June 26, 1956 V. P. STEELE 2,752,072

ADJUSTABLE STROKE SYRUP PUMP

Filed June 12, 1952 2 Sheets-Sheet 1

Fig. 2.

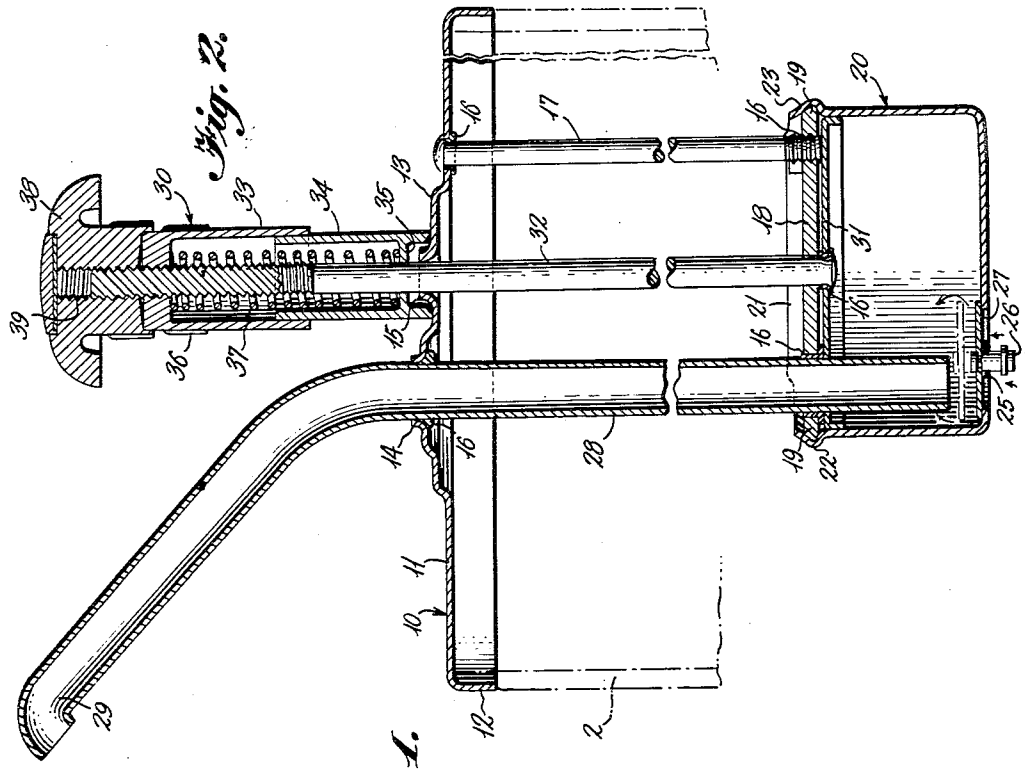
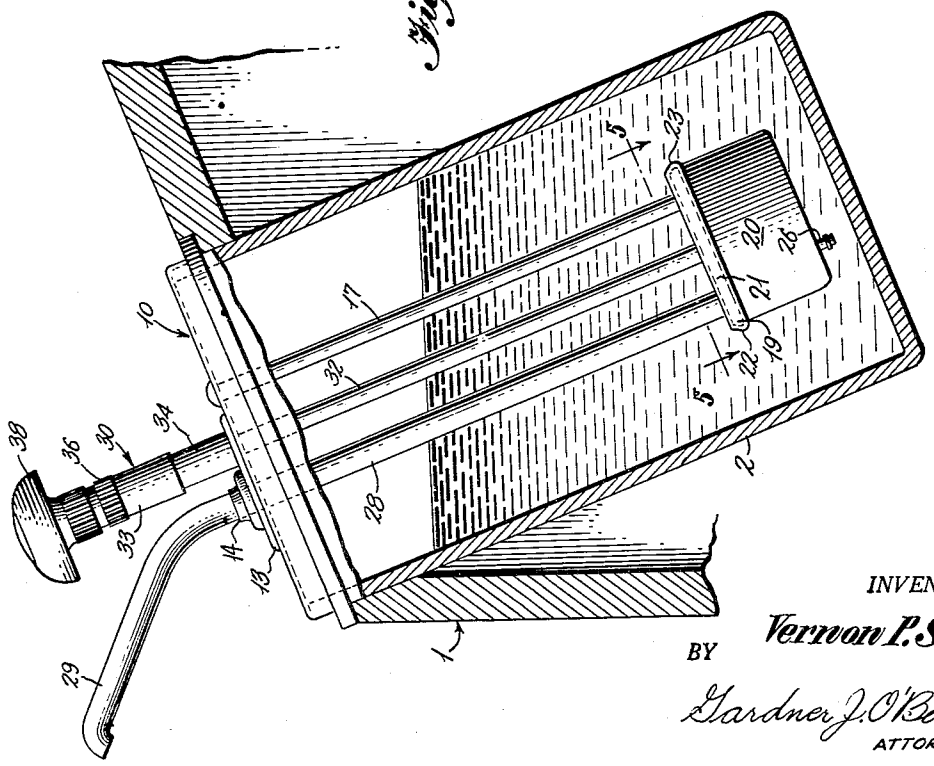


