Dec. 24, 1968 S. MIRKA 3,417,902

DISPENSER FOR VISCOUS MATERIALS

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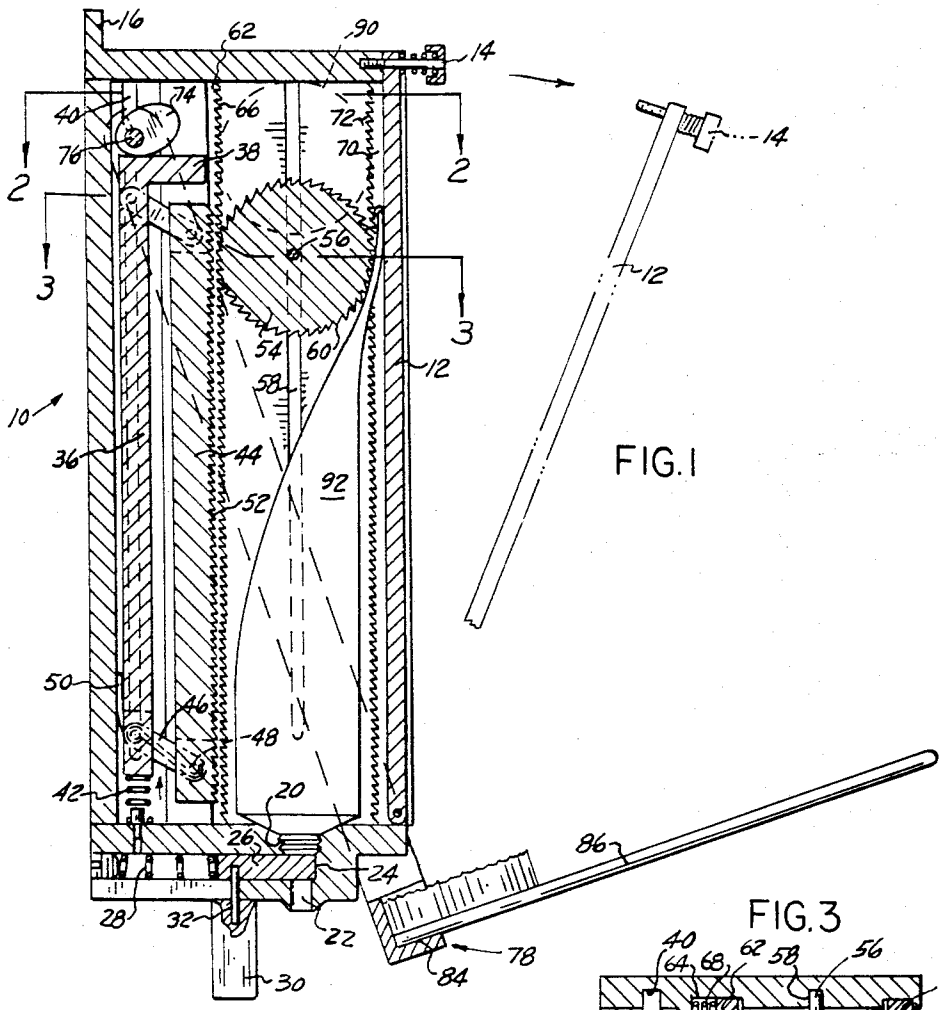

