The present invention relates to liquid dispensers, and pertains more particularly to a non-refillable dispenser for incorporating into the neck of a bottle.

The present invention provides an improved and simplified liquid measuring and non-refilling structure for a bottle.

A further object of the invention is to incorporate a measuring dispenser at small expense into the neck of a bottle, said dispenser including means for preventing the refilling of a bottle in which it is incorporated.

A further object of the invention is to provide a bottle neck with a measuring chamber and valve seat formed integrally therein, and to combine therewith a measuring and non-refilling structure mounted in a plug adapted to be inserted to a selected depth in the neck of a bottle, thereby to provide measuring and non-refilling features for a bottle embodying said invention.

These, and other objects and advantages of the invention, will be apparent from the following description and the accompanying drawings, wherein:

FIG. 1 is an exploded, perspective view of the inner parts of an illustrative embodiment of the invention.

FIG. 2 is a longitudinal, medial, sectional view of a bottle neck embodying the invention, the bottle neck being shown inverted, and with the valve mechanism in normal, spring urged, bottle sealing condition.

FIG. 3 is a view similar to FIG. 2 with the valve mechanism in retracted condition for discharging the contents of the measuring chamber.

FIG. 4 is a view similar to FIGS. 2 and 3 but showing the bottle upright, with the pouring tube partly depressed, and the non-refillable valve element in spring closed position.

Briefly, in the illustrated form of the invention, a bottle neck 10 has a cylindrical measuring chamber 11 formed therein, and an inwardly offset valve seat 12 formed integrally with the bottle neck on the inner end of the measuring chamber. A plug 13 is of a size to fit closely and in seated relation into the outer portion of the measuring chamber 11, and a pouring spout or tube 14 is mounted for axial slidable movement in the plug. A closure valve 15 on the inner end of the pouring tube 14 is formed and positioned to have sealing engagement with the valve seat 12 when the pouring tube 14 is moved axially inwardly to the pouring position thereof shown in FIG. 3. Guide fingers 17 extending radially from the valve 15 have slidable, guiding engagement with the inside of the measuring chamber 11.

A sealing sleeve 19 is slidably mounted on the pouring tube 14 and is adapted to cover, and thus to seal, a plurality of ports 20 communicating with the bore 21 of the pouring tube 14 when said sleeve is seated on a flange 12 provided on the pouring tube 14 axially inwardly of the ports 20. The sleeve 19 is slidable by gravity on the tube 14, and is of a length to completely enter an annular recess 23 provided therefor in the plug 13.

A spring 18 normally urges the pouring tube 14 and its associated parts outwardly and thereby moves the sleeve 19 to its bottle-sealing condition shown in FIG. 2, in which condition the valve 15 is clear of its seat 12 to admit liquid from the bottle to the measuring chamber 11 when a bottle in which the invention is incorporated is inverted to the condition shown in FIG. 2. The ends of the sleeve 19 are formed to have sealing relation with the flange 22 and the bottom of the recess 23 respectively under the pressure of the spring 18.

Normally the spring 18 urges the pouring tube 14 and its associated parts outwardly to the position thereof shown in FIG. 2 regardless of whether the bottle is upright or inverted, and in this condition the sleeve 19 covers and seals the ports 20 as shown in FIG. 2. With the bottle thus inverted liquid flows from the interior of the bottle past the open valve 15 and fills the measuring chamber 11 as indicated by the arrows in FIG. 2.

When the pouring tube is then urged axially upwardly, as by engagement with the rim of a glass or tumbler 24 (FIG. 3) the valve 15 seats in the seat 12, sealing off the measuring chamber 11 from the interior of the bottle and simultaneously communicates said measuring chamber with the bore of the pouring spout through the ports 20 as shown in FIG. 3.