Fig. 1.



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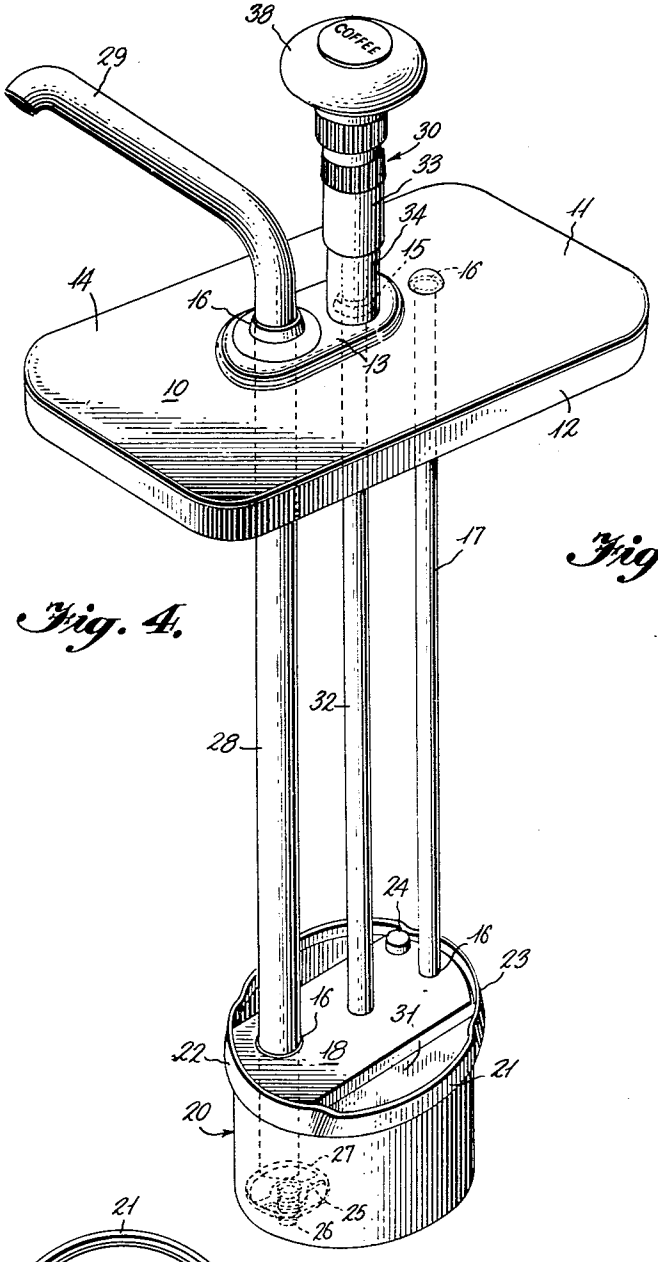


Fig. 4.

