Sept. 17, 1968 S. M. NEWCOMB 3,401,851

DISPENSING CLOSURE FOR RECEPTACLES

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Fig. 1

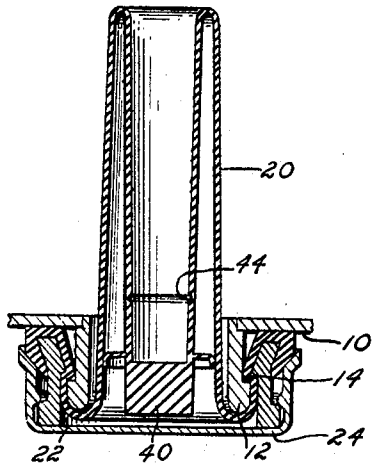


Fig. 2

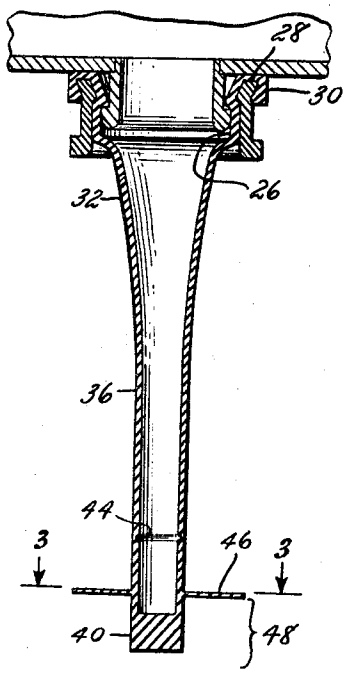
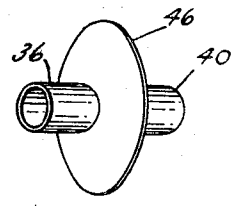


Fig. 4



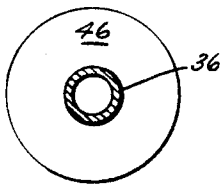


Fig. 3

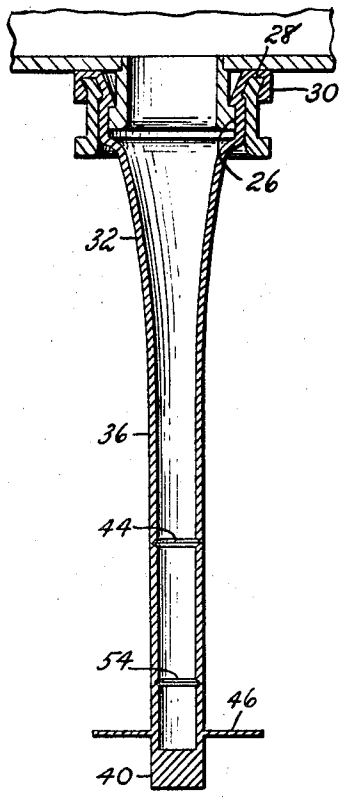
INVENTOR.
SIDNEY M. NEWCOMB
BY
Herbert Smith Sylvester
ATTORNEY

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Fig. 5



INVENTOR.
SIDNEY M. NEWCOMB
BY George H. Mortimer
ATTORNEY

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DISPENSING CLOSURE FOR RECEPTACLES

Sidney M. Newcomb, Box 41, R.F.D. 1,
East Stroudsburg, Pa. 18301

Continuation-in-part of application Ser. No. 498,592, Oct. 20, 1965. This application Feb. 17, 1967, Ser. No. 632,124
4 Claims. (Cl. 222—527)

ABSTRACT OF THE DISCLOSURE

A sanitary dispensing closure to be attached to the outlet opening of a liquid container, especially a bulk milk container, to provide a discharge nozzle of desired length that is sealed against loss or contamination of contents until discharge is desired and which is concealed within the discharge opening during shipping. The closure is made of rubber or like elastic material and comprises a thick ring to secure it to the container and a nozzle portion having one or more weakened areas near the sealed end that can be broken off at the desired weakened area by merely pulling the closed end beyond the elastic limit of the rubber at that point, or by cutting it when extended where the weakened area is easily visible.

