Nov. 2, 1948. O. L. ENGSTROM 2,453,004

LIQUID MIXING AND DISPENSING APPARATUS

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Fig. 1

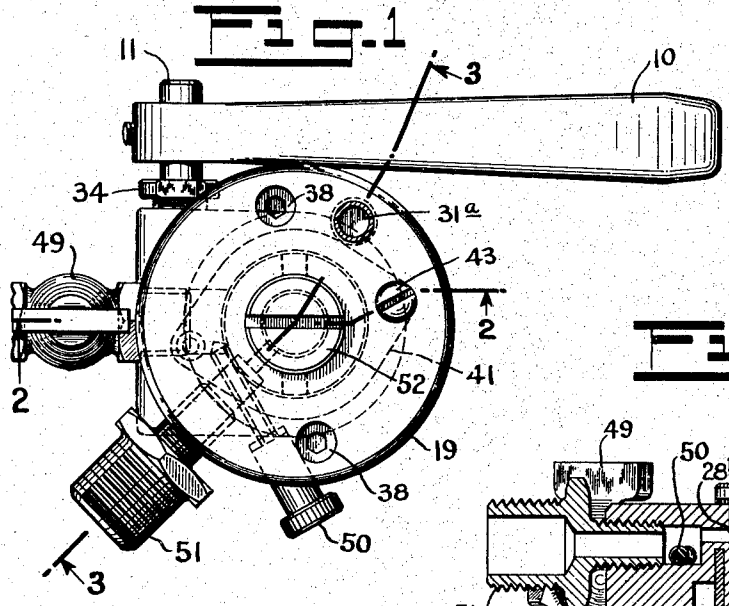


Fig. 3

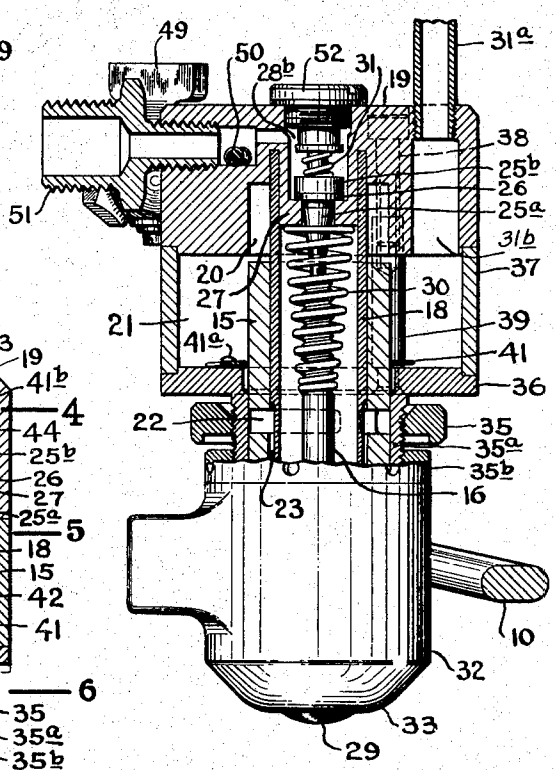
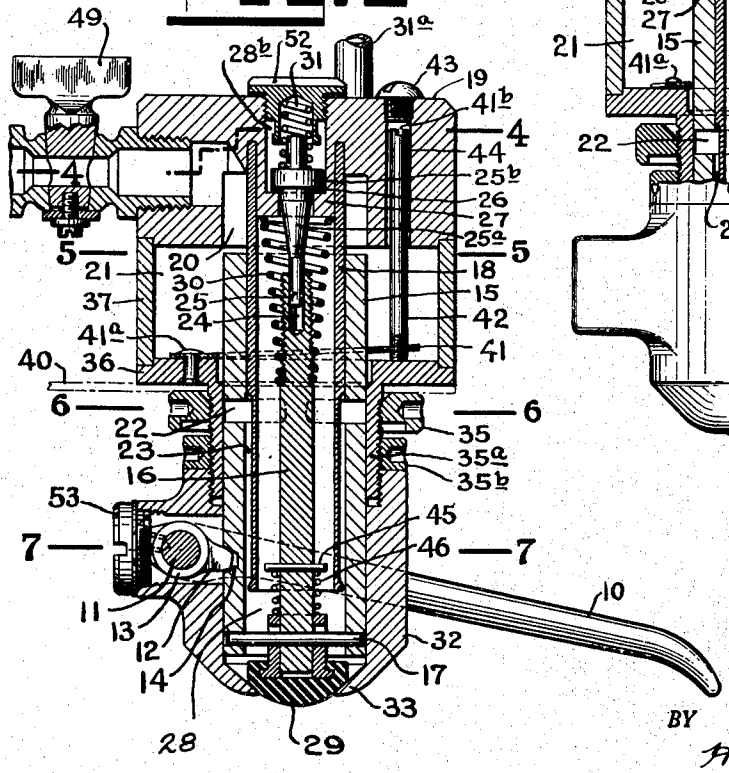