In the event that one should attempt to refill the bottle by pouring liquid into the pouring tube 14 with the bottle upright and the pouring tube partly depressed as shown in FIG. 4, the sleeve 19 would seat by gravity on the flange 22, thereby covering and sealing the ports 20 and thus shutting off communication from the bore 21 of the pouring spout to the interior of the measuring chamber 11. Referring to the drawings in greater detail, the measuring chamber 11 is formed in the bottle neck 10 by conventional bottle making procedures which are well known to those familiar with this industry. The valve seat 12 comprises an annular shoulder formed integrally with the bottle neck 10 around the inner end of the measuring chamber 11. The closure plug 13 is cylindrical and is of a diameter to fit snugly and in liquid tight relation into the outer end of the measuring chamber 11 as shown in FIGS. 2-4. Preferably this plug 13 is securely anchored in adjusted position in properly seated position in the measuring chamber 11 as, for example, by being first coated or partially coated with a suitable adhesive such as epoxy resin so that the plug 13 cannot later be removed from the bottle neck 10 without destroying one or the other.

The pouring tube 14 may be made of any suitable material, such as, for example, a suitable non-rusting alloy or plastic material. Such material, like that of all other parts of the invention, must be odor and taste free and insoluble in the liquids for which the bottle is intended. Since such plastics are well known to those familiar with the art of plastic compounding and molding it will be unnecessary to specifically enumerate these materials herein.

The closure coil spring 18 is held in compression between the closure plug 13 and a flange 25, which preferably is secured to the pouring tube 14 after the other parts illustrated in FIG. 1 have been assembled with the plug 13. This flange 25 is illustrated as being screwed onto a threaded portion 27 of the pouring tube, but may be secured thereto in any suitable manner, for example by use of a suitable adhesive or heat sealing.
The closure valve 15 on the inner end of the pouring tube 14 may be of any suitable material such as, for example, a non-rusting metal alloy or plastic, and is secured concentrically onto the inner end of the pouring tube 14. The radial guide 16 may be formed integrally with the valve 15 and are offset axially outwardly therefrom sufficiently so as not to interfere with the proper seating of the valve 15. The outer ends of these guide fingers 17 preferably just clear the inside of the measuring chamber 11 so as to resist lateral tilting of the pouring tube 14 relative to the plug 13.

The pouring tube 14 may be solid from the ports 20 to the valve head 15 as indicated in FIG. 3, and axial bore 21 then extends from said ports outwardly for the remainder of its length. The narrow flange 22 preferably is integral with the pouring tube 14 and projects radially from said tube axially inwardly of the ports 20 which are positioned in the pouring tube to lie inwardly just clear of the plug 13 when the latter is in its adjusted position in the measuring chamber 11, and the pouring tube is in its inward limit of movement with the valve head 15 seated on said seat 18 shown in FIG. 2.

The portion of the pouring tube 14 from the sleeve retaining flange 22 outwardly through the plug 13 is smooth and uniform, and the non-refilling valve sleeve 19 is fitted on the tube 14 quite closely, but still free for axial, slidable, gravitational movement thereon each time the pouring tube is inverted. The sleeve valve 19 preferably is of suitable non-rusting metal alloy such as, for example, stainless steel, brass or bronze. The recess 23 in the plug 13 for the sleeve 19 comprises an enlarged portion of the bore 28 of the plug 13 through which the pouring tube 14 is inserted. The recess 23 is of sufficient diameter to permit the sleeve 19 to slide freely in and out under its own weight.

The operation of the illustrated embodiment A of the invention is as follows: Normally the bias of the spring 18 urges the pouring tube 14 axially outwardly to the position thereof shown in FIG. 2. In this position of the pouring tube the bottle is sealed by the sleeve 19, which is moved by the flange 22 into the recess 23 and surrounds and covers the ports 20. In this position of the sleeve 19 its ends are sealed by their spring-pressed engagement with the flange 22 and the bottom of the recess 23, respectively.

When the bottle neck 10 is upright with the parts in the position shown in FIG. 2 any liquid in the measuring chamber 11 will drain back into the bottle past the open valve 15. When the bottle is inverted to the position of FIG. 2 however, liquid will flow from the bottle past the open valve 15, and, if a sufficient quantity remains in the bottle, will completely fill the measuring chamber 11. By then suddenly moving the pouring tube 14 and its associated parts axially inwardly to the position of FIG. 3, as by bearing down on the bottle with the flange 25 resting on the edge of a glass or tumbler 24 as shown in FIG. 3, the valve head 15 will be moved thereby to seated condition on its seat 12, and the ports 20 will be elevated above the plug 13.

