Feb. 2, 1937. F. NEDBALEK 2,069,383

LIQUID DISPENSER

Filed May 29, 1936

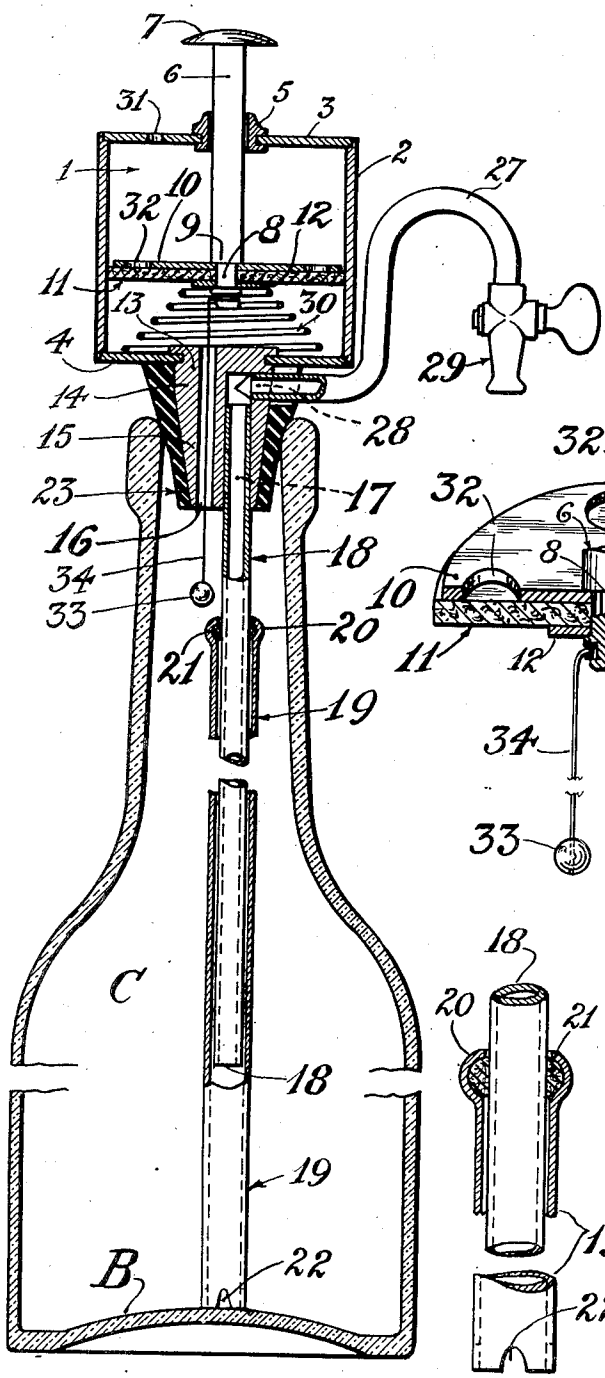


Fig. 1

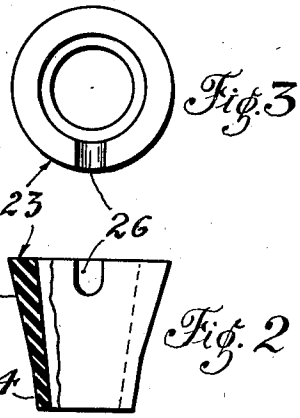


Fig. 3

Fig. 2

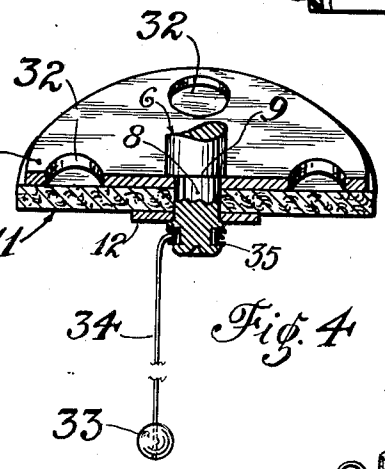


Fig. 4

Fig. 5

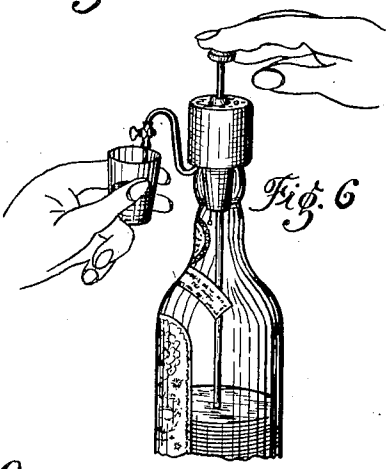


Fig. 6

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Patented Feb. 2, 1937 2,069,383

UNITED STATES PATENT OFFICE

2,069,383

LIQUID DISPENSER

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Application May 29, 1936, Serial No. 82,467

5 Claims. (Cl. 215—4)

This invention relates to liquid dispensers and more in particular to dispensers to be used in connection with bottles, jugs and similar liquid-containers having rather restricted pouring necks.

