UNITED STATES PATENT OFFICE

2,638,250

AUTOMATIC DISPENSER FOR COLLAPSIBLE TUBES

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Application January 12, 1948, Serial No. 1,385

15 Claims. (Cl. 222—95)

This invention relates to a dispensing device and particularly to improvements in an automatic dispenser for use with collapsible tubes containing semi-fluid or plastic materials.

An important object of this invention is to provide an improved dispensing device for automatically expelling the contents of a tube when the discharge outlet is opened. Another important object of this invention is to provide a novel enclosure or jacket into which a flexible collapsible tube containing plastic material, such as toothpaste or shaving cream, may be inserted and used to evenly expel the content material therefrom. A further important object of this invention is to provide an enclosure or jacket of this character which is self-operable to squeeze the tube and progressively discharge the content material thereof when the outlet is opened.

The self-operable jacket or enclosure of this invention is especially adapted for discharging content material from a tube or container of which the wall thereof is formed of thin flexible material, and an important object of this invention is to provide a novel combination of elements consisting of the self-squeezing jacket and a transversal clamping plate of this character enclosed therewithin.

In carrying out the invention, the novel jacket is formed and arranged to enclose a collapsible portion of a collapsible tube therewithin. The jacket exerts a compressible force or pressure on the tube preferably progressing in strength from the forward discharge end of the tube toward the rear sealed end thereof, so that when the discharge outlet is opened the content material is evenly advanced through the tube and out of the discharge outlet, the amount of which expelled can be controlled by the length of time the user allows the outlet to be opened. There is preferably associated with the jacket a novel pressure clamp which is operable by the user to assist in moving the content material toward the discharge opening. In use the novel clamping implement is initially assembled around the jacket over the flattened end of the tube and is so constructed as to assert a compressible force on the casing or jacket and thereby assist the latter in squeezing the content material toward the discharge outlet. This clamp is optional in use and may be employed when the content material of the tube is heavy or solid enough to require additional manual pressure for squeezing the tube.

Various other objects, advantages and meritorious features of the invention will become more fully apparent from the following specification, appended claims and accompanying drawings, wherein:

Fig. 1 is a perspective view illustrating a jacket or casing of this invention having enclosed therewithin a collapsible dispensing tube and assembled pressure clamp.

Fig. 2 is a plane right hand end view of this invention showing the parts thereof in full line prior to the insertion of a collapsible dispensing tube and showing in dotted outline the position of the casing or jacket after the tube is inserted therein.

Fig. 3 is a right hand end view of the casing or jacket with a collapsible tube therein having an automatic cut-off cap, and

Fig. 4 is a back view of the pressure clamp.

The dispensing device of this invention comprehends a collapsible casing or jacket generally indicated at 10 into which a dispensing tube of the character of conventional toothpaste and shaving cream tubes is insertable. Preferably associated with the casing or jacket 10 is a manually operable squeezing or clamping member generally indicated at 14 which is capable of traveling over the outer surface of the jacket and assisting the latter in expelling the content material from the dispensing tube.

The casing or jacket 10 is composed of material that will enable it to be formed so that the walls thereof will exert a compressible squeezing force upon the tube therewithin. The tube jacket is formed with two side wall sections indicated at 16—16 which prior to the insertion of the tube lay flat together as shown in full line in Fig. 2. The two opposing walls 16—16 are integrally connected together at each of their opposite sides margins by a rolled portion indicated at 10. The marginal portions 10—10 of the jacket or casing cause the side wall portions 16—16 to exert an inward pressure so that they normally tend to collapse together in substantially face-to-face contact in the manner shown in full line in Fig. 2. Throughout the length of the jacket, the rolled marginal portions 10—10 may be cut or notched by a series of V-shaped openings 20. These cuts 20 are spaced apart longitudinally of the jacket along each rolled portion 10—10 thereof and enable the jacket walls 16—16 to be sprung apart from one another upon manually advancing the two rolled edges toward one another. In use, the jacket is gripped in the hands so that the fingers when squeezing will draw the rolled edges 10—10 toward one another and cause the wall portions 16—16 to expand apart and assume the substantially cylin-
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The outer edges, therefore, of the rolled portions 34–34 are connected to the back plate. The inner edges of the rolled portions 34–34 are free and substantially abut one another when the clamping member is not assembled upon the jacket. However, when assembled, these portions are spread apart by the walls 16–16 of the jacket and by virtue of their rolled formation exert a yielding pressure upon these walls at all times.

