May 27, 1969 H. S. McCRAY 3,446,405

SOAP DISPENSER WITH SEVERABLE STOP STRIP

Filed Feb. 1, 1968

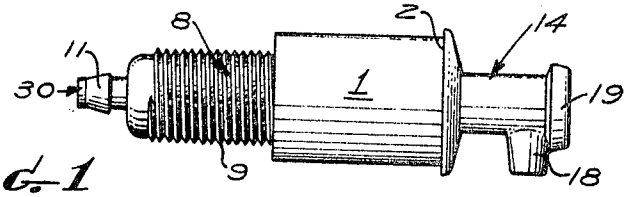



FIG. 1

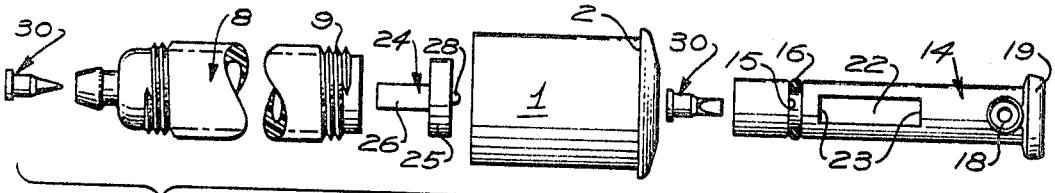



FIG. 2

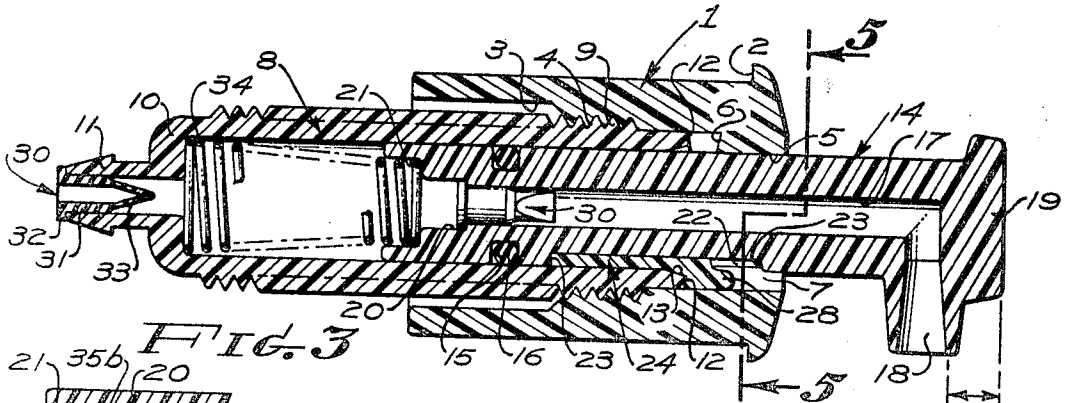



FIG. 3

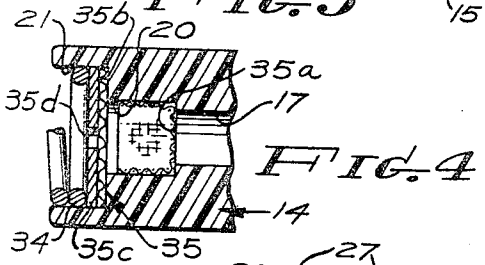



FIG. 4

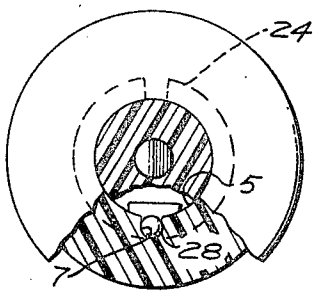



FIG. 5

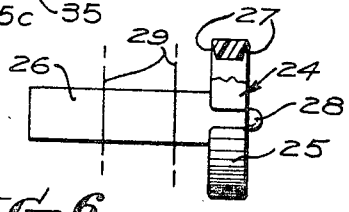



FIG. 6

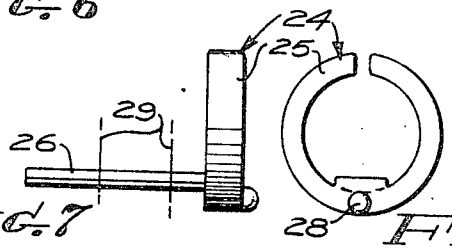



FIG. 7

FIG. 8

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United States Patent Office 3,446,405 Patented May 27, 1969



3,446,405

# SOAP DISPENSER WITH SEVERABLE STOP STRIP

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Filed Feb. 1, 1968, Ser. No. 702,277
Int. Cl. G01f 11/06, 11/16
U.S. Cl. 222—309
7 Claims

## ABSTRACT OF THE DISCLOSURE

A soap dispenser in which a liquid soap is pumped by manually engaging a pump plunger which is provided with a flow passage and nozzle arranged to discharge a predetermined quantity of soap with each stroke of the pump. The dispenser includes a stroke limiting member having a tab which may be severed so as to change the pump stroke and, hence, the quantity of soap discharged with each stroke. Also, the dispenser may be used to discharge the soap as a lather by increasing its stroke and causing air to be mixed with the soap in the pump chamber.

