ABSTRACT OF THE DISCLOSURE

A dispenser for extracting in pre-selected quantities viscous materials packaged in collapsible containers.

Background of the invention

This invention relates to dispensers generally, and more particularly to a dispenser of the type suitable for use in removing toothpaste and other materials of similar consistency from collapsible tubes. Most toothpaste dispensers now in use are unable to deliver repetitiously uniform amounts of paste from the tube.

Furthermore, such dispensers cannot positively interrupt the flow of paste from the tube after each extraction, so as to prevent a needless waste of the contents. Dispensers for toothpaste also rarely provide a positive means for sealing the tube during non-use; thus permitting the paste to harden so as to impair operating efficiency of the dispenser and eventually render it completely inoperative.

Summary of the invention

This invention comprises a mountable case for supporting therein a collapsible container. A slidable bar gear in the case operated by a cam, drives a roller which squeezes the collapsible container and forces the contents into a discharge port. A spring loaded valve, controlling the discharge port, is operated by a lever which drives the cam, so that the valve is opened as the container is being squeezed. When the lever is released, the deforming force of the roller on the collapsible container is thereby relieved, and the spring loaded valve automatically closes the discharge port.

Brief description of the drawing

FIGURE 1 is a section view showing structural details of the applicant's dispenser with the bar gear 26 in its elevated position.

FIGURE 2 is a fragmentary section view, taken substantially on plane 2-2 in FIGURE 1, showing the U shaped lever 78 and the cam 74 on the rotary shaft 76.

FIGURE 3 is a section view, taken substantially on plane 3-3 in FIGURE 1, showing the pivoted connectors 46 attaching the operator bar 26 to the bar gear 24.

FIGURE 4 is a section view, similar to FIGURE 1, showing the operator bar 36 in its lowered position.

FIGURE 5 is a front elevation view showing the U shaped lever 78 and the two mounting flanges 16 on the case 10.

FIGURE 6 is a section view, taken substantially on plane 6-6 in FIGURE 4, showing the retractor 30 on the plunger 26.

For a more detailed description of the invention, reference is made to the drawings in which numeral 10 designates a case member. Migrated by a screw 12 secured thereto by a spring loaded hand screw 14. A mounting flange 16 on the top and bottom edges of the case 10, has spaced openings 18 therein for the reception of fasteners, not here shown. A threaded recess 20 in the bottom of the case 10 communicates with a discharge port 22.

A valve in the bottom of the case 10 comprises a transverse cylindrical chamber 24 containing a plunger 26 yieldably held over the discharge port 22 by a coil spring.

Use and operation

In practice, the dispenser may be mounted on a wall or other fixed support, either by fasteners inserted through the openings 18 in the mounting flanges 16, or by the use of a suitable adhesive applied to the case 10. The dispenser is prepared for operation by retracting the hand screw 14 and pivoting the cover 12 to the broken line position shown in FIGURE 1, so as to open the case 10. The bar gear 44 and locking bars 62 are then pushed out of contact with the roller 54 so that the latter may be ejected to the broken line position 90 shown in FIGURE 1. A collapsible container, such as the toothpaste tube 9 is then introduced into the case 10, and the discharge neck thereon secured in the threaded recess 20. The roller 54 next lowered into contact with the tube 92, and the cover 12 returned to its closed position on the case 10. A tooth brush 86 is then placed in the cavity 84 of the lever 78, as shown in FIGURE 4, and a push of sufficient magnitude applied to move the lever 78 rearwardly.

The lever 78 thereupon swings into contact with the retractor 30, which is shifted to the position shown FIGURE 4. This movement of the retractor 30 slides the plunger 26 back in the cylindrical chamber 24, as shown in FIGURE 4. A partial vacuum is thus created in the cylindrical chamber 24 thereby implementing the flow of toothpaste from the tube 92 into the space vacated by the plunger 26.
When the lever moves to its rear position, it also pivots the cam which forces the operator bar and bar gear to their lowered positions, as shown in Figure 4. The roller is thus driven counter-clockwise, as viewed in Figure 1 and 4, by the bar gear, which causes it to travel downward on the tracks and exert a deforming force on the collapsible tube. Internal pressure is thereby produced in the tube, which forces toothpaste into the cylindrical chamber when the plunger is retracted.