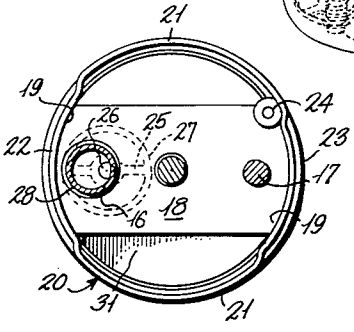


Fig. 5.

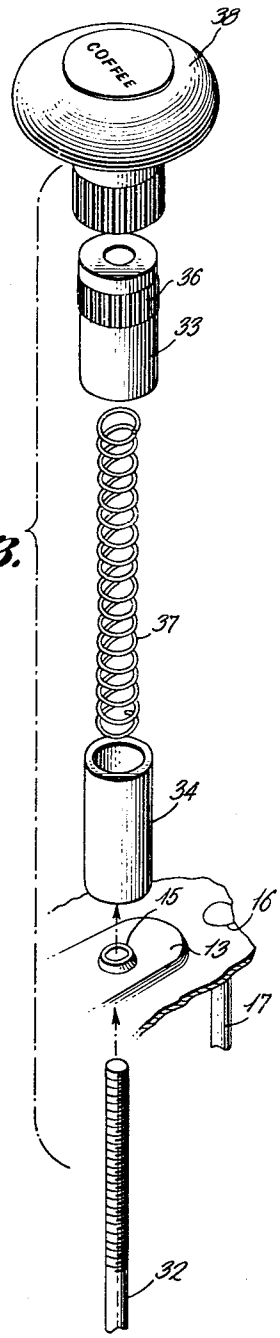


Fig. 3.

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ADJUSTABLE STROKE SYRUP PUMP

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Application June 12, 1952, Serial No. 293,057

5 Claims. (Cl. 222—309)

This invention relates to improvements in syrup pumps, and more particularly to an adjustable stroke syrup pump.

In Patent No. 2,587,241, issued to me February 26, 1952, there is described and claimed a novel adjustable stroke syrup pump having special stroke regulating and adjusting means, as well as a novel syrup delivery assembly, including a double-ended delivery tube and a detachable spout, the entire top being sealed against contamination. The present application relates to a new pump assembly characterized by a unitary pump delivery tube and spout, as well as by a novel cup construction and assembly cooperating with the delivery system to form a pump having maximum efficiency, with longer lasting service, and with highest sanitation refinements.

I have found, after considerable research and experimentation, that the construction of my prior patent can be substantially simplified to provide improved operation with marked economies in manufacture, and that improved results can be obtained by reason of certain modifications and/or combinations of the arrangements of the aforementioned patent.

An object of my invention is to provide an improved adjustable stroke syrup pump.

Another object of my invention is to provide a syrup pump having an improved one-piece fluid tube with dripless spout.

Yet another object of my invention is to provide a syrup pump having an improved cup construction and assembly.

Still another object of my invention is to provide a syrup pump having an improved detachable syrup cup.

A further object of my invention is to provide an improved syrup pump constructed and arranged whereby the entire pump can be manually disassembled in a matter of seconds, without the use of tools or other implements.

A still further object of my invention is to provide an improved adjustable stroke syrup pump which is strong and sturdy in construction, consisting of relatively few parts, and not liable to get out of order even after long and continued use.

With these and other objects in view, which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention, may be varied in construction, proportions and arrangements, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful application to the particular constructions, which for the purpose of explanation, have been made the subject of illustration.

In the drawings, like numerals refer to similar parts throughout the several views, of which

Figure 1 is a fragmentary detail of a serving counter with a syrup jar in position, shown partly in elevation and partly in section, and an associated pump shown in elevation;

Fig. 2 is a vertical section of the pump taken in the plane bisecting the delivery tube and the plunger;

Fig. 3 is an exploded view of the plunger control elements;

Fig. 4 is an elevation of the pump assembly, and

Fig. 5 is a plan view of the cup assembly taken on line 5—5 of Fig. 1.

