Dec. 1, 1925.

1,563,813

G. WASHINGTON, JR., ET AL

CLOSURE FOR FLUID CONTAINERS

Filed Nov. 18, 1924

FIG 1

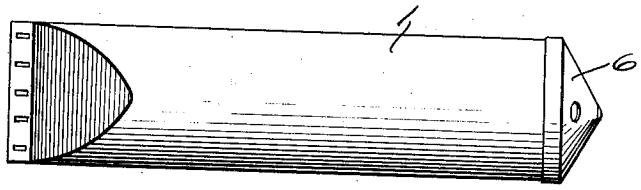


FIG 2

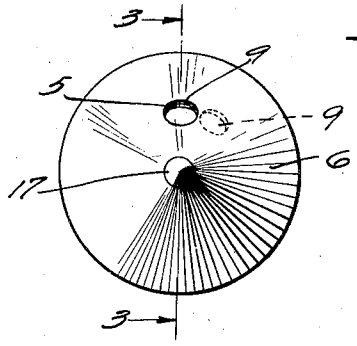


FIG 3

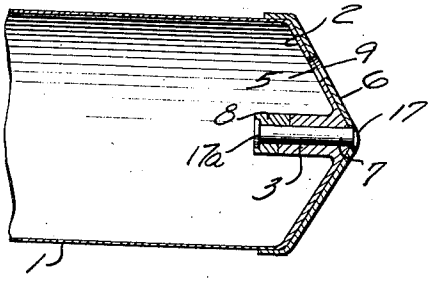


FIG 4

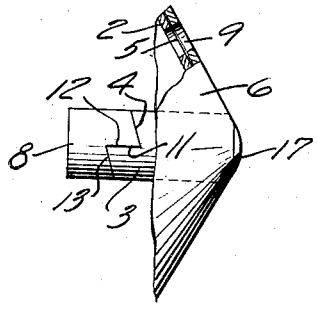


FIG 5

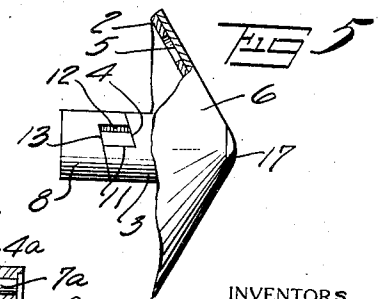


FIG 6

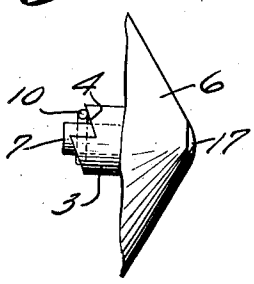
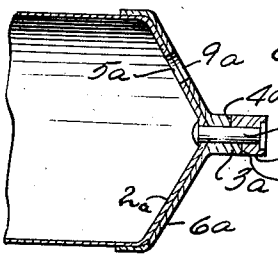


FIG 7



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UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON, JR., AND ROBERT COLLER, OF BROOKLYN, NEW YORK.

CLOSURE FOR FLUID CONTAINERS.

Application filed November 18, 1924. Serial No. 750,540.

To all whom it may concern:

Be it known that we, GEORGE WASHINGTON, JR., and ROBERT COLLER, citizens of the United States of America, residing at borough of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Closures for Fluid Containers, of which the following is a specification.

Our invention relates generally to containers for fluid materials such as toothpaste and is designed to produce cheap and efficient means for effecting alternately a fluid tight closure of the discharge orifice of the container, or a free opening of said orifice. The best form of apparatus at present known to us for carrying out our invention, together with certain modifications thereof, are illustrated in the accompanying sheet of drawings in which,

Fig. 1 is a side view of an ordinary form of collapsible tube container to which our invention has been applied.

Fig. 2 is an end view thereof showing the parts in position of opening of the discharge port in full lines and of closure in dotted lines.

Fig. 3 is a longitudinal section, on line 3—3 of Fig. 2, parts being broken away.

Fig. 4 is a detail of the closure means in open position, parts being shown in section and other parts broken away.

Fig. 5 is a similar detail showing the parts in closed position, and

Fig. 6 and Fig. 7 illustrate possible modifications of certain elements of the general combination.

Throughout the drawings like reference characters indicate like parts.

1 is a collapsible tube having a reinforced end wall 2 which is perforated at 5 to form a discharge port for the contained paste or other fluid contents when said perforation is left unobstructed and the tube 1 is subjected to external pressure in the usual way. 3 is a sleeve which, in the preferred embodiment of our invention here shown in Figs. 1 to 5, is formed on, or attached to, the inner surface of end wall or head 2, its axis coinciding with that of tube 1, and said head having an opening forming a continuation of the bore of said sleeve 3. The inner end of sleeve 3 is cut or shaped to form a section of a helix shown at 4.

