# United States Patent [19]

**Gores**

[11] **3,739,955**

[45] **June 19, 1973**


[54] **RESERVOIR DISPENSER**


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[22] Filed: **Jan. 12, 1972**

[21] Appl. No.: **217,216**

**Related U.S. Application Data**

[63] Continuation of Ser. No. 9,235, Feb. 6, 1970, abandoned.

[52] **U.S. Cl.** ..... **222/385**

[51] **Int. Cl.** ..... **B67d 5/42**

[58] **Field of Search** ..... 222/321, 518, 580, 222/582, 509, 385, 205, 146; 128/249; 417/545, 554



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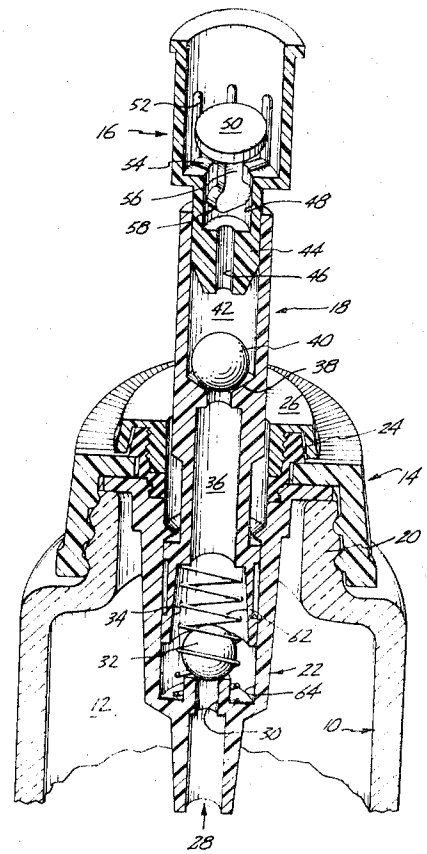
*Primary Examiner*—Samuel F. Coleman
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[57] **ABSTRACT**

A cup forms an upper portion of a manually-operable pump associated with a container from which liquid is to be withdrawn in small amounts. A disc of substantial area is mounted in the lower portion of the cup in a fixed spaced relationship over an inlet opening and spaced from bottom and lower side wall portions of the cup. Liquid flowing through the inlet opening is first diverted radially outwardly by the disc, to flow through the space between the disc and the cup bottom, and is then diverted upwardly by the cup side wall to flow through the space between the periphery of the disc and adjacent side wall portions of the cup.


**2 Claims, 4 Drawing Figures**



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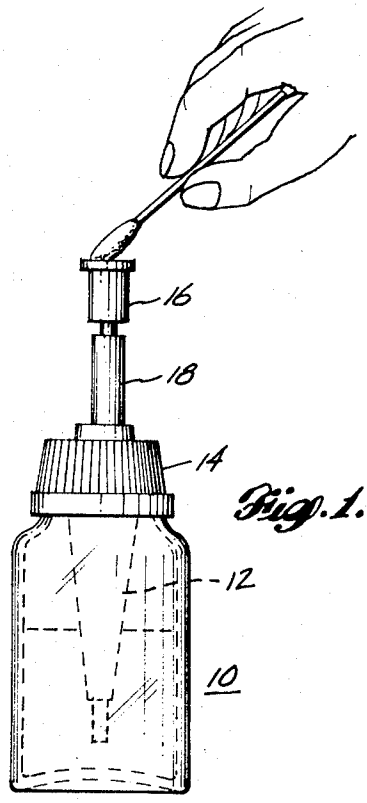



Fig. 1.