Referring to the drawings, and more particularly to Fig. 1 thereof, there is shown a fragmentary detail of a soda fountain, indicated generally by the numeral 1, mounting a syrup jar 2, shown in longitudinal section. The lip of the syrup jar serves as a support for the cover 10 of the novel syrup pump comprised of a detachable cup 20, an associated delivery tube and fixed cup supporting means, and a variable stroke plunger piston assembly, designated generally by the numeral 30. The cover, which can be of any suitable configuration, is a unitary member having a generally flat upper surface 11, and a depending marginal skirt 12. A central boss or raised section 13 is formed with a pair of aligned apertured bosses 14, 15, respectively mounting the fluid tube and the pump piston. The fluid tube is soldered in place, as indicated at 16, while the piston is freely reciprocable, as will be described more in detail hereinafter. A headed stay rod or support 17 is soldered in place in an aperture in the cover which is aligned with the apertured bosses 14, 15, the piston receiving boss or journal 15, being centrally disposed with respect to the other elements. The rod 17 is threaded at its lower end and is tapped into one end of a generally rectangular supporting plate 18 having concentric, curved ends 19, which are desirably beveled, as shown. The plate 18 is apertured to receive the piston rod of the pump and the fluid tube, and the threaded end of the rod 17 and the fluid tube are silver soldered to the supporting plate 18, all as indicated generally by the numeral 16, with the result that the plate is fixedly secured to and spaced from the cover 10.

The operative elements of the pump comprise a dispensing cup 20 and a piston assembly 30. The cup 20 is of cylindrical shape and is provided with an offset lip 21, forming a shoulder 22, adapted to freely receive and seat the curvilinear beveled end sections 19 of the supporting plate 18. The lip 21 is peened in at diametrically opposed sections to form a pair of retaining grooves 23, adapted to receive the plate ends 19 in gripping engagement, whereby the cup is detachably secured to the supporting plate, and made temporarily integral with the cover assembly. A stop member 24 is mounted on one end of the supporting plate 18, and is designed to engage adjacent ends of the grooved sections 23, whereby rotation of the cup is restricted to a quarter turn from locked to unlocked position, and, in the latter position, the cup can be readily detached from its support. An apertured spider 25 is struck out from the bottom of the cup and receives a spindle 26 of a disk valve 27 in snap-locking engagement. The cup discharges through fluid tube 28, which, as shown, extends through the cover, the tube being bent at an angle, and terminates in a drip-proof spout 29. It will be noted that the supporting plate 18 defines an upper limit stop for a piston 31, while the lower limit of travel of the piston is determined by the adjustment of the pump handle, as will now be described.

The piston or pump assembly 30, comprises the piston 31 reciprocable in and having close clearance with the wall of the cup 20. The piston is fixedly mounted on the end of piston rod 32, which is freely reciprocable in supporting plate 18. The reciprocation of the piston rod, that is, the length of the pump stroke, is controlled in the following manner: as shown in Figs. 2 and 5, the threaded upper end of the piston rod 32 is reciprocable in apertured boss 15 of the cover, while the lower end is reciprocable in the supporting plate 18 of cup 20. A splash

shield assembly comprises an upper shield 33 telescoping a lower shield 34, the top of the upper shield being tapped to receive the threaded upper end of the piston rod, while the lower shield is provided with an internal annular flange 35 in which the piston rod is freely reciprocable. The flange 35 of the lower splash shield is normally positioned above and spaced from the upper edge of the apertured boss 15 and the outside of upper splash shield 33 is knurled, or otherwise roughened, as indicated at 36. A compression spring 37 is fitted over the piston rod with its ends severally abutting the top of the upper splash shield and the annular flange of the lower shield, whereby the piston rod is normally spring biased to its upmost position, and the piston is positively urged up and against the supporting plate 18 of the cup assembly. A knob 38, internally threaded at 39, is threaded on the upper end of the piston rod, and is screwed up against shield member 33, serving as a lock nut therefor. When it is desired to vary the stroke of the piston, and thereby vary the volume of liquid discharged by the pump, the upper shield 33 is rotated on the rod 32, knob 38 having been previously loosened or removed. When the throw of the rod has been appropriately shortened or lengthened, the knob is screwed in place to resume its function as a lock nut.