Fig. 2



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Fig. 4

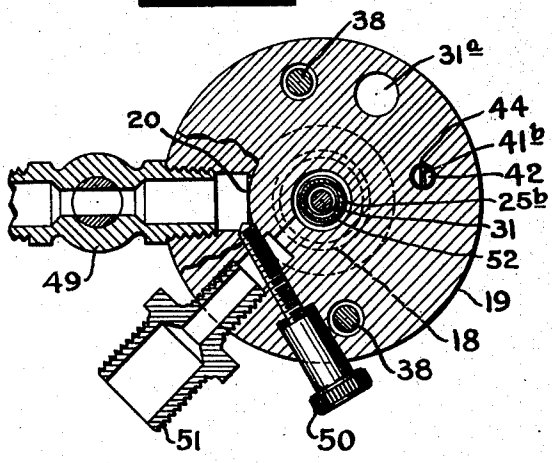


Fig. 5

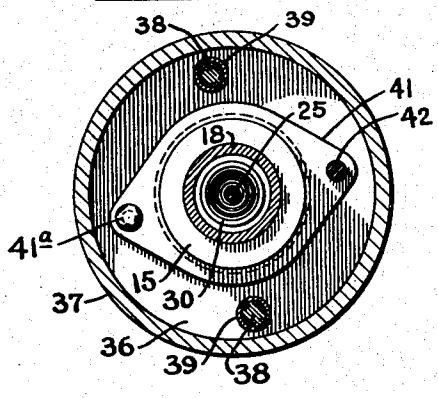


Fig. 7

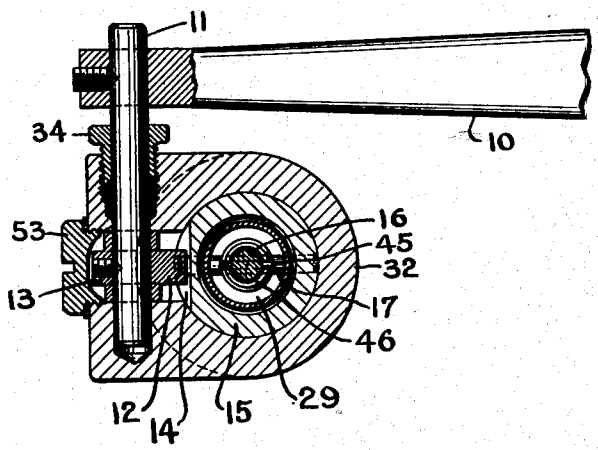


Fig. 6

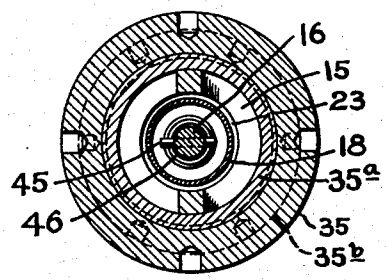
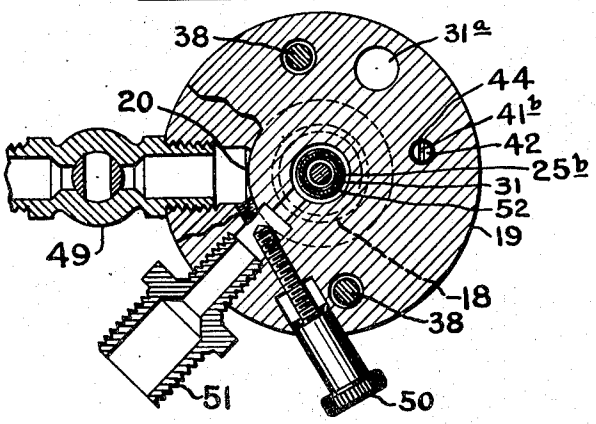


