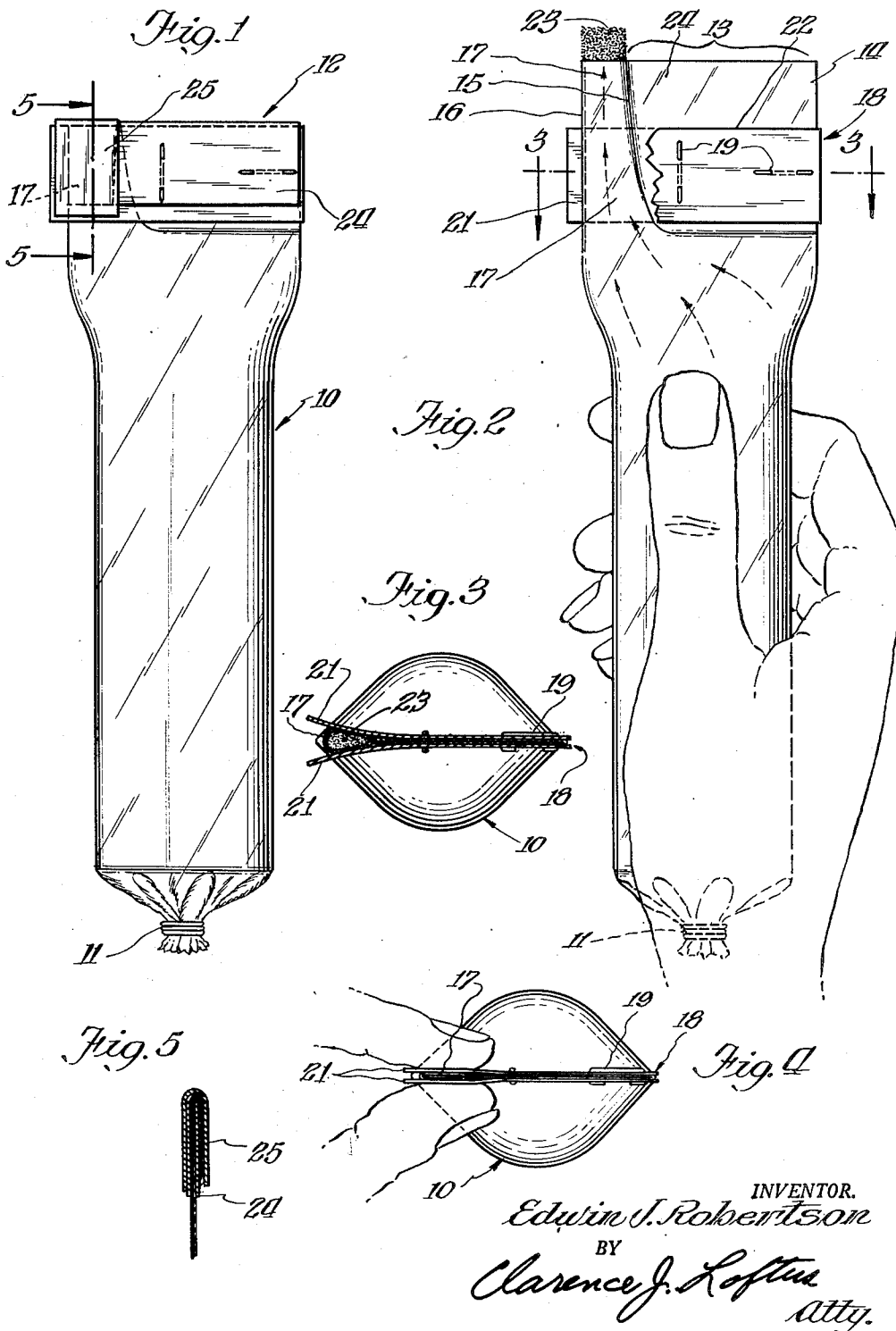
Jan. 5, 1954

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2,665,033

COLLAPSIBLE DISPENSING TUBE AND CLOSURE THEREFOR

Filed Sept. 14, 1950



UNITED STATES PATENT OFFICE

2,665,033

COLLAPSIBLE DISPENSING TUBE AND
CLOSURE THEREFOR

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Application September 14, 1950, Serial No. 184,765

4 Claims. (Cl. 222-107)

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This invention relates to dispensing devices and more particularly to a novel and improved closure for a collapsible dispensing tube.

