Oct. 20, 1936. F. W. NITARDY ET AL 2,058,251

MULTICAMERAL COLLAPSIBLE CONTAINER

Filed Dec. 29, 1934 2 Sheets-Sheet 1

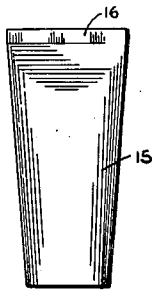


Fig. 1

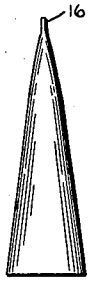


Fig. 2

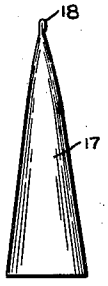


Fig. 3

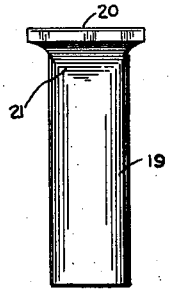


Fig. 4



Fig. 5

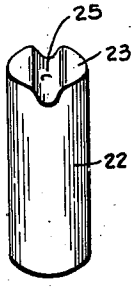


Fig. 6

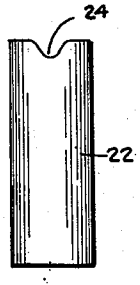


Fig. 7

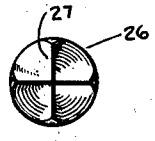


Fig. 8

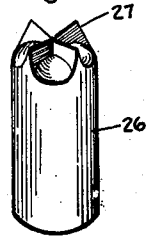


Fig. 9

F. W. Nitardy.
W. Erhard.

INVENTORS.

BY Frank Wilen

ATTORNEY.

Oct. 20, 1936. F. W. NITARDY ET AL 2,058,251

MULTICAMERAL COLLAPSIBLE CONTAINER

Filed Dec. 29, 1934 2 Sheets-Sheet 2

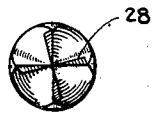


Fig. 10

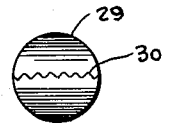


Fig. 12

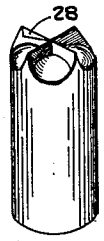


Fig. 11

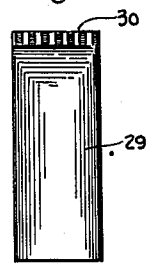


Fig. 13

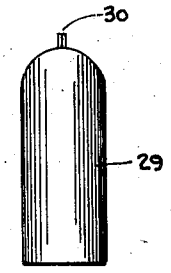


Fig. 14

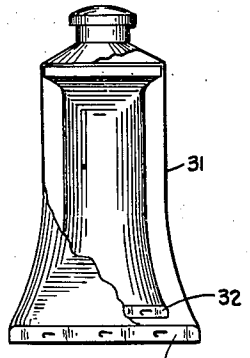


Fig. 15

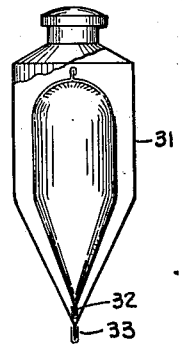


Fig. 16

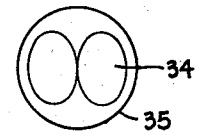


Fig. 17

F. W. Nitardy.
W. Erhard.
INVENTORS

BY Frank Wilen

ATTORNEY.

Patented Oct. 20, 1936

2,058,251

UNITED STATES PATENT OFFICE

2,058,251

MULTICAMERAL COLLAPSIBLE CONTAINER

Ferdinand W. Nitardy, Brooklyn, N. Y., and William Erhard, North Bergen, N. J., assignors to E. R. Squibb & Sons, New York, N. Y., a corporation of New York

Application December 29, 1934, Serial No. 759,696

6 Claims. (Cl. 221—60)

This invention relates to multicameral collapsible containers, particularly such as are designed to hold a different substance in each of the several chambers, the substances being kept apart until the time of use, when they are brought into mutual contact for interaction and/or concomitant dispensing.

It is the object of this invention to provide a simple and economical construction for these containers.

Multicameral collapsible containers constructed in accordance with this invention comprise an outer collapsible tube and at least one inner collapsible tube therewithin, each tube having a separate closure at its discharge end. Preferably, the discharge end of the inner tube is openable from without the outer tube; for example, (*a*) it may be made pressure-responsive by merely pressing its edges together (to give, among other possibilities, a diametric rib or a plurality of radial fins), by closing it with a single fold, by forming it with a weakened structure, and/or by applying to it an inert sealing means, such as paraffin, or otherwise, or (*b*) if it presents a relatively broad imperforate surface, it will be puncturable by a prod introduced through the opened discharge end of the outer tube or by a prod fixed to the interior of the outer tube or to the underside of its cap. The filling ends of all the tubes—the filling end herein means the end opposite the discharge end—may have a joint closure (for example, being folded together), or may be closed individually.

In one method of assembling the multicameral collapsible container, the outer tube, which may be the conventional soft-metal collapsible tube, its discharge end being closed, is partially filled in the customary manner (space being reserved for the inner tube), the filling end being left open; (*a*) the inner tube, which may be a cylindrical tube of the same material as the outer tube but of smaller diameter, its discharge end being closed, is filled, and, its filling end being left open, is inserted, discharge end foremost, into the outer tube; and the filling ends of both tubes are jointly closed; or (*b*) the inner tube, its discharge end being closed, is filled, closed in the conventional manner at its filling end, and inserted, discharge end foremost, into the outer tube; and the filling end of the outer tube is separately closed.