Fig. 12



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Fig. 8

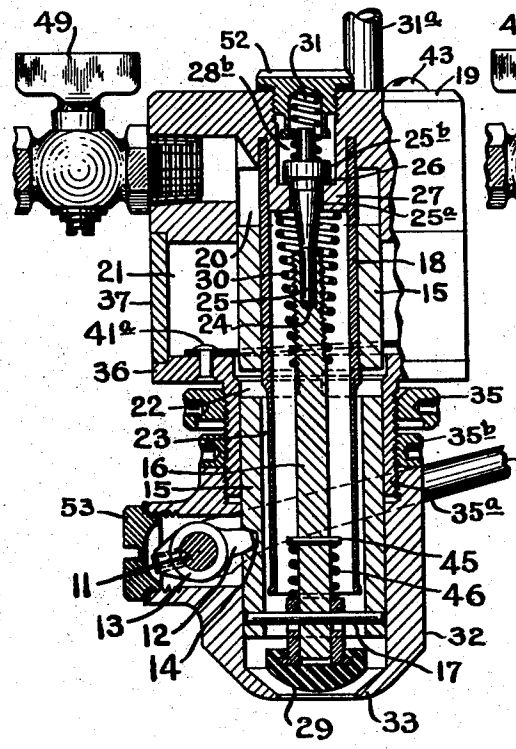


Fig. 9

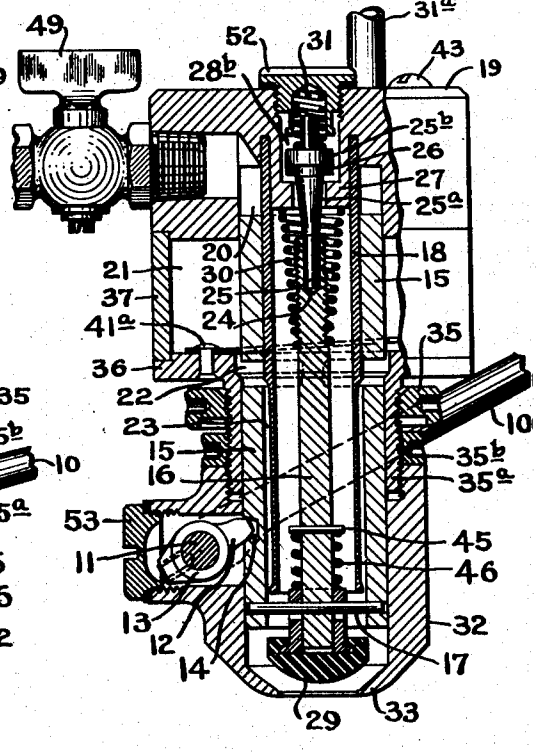


Fig. 10

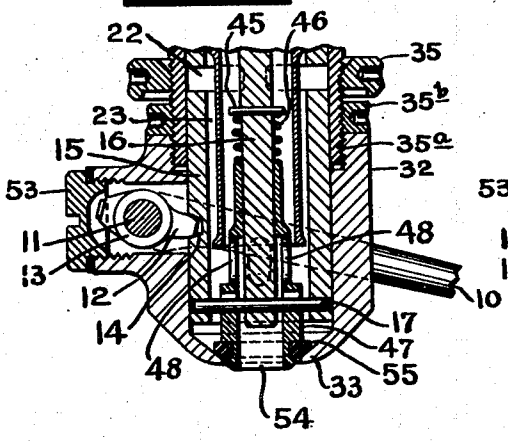
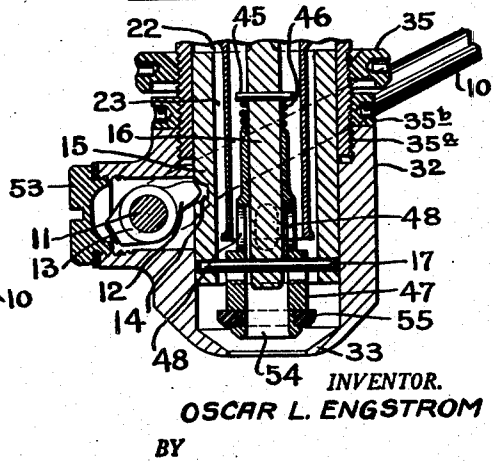


Fig. 11



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LIQUID MIXING AND DISPENSING APPARATUS

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Application February 24, 1947, Serial No. 730,426

11 Claims. (Cl. 222—133)

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This invention relates to dispensing apparatus, and more particularly to a liquid measuring and dispensing apparatus, especially designed for use at soda fountains for mixing syrup with soda water.

