

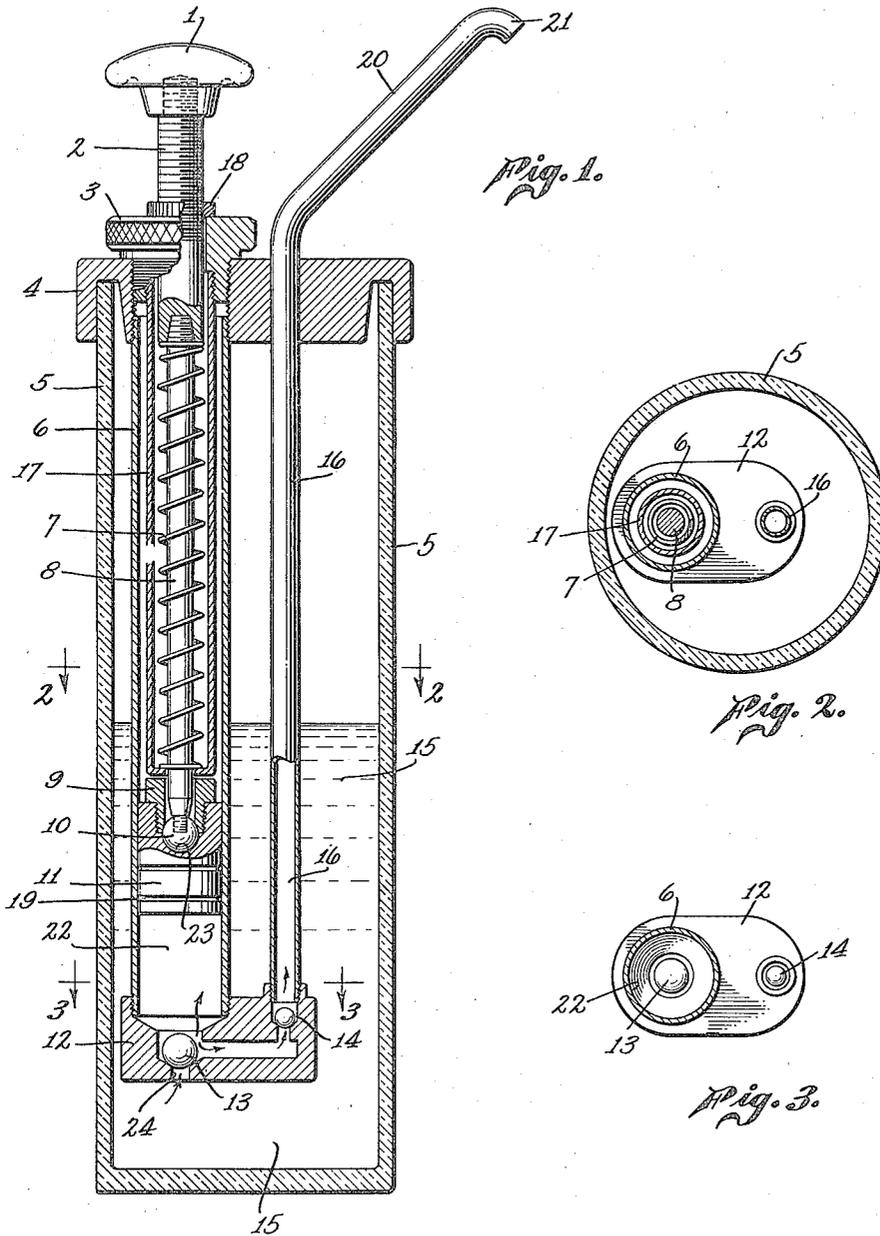
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LIQUID DISPENSER

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LIQUID DISPENSER

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Our invention relates to liquid dispensers, particularly with reference to the dispensing of syrups, fruit juices, and other liquids where the furnishing of small amounts of fluids as a basis for the compounding of beverages is necessary or desirable, and its objects are to afford a ready and accurate means for measuring or metering the required amount of essential ingredients; to construct a dispenser which can readily be disassembled for cleaning the parts thereof and reassembled within a short space of time; to permit rapid replacements of elements of pumping mechanism and adjacent parts with a minimum of time and effort; to obviate the necessity of inclining dispensing apparatus from a vertical position in order to produce the best results, and in general to simplify and render more effective the operation of the several parts.

We are aware that there are now upon the market complicated and cumbrous pumping structures which are used as dispensers, and which utilize the principle of having the principal parts thereof housed and submerged within the tank containing the liquid to be dispensed, but all such structures are open to the objection that, in addition to being complicated and unwieldy, they cannot be broken apart, cleaned and restored to service without sending them to the servicing or repair shop for the purpose.