### *Background of the invention*

Soap dispensers of the general type herein illustrated are in common use, especially in schools, public buildings and institutions; that is, the dispensers involve a pump which includes a plunger that is hand operated and is provided with a discharge passage and nozzle so that a charge of soap may be discharged, usually onto the fingers or palm of the hand of the user.

Normally the dispensers are not sold individually, but in groups; for example, to a school board. The quantity of soap dispensed is not under the control of the user, but instead, is predetermined by the purchasers. For various reasons, such purchasers differ as to the desired volume of soap to be dispensed. Heretofore, this variable has been met by making special dispensers with the various selected stroke which cannot be changed except at the factory. This materially increases the inventory to be carried or requires the filling of special orders at extra expense.

Also, soap is dispensed as a liquid or as a lather. This has formerly required special manufacture.

### *Summary of the invention*

The object of this invention include:

First, to provide a soap dispenser which incorporates a novel stroke limiting member which may be readily altered at the factory or in the field so as to increase the stroke any desired amount.

Second, to provide a soap dispenser which is so arranged that it may be factory assembled as a liquid soap dispenser or lather soap dispenser, or readily altered in the field.

Third, to provide a soap dispenser which incorporates a novel means for holding the stroke limiting means in position.

### *Description of figures*

FIGURE 1 is a side view of the soap dispenser.

FIGURE 2 is an exploded view thereof, showing the individual parts in side aspect.

FIGURE 3 is an enlarged longitudinal sectional view.

FIGURE 4 is a fragmentary sectional view of the plunger, as it is arranged for the dispensing of a soap in lather form.

FIGURE 5 is a sectional view, taken through 5—5 of FIGURE 3.

FIGURE 6 is a side view of the stroke control member, with a portion shown in section.



FIGURE 7 is another side view thereof, taken at right angles to FIGURE 6.

FIGURE 8 is an end view thereof.

### *Specification*

The soap dispenser includes a cylindrical body **1** having a flange **2** at one end, and having a bore **3** therethrough. A portion of the bore is provided with screwthreads **4**, and the end of the bore adjacent the flange **2** is reduced in diameter to form a slide bearing **5** and to form a beveled shoulder **6**. The slide bearing is intersected by a longitudinal groove **7**.

The body **1** receives a pump barrel **8** having screwthreads **9** which mate with the screwthreads **4**. The pump barrel is provided with a reduced outer end **10**, from which protrudes a connection element **11** adapted to be forced into a plastic tube, not shown. The opposite or open end of the pump barrel is provided with a beveled end face **12** confronting the beveled shoulder **6** and the open end is tapered as indicated by **13**.

A pump plunger **14** is slidably received in the slide bearing **5** and in the open end of the pump barrel **8**. Near its inner end, the pump plunger is provided with an O-ring groove **15** which receives an O-ring **16**. The pump plunger is provided with an axial passage **17**, extending to a point near its outer end and is joined to a side nozzle **18**. The extremity of the pump plunger is enlarged, forming a head **19** for manual engagement.

The inner end of the pump plunger is provided with a small first counter bore **20**, which joins a second or larger counter bore **21**.

The pump plunger is provided along one side with a longitudinal recess **22**, forming stop shoulders **23** at its extremities.

Fitted between the beveled shoulder **6** and beveled end face **12**, and received in the recess **22**, is a stroke control member **24**. The stroke control member includes a split ring **25** adapted to be clamped between the shoulder **6** and the end face **12** and the longitudinally extending stop strip **26**, which fits within the recess **22**. The split ring **25** is provided with beveled end faces **27** which conform to the beveled shoulder **6** and the beveled end face **12**, so that when the split ring is clamped, the split ring tends to spread radially a slight amount in order that the plunger may slide freely therein. This is desirable for the reason that the stroke control member **24**, in order to be assembled on the plunger, must be slipped axially on the plunger and the split ring must be spread in order to accommodate the stop strip **26**.

In order to orient the pump plunger **14** with respect to the body **1**, the stroke control member is provided with an axially extending key lug **28**, which is received in the groove **7**.

It is intended that the stop strip **26** be so constructed that it may be cut or broken at any desired line of severance, as indicated by **29**.

The inlet or outer end **10** of the pump barrel **8** and the inner end of the pump plunger each receive a check valve **30**. Each check valve is molded of rubber or other elastomer and includes a cylindrical tubular portion **31**, having a flange **32** at one end and tapering at its other end to form a pair of mutually engageable sealing lips **33**.

A spring **34** is interposed between the pump plunger **14** and the reduced end **10** of the pump barrel, the forward end of the spring fitting within the second counter bore **21**.

It is preferred that all parts of the soap dispenser be formed of plastic material with exception of the metal spring **34**, which is plastic coated, the plastic material except for the O-ring **16** and the check valves **30** being formed of a tough fairly rigid plastic, whereas the O-ring and check valves are formed of rubber or other elastomer.