It has been common practice in the prior art to provide collapsible tubes of tin, aluminum or plastic materials as containers for various liquid and semi-liquid commodities such as creams, cosmetics, toothpaste, etc., and a number of different types of closures have been proposed for these tubes. The conventional screw cap is commonly used, as have been various types of valve-like nozzles and injector tips. These have been unsatisfactory in certain respects, however, for several reasons.

In the first place, they have been comparatively expensive. Moreover, their design has been such that if the material is discharged from the tube in small quantities from time to time, the dispensing means is quite apt to be clogged and obstructed by solidification of the material. In other instances, the inadequate seal provided has resulted in product deterioration due to evaporation, particularly in the case of substances having volatile ingredients. This objection has been so well recognized that auxiliary imperforate metal seals are usually used for volatile materials, but even these fall short of accomplishing their intended purpose, since even if they maintain the product in salable condition only until the tube is first punctured, they do not provide adequate protection against evaporation thereafter. If the tube contents is to be used intermittently from time to time, spoilage results.

It is, therefore, the primary object of the present invention to provide a novel and improved closure for a collapsible dispensing tube which opens up an entirely new field mainly in the use and application of plastic materials as a substitute for expensive metal tubes. More specifically, it provides a closure having means for conveniently dispensing small amounts of liquid, powder, cream, paste, or semi-liquid material from a collapsible tube, with means for effecting a tight seal thereon, and means for collapsing the dispensing channel of the tube along substantially the entire length thereof to prevent the possibility of solidification of the contents of the tube in the dispensing channel and to thus prevent clogging of the dispensing channel during periods of nonuse of the dispenser.

A further object of the invention is to provide an improved closure device as indicated above, wherein the sealing devices are more airtight than those heretofore proposed, yet are more conveniently opened and closed. A still further object of the invention is to provide a closure for a collapsible tube accomplishing both of the above-mentioned aims, yet of such design and construction that it may be conveniently manufactured by the use of conventional machinery and produced in quantity by modern manufac-

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turing methods, and will be lower in cost than comparable dispensers heretofore proposed.

By the accomplishment of these objects, the present invention makes possible an extension to the use of collapsible tubes for packaging of consumer goods, which in turn results in improved sanitary conditions and lower cost in merchandising of many commodities not heretofore packaged in containers of this kind, the said dispenser being of great convenience and utility to the consumer over previous practices.

The invention will be described in connection with an illustration of the preferred embodiment thereof, shown in the drawings of the present specification, wherein:

Figure 1 is a front elevational view of a collapsible dispensing tube as contemplated by this invention, the tube being shown in closed and sealed position;

Figure 2 is a side elevational view of the tube illustrated in Figure 1, showing the closure thereof in open position to illustrate the manner in which the contents of the tube may be dispensed;

Figure 3 is a detail cross-sectional view taken substantially on the plane of the line 3-3 of Figure 2, illustrating the manner in which the closure device is automatically opened by pressure on the tube;

Figure 4 is a detail sectional view similar to Figure 3, showing the closure device in closed position; and

Figure 5 is a detail sectional view taken substantially on the plane of the line 5-5.

The form of the invention shown here is designed specifically for use in connection with a collapsible tubular dispenser 10. In the preferred form illustrated, this comprises an extruded tube of thin, transparent, flexible plastic material such as polyethylene, for example. A polyethylene tube having a thickness of one to four thousandths of an inch is satisfactory for most purposes, but thinner or heavier containers may be utilized as desired.

The lower end of the tube may be sealed in any conventional manner as by heat sealing, by the application of a crimped clamp, or by tying in the manner illustrated at 11. The upper end of the tube is provided with a dispensing device wherein the novelty of the present invention resides.

As will be apparent from Figures 2 and 4, the upper end of the tube is flattened and the opposite side walls are heat sealed together in an area 13 extending across a major part of the tube. This heat sealed section may conveniently extend from one edge 14 of the flattened tube to a line 15 spaced from the opposite edge 16 thereof so as to provide a dispensing channel 17 along one edge of the tube at its upper end. The channel 17 may be tapered as shown, or may be of uniform width throughout its length.