FIG. 1

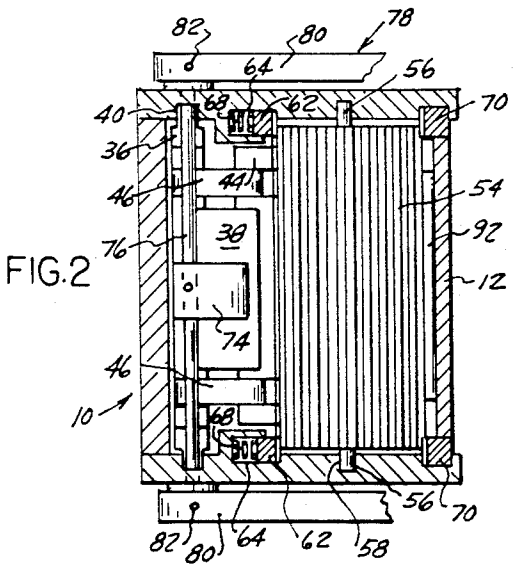

FIG. 2

FIG. 3

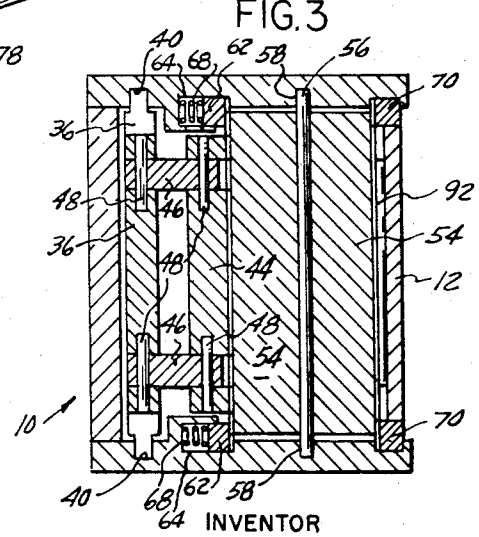

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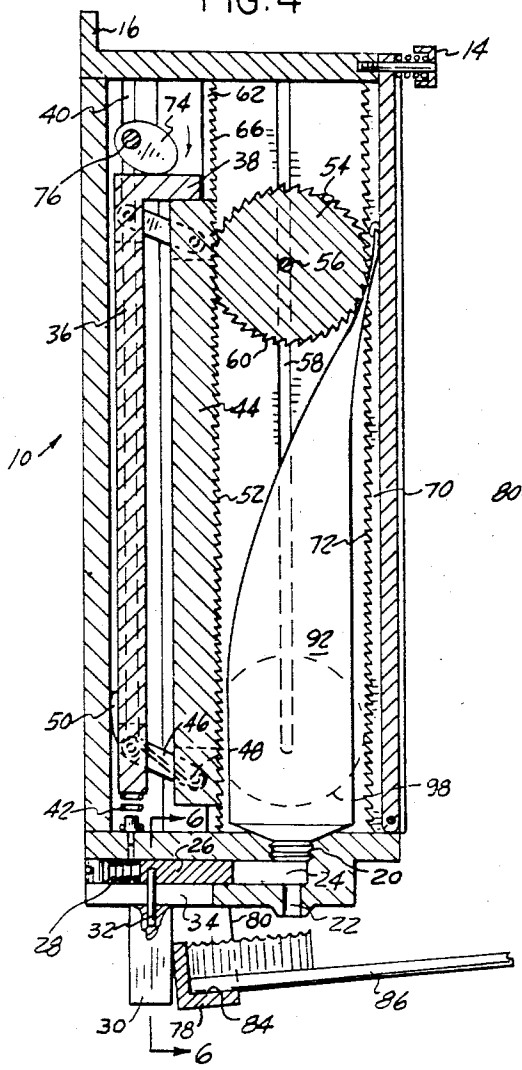
FIG. 4



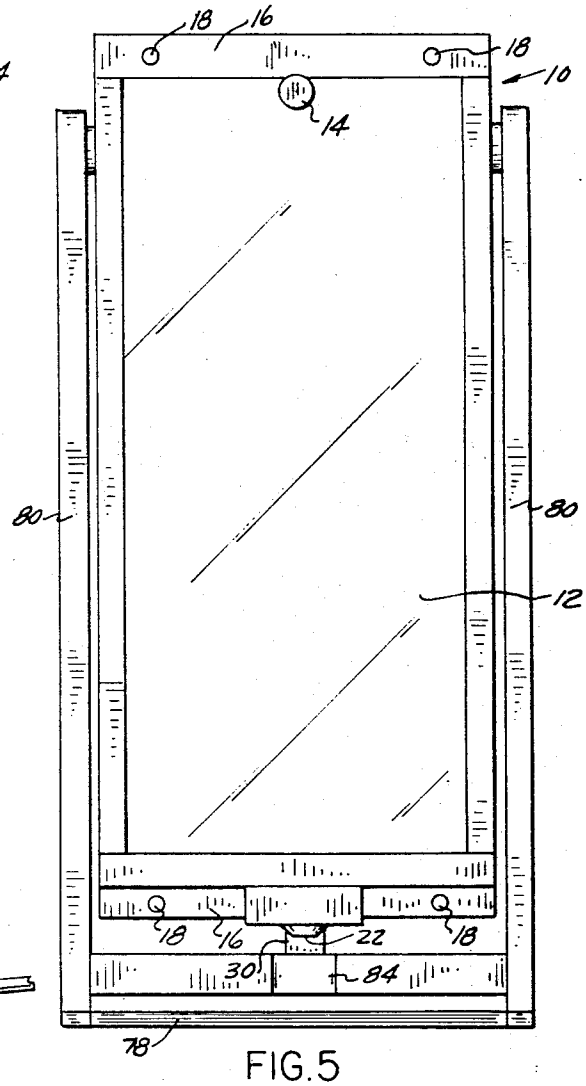
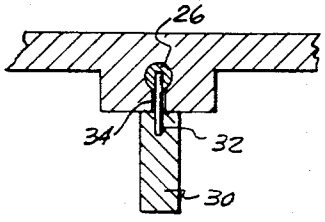


FIG. 5

FIG. 6



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DISPENSER FOR VISCOUS MATERIALS

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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 operator bar **36** 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 rotatable 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 **36** to the bar gear **44**.

