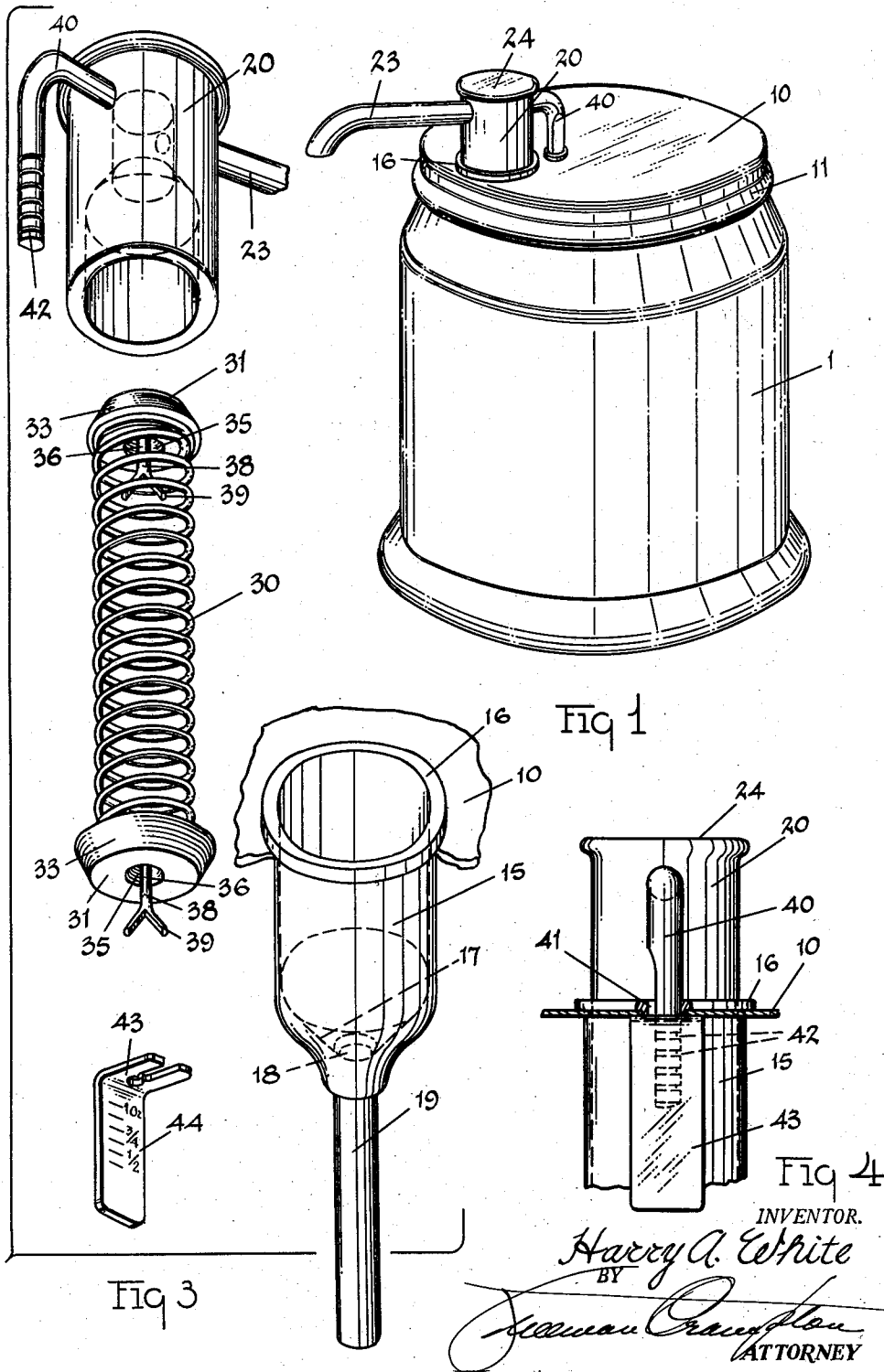


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2 Sheets-Sheet 1

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UNITED STATES PATENT OFFICE

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MEASURING PUMP WITH ADJUSTABLE
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2 Claims. (Cl. 222-43)

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My invention relates to the dispenser art and particularly to the art of periodically operated and measuring liquid dispensers. An embodiment of my invention is readily adapted to use in dispensing measured quantities of cream in the purveying of coffee by the cup.