One of the primary objects of this invention is to provide a liquid dispenser by means of which a beverage, or other liquid, may be dispensed without tilting the container thereof; which may be operated quickly by the pressure of a finger, and by means of which the flow of liquid dispensed by each push of the finger may be controlled very closely or stopped immediately and with practically no subsequent dripping.

Another object of this invention is to provide a liquid-dispenser which may be applied rapidly to all sorts of bottles, etc., having pouring-necks of varying sizes.

A further object of this invention is to provide a dispenser of this type which may be adjusted in length to suit liquid-containers of varied depths.

Still another object of this invention is to provide a liquid dispenser which automatically returns into original starting position, as soon as pressure on the operating mechanism is released, and which will also seal itself automatically against leakage of liquids as well as gaseous fluids therethrough when not in use or when the container to which it is applied is accidentally upset.

Yet another object of this invention is the provision of a liquid dispenser which is neat in appearance, sanitary, efficient, and which can be manufactured at relatively low cost.

Additional features and advantages of this invention will appear in the following description considered in connection with the accompanying drawing forming a part of this application.

In the drawing:

Fig. 1 is a sectional view of the liquid-dispenser applied to a bottle.

Fig. 2 is a side elevation, partly in section, of a rubber bushing used in the dispenser, to produce a tight seal between the latter and the bottle-neck.

Fig. 3 is a top plan view of Fig. 2.

Fig. 4 is a fragmentary perspective view, half in section, showing the construction of the piston of the device.

Fig. 5 is an enlarged, fragmentary, view of the telescoping well-pipe of the device.

Fig. 6 is a fragmentary perspective view illustrating the method of operating the liquid-dispenser.

Reference being had to the drawing, in which similar parts in the various figures are identified throughout by the same reference-numerals, the liquid dispenser comprises a cylinder **1** consisting of a shell **2**, a flat head **3** and a flat bottom **4**, all securely and tightly assembled together. Centrally of the head there is a drilled bushing **5** acting as a guide for the piston-rod **6**, provided at its outer end with the push-knob **7**.

The lower end of the piston-rod is slightly reduced, as at **8**, to produce a shoulder **9** against which bears the large backing-disc **10** for the flexible leather piston **11**. The latter is held in place, underneath, by a considerably smaller washer **12** which is secured on the piston-rod by riveting or flaring the latter thereover. The purpose of making the backing-disc large, (only slightly smaller than the diameter of the leather piston) and the washer **12** so much smaller is to properly support the flexible piston against upward flexing during the down-stroke, i. e. compression stroke, and to facilitate the downward flexing of said piston during the upward, or idle, stroke, to thus reduce the friction of the piston against the cylinder.

At the center of the bottom **4** there is secured, in a fluid tight manner, the downwardly directed plug **13** comprising a short cylindrical portion **14** and a longer frusto-conical part **15**. Eccentrically disposed in the plug is the longitudinal port-hole **16** by means of which communication between the cylinder of the dispenser and the bottle-like container is established.

Parallel to the port there is drilled to the required depth a hole **17** in which is tightly driven the inner tube **18** over which slidably fits the outer tube **19**, both tubes forming the telescoping well-pipe of the dispenser. As shown in Figs. 1 and 5, the outer tube has at the top a bulbous enlargement **20** which receives a packing ring **21** of leather, or of any suitable and desired material, fitting snugly around the inner tube. At the lower end of the outer tube means, such as the slots **22**, are provided to insure the entrance of the liquid into the well-pipe, should the latter be forced in close contact with the bottom "B" of the container "C".

Secured over the plug **13** is a bushing **23** made, preferably, of soft rubber, or other yielding material. This bushing is of double conical shape; its lower end **24** being at the periphery substantially parallel to the taper of the plug **13**, whereas the upper part **25** has a greater flare obtained by gradually increasing the thickness of its wall toward the top. The purpose of this double conicity is to allow the application of the dispenser to

small bottle-necks, as well as to large ones. When used on larger necks, the increased thickness of the bushing affords a greater volumetric constriction of the rubber, thus insuring a tighter engagement, sufficient to withstand the great total fluid pressure which may prevail, owing to the greater diameter of the neck. A notch **26** is provided in the upper end of the bushing to accommodate the dispensing tube **27**.

The liquid forced up into the well-pipe is discharged by way of the goose-neck dispensing-tube **27**, secured in a lateral hole **28** drilled through the cylindrical part of the plug **13** and communicating with the hole **17**, respectively the well-pipe.

At the end of the dispensing-tube there may be mounted a suitable closure means, such as the spigot **29**, which is especially useful, when shut, to prevent the escape of the carbonic gas in carbonated or naturally effervescent liquids.

The downward, effective, stroke of the piston is effected by exerting pressure on the push-knob **7**. Upon release of the latter, the upward stroke of the piston is obtained by the agency of a coil-spring **30** resting on the bottom **4** of the cylinder and pressing against the underside of the piston. This spring, as shown, is of the conical type, with the small end pressing against the piston so as not to interfere with the downward flexing of the latter. This type of spring is preferred because when fully compressed it will lay substantially flat on the bottom of the cylinder, thus reducing the dead space in the compression side of the cylinder to a minimum.