The understanding of the objects, advantages, and practice of the invention will be facilitated by reference to the accompanying drawings, wherein:

Figures 1 and 2 are, respectively, a longitudinal top view and a side elevation of one form of the inner tube;

Figure 3 is a longitudinal side view of another form of the inner tube;

Figures 4 and 5 are, respectively, a longitudinal top view and a longitudinal side view of still another form of the inner tube;

Figures 6 and 7 are, respectively, a perspective view and a side elevation of yet another form of the inner tube;

Figures 8 and 9 are, respectively, a discharge-end view and a perspective view of again another form of the inner tube;

Figures 10 and 11 are, respectively, a discharge-end view and a perspective view of a modification of the inner tube represented by Figures 8 and 9;

Figures 12, 13, and 14 are, respectively, a discharge-end view, a longitudinal top view, and a longitudinal side view of a modification of the inner tube represented by Figures 4 and 5;

Figures 15 and 16 are, respectively, a longitudinal top view and a longitudinal side view, partly in section, of a complete multicameral collapsible container, having an inner tube of the type represented by Figures 4 and 5; and

Figure 17 is a medial transverse sectional view of a complete multicameral collapsible container having two inner tubes.

In the drawings, 15 is an inner tube whose discharge end is closed by pressing its edges together to give a diametric rib 16; 17 is an inner tube having its discharge end closed by a single fold 18 (the corners of which may, additionally, be turned down); 19 is an inner tube having its discharge end closed by a single fold 20, the cylindricity of the tube, and therefore, its capacity, being maximized by rounding the portion adjacent to the fold, as at 21 (e. g. with the aid of a suitable internal former); 22 is an inner tube whose discharge end is closed by an integral relatively broad imperforate head 23, which may have a transverse groove 24, to serve as a passage for the contents of the outer tube in the event they are otherwise obstructed, and a small central depression 25, at which the material of the inner tube may be thinned, to facilitate puncture by a prod introduced from without; 26 is an inner tube whose discharge end is closed by pressing its edges together to give four radial fins 27 (the corners of which may, additionally, be folded over, as at 28), which, in virtue of not extending laterally beyond the walls of the tube, do not impose an upper limit on its relative diameter; and 29 is an inner tube whose discharge end is closed by a fold 30

that, being crimped (i. e. corrugated, as by means of appropriate dies), likewise does not extend beyond the walls of the tube. Outer tube **31** may be a conventional collapsible tube, with shoulder, neck, and cap (or, optionally, applicator nozzle) at its discharge end; within it is the inner tube; and the filling ends of the two may be interfolded and a clip superimposed, or they may be separately folded and clipped, as at **32** and **33**; or there may be two (or more) inner tubes **34**, which may be of predominantly oval transverse section and may be closed independently of each other and of the outer tube **35**.

To use such multicameral collapsible containers as have been described above, the closure at the discharge end of the outer tube is removed; the discharge end of the inner tube is opened (*a*) by pressing on the outer tube, which pressure is communicated to the inner tube and opens the pressed-together edges and/or the folds at its discharge end or breaks the discharge end at its weakened places, or (*b*) by introducing a prod through the orifice of the outer tube and puncturing the discharge end of the inner tube therewith; and the contents of the two tubes are brought into mutual contact and concomitantly dispensed by continued pressure on the outer tube.

It is to be understood that the foregoing examples are merely illustrative and by no means limitative of the invention, which may be variously otherwise embodied within the scope of the appended claims.

We claim:

1. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube therewithin, the discharge end of the outer tube having a closure, and the discharge end of each inner tube being closed by a fold, the discharge end of each inner tube being openable by pressure exerted from without the outer tube.

2. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube therewithin, the discharge end of the outer tube having a closure, and the discharge end of each inner tube being closed by a crimped fold, the discharge end of each inner tube being openable by pressure exerted from without the outer tube.

3. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube therewithin, the discharge end of the outer tube having a closure, and the discharge end of each inner tube being closed by pressing its edges together, the discharge end of each inner tube being openable by pressure exerted from without the outer tube.

4. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube therewithin, the discharge end of the outer tube having a closure, and the discharge end of each inner tube being closed by pressing its edges together to give a plurality of radial fins, the discharge end of each inner tube being openable by pressure exerted from without the outer tube.

5. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube, each tube having a separate and independent closure at its discharge end, and each inner tube and its closure being entirely within the outer tube, each tube containing a separate substance to be dispensed, the discharge end of each inner tube being openable from without the outer tube, and the tubes being so constructed and arranged that the contents of all of them are discharged through the opened discharge end of the outer tube.

6. A multicameral collapsible container comprising an outer collapsible tube and at least one inner collapsible tube entirely within the outer tube, the discharge end of the outer tube having a closure and the discharge end of each inner tube being closed by an integral imperforate head, each tube containing a separate substance to be dispensed, and the tubes being so constructed and arranged that the head of each inner tube is puncturable by a prod introduced through the orifice of the opened discharge end of the outer tube and that the contents of all the tubes are discharged through the opened discharge end of the outer tube.

FERDINAND W. NITARDY.
WILLIAM ERHARD.