Liquid dispensers available and known to the art, heretofore, are of such complexity and multiplicity of separable parts that a disassembly of the same, for purposes of cleaning, requires skilled knowledge and utilizes considerable time. As a consequence, the task of cleaning has been slighted, unless supervised, and the degree of maintained cleanliness required by public health codes often is not met. In some constructions of the prior art, the assembly of parts is of such character as to make rigorous and thorough cleansing a veritable impossibility.

It is, therefore, one of the main objects of my invention to provide a liquid dispenser which may be easily and quickly disassembled to expose all liquid contacting parts in position to receive a cleansing scrub or immersion. Further, my invention provides a construction which may be disassembled without the need of skilled knowledge or the use of tools of any kind. Still further, my invention provides a construction in which related operating parts, although exposed for cleansing, operation in disassembly, are maintained in loosely connected or "chained" relation, facilitating handling without risk of part loss or disturbance of desired operative relation in the cleansing operation. The invention further provides a construction in which reassembly, following cleansing, may be readily effected.

The invention has for a further object to provide a liquid dispenser having a housing provided with thermally insulated walls and provision for containing a coolant or refrigerant in heat exchange relation to the liquid to be dispensed.

A still further object of the invention is to provide a liquid dispenser of attractively pleasing appearance and low cost.

The invention consists in other features and advantages which will appear from the following description and upon examination of the drawings. Structures containing the invention may partake of different forms and still embody the invention. To illustrate a practical application of the invention, I have selected a measuring liquid dispenser as an example of the various structures and details thereof that contain the invention and shall describe the selected structure hereinafter, it being understood that variations may be made without departing from the

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spirit of the invention. The particular structure selected is shown in the accompanying drawings and described hereinafter.

Fig. 1 of the accompanying drawings illustrates a perspective view of a measuring liquid dispenser embodying my invention. Fig. 2 illustrates an enlarged view of a longitudinal section of the dispenser shown in Fig. 1. Fig. 3 illustrates, perspectively, a view of disassembled parts of the dispenser shown in Fig. 1. Fig. 4 illustrates a view taken along the plane of the line 4-4 indicated in Fig. 2. Fig. 5 illustrates a longitudinal section of a modified form of construction of a liquid dispenser embodying certain features of my invention.

The embodiment of my invention shown in Figs. 1 to 4 of the accompanying drawings includes an open ended housing 1 of pleasing appearance adapted to be disposed on the counter or service bar, in a position of convenience to use. The housing 1 is preferably of general cylindrical contour having a lateral side wall 2 and bottom wall 3, which are thermally insulated against heat exchange between the zone within the housing 1 and the exterior atmosphere.

Disposed within the housing 1 is provided an open end liquid container 5. The container 5 is supported by means, such as the protruding dimples 6 formed in the side lateral wall of the container in engaging relation to the inner surfaces of the walls 2, adapted to support the container 5 in a nesting coaxial and spaced relation to the housing 1. The housing walls 2 are provided with an annular shoulder 7 in spaced relation to the plane of the housing bottom wall 3. The shoulder is adapted to engage the container 5 and support the same in spaced relation to the bottom wall 3. The space, indicated at 8 in Fig. 2 of the accompanying drawings, thus formed between the housing bottom wall 3 and the container 5 provides a compartment which may be charged with a coolant or refrigerant maintained in heat exchange relation to the container 5 and to a liquid therein for dispensing.