One object of the present invention is to provide an apparatus of the above nature in which provision is made of a vertical casing having a central vertical operating rod provided with a main outlet valve plug on the bottom end thereof, and having a water supply chamber on the top thereof.

A further object is to provide an apparatus of the above nature having an upper side syrup supply valve, and an annular syrup measuring chamber surrounding said rod and the water supply chamber.

A further object is to provide an apparatus of the above nature, which will be non-dripping, simple in construction, inexpensive to manufacture, easy to install and manipulate, compact, ornamental in appearance, and very efficient and durable in use.

With these and other objects in view, there have been illustrated on the accompanying drawings two forms in which the invention may conveniently be embodied in practice.

In the drawings,

Fig. 1 represents a top plan view of the improved apparatus.

Fig. 2 is a longitudinal vertical sectional view of the same, taken along the line 2—2 of Fig. 1, showing the appearance of the apparatus when the discharge valve and the water inlet valve are closed and the syrup inlet valve is open.

Fig. 3 is a similar vertical sectional view of the same, taken along the broken line 3—3 of Fig. 1, through the vent hole of the syrup chamber and the water inlet.

Fig. 4 is a horizontal sectional view, taken along the line 4—4 of Fig. 2.

Fig. 5 is a similar horizontal sectional view, taken along the line 5—5 of Fig. 2.

Fig. 6 is a similar horizontal sectional view, taken along the line 6—6 of Fig. 2.

Fig. 7 is a similar horizontal sectional view, taken along the line 7—7 of Fig. 2.

Fig. 8 is a longitudinal vertical sectional view similar to Fig. 2, showing the appearance of the apparatus when the main valve is open.

Fig. 9 is a longitudinal sectional view, similar to Fig. 2, showing the appearance of the apparatus when the water valve is open.

Fig. 10 is a longitudinal sectional view of a modified form of the lower portion of the apparatus adapted to provide for a hollow main valve discharge plug, showing the appearance of the plug in closed position.

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Fig. 11 is a similar longitudinal sectional view of the same, with the discharge plug in open position.

Fig. 12 is a horizontal sectional view, similar to Fig. 4, showing the syrup cutoff valve in closed position, and with the water bypass screw withdrawn to permit the flushing of the syrup supply chamber for cleaning purposes.

Referring now to the drawings, in which like reference numerals denote corresponding parts throughout the several views, the numeral 10 indicates a handle which is mounted on a horizontal pivot shaft 11, carrying a short vertical arm 13, provided with an inwardly projecting tooth 12, which is adapted to fit within an exterior recess 14, formed on a vertically slidable sleeve 15. The shaft 11 has an exterior bearing gasket bushing 34.

Located within the sleeve 15 is a central operating rod 16 loosely connected to said sleeve with backlash by means of a cross pin 17, at the bottom thereof (see Figs. 2 and 11).

Located within the sleeve 15 is a stationary vertical tube 18 extending substantially three-quarters of the length of the apparatus—said tube being rigidly secured at its upper end to a hollow casing 19, below which is a syrup supply chamber 20 connected to an annular measuring chamber 21.

The syrup measuring chamber 21 is provided at its lower end with an annular inner port 22 for conducting the syrup therefrom into an annular passage 23, located between the fixed tube 18 and the slidable sleeve 15, as clearly shown in Figs. 2, 3, 8. 9, 10, and 11 of the drawing.

The rod 16 is provided on its upper end with a vertical socket 24 for slidably embracing a depending stem 25 of a water inlet valve having an intermediate conical section 25*a*, above which is a cylindrical valve head 25*b*. Below the valve head, provision is made of a gasket 26, which is adapted to engage upon an annular seat 27 formed in the casing 19.

In order to control the flow of the liquid from the dispensing apparatus, provision is made at the lower end thereof, of a main discharge plug 29 seated on the bottom of a mixing chamber 28, connected with the syrup passage 23, and an annular water passage 28*a* surrounding the rod 16. Soda water is adapted to be admitted to the casing 19 through an inlet valve 51, and from which it flows to the water supply chamber 28*b*.

Syrup is admitted to the casing through a syrup inlet valve 49.