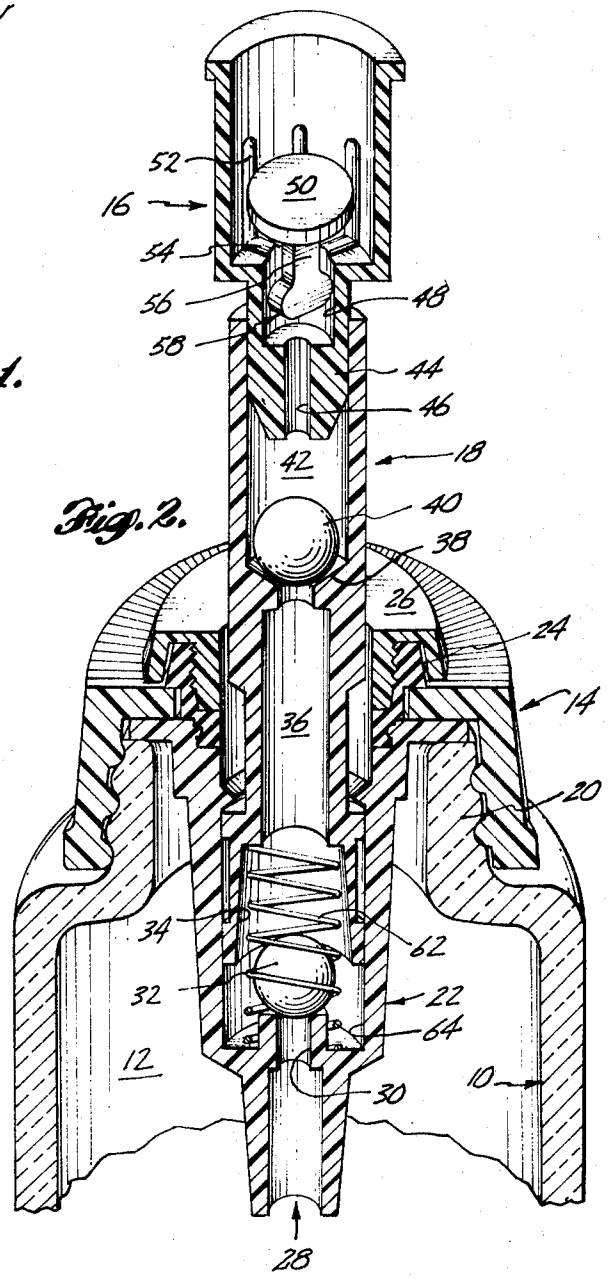



Fig. 2.

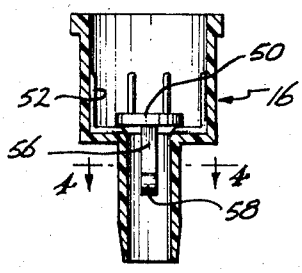



Fig. 3.

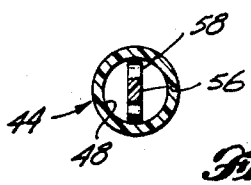



Fig. 4.

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# RESERVOIR DISPENSER

## CROSS REFERENCE TO RELATED APPLICATION

This is a continuation of my co-pending application Ser. No. 9,235, filed Feb. 6, 1970, now abandoned and entitled RESERVOIR DISPENSER.

## BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a reservoir type dispenser and in particular to provision of such a dispenser with a member which both serves as a pressure receptor for cotton applicators or the like and a diffuser baffle.

2. Description of the Prior Art

Doctors, dentists, nurses, professional assistants, mothers, and others, often have need to one-handedly withdraw a small amount of liquid from a container to wet a swab or the like. Dispensers are known which include a cup on top of a container in which a swab is placed by the user. The cup is often an upper portion of a pump mechanism which serves to force liquid upwardly from the container into the cup by a downward pressure on the cup bottom. A known dispenser of this type is disclosed by U. S. Pat. No. 2,593,591, granted on Apr. 22, 1952, to Benjamin David Menkin and Frank M. Darling.

These known dispensers have one or more relatively small area openings in the bottom of the cup forming fluid passageway means from the pump into the cup. One disadvantage of this type of inlet passageway for the cup is that the liquid is moved through the openings in the form of relatively high energy jets or spurts or pulsating streams, sometimes resulting in the liquid being expelled forceably upward from the confines of the cup. Another disadvantage of the small orifice type inlet is that it is possible for cotton swabs to enter into and occlude the inlet openings.

## SUMMARY OF THE INVENTION

The primary object of this invention is to provide a reservoir type dispenser which has neither the spurting nor clogging problem. According to the invention, a disc member is supported in the bottom of the cup. It serves as the pressure receptor for the swab. The disc completely covers the inlet passageway so that the swab material cannot enter into and occlude such passageway. The disc functions without impeding the flow of liquid into the cup, which flow occurs in the annular regions between the periphery of the disc member and side wall portions of the cup. The disc also cooperates with the bottom and side wall portions of the cup to form a diffuser passageway means through which liquid will flood into the cup rather than enter as a stream.

In a preferred form, the disc is provided with a stem which is press fitted into and thus anchored in a single inlet passageway. A plurality of spaced apart radial ribs are formed between the floor of the cup and the under side of the disc to function as vertical spacers between the disc and the cup bottom and to define flaring passages for the liquid.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sketch in elevation of the reservoir dispenser as used;

FIG. 2 is a vertical sectional view in perspective of the dispenser;



FIG. 3 is a vertical sectional view of the dispensing cup; and

FIG. 4 is a cross-section on line 4—4 of FIG. 3.

## DESCRIPTION OF THE INVENTION:

The dispenser comprises the container **10** having an internal pump device **12** forming part of closure cap **14** for the container **10**. Dispensing reservoir or cup **16** is mounted atop stem of pump **12**. Normally container **10** is formed of glass or plastic and has a neck **20** to which cap **14** is readily secured.

Pump barrel **22** is secured to cap **14** by flanged retainer **24** which, in turn, is fastened to cap **14** by ring member **26**. At its lower end, barrel **22** has an inlet **28** immersed in fluid in the container. Seat **30** closed by ball **32** is located in barrel **22** above inlet **28**.

On the lower end of stem **18** is a cup-shaped piston **34** at the lower terminus of passage **36** in stem **18**. The upper end of passage **36** is necked and shaped to provide seat **38** on which rests check ball **40** in liquid holding chamber **42** in the upper part of hollow stem **18**.

Cup **16** has a depending nipple stem **44** including small passage **46** and larger but nevertheless reduced inlet passageway.