In order to provide a removable closure for both the housing 1 and container 5, I provide a cover plate 10 of general discular contour. The cover plate 10 has a depending skirt or flange 11 which is adapted to fit the beaded edge of the wall 2 of the housing 1 and thereby effectively close both the container 5 and its housing 1. The cover plate 10 besides providing the closure means mentioned also functions as a supporting means for the pumping mechanism of the dispenser now to be described.

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The pumping mechanism is best shown in assembled form in Fig. 2 of the accompanying drawings. When disassembled for cleaning, the parts of the mechanism appear as shown in Fig. 3 of the drawings. The pumping mechanism includes a pair of telescopically pumping cylinder parts. One of said cylinder parts is embodied in the open end cylindrical part 15 mounted on the cover plate 10. Preferably, the part 15 extends through and is press fitted to the edges of an opening formed in the cover plate 10. In such position, the part 15 is supported with its major axis extending vertically and its open end facing upwardly and outwardly of the housing. Preferably, the open end of the part 15 is provided with a square bead or annular shoulder 16 which engages the cover plate 10 and serves to supplement the sealing and affixing obtained by the press fit mentioned.

The lower end of the part 15 has a ported and conically surfaced end wall 17. The port 18 of the wall 17 communicates with the interior of the container 5 through a suitable sucker tube 19 extending to a point well within the confined space enclosed by said container. Preferably, the sucker tube 19 is press fitted to the part 15 and, thus, the part 15 and cover plate 10 are effectively integrated.

The second cylinder part of the pumping mechanism is embodied in the manually operable open end cylinder part 20. The part 20 is adapted to slidably fit within and be reciprocable relative to the part 15. Like the part 15, the part 20 has a ported, conically surfaced end wall 21. The port 22 thereof communicates with a discharge tube 23 through which liquid may be dispensed. The upper end of the part 20 is provided with a shouldered surface 24 adapted for manually pressing to move the part 20 downwardly and telescopically relative to the part 15, thereby to effect displacement of liquid in and between the parts 15 and 20, outwardly through tube 22.

In order to provide a system of valves cooperative with the cylinder parts 15 and 20 and to provide means operating to cause liquid recharge of the cylinders following manual compression, I provide a valving and actuating assembly. Said assembly as is shown in Fig. 3 of the accompanying drawings includes a resilient element embodied in the compressible spring 30, and a pair of ported valve seat units, embodied in the units 31, connected to the opposite ends of said resilient element and a pair of valve members each pinned in and to one of said valve units. Thus, I provide an assembly that, when disassembled, as shown in Fig. 3, has all its parts and all the surfaces of said parts exposed for cleaning but which parts are so chained together that there is no danger of individual part loss or reassembly in inoperative order.

The valve seat units 31 each have an annular bearing surface 33 of conical contour adapted to fit and engage the conically surfaced end wall 17 and 21 of one of the parts 15 and 20 so that when pressed there-against, by the constraint of the spring 30, will prevent passage of liquid or air between said surface 33 and the particular end wall engaged thereby. The units 31 are each provided with a valve opening 35 with which a valve member, such as the member 36, is associated.

Each valve member 36 has a head 37 and a pin shank 38. The shank 38 has a bifurcated end 39, the legs of which extend to points at greater spaced relation than the diameter of the valve opening 35. Thus, when installed with the shank

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38 extending through the opening 35, the valve member 36, although free to move to open and close the opening 35 and expose the surfaces thereof for cleaning, cannot be dislodged from an operative relation and automatically assumes its desired operative position, on reassembly.

As is shown in Fig. 2 of the drawings, the valving and actuating assembly just described is designed to be positioned between and within the cylinder parts 15 and 20. The manual depression of part 20 causes compression of the spring 30 and the liquid disposed within and between the parts 15 and 20 exerts a pressure against the valve member 36 controlling flow through port 22 of the end wall 21 to open the valve member in a manner well known in the art. Upon a discontinuance of the application of manual pressure to the part 20, the spring 30, now in a state of compression, urges the part 20 to move upwardly. A condition of atmospheric rarefaction is thus created in and between the parts 15 and 20, allowing the valve member 36 controlling port 22 to close and causing the valve member 36 controlling port 18 to open. As is well known in the art, liquid within the container 5 will, by atmospheric pressure, be caused to pass up through sucker tube 19 and into the space between and within the parts 15 and 20, for subsequent ejection.