The exterior cap 6 is mounted on a shaft 7 which is journaled in sleeve 3 and 8 is a button fast on the inner end of said shaft, which button has its inner face cut or shaped to form a section of a helix 13 corresponding to that formed on the inner end of sleeve 3 at 4. The shaft 7 may be conveniently fastened in cap 6 by upsetting one end of said shaft, as shown at 17, and the button 8 may be similarly fastened on the other end of shaft 7 by upsetting that end, as shown at 17^a. The cap 6 has a perforation 9 so placed in it as to register with port 5 in tube head 2 when the cap and button 8 are in the relative positions shown in Figs. 3 and 4, and in full lines in Fig. 2, which positions relieve the opposing inclined surfaces of helices 4 and 13 from any force pressing one upon the other, and consequently relieve pressure between cap 6 and head 2. This position of perforation 9 leaves discharge opening 5 unobstructed so that any desired portion of the contents of tube 1 may be ejected therethrough. The oppositely facing shoulders marked 11, on the end of sleeve 3, and 12 on the button 8, cooperate to form a stop against further rotation of cap 6 in a counter clockwise direction (looking at Fig. 2) after perforation 9 and discharge port 5 are thus in registry. When, however, cap 6 is rotated in a clockwise direction into a position indicated in Fig. 5, and in dotted lines in Fig. 2, perforation 9 is swung out of registry with port 5, and, as the action of the helical surfaces 4 and 13 has then pulled cap 6 down tightly on tube end 2, a liquid tight closure of discharge port 5 is thereby effected.

Obviously various other arrangements of projections carried by the central portions of cap 6 and tube head 2 could be devised to secure the results above described so long as one of these projections presented an inclined face to be wedged against the other and so pull or force the cap 6 against the tube head when said cap is turned to close discharge port 5. Thus, as shown in Fig. 6, the radial pin 10 set in shaft 7 may take the place of button 8. Also the arrangement of parts may be reversed, as shown in Fig. 7, where 7^a is a shaft projecting from the exterior of head 2^a having a port 5^a on which shaft cap 6^a having perforations 9^a is journaled by means of sleeve 3^a on the outer end of which the helical surface 4^a is formed co-

operating with a similar surface 13ª on the inner face of button 8ª, which button is fast on the outer end of shaft 7ª.

In this transposition of certain parts of the combination the sleeve 3 of Figs. 3 to 5 extending inwardly from tube head 2 is transformed into sleeve 3ª of Fig. 7 extending outwardly from cap 6, and the shaft 7 extending inwardly from cap 6 is transformed into the shaft 7ª extending outwardly from tube head 2, but these rearranged elements of the combination work together to produce the same result as before and in the same way.

It is to be understood, of course, that in all these forms the pitch of the helix or other cooperating inclined surface or projection is to be made so small that the wedging action of the cap against the tube end will be sufficiently great to hold the parts in closed position with the existing coefficient of friction between the cap and tube end.

The principal advantages of this invention result from the concentration of both the wedging means for closing position, and the stop means for open position at the center of the cap, as this conduces to rigidity of construction, cheapness of manufacture, ease of assembly and certainty of producing the desired fluid tight closure of the discharge orifice.

While our invention is usually applied to fluid containers, it can, of course, be used on containers for powdered material.

Having described our invention, we claim:

1. A closure device for fluid containers and the like, which device comprises a rigid wall section for the container provided with a discharge port and having a sleeve which tends inwardly from a projection in said wall and has its inner end shaped to form a section of a helix, combined with a cap adapted to closely fit the exterior of said rigid wall section provided with a perforation adapted to register with the discharge port in said wall section and rigidly mounted on a shaft journaled in said sleeve, the inner end of said shaft having a radial projection adapted to engage the helically shaped inner end of said sleeve, whereby, when said cap and shaft are rotated in a direction to swing said cap perforation out of registry with said discharge port, said projection from the shaft rides up the inclined surface of the inner end of said sleeve and thereby pulls said cap against the container wall and forms a fluid tight closure of the said discharge port.

2. A combination such as set out in claim 1 in which said radial projection on the cap shaft comprises a button, the inner face of which forms a section of a helix cooperating with that on the inner end of said sleeve.

3. A tubular container for fluid materials having a perforated end with a sleeve attached to said end in line with said perforation and a cap for said end mounted on a shaft which is journaled in said sleeve, said shaft and sleeve being each provided with cooperating surfaces similarly inclined to a plane to which the common axis of both said shaft and sleeve is perpendicular, and said tube end and cap being both provided with delivery openings adapted to register one with another when the cap is rotated to relieve said inclined surfaces from pressure one against the other but to swing out of registry when the cap is rotated to produce pressure between said inclined surfaces and thereby pull said cap tightly against said end of the container.

4. A combination such as set out in claim 3 in which said inclined surfaces terminate in shoulder sections adapted to engage and act as a stop at a predetermined point against further rotation of said cap in the direction relieving pressure between said surfaces.

5. In a container for fluid materials having a port in its wall for discharge of the contents and a rotating cap provided with a perforation adapted to be swung into or out of registry with said port, the combination, with said container, of means for pressing said cap tightly against said container wall when said port and perforation are out of registry, which said means comprises a projection extending from the container wall in a line perpendicular to the plane of rotation of said cap, about the axis of which projection the cap rotates, and cooperating engaging elements carried one by said projection and the other by said cap, one of said elements having an inclined surface adapted to produce a wedging action against the other when the cap is rotated in a predetermined direction.

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