The clamping member is preferably formed with means for self-locking the member in adjusted position on the jacket 10. This member is preferably accomplished by providing a pair of recesses 35–36 on each side of the slot 30 and opening therein to adjacent to the widened end portions 32 thereof. These recesses 35–36 form on each side of the slot two opposite end tongues or detents 38 and a wider tongue in the center. These tongues 38 are so related to the side walls 16–16 of the jacket that they may be releasably locked in adjusted position thereon. For this purpose, the walls 16–16 are provided with a series of bosses 40, alternating with slightly depressed areas between each pair of bosses, with which the tongs 38 intermesh and alternately hold the clamping members against backward movement in use. When moving the member toward the discharge end 26 of the jacket, the tongues 38 spring over the bosses 40 as it is advanced in step-by-step manner down the length of the jacket and catch in any one of the valleys between the bosses to releasably lock the member in adjusted position.

The tongues 38 force the clamping member 14 forward to produce a resilient forward thrust, and the resilient rolled or curved portions 33–34 support the clamping member 14 in upright transverse position by rearward thrust, which yields to manual forward pressure on the outer transverse edges of said clamping member for advancement step by step with a dragging effect, or for dismounting.

Preferably the dispensing tube has a rotatable cap 42 wherein one portion of its rotation allows the content material to discharge therefrom and in another position of its rotation acts to register with a discharge opening in the base of the head member 46. For this purpose, the member 45 is made circular in formation as shown in dotted outline in Fig. 3 to form a base upon which the cap rotates and to provide the discharge opening indicated in dotted outline at 48. When the cap is rotated in the direction in Fig. 3 the two discharge outlets or ports 45 and 50 are brought into registration for the discharge of the content material from the tube. When the cap is turned so that the two ports are out of registration, such as shown in Fig. 3, the earlier cut off the stream of content material and prevents further discharge thereof.

Preferably the action of the cap is assisted by means of a spring in the form of a flexible blade 52 interposed between one end of the head member 46 and a projecting lever or handle 54.
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formed on the cap. This blade is so constructed and mounted as to yieldingly urge the cap to cut-off position but upon manual pressure being exerted on the lever 54 will yield so that the cap may be turned to bring the ports into registration. The head member 46 as described in my former patent application is also clamped or otherwise secured to the end of the dispensing tube. This is preferably accomplished as described therein; by making the head in a channel formation having the widened intermediate portion 45 to which the cap is secured and narrow-oppositely extending channel sections 47-41. The latter are clamped to the flattened-corners portions of the tube which as described in the aforesaid application may be of triangular formation. The intermediate widened portion of the head 46 allows the side walls of the tube 12 to be spaced apart at the discharge end to permit the content material thereof to be advanced against the widened portion of the channel member for discharge through its port 50.

I claim:

1. A dispensing device for collapsible containers comprising a back plate having a narrow elongate slit through which flattened portions of a container are drawn, said back plate having resilient tongues engageable with the flattened portions of the container drawn through the slit and creating a forward thrust on the plate, said back plate having forwardly and inwardly curved resilient portions adapted to bear on the opposite sides of the container and create a resilient rearward thrust on said plate.

2. A dispensing device for collapsible containers comprising a back plate having a narrow elongate slit through which flattened portions of a container are drawn, said back plate having one or more resilient tongues on each side having resilient inward and forward thrust, counteracted by forwardly and inwardly curved portions that produce a resilient rearward thrust, said tongues and curved portions cooperating to hold the plate approximately perpendicularly to the longitudinal axis of the container for creating a squeezing pressure to expel the contents of the container.

3. A dispensing device for collapsible tubes comprising a back plate having a narrow elongated slit with one or more resilient tongues on each side having resilient inward and forward thrust, counteracted by forwardly and inwardly curved portions that produce a resilient rearward thrust, thus the tongues and curved portions cooperate to hold the plate approximately perpendicularly to the longitudinal axis of the plate first one edge then the other causing the resilient curved portions to decrease, releasing and advancing the resilience tongues dragging them from one position to another, therefor a resilient thrust on the container from the device in opposite direction to releasably lock the device against rearward movement.

4. The combination, as previously claimed in claim 3, characterized in that the plate member is operably assembled upon the rear end of the casing, adapted to create additional inward pressure, when said pressure is required, thus creating a driving element on the opposite sides of said casing through the step by step advancement thereon, said plate member acting as a releasable lock against rearward movement of the content material in the forward discharge end of the tube, said casing of resilient material, having two wall sections and two marginal portions, which are operably secured together along their side edge, substantially flat in normal position, and manually expandable to receive a collapsible portion of a collapsible tube, the casing having means of engaging the contour of said portion of the tube securing it therein, and urging itself toward its normal position collapsing said portion of the tube as its content material is expelled for use.

5. A device for expelling content material from collapsible tubes comprising, in combination, a self-collapsible casing of resilient material, having two wall sections with two marginal portions, secured together along their side edges, substantially flat in normal position, and manually expandable to a substantial circular formation, of sufficient size to encircle a collapsible portion of a collapsible tube on which it is to act, the casing having means of engaging the contour of the portion securing it therein, and urging itself toward its normal position collapsing said portion of the tube as its content material is expelled for use.

