

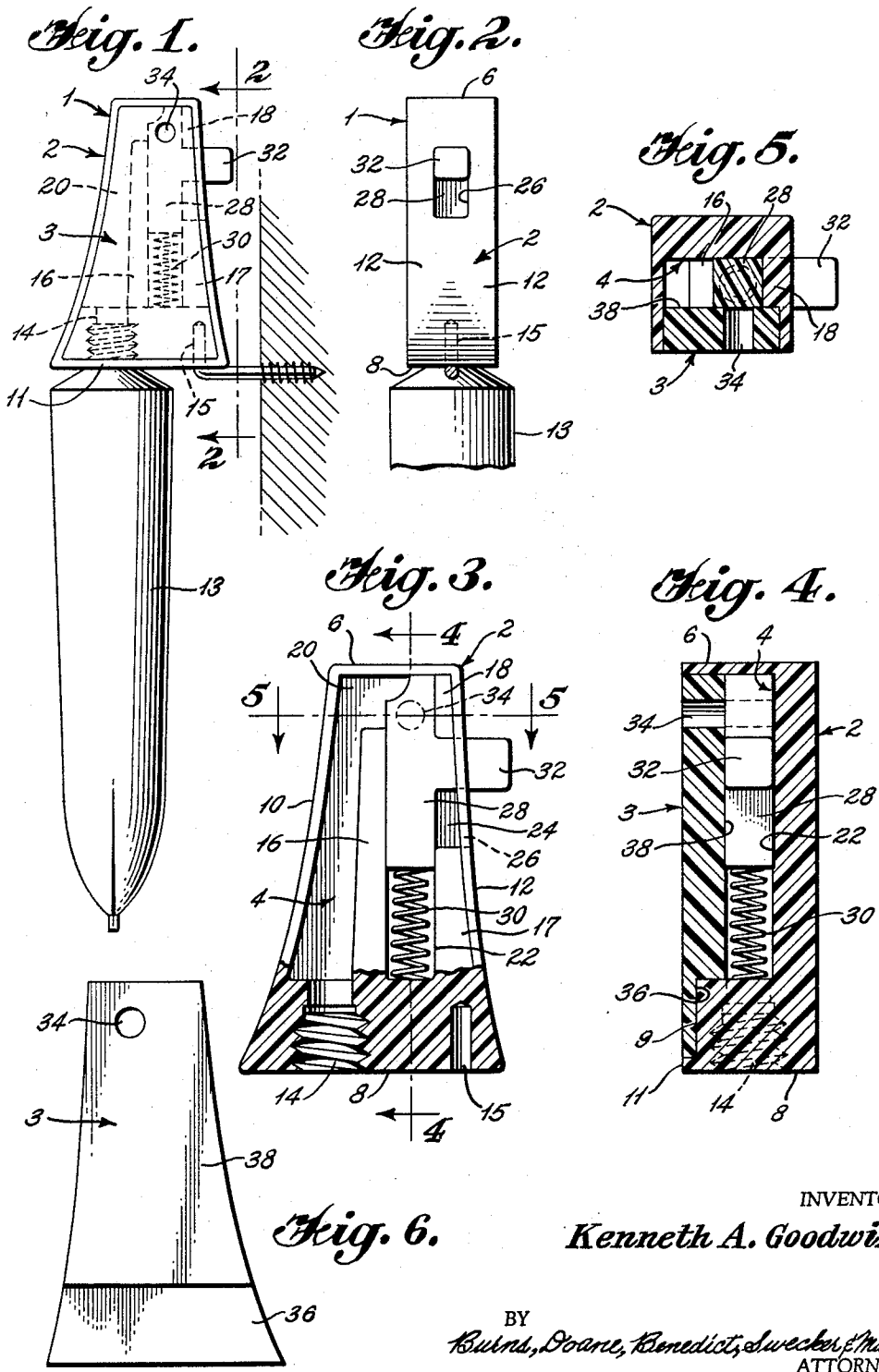
Aug. 25, 1964

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3,145,886

SELF-CLOSING CAPS FOR COLLAPSIBLE TUBES

Filed April 10, 1962



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3,145,886

SELF-CLOSING CAPS FOR COLLAPSIBLE TUBES

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Filed Apr. 10, 1962, Ser. No. 186,385

2 Claims. (Cl. 222-511)

This invention relates to self-closing caps for collapsible tubes.

There has been a long felt want in the industry for a suitable self-closing cap for toothpaste tubes or other such collapsible type tubes which would be practical and economical to manufacture. A cap of this nature must also be capable of being cleaned easily so that the cap may be reused as often as desired. It must be constructed in such a manner so that it may be produced in large quantities and at very low cost.