As noted hereinabove, the novel syrup pump of the present invention is characterized by several features of novelty, not the least of which is the fact that it can be assembled and disassembled, without the use of any tools, and in a matter of seconds. Another feature is the greatly increased structural rigidity of the cover-supported assembly, wherein the supporting plate for the cup is fixedly secured thereto, in spaced relation, by means of the syrup discharge or fluid tube and an axially aligned stay rod or strut. The discharge tube and the stay rod are brazed to the cover and the supporting plate, at the joints formed therebetween, by sufficient silver solder to fill any depressions and to provide joints which are at least flush with the surrounding plane surfaces, whereby said surfaces can be readily cleaned, and the entire structure efficiently maintained in a sanitary condition. Additionally, the stay rod is preliminarily threaded into the supporting plate, so that a maximum of physical strength is imparted to the assembly.

The special one-piece construction of the fluid tube, with its dripless spout, eliminates the use of plugs, buttons, and caps, with their concomitant liability of getting lost, as well as serving as breeding spots for contamination. The novel pump of the present invention can be made of any suitable material which has the requisite strength, and meets the most rigid sanitary requirements. Preferred materials are stainless steel, Monel metal, and the like; however, the invention comprehends the use of suitable molded or extruded plastics, of the requisite structural strength. If plastics are used, they should be characterized by chemical resistance to water and cleaning agents, and be free from odor and susceptibility to attack by or reaction with fruit acids, and any and all ingredients of fruit syrups, or milk and cream.

The syrup cup has considerable bearing surface for engagement with the supporting plate, and is readily tightly locked thereto. It has maximum strength, due to the offset lip and peened-in lip sections, which permit the elimination of cut-outs in the wall. By varying the degree of rolling over or peening of the opposed lip sections, from the starting edges to the trailing edges thereof, a pinch-gripping or vise action can be effected on the cooperating arcuate ends of the supporting plate, and the latter securely locked in place. The double action valve snaps on the cup in a retaining position, and can be snapped off in a jiffy for cleaning. A comparatively large volume of syrup is dispensed with a shorter stroke of the plunger, because the latter is machined to very close tolerances with relation to the cup.

The cleaning of the improved structure is most simple. The pump is removed from the syrup jar, excess syrup being drained back into the jar by unseating disk valve 27. With the cup emptied of syrup, the cup is detached from the plate. The knob 38 is unscrewed from the upper end of piston rod 32, and is followed by the unscrewing of upper shield 33. Withdrawal of the upper shield frees the compression spring 37, and permits its removal, together with the lower splash shield 34. The piston rod 32 is then retracted through the cover 10 and the supporting plate 18, and carries the piston 31 with it. The disassembled parts can then be cleaned in any suitable manner, as usually set out and determined by the sanitary code of the particular municipality in which the dispensing unit is located. Because of the ready accessibility of all parts for the most rigorous cleaning and sanitation treatment, the novel pump assembly herein is approved by boards of health throughout the country, including those boards which maintain a rigid and efficient inspection service. After the requisite cleaning and drying of the parts, the pump elements are reassembled, in the reverse order of their dismantling, and the pump is again ready for use.

It is noted again, by way of résumé, that the cover and cup-supporting plate, as fixedly joined by the stay rod and fluid tube, form a structural entity of the utmost rigidity and strength, and serve further to provide spaced bearing supports or journals for the spring-biased piston rod and attached piston, whereby the piston and its actuating elements are afforded the maximum rigidity and support, with total freedom from weaving or twisting met with in less rigidly supported syrup pump structures. It is also to be noted that the novel cup structure incorporates a maximum of rigidity and structural strength, due to the novel design features therein. Of these, particular note is made of the offset lip structure which rigidifies the top of the cup without requiring added structural elements or supports of any nature whatever. This rigidifying effect is further enhanced by the rolling or peening in of the intermediate lip sections 23, as described in detail hereinabove. Thus, the cup is possessed of a maximum structural strength, and particularly in the region where it is most necessary, namely, where it engages the arcuate ends of the supporting plate in grip-locking engagement, so that, in operation, it becomes an integral part of the structural entity of the novel adjustable stroke syrup pump of the present invention.