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 drawing in which numeral **10** designates a case having a hinged cover **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 **28**. A retractor **30** is attached to the plunger **26** by a pin **32** which is slidable in a slot **34** provided in the bottom of the case **10**. An upright operator bar **36**, having on the top thereof an inwardly projecting seat **38**, is slidably engaged in slots **40** in each side of the case **10**, which provide upper and lower travel limits for the operator bar **36**.

A resilient member **42**, seated in the bottom of the case **10**, yieldably holds the operator bar **36** in its raised position. A bar gear **44**, adjacent the operator bar **36**, is movably attached thereto by pivoted connectors **46** supported at each end on a pintle **48**. A spring member **50** around the lower pintles **48** is so disposed as yieldably to urge the bar gear **44** away from the operator bar **36**. Teeth **52** on the outer face of the bar gear **44** are provided with a downward rake.

A transverse roller **54** has a central pintle **56** slidably retained in vertical slots **58** in each side of the case **10**. Teeth **60** on the roller **54** are so inclined as to have a rake oppositely disposed to that of the teeth **52** on the bar gear **44** with which they engage. An upright locking bar **62**, adjacent each side of the bar gear **44**, is confined for limited lateral movement in vertical slots **64** in each side of the case **10**. Teeth **66** on the locking bars **62**, have a downward rake matching that of the teeth **52** on the bar gear **44**.

Resilient members **68** in the vertical slots **64**, yieldably hold the teeth **66** on the locking bars **62** in engagement with the teeth **60** on the roller **54**. A pair of upright tracks **70**, fixed in each side of the case **10** adjacent the cover **12**, have teeth **72** with an upward rake engaged with the teeth on the roller **54**. A cam **74** bearing on the seat **38**, is fixed on a transverse rotatable shaft **76**, extending through both sides of the case **10**. A U shaped lever **78** has a pair of arms **80** attached to the ends of the transverse rotatable shaft **76** by set screws **82**.

A cavity **84** is provided in the lower end of the U shaped lever **78** for reception of a tooth brush **86**, as shown in FIGURES 1 and 4 of the drawing. The preceding discussion completes a description of the structural details of the applicant's invention; however, to comprehend more fully the subject matter herein presented, a discussion is next directed to the manner in which the dispenser is used and operated to perform its intended function.

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 elevated to the broken line position **90** shown in FIGURE 1.

A collapsible container, such as the toothpaste tube **92** is then introduced into the case **10**, and the discharge nec thereon secured in the threaded recess **20**. The roller **54** next lowered into contact with the tube **92**, and the cove **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 1, 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 in 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 **78** moves to its rear position, it also pivots the cam **74** which forces the operator bar **36** and bar gear **44** to their lowered positions, as shown in FIGURE 4. The roller **54** is thus driven counter-clockwise, as viewed in FIGURES 1 and 4, by the bar gear **44**, which causes it to travel downward on the tracks **70** and exert a deforming force on the collapsible tube **92**. Internal pressure is thereby produced in the tube **92**, which forces toothpaste into the cylindrical chamber **24** when the plunger **26** is retracted.

When the push on the toothbrush **86** is released, the compressed resilient member **42** forces the operator bar **36** upward to the position shown in FIGURE 1. The pivoted connectors **46** thereupon assume the full line positions shown in FIGURE 1, which retracts the bar gear **44** and disengages its teeth **52** from the teeth **60** on the roller **54**. This disengagement permits the spring member **50** to elevate the bar gear **44** whereupon it again automatically engages the roller **54**.

Upward travel of the roller **54** is prevented by the locking bars **62** which hold it in a squeezing engagement with the collapsible tube **92**. As the operator bar **36** returns to its raised position, it pivots the cam **74** and rotatable shaft **76** which swings the lever **78** forward. As the lever **78** returns to its front position, the coil spring **28** moves the plunger **26** so as to force the preselected charge of toothpaste in the transverse cylindrical chamber **26** through the discharge port **22**.

Thus as the brush **86** is drawn across the discharge port **22**, the charge of toothpaste is deposited on the bristles of the brush **86**. The plunger **26** automatically closes the discharge port **22**, as shown in FIGURE 1, before the brush **86** is fully withdrawn, thereby preventing any toothpaste from being wasted. This cycle of operation is repeated until the roller **54** has reached the broken line position **98** in FIGURE 4, where the contents of the tube **92** will have been depleted. The fully collapsed tube **92** 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:

1. 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 yieldably 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, pivoted 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 yieldably 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 yieldably 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 yieldably holding the plunger over the discharge port, and a retractor on the plunger for engagement with the lever 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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U.S. Cl. X.R.

141—362; 222—101