Such a cap may be given away with the toothpaste or other material contained in the collapsible type tubes as an inducement to buy the product. The cap may display advertisement for the firm manufacturing the product. Also, the cap may include advertising indicia of a firm which gives the item away as an advertising stunt.

While there have been endeavors to produce such a cap, none of the devices heretofore known have become practical in use.

It is an object of this invention to provide a self-closing cap for collapsible containers which can be manufactured quickly and economically.

It is another object of this invention to provide a self-closing cap for collapsible containers which is practical in use and is durable.

It is still a further object of this invention to provide a self-closing cap for collapsible containers which can be cleaned easily for reuse.

These and other objects of the invention may be accomplished by one embodiment of the invention which is comprised of a self-closing cap having two sections which form the body of the cap. One section, which may be molded or stamped of plastic or suitable metal, has walls defining a cavity with projections in the cavity forming several channels therein. One of the walls of this member is apertured to receive threadably the head of a conventional collapsible tube. A first one of the channels cooperates with the threaded aperture to provide a passageway for material from the tube into the cap body.

The second member, which also may be molded or stamped from plastic or suitable metal, consists of a substantially flat plate like member having a discharge opening at its one end and a recess at its other end. This member conforms to the shape of the cavity defined by the walls of the first member. The discharge opening, when the two members are assembled, overlies a portion of the first channel.

A closure member may be provided, which in the preferred embodiment, may be rectangular and is positioned in the second one of said channels in the first member. A spring may be supported in the second channel between one end of the closure member and the adjacent wall of the first member. The closure member is urged by the spring into a closed position underlying the discharge opening of the second member.

A projecting finger piece is provided on the closure member to enable it to be moved rearwardly against the action of the spring to connect the discharge opening with the first channel thus permitting the material to flow from the tube through the channel and outwardly through the discharge opening. When the finger piece is released the spring will urge the closure member to its closed position thus cutting off the flow of material.

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This embodiment of the invention is illustrated in the accompanying drawing, in which:

FIGURE 1 is a side view of the cap secured to a tube and supported on a hook with the internal features shown in broken lines;

FIGURE 2 is a view taken along line 2-2 in FIGURE 1;

FIGURE 3 is a side view partially in section of the cap with one side member removed;

FIGURE 4 is a sectional view taken on line 4-4 in FIGURE 3;

FIGURE 5 is a sectional view taken on line 5-5 in FIGURE 3; and

FIGURE 6 is a view of the inner surface of the one member.

The self-closing cap 1 is comprised of a first body member 2 which is illustrated as being of plastic and may be formed by molding in one piece. Any suitable material may be used and instead of molding this portion may be stamped, if preferred.

The first body member 2 is formed with a cavity 4 therein surrounded by extending portions which form the top, bottom, and side walls 6, 8, 10 and 12 respectively of the cap 1. The top wall 6 is somewhat shorter than the bottom wall 8. The side walls 10 and 12 extend in diverging sloping relation from the top wall 6 to the bottom wall 8.

The bottom wall 8 has a thickness at least equal to the length of the threaded top of a conventional collapsible tube. The bottom wall 8 has a recess 9 which forms a boss 11 along the outer edge thereof.

The bottom wall 8 has an elongated aperture 14 extending therethrough, a portion of which is threaded to receive the head of a conventional collapsible tube 13, as shown in FIGURE 1. The bottom wall 8 also has a bore 15 extending therein which is adapted to receive a hook or other suitable means for securing the cap 1 with a tube 13 attached thereto to a wall or other supporting surface. This provides a convenient manner in which to store the toothpaste tube when not in use.

There are, in the cavity 4, projections 16, 17 and 18 which are formed integrally with the body member 2. The projection 16, the side wall 10, and the top wall 6 define a substantially L-shaped channel 20 in the cavity 4. The projections 16, 17 and 18 define an elongated channel 22. The projections 17 and 18 are spaced apart defining an opening 24 which communicates with an opening 26 in the side wall 12 of the first body member 2.

It will now be understood that the body member 2 may be formed as an integral unit as by molding or stamping or in any other suitable manner.

A closure member 28 is slidably disposed in the channel 22 and is substantially rectangular in cross section to fit rather snugly in the channel 22. A spring 30 is disposed in the channel 22 between the end of the closure member 28 and the bottom wall 10. The spring 30 presses against the end of the closure member 28 and urges it against the top wall 6. A finger piece 32 extends outwardly from the closure member 28 through the openings 22 and 26 to provide means for manually manipulating the closure member 28.