With our improved apparatus, however, the replacement of the pump or outlet nozzle can readily and rapidly be accomplished without the necessity of removing the tank or of interrupting to any material extent the operation of dispensing the liquid.

Attention is hereby directed to the accompanying drawing of one of the preferred forms of our apparatus, in which similar numerals of designation refer to similar parts throughout the several views, and in which—

Figure 1 is a vertical section of our improved apparatus, showing some of the parts in elevation;

Figure 2 is a section on line 2—2, of Figure 1, looking in the direction of the arrows, and

Figure 3 is a section on line 3—3, of Figure 1, looking in the direction of the arrows, of that part of the pumping mechanism adjacent to the inlet and outlet of the dispensing fluid.

Referring to the drawing, within the tank 5, which is normally in an upright position and wholly or partially filled with liquid juice 15, we house and submerge in said liquid the lower part of the main pumping structure. The tank 5 is

preferably constructed of heavy glass, but may be of metal, cement, earthenware, wood, fibre or other suitable material for liquid containers. As here shown it is preferably in the form of an elongated cylinder, but it may be in any form suitable for the purpose. It is normally closed at the top by a cap 4, of any suitable material, preferably aluminum, and fits loosely upon the upper edge of said tank and is easily removable therefrom. It may, if desired, be provided with a gasket to prevent friction and wearing of the parts. The said cap has extending through it at one side a vertical opening threaded to receive the thrust collar or bearing 3, and the plunger barrel 6. To the lower end of the said barrel is affixed the block 12, having a chamber and passage communicating with the interior of said barrel 6, and also a passage communicating with the lower end of outlet spout 16, which is detachably secured to said block. Preferably both said barrel 6 and said spout 16 are in screw threaded engagement with said block 12. At the bottom of said block 12, below the barrel 6, is the aperture 24, normally closed by the ball 13, and at one side of the upper portion of said block closing the outlet to said spout 16 is the ball 14. Extending upwardly through the upper part of the tank 5, the spout 16 passes through an opening in the cap 4 and terminates in the nozzle 20 and discharge orifice 21. Preferably, the said spout is made all in one piece and, while snugly fitting its said opening, can readily be twisted and removed therefrom. To facilitate the proper dispensing of the juice 15, we preferably bend the nozzle 20 outwardly as shown beyond and clear of the top of the tank 5, so that said juice may properly be projected into the receptacle advanced to receive the same.

Extending through the collar 3 is the plunger rod 2, threaded at the upper end thereof to engage with the handle 1, and also threaded to engage with the collar 18, said collar serving to regulate the extent of stroke of the plunger. To the lower part of the collar 3, and in screw threaded engagement therewith is the box 17, which serves to house the helical spring 7 within which reciprocates the plunger member 8 affixed to the plunger rod 2, the lower end of said member 8 protruding through an opening in the bottom of said box and secured to the plunger head 11, by a ball and cup joint, said joint comprising the ball 10 secured to the end of said member, the chamber 23 within said head shaped to receive said ball and allowing free play therein and the

cap 9 provided with a central opening somewhat larger than the diameter of said member.

As will be observed, the cap 9 is provided with a threaded shank depending therefrom and threaded to engage with a threaded opening adjacent thereto in the head 11, the bore of said shank being narrowed so as to prevent the passage of the ball 10 therethrough and the separation of the plunger member 8 from said head 11. Annular recesses 19 in the head 11 form sealing grooves when filled with the liquid first drawn in from the tank 5, upon the initial reciprocation of said head, which when so sealed, and after the entire interior of the pump unit and discharge pipe have been filled with liquid, effectually prevent further seepage of said liquid upwardly by said head to any material extent.

The lower portion of the plunger barrel 6, when the plunger elements are in the normal raised position shown in Figure 1, forms the chamber 22, normally filled with liquid 15 from the tank 5. By turning the collar 18 upon the threaded plunger rod 2, the piston head 11 may be depressed and the size of said chamber changed, so that accurately measured quantities may be discharged upon the downward stroke of the piston, such measured quantities varying from a drop or drops to the full capacity of the chamber 22. For such measure, I may employ the quantity indicated by one or more successive threads upon the rod 2, or I may embed in such threads a numbered scale setting forth the exact measured quantity.