Description

This application is a continuation-in-part of my copending application Ser. No. 498,592 filed Oct. 20, 1965, now abandoned.

This invention relates to dispensing closures for receptacles. More particularly, it relates to flexible, elastic, sanitary dispensing closures for fluid-material containing receptacles, such as bulk milk containers.

It is the purpose of this invention to form an integral, flexible, one-piece elastic closure nozzle or nipple which may be folded back upon itself during storage so as to reduce storage space and protect the closure from damage and which is provided with a circumferential weakened zone such that upon extension and positioning for use, the nozzle may readily be opened manually by severance at the readily discernable weakened zone so as to insure the formation of a nozzle of predetermined optimum uniform length. Preferably, the severing of the nozzle is accomplished by stretching it in tension beyond its elastic limit at the weakened zone, thus accomplishing severance without the need for any tools and in a completely sanitary manner.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

FIG. 1 illustrates a portion of a metal can or similar receptacle for bulk milk which carries a molded rubber dispensing closure of the instant invention, the closure being in collapsed form and enclosed for storage by a protective cover;

FIG. 2 is a cross-sectional view of the device of FIG. 1 with the protective cover removed and the closure extended into position for opening;

FIG. 3 is a cross-sectional view taken along the line 3—3 of FIG. 2 in the direction indicated;

FIG. 4 is a view in perspective of the severed end of the closure which is removed and discarded on opening of the closure; and

FIG. 5 is a cross-sectional view of another embodiment of the invention in an extended condition similar to that of FIG. 2.

Referring now to the drawings in further detail, FIG. 1 illustrates a portion of the wall **10** of a bulk container for a liquid such as milk. The wall of the container is

provided with an outwardly lipped upstanding neck **12** which is tightly grasped by an annular peripheral ridge **14** of a rubber dispensing closure **20** which is telescoped or folded back upon itself to minimize storage room requirements and to protect the closure from damage.

A metal collar **22** clamps the closure **20** over the neck **12**, and an outer protective cover **24** is positioned over the exposed portions of the closure **20**.

As shown more clearly by FIG. 2, the rubber dispensing closure **20** or nozzle constitutes an upper cylindrical segment **26** from which a terminal radial flange **28** projects outwardly. A lip **30** depends downwardly and slightly outwardly from the flange **28**, and the upper portion of the cylindrical segment **26** is thickened inwardly to form the circumferential ridge **14**.

A tapering shoulder portion **32** connects the bottom of the cylindrical segment **26** to a substantially straight cylindrical tube **36** which, for most of its length is hollow and of generally uniform cross-sectional area.

The projecting end of the tube **36** is sealed by an integral solid segment **40** which terminates the tube. At a location which is some distance, e.g., at least about one diameter of the tube, back from (but proximate to) the end of the tube which is closed by the solid segment **40**, the inner wall of the tube **36** is weakened against tensile forces by a circumferential recess **44** on the interior of the tube which preferably is at least half the thickness of the tube wall in depth. By locating the recess **44** on the inside of the tube no external recess is produced to hold soil. A flange **46** projects radially outwardly from the outer surface of the tube at a location between the recess **44** and the solid segment **40** at the closed end of the tube **36**.

The exterior portion of the tube **36** between the flange **46** and the outer end of the solid segment **40** constitutes a finger-grip **48** for manual erection and opening of the closure, this portion being of a length sufficient to be grasped and pulled easily by the finger tips, i.e. at least about one-quarter inch long. Likewise, the flange **46** forms a sanitary shield between the fingers and the remainder of the closure when the closure is so grasped inasmuch as it extends radially outwards a distance sufficient to cover the finger tips, i.e. at least about one-eighth of an inch and preferably from about three-sixteenths to one-half an inch. Reference to the drawing shows that the flange **46** of the preferred size is large enough to engage the wall of the tapered portion **32** in the telescoped or folded back position so as to help maintain the sanitary condition of the tube **36** above the flange. The flange **46** also serves the further function, of course, of indicating the portion of the closure to be grasped during opening thereof.