The heat sealed portion 13 of the tube carries a pair of transverse strips 18 secured thereon by any convenient means, as by the staples 19. These strips 18 are positioned on opposite sides of the flattened portion of the tube, so that their free ends provide a pair of resilient flaps 21 disposed on the opposite sides of the dispensing channel 17 (Figure 3). The strips 18 are conveniently formed of a paper or plastic of sufficient stiffness as to present a firm edge 22 along the outer side thereof, but are sufficiently yieldable that when pressure is exerted on the contents of the tube, the flaps 21 may flex apart and allow the material within the tube to be discharged at 23 (Figure 3). When the desired amount of the contents of the tube has been discharged, the resiliency of the end flaps 21 on the strips 18 tends to close the dispensing channel from the position of Figure 3 to the position illustrated in Figure 4. If desired, this action can be aided by pressing the flaps together with the fingers, as illustrated. This will completely close the dispensing channel 17, and discharge all material from it.

The dispensing channel may be tightly sealed by folding the end portion 24 of the tube back over one of the strips 18 and applying a spring clip 25 thereon to maintain it in position (Figure 1). This seal may be permanently maintained by applying a light spring clip or metal overset 25 thereon.

It is to be noted, however, that the clip 25 need not be clamped tightly on the tube, since any pressure exerted on the tube when closed will first tend to force material into the portion of the dispensing channel extending between the ends 21 of the transverse strips 18. This will tend to press these strips apart in such a manner as to exert closing pressure on the end portion of the dispensing channel which is held immediately under the retaining clip 25. It therefore follows that the exertion of any of the squeezing forces on the tube merely seals the discharge orifice all the tighter and eliminates the need for any screws, clamps or tightening devices.

From the above description it should be apparent that the teachings of the present invention provide a closure for collapsible tubes which is of extreme simplicity and capable of manufacture at a cost far less than the cost incident to conventional devices of this type, yet is capable of affording a more airtight seal than heretofore accomplished. It is so designed and constructed that the material in the tube may be quickly and easily discharged as required, yet will exhibit no tendency to solidify in the dispensing channel, evaporate in the tube, or otherwise deteriorate. The end of the discharge channel of the dispenser is entirely covered when not in use, and the channel is closed throughout its entire length. The closure is, moreover, of a pressure sealing type such that internal pressure on the tube contents serves only to exert increased pressure tending to hold the discharge channel thereof closed, and effectively prevents any leakage of the dispenser even when utilized for thin, non-viscous liquids.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A dispensing device comprising, in combination, an elongated, generally cylindrical tube of thin, pliable material, with one end of said tube permanently closed and the opposite end

thereof flattened and sealed to provide an integral closed section extending partially across the tube to define an expansible dispensing channel therealong; with closing means comprising a pair of thin, flat, elongated, resilient transverse strips each secured to the closed section on one side only and at a point spaced from the end of the tube and on opposite sides thereof, each of said strips having a free end flap extending across the dispensing channel and adapted to bear on the wall thereof; the end of the tube being foldable back over one of said strips to close the dispensing channel, and means for holding said end of the tube in folded position.

2. A dispensing device comprising, in combination, an elongated, generally cylindrical tube of thin, pliable material, with one end of said tube permanently closed and the opposite end thereof flattened and sealed to provide an integral closed section extending from one edge across a major portion of the tube but terminating short of the other edge thereof to define an expansible dispensing channel therealong; with closing means comprising a pair of resilient transverse strips each secured to the closed section at a point spaced from the end of the tube and on opposite sides thereof, each of said strips having a free end flap extending across the dispensing channel and adapted to bear on the wall thereof; the end of the tube being foldable back over one of said strips to close the dispensing channel.

3. A dispensing device comprising, in combination, an elongated, generally cylindrical tube of thin, pliable material, with one end of said tube flattened and sealed to provide a closed section extending partially across the tube to define an expansible dispensing channel therealong; closing means attached to said closed section having a firm edge extending transversely across the dispensing channel at a point spaced from the end of the tube, the end of the tube being foldable back over said edge to close the channel to provide a seal therefor; together with a spring clip holding said end of the tube in folded position.

4. A dispensing device comprising, in combination, an elongated, generally cylindrical tube of thin, pliable material, with one end of said tube flattened and sealed to provide a closed section extending from one edge across a major portion of the tube but terminating short of the other edge thereof to define an expansible dispensing channel therealong; with closing means attached to said closed section having a firm edge extending transversely across the dispensing channel at a point spaced from the end of the tube, the end of the tube being foldable back over said edge to close the channel.

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