To expedite the return of the piston into normal, or raised, position, a vent-hole **31** is provided in the cylinder-head **3** to permit the air above the piston to escape. The upward stroke of the piston which is motivated solely by the spring **30** is further quickened by the ease with which the leather piston may be flexed downwardly, as explained heretofore, and also by the provision of several large holes **32** in the backing-disc **10**. As will be readily understood, the upward stroke of the piston produces in the cylinder, above the piston, and in spite of the vent-hole **31**, a certain compression of air; this compressed air acting through the holes **32** on the flexible piston further induces the downward flexing of the latter.

If desired, the port **16** may be supplied with an automatic sealing means to prevent the leakage of liquid or gaseous fluids into the cylinder **1**, when the device is not in use or the container on which it is mounted happens to be inadvertently tipped over.

In the embodiment shown in Figs. 1 and 4, this sealing means consists of a ball-valve **33** suspended on a very flexible wire **34**, the upper end of which is attached to a small eyelet **35** freely mounted and held on an extension of the reduced shank **8** of the piston **6**. The ball-valve is of suitable size to seal the port **16** and the length of the wire **34** which passes therethrough is such that the seating will be effected when the piston is at its upward position.

The reason for rotatably securing the upper end of the wire **34** to the piston-rod is to prevent the former from being wrapped around the latter, should a person, absentmindedly playing with the dispenser, rotate the piston-rod.

In practice, the dispensing device is made as light as possible, since otherwise its location on top of a bottle, or the like, would render the latter "top-heavy" and thus more easily upset.

The operation of the dispensing device is substantially as follows: It is applied to the neck of a bottle, for instance, by direct downward pressure on the cylinder-body; this causes the rubber-bushing **23** to wedge itself tightly in the neck. Now, the piston is pushed down by pressing on the push-knob **7**; the displaced air below said piston in the cylinder is thereby forced into the bottle, thus creating therein an increased hydrostatic pressure which causes the liquid to rise into the well-pipe and discharge through the dispensing tube **27**, or the spigot **29**, as the case may be.

As soon as the push-knob is released, the spring **30** forces the piston up, thus reducing the hydrostatic pressure within the bottle and, sucking whatever liquid may be in the dispensing tube back into the former, eliminates outside dripping of the liquid.

The fact that, by means of this dispensing device, liquids may be served without tilting the bottles, is of especial importance nowadays in view of the widespread custom of keeping several bottles of beverages in close-fitting sections of ornamental, basket-like, holders (not shown). By using an individual dispenser for each bottle, the contents thereof may be served without lifting the bottle out of its compartment, thus greatly reducing the possibilities of breaking the bottle through frequent handling.

While I have illustrated and described herein the preferred embodiment of my invention, and one which I have found by extensive use to be very practical and efficient, it may be found advisable after continued experience to make slight changes in the construction and arrangement of the details of my invention, and I intend to include in this application all such variations as agree with the scope of the appended claims.

I claim:

1. In a dispensing device of the character described, a cylinder, a top and bottom therefor; a piston reciprocable in the cylinder; means to automatically force the piston into raised position; a plug secured to said bottom and having a longitudinal port; means effective only when the piston reaches its uppermost position to automatically seal said port; a well-pipe secured to said plug and a discharge tube in communication with the well-pipe.

2. In a dispensing device of the character described, a cylinder, a top and bottom therefor; a piston reciprocable in the cylinder; means to automatically force the piston into raised position; a plug secured to said bottom and having a longitudinal port; means actuated by the piston and effective only when same reaches its uppermost position to automatically seal said port; a well-pipe secured to said plug, and a discharge tube in communication with the well-pipe.

3. In a dispensing device of the character described, a cylinder; a top and bottom therefor; a piston reciprocable in the cylinder; a plug having a longitudinal port secured in the bottom of the cylinder; a flexible filamentary element connected to the piston and passing through said port; a valve-means depending from said filamentary element and effective to seal said port only when the piston reaches substantially its uppermost position; a well-pipe secured to said plug, and a discharge tube in communication with the well-tube.

4. In a dispensing device of the character described, a cylinder; a top and bottom therefor; a piston of flexible material reciprocable in the cylinder; a backing-disc positioned on top of said

piston to prevent the upward flexure thereof; a disc substantially smaller than the piston supporting same from below and permitting downward flexure thereof; means positioned in the backing disc to promote the downward flexure of the piston; a plug secured to said bottom and having a longitudinal port; a well-pipe secured in said plug, and a discharge tube in communication with the well-pipe.

5. In a dispensing device of the character described, a cylinder; a top and bottom therefor; a piston of flexible material reciprocable in the cylinder; a backing-disc positioned on top of the piston to prevent the upward flexure thereof and having a plurality of apertures to promote the downward flexure of the piston; a disc substantially smaller than the piston supporting same from below and permitting downward flexure thereof; a plug secured to said bottom and having a longitudinal port; a flexible filamentary element connected to the piston and passing through said port; a valve-means depending from the filamentary element and effective to seal said port only when the piston reaches substantially its uppermost position; a well-pipe secured in said plug, and a discharge-tube in communication with the well-pipe.

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