The second body member 3 consists of a substantially flat plate like member of the same material as the first body member and has a discharge opening 34 adjacent one end thereof. The member 3 conforms in shape substantially to the shape of the cavity 4 defined by the walls 6, 8, 10 and 12 of the first body member 2. One end of the body member 3 is provided with a recess 36 on its one surface thereof to cooperate with the bottom wall 8 and the boss 11 on the first body member, as

best seen in FIGURE 4. The second body member 3 may be inserted within the cavity 4 defined by the walls of the first body member 2 and secured to the walls by fusing or by applying suitable adhesive means.

When the cap has been assembled, the discharge opening 34 overlies the short leg portion of the L-shaped channel 20. The inner surface 38 of the member 3 abuts the projections 16, 17 and 18 to separate entirely the various channels formed by said projections. The closure member 28 in its normal position underlies and closes the discharge opening 34. When the closure member 28 is manually moved rearwardly against the spring 30, the discharge opening 34 communicates with the L-shaped channel 20 to permit passage of material from the tube 13 through channel 20 and outwardly through the discharge opening 34. On release of the finger piece 32 of the closure operator 28, the spring 30 urges the closure member 28 into position under the discharge opening 34 to close it from the L-shaped channel 20 thus stopping the dispensing of material therefrom. The end of the closure member 28 may be somewhat arcuate in shape so as to create a self-cleaning action as the closure member 28 moves across the discharge opening 34.

It will now be understood that the parts of this self-closing cap may be economically and quickly manufactured and assembled. The cap consists of only four parts—a first body member, a second body member, a closure operator, and a spring. The spring may be of any suitable type. Since the closure member 28 is substantially the same size in cross section as the cross section of the channel 22 the spring 30 is completely encased within the channel and therefore it is impossible for the material from the tube to get to the spring 30.

The bore 15 provides means for hanging the cap with the attached tube to a wall or other supporting surface as shown in FIGURE 1.

It will be noted that there is only one moving part in the cap disclosed in this embodiment of the invention.

Also it is an important result obtained by applicant's construction that this one moving part is well protected. In the event the cap is dropped accidentally, the slidable closure member is enclosed in the cap, thus protected against breakage. The only exposed portion of the operating means is the small finger piece 32.

This is another feature of applicant's invention which results in a very practical and desirable self-sealing cap.

When the cap is to be cleaned, it is necessary for a person to merely move the closure member rearwardly, against the spring, to its open position and place the cap under a stream of water so that the water will enter the threaded aperture 14 and pass through the channel 20 and out of the discharge opening 34 carrying therewith any material remaining in the channel.

While the invention has been illustrated and described in a preferred embodiment, it is recognized that other variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. A self-closing cap for collapsible tubes comprised of a first member having walls formed integrally therewith defining a cavity in said member, projections in said cavity formed integrally with said member defining channels in said cavity, one of said channels being substantially L-shaped and the other being elongate, one

of said walls having a threaded aperture therein adapted to receive the threaded discharge head of a collapsible tube, said aperture communicating with said L-shaped channel and adapted to permit passage of material there-through, a closure member slidably mounted in said elongate channel, spring means supported in said elongate channel in abutting engagement with said closure member, a finger piece on said closure member, a second plate-like member conforming to the shape of the cavity defined by the walls of the first member and having an aperture adjacent one end thereof, the other end of said second member having a recess therein adapted to engage with the apertured wall of said first member, said second member being secured to the walls of the first member with the opening overlying said closure member so that when said closure member is moved against the spring said opening will cooperate with said L-shaped channel to permit passage of material there-through, and said closure member having an arcuate shaped end portion so as to create a self-cleaning action as the closure member moves across said opening.

2. A self-closing cap for collapsible tubes comprised of a first member having walls formed integrally therewith defining a cavity in said member, projections in said cavity formed integrally with said member defining channels in said cavity, one of said channels being substantially L-shaped and the other of said channels being elongate, one of said walls of said first member having a threaded aperture therein adapted to receive the threaded discharge head of a collapsible tube, said aperture communicating with said L-shaped channel and adapted to permit passage of the material therethrough, a closure member slidably mounted in said elongate channel, a spring supported in said elongate channel in abutting engagement with said closure member, a further one of said walls of said first member having an elongated slot therein, a finger piece on said closure member extending outwardly through said elongate opening, a second member substantially planar and conforming to the shape of the cavity defined by the walls of said first member, said second member having an aperture adjacent one end thereof, the other end of said second member having a recess therein adapted to engage a wall of said first member, said second member being secured to the walls of the first member with the opening therein forming a discharge opening directed laterally of said L-shaped channel, said closure member being movable from a position underlying the opening of said second member to a position remote therefrom to permit passage of material outwardly through said discharge opening, said spring normally acting to move said closure member to its position underlying said discharge opening when said finger piece is released, said closure member having an arcuate shaped end portion so as to create a self cleaning action as the closure member moves across said discharge opening, and said first member being provided with a bore to receive support means for supporting the cap and tube secured thereto.

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