The soap dispenser is assembled by placing the check

valves **30** into the pump barrel **8** and pump plunger **14**, then inserting the pump plunger into the body **1** after placement of the O-ring **16**, then sliding the stroke control member **24** along the pump plunger until the stop strip **26** is received in the recess **22**, then manipulating the pump plunger until the key lug **28** is received in the groove **17**, whereupon the pump barrel is screwthreaded into the body so as to clamp the split ring **25**, first, however, inserting the spring **34**.

Prior to assembly, the stop strip **26** is cut to the desired length that will permit a preselected stroke of the pump plunger. In some instances, such as illustrated in FIGURE 3, a short stroke is adequate. In other cases, a longer stroke is desired and the stop strip is accordingly shortened.

If it is desired to produce a soap lather, the check valve in the pump plunger **14** is omitted and instead a set of fine screens **35** is placed in the pump plunger. The screens include a cup-shaped screen **35***a*, set in the bore **20**, a larger diameter screen **35***b*, placed in the bore **21**. The lather screens serve as an inefficient valve permitting air to be drawn in through the pump plunger, yet establishing enough pressure differential that liquid soap will be drawn into the pump barrel. This occurs during outward movement of the plunger produced by the spring **34**. When the plunger is pressed inward, the mixture of soap and air is forced through the lather screens and mixed so as to discharge as lather from the side nozzle **18**. In order to predetermine the air-soap ration, a disk **35***c* is placed between the screen **35***b* and the spring. The disk **35***c* is provided with an orifice **35***d* which meters the incoming air and as a consequence, predetermines the air-soap ratio of the lather which flows to the orifice plate and screens to the nozzle **18**.

Normally, the soap dispenser is mounted in a horizontal position, as indicated in FIGURES 1 and 3. The body **1** may be clamped in a suitable conventional fixture, or the dispenser may be secured to a conventional supporting means by nuts screwthreaded onto the pump barrel. In other cases, the soap dispenser may be mounted in a vertical position. In such a case, a modified plunger with a curved side nozzle is employed so that the soap or lather will be directed downward. Also, it should be noted that the exterior construction of the body **1** may be modified to permit other types of installation. In any case, a length of plastic tubing, not shown, extends from the pump barrel to an appropriate container of liquid soap.

I claim:

**1.** A soap dispenser, comprising:

(a) a manually operated plunger having a passageway therethrough between an inlet end and a discharge end, and a longitudinally extending recess formed in at least one side;

(b) a pump barrel having an open end to receive said plunger and an inlet end;

(c) a stroke limiting member including a ring slidably receiving said plunger and secured at the open end of said barrel, and at least one axially extending severable stop strip partially filling said recess lengthwise and engageable with the ends thereof to limit movement of said plunger with respect to said barrel;



(d) valve means controlling the inlet ends of said barrel and the passageway in said plunger;

(e) and a spring for urging the plunger toward one extremity of its stroke.

**2.** A soap dispenser, as defined in claim **1**, wherein:

(a) the ring of said stroke limiting member is split to permit said stop strip to slide over said plunger until received in said recess;

(b) a tubular body receives the joined portions of said barrel and plunger and includes a shoulder confronting the open end of the barrel to clamp said ring.

**3.** A soap dispenser, as defined in claim **2**, wherein:

(a) the open end of said barrel, the shoulder and the axial ends of said ring are beveled to cause expansion of said ring, when clamped, and permit said plunger to move freely therein.

**4.** A soap dispenser, as defined in claim **1**, wherein:

(a) said valves are formed of an elastomer and include sealing lips facing downstream.

**5.** A soap dispenser, as defined in claim **1**, wherein:

(a) said plunger valve includes foraminous members forming a multiplicity of labyrinth passages to permit leakage of air from its normally downstream side into said barrel to mix soap therein, thereby to produce a lather.

**6.** A soap dispenser, comprising:

(a) a body having a bore therethrough internally screwthreaded at one end and having a reduced end forming a clamping shoulder;

(b) a pump barrel externally screwthreaded for connection to said body and having an open end bordered by a clamping shoulder, and an inlet end of reduced size;

(c) a plunger slidable within the reduced portion of said body and extending into the open end of said barrel, said plunger having a discharge passage extending from said barrel, and also having an external recess disposed longitudinally;

(d) a stroke limiting member including a ring secured between said clamping shoulders and slidable on said plunger, and a stop strip extending axially thereof and partially filling said recess to engage the ends thereof, thereby to limit the stroke of said said plunger;

(e) a spring urging said plunger outwardly from said body and barrel;

(f) and valves disposed in the inlet ends of said barrel and plunger to effect pumping of soap through said barrel and plunger.

**7.** A soap dispenser, as defined in claim **6**, wherein:

(a) the clamping shoulders and axial end faces of said ring are beveled in a direction to expand said ring upon being clamped, thereby to expand said ring for free passage of said plunger.

**References Cited**

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STANLEY H. TOLLBERG, *Primary Examiner.*