When the push on the toothbrush is released, the compressed resilient member forces the operator bar and bar gear into the position shown in Figure 1. The pivoted connectors thereupon assume the full line positions shown in Figure 1, which retracts the bar gear and disengages its teeth from the teeth on the roller. This disengagement permits the spring member to elevate the bar gear whereupon it again automatically engages the roller.

Upward travel of the roller is prevented by the locking bars which hold it in a squeezing engagement with the collapsible tube. As the operator bar returns to its raised position, it pivots the cam and rotatable shaft which swings the lever forward. As the lever returns to its front position, the coil spring moves the plunger so as to force the selected charge of toothpaste into the transverse cylindrical chamber through the discharge port.

Thus as the brush is drawn across the discharge port, the charge of toothpaste is deposited on the bristles of the brush. The plunger automatically closes the discharge port, as shown in Figure 1, before the brush is fully withdrawn, thereby preventing any toothpaste from being wasted. This cycle of operation is repeated until the roller has reached the broken line position in Figure 4, where the contents of the tube will have been depleted. The fully collapsed tube is then removed and replaced with a full tube in the manner previously described for placing the dispenser in operation.

Based upon the foregoing discussion, the applicant is of the opinion that his invention has fulfilled a long-felt need in the field of dispensers, and that he has accordingly made a valuable contribution to the related art. However, while the invention was described with reference to the structure details of a single embodiment, it will be appreciated by those familiar with the art that the principles involved are susceptible of numerous other practical adaptations. I therefore claim as new and desire to secure by Letters Patent:

A dispenser for extracting materials from collapsible containers having a discharge neck, such dispenser comprising a case, an upright operator bar slidably mounted in the case, such operator bar having a raised and a lowered position, resilient means yieldingly holding the operator bar in its raised position, a bar gear in the case disposed parallel to the operator bar, such bar gear also having a raised and a lowered position, transverse teeth on the bar gear having a downward rake, pivotable connectors attaching the operator bar to the bar gear, a roller in the case adapted for vertical travel, transverse teeth on the roller engageable with the teeth on the bar gear, such teeth on the roller being so inclined as to present a rake oppositely disposed to that of the teeth on the bar gear with which they engage, resilient means yieldingly holding the bar gear in engagement with the roller, at least one upright laterally movable locking bar adjacent the bar gear having teeth thereon with a downward rake, resilient means yieldingly holding the locking bars in engagement with the roller, cam means for simultaneously driving the operator bar and the bar gear to their lowered positions, lever means pivotally supported by the case for operating the cam means, such lever means having a front and a rear position, holding means in the case for receiving the discharge neck of the collapsible container, a discharge port in the holding means providing communication with the interior of the collapsible container, and a valve controlling the discharge port, such valve being actuated by the lever means when the latter is moved to its rear position so as to operate the cam and drive the roller downward to collapse the container.

2. The dispenser of claim 1 having in addition thereto a pair of spaced upright tracks in the case, and teeth on the tracks having an upward rake engaged with the teeth on the roller so as to prevent any lateral movement of the roller away from the bar gear.

3. The dispenser of claim 1 in which the valve controlling the discharge port comprises a plunger, a resilient member yieldingly holding the plunger over the discharge port, and a retactor on the plunger for engagement with thelever means when the latter is moved to its rear position so as to shift the plunger and open the discharge port.

4. The dispenser of claim 3 in which the lever means for operating the cam means comprises a rotatable shaft in the case extending through the sides thereof, and a U shaped member attached to both ends of the rotatable shaft.

5. The dispenser of claim 4 in which the cam means comprises a cam mounted on the rotatable shaft.

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