Diffuser disc **50** in cup **16** has area dimension substantially greater than the reduced diameter inlet passageway **48**. Disc-mounting means support disc **50** in a fixed position close to the bottom of cup **50** and over the upper end of the inlet passageway **48** with its periphery and under side in spaced relation to side wall and bottom portions respectively of said cup **50** to form diffuser passageway means through which the liquid forceably pressed upward by pump **12** will flood into said cup rather than enter as a strong stream. Disc **50** has an upper surface of substantial area to be contacted as shown in FIG. **1** by an absorbent swab introduced into cup **16** for wetting. Such swab upon being forced downwardly on disc **50** functions to depress cup **16** for operating pump **12**.

The disc-mounting means supporting it in fixed relation includes a plurality of spaced apart radial ribs **54** functioning as vertical spacers between the disc underside and the cup bottom. Ribs **54** divide the space between said disc and said cup bottom into flaring passageways leading from the upper end of inlet passageway **48** outwardly to the space between the cup side wall and the periphery of disc **50**. It is believed the flaring passageways permit a liquid pressure relief aid in insuring that the liquid floods or flows slowly into cup **16**. The disc-mounting means may also include a stem **56** depending from disc **50** into the inlet passageway **48**. Stem **56** is shown as having an enlarged section **58** lodged in inlet passageway **48** for retaining the disc in place. Stem **56** is dimensioned and shaped to leave space or spaces in the inlet passageway **48** sufficient for upward movement therepast of liquid through said passageway. As shown stem **56** and its enlarged section **58** is thinner than the diameter of passageway **48** with the enlarged section **58** being so broad as to be press fitted across passageway **48**.

When pressure is applied to disc **50** in cup **16** by a user, one-handedly, as by the instrumentality of an absorbent swab **60**, the cup and pump stem **18** are depressed. Assuming the pump to be dry, no liquid will flow on the down stroke. Release of pressure permits spring **62**, previously compressed, to expand and force the piston upward. A vacuum is created tending to

draw liquid upward past ball **32** which is dislodged from seat **30** as the flow continues. On the next down stroke, the fluid in pump chamber **64** above ball **32** is forced upward in passage **36**, past ball **40** into chamber **42** and, if the volume is sufficient, into cup **16**. It may be initially required that more than one or two strokes are required to flood cup **16** and fill chambers **42** and **64**. As the liquid flows upward in passage **46** and passageway **48**, it encounters diffuser disc **50** under which and around the periphery of which it floods into cup **16**. In this way, spurting or jetting is avoided and since only a small amount of liquid is ordinarily needed to wet swab, the latter will be suitably wetted.

The liquid trapped in chamber **42** is immediately subjacent the cup. If not enough liquid is available in the cup, all the user need do is apply a slight amount more of downward pressure.

It will be observed that disc **50** in cup **16** serves as both a pressure receptor and liquid diffuser baffle. It permits one handed operation for users who often have the other hand occupied and unavailable to hold the container while the cup is depressed. This reservoir dispenser also permits the use of the sterile swab or absorbent applicator to operate the pump and eliminates the necessity for a person's hand to come in contact with the cup at all, which is desirable when caustic or staining liquid compounds are being dispensed. Note further that the use of the swab to depress the cup is without clogging or occlusion of the inlet passageway **48**, that would otherwise impede liquid flow into the cup **16** and most importantly spurting or jetting is avoided thus eliminating undesirable wetting in the environs of said reservoir dispenser.

It will be understood that the foregoing description sets forth fully, clearly, concisely and exactly a preferred form of the invention. To those skilled in the art, alternatives and substitutions will occur. All such as by a liberal application of the doctrine of equivalents as fall within the scope of the subjoined claims is intended to be covered by this patent.

What is claimed is:

**1.** A reservoir dispenser comprising a liquid container having a manually-operable, vertically-reciprocal pump thereon including a reservoir-forming cup which is depressible to operate said pump, said cup including a bottom, an upright side wall, and an open upper end located substantially above said bottom, and a reduced diameter inlet passageway from said pump enters the cup through said bottom; and the improvement, comprising:

an imperforate disc in the cup having area dimension substantially greater than the reduced diameter inlet passageway; and disc-mounting means supporting said disc in a fixed position close to the bottom of said cup and over the upper end of the inlet passageway with its periphery and under side in spaced relation to side wall and bottom portions respectively of said cup to form diffuser passageway means through which the liquid will flood into said cup rather than enter as a stream, said disc having an upper surface of substantial area to be contacted by absorbent swab placed into the cup for wetting said swab upon being forced downwardly on said disc functioning to depress said cup for operating said pump; said disc-mounting means including a stem depending from the underside of said disc into said reduced diameter passageway, said stem being dimensioned to incompletely block said reduced diameter passageway and having means outstanding therefrom to span between opposite walls of said reduced diameter passageway lodging said stem therein against longitudinal movement.

**2.** The reservoir dispenser of claim **1** in which said disc-mounting means includes a plurality of spaced apart radial ribs functioning as vertical spacers between the disc and the cup bottom, and dividing the space between said disc and said cup bottom into flaring passageways leading from the inlet passageway outwardly to the space between the cup side wall and the periphery of the disc.

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