In order that the stroke of the part 20 relative to the part 15 may be restricted and thus measured quantities of liquid be discharged at each complete depression of the part 20, I propose to provide an adjustable stroke limit means. Said means is embodied in a traveling rod 40 suitably pinned to the part 20 and extending through a gasketed opening 41 formed in the cover plate 10. Said rod 40 may have annular recesses 42, as shown in Fig. 2, adapted to receive opposite legs of a removable clip 43, best shown in Fig. 3 of the drawings and located on the underside of the cover plate 10. Thus, as shown in Figs. 2 and 4, the clip 43 limits the upward stroke of the part 20 to any desired degree according to the particular recess 42 engaged thereby. If desired, the clip 43 may have a tell-tale tag portion 44 bearing gauge indications which, when read in conjunction with the lower end of the rod 40 in its particular position of engagement with the clip 43, advise of the quantity of liquid that will be dispensed upon a full depression stroke of the part 20.

In the form of construction shown in Fig. 5 a sleeve member 43' is used, in lieu of the mentioned clip, in conjunction with a rod 40'. The sleeve member 43' may be adjusted along the length of the rod 40' and be locked thereto by a suitable stud. Also, in the form of construction shown in Fig. 5, the valve members 36' comprise well known ball checks disposed in tubular housings 50. One housing 50 is threadably connected to the part 20' and the other to the lower end of the sucker tube 19'. The container 5' is identical with the container 5 and is adapted to be received within a housing similar in all respects to housing 1.

While I have illustrated and described the best forms of my invention now known to me, as required by the statutes, those skilled in the art will readily understand that changes may be made in the disclosed construction without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. In a liquid dispenser having the combination of an open ended housing; an open ended liquid

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container adapted for disposition in nesting coaxial relation to said housing; a cover plate adapted for disposition over the open ends of said container and housing to form a removable closure for both of the same; the provision of liquid dispensing means characterized by being easily disassembled and having a pair of telescopically related pumping cylinder parts; one of said parts extending through and sealed to an edge of an opening in said cover plate and adapted for providing a slide bearing for the movement of the other part in mutually coaxial telescopic relation thereto; each of said cylinder parts having an inner conically surfaced and ported end wall of like contour; a valving and actuating assembly adapted for disposition between and within said telescopically related cylinder parts and having a longitudinally compressible resilient element, a pair of ported valve seat units of identical contour connected at opposite longitudinal ends of said resilient element and a pair of pinned valve members of identical contour each movably supported on and operatively associated with one of said valve seat units and adapted for controlling flow through the port thereof; each of said valve seat parts having an annular bearing surface adapted for engaging said inner conically surfaced end wall of one of said cylinder parts wherefore, upon relative movement of the telescopically related cylinder parts toward each other, said compressible element will be compressed urging said valve seat unit's said annular surface to bear with increased sealing pressure against

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said inner conically surfaced end walls of the cylinder parts and tending to effect movement of said cylinder parts to movement away from each other.

2. In a liquid dispenser, the combination as claimed in claim 1 having in addition thereto means connected to one of said cylinder parts adapted to limit the movement thereof and comprising a rod connected at one end thereto to the said cylinder part and a stop part; the shank of the rod adapted to extend through and be guided by an opening in said cover plate; the stop part having means adapted for adjustably engaging said shank in a desired adjusted position along the length of the same thus limiting, by engagement with the inner surface of the cover plate, the movement of said cylinder part in response to the forces exerted by said compressible element.

HARRY A. WHITE.

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