In use, when it is desired to remove milk from the bulk container of FIG. 1, the protective cover **24** is pried off, the finger grip **48** is grasped with the fingers, and the closure is pulled to the erect position illustrated in FIG. 2. The container is then inserted into a dispenser (not illustrated) such as is commonly provided as soda fountains, in restaurants, milk bars and the like, having an opening in its base through which the closure passes. The projecting closure further extends through a pinch clamp, e.g. in the manner shown in U.S. Patent 2,718,985, adapted to control the flow of milk after the end of the tube **36** is severed by grasping and closing the upper portion of the tube between the location of the recess **44** and the shoulder **32** during use of the closure.

In severing the end of the closure in the preferred manner, the finger grip **48** is grasped with the fingers below the shield **46** and is pulled with a force sufficient to exceed the elastic limit of the rubber wall of the tube at the circumferential recess **44** and to thus break the tube **36** at this point. When this is done, the tube is broken

readily and cleanly and the closure is opened for discharge of milk in a completely sanitary manner which precludes any contact between the interior of the dispensing portion of the tube and any cutting or severing tool or other foreign object. Alternatively, the tube may, of course, be cut to the predetermined correct length with a cutting tool by cutting it at the weakened zone, which is made readily apparent (as a necked-down portion of the nozzle) by the application of a slight tensile force to the finger grip **48**. (Preferably, of course, the tube is grasped and closed by the pinch clamp while it is being severed.)

The severed portion of the closure is illustrated in FIG. 4. This portion of the closure, once removed, is discarded.

As is apparent, the tube **36** is of predetermined length such that when severed at the weakened zone **44**, the opened tube is of correct length for use in the dispensers with which the closure **20** and the bulk container on which it is employed are used.

FIG. 5 illustrates a milk container tube which can accommodate milk dispensers (of more than one type) with requirements for differing final nozzle lengths. The nozzle of FIG. 5 is of particular utility in those instances in which a single dairy may be called upon to furnish milk container tubes of more than one length, as, for instance, in those cases in which a single dairy markets its products in two major markets, one of which requires one length of tube and the other of which requires another length of tube. In these circumstances, it is awkward and sometimes difficult for the dairy to keep track of their product packages to make certain that the proper length tube reaches a given customer.

Under these circumstances, the dispensing closure of FIG. 5 furnishes a tube of proper length to serve the needs of both types of markets, simply leaving it to the milk-serving operator to sever the tube **36** at a proper and convenient length. As is apparent, the dispensing closure of FIG. 5 differs from that of FIG. 1 in that the tube **36** is somewhat longer and, further, in that in addition to the weakened zone **44**, a second weakened zone **54** is provided.

The wall thickness at the upper weakened zone **44** is somewhat less than that of the lower weakened zone **54**, thus causing the upper zone **44** to be somewhat weaker than the lower zone **54**.

In use, the dispensing closure of FIG. 5 is handled in the same manner as that previously described in connection with the embodiment of FIG. 2, however the weakened zones **44** and **54** are pre-disposed such that the aforesaid pinch clamp (not shown) grips the tube **36** slightly above either the weakened zone **54** or the weakened zone **44**, depending upon the particular dispenser. In either case, the milk serving operator severs the portruding portion of the tube **36** at the weakened zone proximate to but below the pinch clamp.

Severance of the tube **36** of the nozzle of FIG. 5 may be accomplished either by applying tensile force to the finger grip **40** at the end of the tube in excess of the elastic limit of the wall **36** at a weakened zone as previously described, or by applying conventional cutting action at the obvious and weakened portion of the tube disposed immediately next below the pinch clamp. Cutting action is most readily carried out at this point not only because the proper point is readily apparent but also because the tube is more readily severed there.