There has been described and illustrated a device capable of performing all of the specifically mentioned objects of this invention as well as others which are apparent to those skilled in the art. Various uses of the present invention may be made employing the described structure. Accordingly, it is apparent that variations as to operation, size and shape, and rearrangement of elements may be made without departing from the spirit of the invention. Accordingly, limitation is sought only in accordance with the scope of the following claims.

What is claimed is:

1. In an adjustable stroke syrup pump, including a cover member, a fluid tube and a stay rod mounted in and integral with the cover, the improvements comprising a syrup cup having an offset lip including opposed peened-in groove sections, and supporting means for the cup comprising a rectangular plate integral with the fluid tube and the stay rod and fixedly spaced from and supported by the cover member, said plate having arcuate ends adapted for locking engagement with the said groove sections.

2. In an adjustable stroke syrup pump, including a cover member, a fluid tube and a stay rod mounted in and integral with the cover, the improvements comprising a syrup cup having an offset lip including opposed groove sections, and supporting means for the cup comprising a rectangular plate integral with the fluid tube and the stay rod and fixedly spaced from and supported by the cover member, said plate having arcuate shaped ends engageable in and by said opposed groove sections

upon apposition of the cup to the plate and rotation of the cup on and about the plate.

3. In an adjustable stroke syrup pump of the character described, a cover, a fluid tube and a stay rod mounted in and integral with the cover and severally depending therefrom, the fluid tube having a dripless discharge spout extending upwardly from the cover; a cup-supporting plate integral with the said tube and rod and fixedly spaced from and supported by said cover, the said plate being of rectangular shape and having arcuate ends; and a cup secured to the plate, said cup having an offset rim with opposed inturned locking grooves, said grooves being engageable by the ends of said plate when the cup is apposed to the plate and rotated thereon, whereby the cup is detachably secured to the cover assembly.

4. In an adjustable stroke syrup pump, in combination, a cover; a cup-supporting plate spacedly secured to and depending from the cover, said plate being of rectangular shape and having beveled arcuate ends, the plate-securing means comprising a stay rod and a one-piece fluid tube having a dripless spout extending above the cover and an inlet extending below the plate; a cup detachably secured to said plate, said cup having an offset rim with opposed inturned locking grooves, the said grooves being engageable by the ends of said plate when the cup is apposed to the plate and rotated in place; a disk valve snap-fitted in the bottom of the cup; a piston mounted in the cup and having close tolerances with the wall thereof; a piston rod fixedly secured to the piston and journaled in and by the supporting plate and the cover; and spring-biased actuating means for the pump mounted on the cover and controlling the piston rod, the said actuating means being adjustable to vary the stroke of the piston rod and thereby control the volume of liquid delivered by the pump.

5. In an adjustable stroke syrup pump, in combination, a cover; a cup-supporting plate spacedly secured to and depending from the cover, said plate being of substantially rectangular shape and having beveled arcuate ends, plate-securing means comprising a stay rod and a one-piece fluid tube having a dripless spout extending above the cover and having an inlet extending below the plate; a cup detachably secured to said plate, said cup having an offset rim with opposed inturned locking grooves, the said grooves being engageable by the ends of said plate when the cup is apposed to the plate and rotated in place, at least one of said plate ends mounting a stop member, whereby to restrict rotation of the cup on the plate between an open, detachable position, and a closed, locked position; a disk valve snap-fitted in the bottom of the cup; a piston rod fixedly secured to the piston and journaled in and by the supporting plate and the cover; and spring-biased actuating means for the pump mounted on the cover and controlling the piston rod, the said actuating means being adjustable to vary the stroke of the piston rod and thereby control the volume of liquid delivered by the pump.

References Cited in the file of this patent

UNITED STATES PATENTS

1,199,502	Schuyler	Sept. 26, 1916
1,412,329	Altenberg	Apr. 11, 1922
2,443,555	Dunkin	June 15, 1948
2,587,241	Steele	Feb. 26, 1952
2,657,833	Steczynski	Nov. 3, 1953