Since, as explained previously herein, the recess 23 is of a depth to receive the sleeve 19 therein as shown in FIG. 3, the ports 20 will thus be exposed to the interior of the measuring chamber 11 above the plug 15 and any liquid in the measuring chamber 11 will thereupon flow through the ports 20 and the bore 21 of the pouring tube 14 to completely discharge the liquid contents of the measuring chamber 11 into the glass 24. Upon removing the pressure which holds the pouring tube 14 in its depressed condition of FIG. 3 the spring 18 again quickly restores the pouring tube 14 and the sleeve 19 to their sealing condition shown in FIG. 2.

In the event that an effort should be made to refill a bottle with which the invention is incorporated by pouring liquid therein through the pouring tube 14 with the bottle in upright position as shown in FIG. 4, the pouring tube partially retracted as shown in FIG. 4, the weight of the sleeve 19 retains it in sealing condition over the ports 20 and prevents such procedure regardless of the position of the pouring tube 14.

The invention provides a simple inexpensive and effective pouring tube or spout, and one which can be readily incorporated in a bottle having the neck thereof shaped to provide a measuring chamber and valve seat and after the bottle has been filled with liquid. This can readily be done by assembling all the parts in a plug 13 ready for insertion into the neck of a bottle, and then inserting the plug with suitable means to the required depth into the neck of the filled bottle. Thus the present invention can be embodied in each bottle of liquid sold and at only a very slight increase in container cost over that of an ordinary bottle closure of any of the types commonly employed in liquor bottles today. In view of the substantial expense which many firms incur during the Christmas holiday season in providing special bottles and decorations for their product, this invention could readily be incorporated in a bottle for even less than the cost of many of these special packages, and would have a high degree of utility and sales appeal in such case.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims:

1. A plug mounted assembly for mounting in the neck of a bottle having a measuring chamber formed in the neck thereof and with a valve seat formed by a reduction in diameter of the neck opening at the inner end of said chamber, said assembly comprising a closure plug of a size and shape to fit in sealing, retained relation into the outer end of such chamber, a pouring tube slidably mounted for limited axial movement in said plug, a valve mounted on the inner end of said tube for sealing in said relation on such valve seat with the pouring tube in maximum retracted condition, a port in the pouring tube positioned to be inwardly clear of the plug when the pouring tube is in maximum retracted condition and to lie within the plug when the pouring tube is extended, a valve element slidably movable by gravity along the pouring tube from a position overlying and sealing said port with such bottle in upright position and the pouring tube either retracted or extended, to thereby prevent refilling the bottle, to a position outwardly clear of the port with the bottle inverted and the pouring tube retracted, and spring means biasing the pouring tube axially outwardly to thereby draw the pouring tube axially outwardly to a position where the port is within the plug and is sealed by the valve element.

2. An arrangement according to claim 1 wherein a plurality of valve centering fingers extend from the valve flange into guiding engagement with the inside of the measuring chamber.

3. A liquid measuring, non-refillable bottle closure comprising, in combination with a bottle having a measuring chamber formed in the neck thereof and with a valve seat surrounding the inner end of said chamber; a closure plug of a size and shape to fit in sealing, retained relation into the outer end of such chamber, said plug having an axial hole therethrough with an annular recess around the inner end of such hole; a pouring tube mounted for slidable axial movement in such hole, a valve flange on the inner end of said pouring tube for sealing in said relation on such valve seat with a maximum inward movement of the pouring tube and thereby limiting said maximum inward movement of the pouring tube, a port in the pouring tube for communicating the chamber with the bore of the pouring tube, the port being located to be
inwardly clear of the tube when the pouring tube is in maximum retracted condition and to be within the plug when the pouring tube is extended, a retaining flange on the pouring tube inwardly of the port, a valve sleeve of a size to fit freely into such annular recess and axially slidably mounted on the tube, said valve sleeve being movable by gravity on the tube from a position adjacent said retaining flange and overlying and sealing said port, to a position wholly within such recess and outwardly clear of the port with the bottle inverted and the pouring tube retracted toward its inward limit of movement, said sleeve being retained by the retaining flange in sealing relation with the port when the bottle is upright regardless of the position of the pouring tube to prevent refilling, and spring means biasing the pouring tube axially outwardly, whereby the flange on the pouring tube urges the sleeve into contact with the plug at the bottom of such recess and thereby into sealing position over the port.

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