6. The combination, as previously claimed in claim 5, characterized in that the device has means of exerting a desired amount of inward pressure at one end, and a progressively lesser inward pressure as the other end is approached.

7. A device for expelling content material from collapsible tubes comprising, in combination, a self-collapsible casing of resilient material, substantially flat in normal position having two marginal portions secured longitudinally to the edges of two opposing wall sections, collapsing them upon one another, expandable to a substantial circular formation, of sufficient size to encircle a collapsible portion of a collapsible tube on which it is to act, the rear ends of the wall sections engages the flattened sealed end of the tube, the wall sections cooperating with the marginal portions through their connections, to exert a self-induced compression causing said opposing wall sections to collapse upon said portion of the collapsible tube, producing pressure thereon to expel the content material therefrom.

8. A device for expelling content material from collapsible tubes comprising, in combination, a self-collapsible casing normally substantially flat, and capable of expansion to encircle a collapsible portion of a collapsible tube, and engage its contour on opposite sides, the casing having two opposing wall sections with marginal portions, inherently resilient material joined along their side edges, thus yieldingly tending to collapse the opposing wall sections toward one another exerting pressure on the contour of said portion of the tube therein, to expel the content material therefrom.

9. A device for expelling content material from collapsible tubes comprising, in combination, a self-collapsible casing of substantially flat material, normally substantially flat, and of a length substantially equal to the body of a filled collapsible tube to be encircled therein, said casing composed of two wall sections, and marginal portions of resilient material secured thereto, being expandable to a cross sectional area, sufficient to substantially wholly enclose the body of the tube therein, the casing being formed for self-acting to collapse the side wall sections of the casing, along the contour of a portion of
the collapsible tube received therein, and automatically operable to impose a squeezing pressure thereon.

10. An article of manufacture, in combination, a self-collapsible jacket of resilient material having two opposing wall sections, and two resilient marginal portions operable integrally connected together along their longitudinal side edges, and resiliently urged toward one another by such integral side connections to a normally substantially collapsed position, said jacket having a length substantially equal to the collapsible portion of a collapsible container, and capable of being radially expanded on its longitudinal axis to encircle and conform approximately to the contour of the container therein, said marginal portions cooperatively yieldingly resisting such radial expansion, and acting to resiliently urge the wall sections to a substantially collapsed condition, to thereby exert a compressive force on the container received in the jacket, expelling the content material as required therefrom.

11. A device for expelling the contents from collapsible containers comprising, in combination, a self-collapsible hollow casing normally substantially flat of resilient material, having two opposing wall sections, and marginal portions of resilient material, integrally secured to the longitudinal side edges of said opposing wall sections, capable of manual expansion to encircle a collapsible portion of a collapsible tube, said marginal portions pretensioned to resiliently draw the opposing wall sections toward one another, to exert a self-induced compressive force on the container received therein, adapted to expel the content material as required.

12. A device for expelling content material from collapsible tubes comprising, in combination, a self-collapsible casing of resilient material, having two wall sections and two marginal portions, which are operably secured together along their side edge, substantially flat in normal position, and manually expandable to receive the collapsible portion of a collapsible tube, the casing having means of engaging the contour of said portion of the tube securing it therein, and urging itself toward its normal position, a back plate member having a narrow elongated slit with one or more resilient tongues on each side thereof, adapted to produce an inward and forward thrust when operably assembled on a flattened engaging section of the casing, the plate member having resilient curved portions producing a rearward thrust to counteract the forward thrust, thus providing means of additional inward thrust to squeeze the content material toward the discharge end of the tube, the plate member providing means of releasably locking the content material in the forward end of the tube for expelling therefrom.

13. The combination, as previously claimed in claim 12, and characterized in that the device has means of exerting a desired amount of inward pressure at one end, and a progressively lesser inward pressure at the other end is approached.

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References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>649,981</td>
<td>Nelson</td>
<td>May 8, 1900</td>
</tr>
<tr>
<td>1,654,549</td>
<td>Mohun</td>
<td>Jan. 3, 1928</td>
</tr>
<tr>
<td>1,951,544</td>
<td>Burrell</td>
<td>Mar. 20, 1934</td>
</tr>
<tr>
<td>1,989,713</td>
<td>Smith</td>
<td>Feb. 5, 1935</td>
</tr>
<tr>
<td>2,390,314</td>
<td>Massey</td>
<td>Dec. 4, 1948</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>285,745</td>
<td>Great Britain</td>
<td>Feb. 23, 1928</td>
</tr>
</tbody>
</table>