To operate our improved device, we first fill the tank 5 with liquid 15, and place the cap 4 and parts carried thereupon in the position shown in Figure 1. The plunger is then depressed against the spring 7 by a stroke of the hand upon the handle 1, until the head 11, loosely playing within the barrel 6, is forced downwardly to a position completely occupying the chamber 22. Upon releasing pressure upon said handle 1, the spring 7 serves to force the plunger upwardly back to its original position, and to cause sufficient suction to be created by the upward passage of the head 11, to compel the ball 13 to rise and liquid to flow in through the aperture 24 and to fill the chamber 22, and all spaces in the pump mechanism above said chamber. By adjusting the collar 18, the quantity of liquid filling said chamber may be reduced or increased, and furnished in such measure as desired. Thereupon, the plunger is again depressed and the head 11 descends, driving all of such quantity of liquid out of said chamber and into and out through the spout 16, the ball 14 rising upon the first impact of said liquid and permitting its upward passage to the nozzle 21 and discharge orifice 21, and out into the receptacle held in proximity thereto.

By giving a smart blow to the handle 1, practically all of the liquid in the chamber 22 may be forcibly ejected at one time. Upon releasing the pressure on the handle 1, the plunger once more assumes its normal position, the measured quantity is again drawn into the chamber 22, and is again ready for dispensing. By repeated operations as above set forth, double or treble or several times the measured quantity may be supplied to one serving if desired.

We have found in actual practice that the incorporation of the liquid chamber 22, directly in and forming part of the plunger barrel 6, which is preferably made of uniform diameter throughout, is of distinct practical advantage, in

that such construction readily renders itself susceptible to effecting a range of measured quantities of the liquid, and at the same time permits the easy removal of parts for cleaning.

The construction of parts in our improved device has been so greatly simplified and made so compact that the removal of the cap 4 and adjacent parts, and the substitution of a similar unit is only a matter of seconds. Then again, after the unit has been removed, the spout 16 can quickly be unscrewed from the block 12 and twisted out of its engagement with the cap 4, and a new spout substituted if desired. So also the parts comprising the plunger may also be quickly disassembled, cleaned and reassembled, or worn parts removed and replaced.

In the preferred form of construction above illustrated and described, we preferably dispense with any form of compression pump, although in so far as our apparatus is used merely as a measuring and dispensing device of liquids in varying desired quantities, such form of pump might be employed. Preferably the head 11 has sufficient clearance within the barrel 6 as normally to permit the liquid to pass upwardly until the entire open space or spaces in the box 17 outside of the plunger member 8 and the spring 7, the entire space between the said box 17 and the barrel 6, and the sealing grooves 19, are filled with such liquid; whereupon the action of such sealing grooves is such on reciprocation of said head as to prevent any material amount of the fluid so held above to seep out below, while maintaining sufficient suction to draw in the liquid through the aperture 21 on the upward stroke of the plunger. After a number of such strokes, it will be found that, at the beginning of such upward movement (while the contents of the chamber 22 have been completely expelled), the delivery spout 16 will remain full of liquid, the ball 14 serving to prevent such liquid from returning to such chamber. The result is that after a number of strokes of the plunger, the delivery spout 16 will always be primed, and upon each downward stroke of such plunger, while the chamber 22 is emptied, and an amount equivalent to its contents driven out of the discharge orifice 21, the amount of liquid held in the spout 16 will fill the same and will always remain constant.

Our invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Our present embodiment of such invention as above set forth and described is therefore to be considered in all respects as illustrative and not restrictive, the scope of our invention being indicated by the appended and following claims rather than by the foregoing description and all changes which come within the meaning and equivalency of the claims are therefore intended to be embraced therein.

What we claim and desire to secure by Letters Patent is:

1. In a liquid dispenser, a tank, a cover for said tank, an elongated plunger barrel secured to said cover and extending therefrom downwardly into said tank nearly to the bottom thereof, an elongated sleeve attached to said cover and located within said barrel, a piston rod spring yieldingly held within said sleeve and reciprocating therein and extending beyond the same, a removable plunger head affixed to the extended end of said rod, said reciprocating parts having sufficient clearance to permit seepage of the

fluid, from below to fill the open spaces within said barrel.

2. In a fluid dispenser, the combination of a tank, a cover for said tank, non-compressing pump mechanism and delivery spout carried by said cover, an elongated plunger barrel communicating with said spout and secured to said cover and extending downwardly therefrom into the interior of said tank, an elongated sleeve attached to said cover and located within said barrel, the piston rod of said pump mechanism being enclosed by said sleeve and reciprocating therein and extending beyond the same, and the plunger head of said mechanism being pivotally

connected with the protruding end of said rod, the movable parts of said mechanism having sufficient clearance to permit ingress of the fluid from said tank to fill all the open spaces of said mechanism within said barrel and sealing grooves in the periphery of said head for preventing further seepage into said mechanism when said spaces are filled, means for admitting fluid into said barrel at the bottom thereof from said tank, and means for adjusting the stroke of said pump to measure the quantity of liquid received therein and ejected therefrom through said spout.

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