It is apparent that in those instances in which the pinch clamp of the dispenser with which the closure nozzle is used grasps the tube **36** between the weakened zones **44** and **54**, the tube will be severed at the lower weakened zone **54** on the application of excessive tensile force to the finger grip **40**. In those instances in which the nozzle is installed in a dispenser in which the pinch clamp grasps the tube **36** above the weakened zone **44**, the nozzle **36** preferentially is severed at the weakened zone **44** on the application of excessive tensile force to the finger grip **48** because of the fact that the zone **44** is weakened to a greater extent than the lower zone **54**.

Thus, the embodiment of FIG. 5 is of benefit to the dairyman by simplifying his inventory and operating procedure, benefits the food operator by simplifying installation and severing of the dispensing closures, and benefits the consuming public by facilitating the maintenance of proper sanitary conditions.

In the instant closures, the wall thickness of the tube at the circumferential recess is correlated with both the tensile strength of the flexible elastomeric substance from which the closure is fabricated and the force with which it is gripped by the dispenser mechanism (pinch clamp) in order to insure that the tube severs in tension at a circumferential recess without fracture of the nozzle or removal thereof from the neck of the can **12** on which it is mounted.

It will be appreciated of course that in order to be self-telescoping, and to be able to slip over and grasp adequately the neck of a container, the instant nozzle desirably is fabricated from a highly elastic, resilient, flexible material such as natural rubber, synthetic rubbers, and the like. Natural and synthetic rubbers afford the additional advantages of being readily moldable, stable at sterilizing temperatures, clean-breaking under tension, and in addition being suitably soft, flexible, resilient and elastic.

The location and formation of the circumferential weakening recess is not critical, however it is apparent that it is preferred that this recess be disposed toward the outer portion of the protruding tip of the instant closure inasmuch as the material beyond the recess is normally removed and discarded once the nozzle has been opened. It is also apparent that although the recess has been shown and described as a circumferential internal recess, other equivalent weakening of the wall to tensile forces may serve the same purpose.

In the embodiment of the invention shown above, the particular construction shown has been given in an illustrative and exemplary sense and not in a limiting sense, and it is to be understood that variations of this embodiment may be carried out without departing from the inventive concept as defined by the scope of the appended claims.

What is claimed is:

1. A dispensing closure for fluent material-containing receptacles, said closure comprising a unitary body of flexible material capable of being molded, said body having a thin deformable flexible conduit portion, a solid segment integrally formed with and closing said conduit portion at one end thereof, and a circumferential weakened zone in the form of a recess on the interior of said conduit some distance back from said solid segment which permits flexing of said flexible conduit at said weakened zone without breakage but which substantially reduces the tensile strength of said conduit at the said zone and produces no external recess to hold soil.

2. A dispensing closure for fluent material- containing receptacles, said closure comprising a unitary body of flexible elastic material capable of being molded, said body having a thin deformable flexible conduit portion, a solid segment integrally formed with and closing said conduit portion at one end thereof and a plurality of circumferential weakened zones some distance back from said segment on said conduit which permit flexing of said flexible conduit at said weakened zones without breakage but which substantially reduces the tensile strength of said conduit at the said zones.

3. A dispensing closure as set forth in claim **2** in which the circumferential weakened zone disposed proximate to said solid segment is stronger than the circumferential weakened zone most remote therefrom.

4. A sanitary dispensing closure for fluent material-containing receptacles, said closure comprising a unitary molded rubber body, said body having at one end an annular peripheral portion adapted to be secured on the extremity of the neck of a receptacle, a thin, deformable tubular portion extending therefrom and terminating in a solid segment integrally formed with and closing said tubular portion at the end thereof remote from said annular peripheral portion, said tube being capable of telescoping to protect the closure from damage, a circumferential recess on the wall of said tubular portion some distance back from but near to the closed end thereof, and an annular flange projecting from the outer wall of said tubular portion between said solid segment and the portion of said wall which is weakened by said circumferential recess, said flange forming a sanitary finger guard of sufficient diameter to engage the adjacent wall

of the tube when telescoped and indicating that portion of said closed tube to be gripped and pulled by the fingers sufficiently to break said tubular portion at the weakened zone formed by the circumferential recess in order to open said closure.

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SAMUEL F. COLEMAN, *Primary Examiner.*