In order to press the discharge plug 29 tightly against a tapered valve seat 33 formed in a lower casing cap 32 which is screwed upon a depending section 35a of a horizontal plate 36, provision is made of a conical spring 30 which presses downwardly upon the operating rod 16 at all times. The water valve 51 is also pressed downwardly at all times by means of a small upper spring 31 seated in a hollow guide plug 52 to hold it in centralized position.

The syrup-measuring chamber 21 is provided with an upstanding vertical vent tube 31a connected by a passage 31b to the measuring chamber 21.

In order to secure the lower casing cap 32 to the depending threaded extension 35a of the bottom plate 36 of the syrup measuring chamber 21, provision is made of a pair of lock nut rings 35, 35b, which may be adjusted by means of any suitable tool.

The outer portion of the syrup chamber 21 is closed by means of a cylindrical shell 37 and the plate 36 is secured to the upper portion of the casing 19 by means of two vertical screws 38 having tapped lower legs 39, as clearly shown in Fig. 12 of the drawing.

The improved mixing and dispensing apparatus is adapted to be supported in a vertical position upon a horizontal shelf 40, shown in dotted lines in Fig. 2.

In order to control the flow of liquid from the syrup-measuring chamber 21 into the passage 23, provision is made of a substantially horizontal apertured circular collar member 41 secured on one side of the plate 36 by a screw member or rivet 41a, and having its opposite end free to move vertically within said chamber 21. The elevation of the free end of the collar 41 is controlled by means of a vertical adjusting rod 42 extending upwardly through a hole 44 in the top of the casing 19 and covered at its upper end by a closing cap screw 43.

Provision is also made of a safety spring 46 which engages a horizontal pin 45 in the rod 16 to hold the main discharge valve plug 29 upon its outlet seat resiliently.

In order to permit the cleaning and flushing of the syrup supply valve and syrup chamber, whenever desired, the syrup inlet 49 will first be shut off. A horizontal bypass plug 50, which is normally seated in the position shown in Fig. 4 will then be withdrawn to the position shown in Fig. 12, whereupon the syrup chamber may be flushed out with water.

Provision is also made of a side closure plug 53 shown in Fig. 7, to protect the handle-operated arm 13 of the pivot shaft 11.

Operation

In operation, when the handle 10 is swung upwardly about its pivot shaft 11, the tooth 12 on the arm 13 through its engagement in the recess 14 will cause the sleeve 15 to move upwardly and carry with it the central valve-operating rod 16, and lift the discharge plug 29 from its seat 33. The supply of syrup from the chamber 20 will thus be shut off, and the syrup will flow through the port 22 and the passage 23 into thte mixing chamber 28.

When the handle is swung still farther the rod 16 will open the valve stem 25a from its seat 27, and permit water to flow from the water supply chamber 28b to the interior of the fixed

tube 18 and commingle with the syrup in the mixing chamber 28, from which it will flow around the discharge plug 29 through the discharge outlet and into a receptacle (not shown) beneath it.

When the handle 10 is released, the springs 30 and 46 will restore the rod 16 and the valve plug 29 to their original positions as shown in Fig. 2. Also the small spring 31 will close the water valve 25 and the syrup will then be permitted to refill the supply chamber 21, as before.

It will be understood that the vent hole 31a will assist the syrup to flow freely into the syrup measuring chamber 21 by permitting air to escape therefrom.

Modified form

In the modified form of the invention shown in Figs. 10 and 11, a tubular discharge plug 47 is employed at the lower end of the casing, said plug 47 having a pair of opposed liquid mixing apertures 48 on opposite sides thereof, and an open lower central discharge port 54 surrounded by a main gasket ring 55.

One advantage of the present invention is that "after-dripping" will be completely prevented.

A further advantage is that the mixing of syrup and soda water takes place immediately above the discharge port, thus practically eliminating the formation of foam in the apparatus.

While there has been disclosed in this specification several forms in which the invention may be embodied, it is to be understood that these forms are shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosures, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new, and for which it is desired to secure Letters Patent, is:

1. In an apparatus for mixing syrup with soda water, a vertical casing having separate syrup and soda water supply inlets at the upper end thereof, an annular syrup measuring chamber below said syrup supply inlet, a slidable water valve, and a central sliding valve for controlling the flow of syrup from its inlet to said measuring chamber, a manually slidable vertical operating rod located within the central portion of said casing, said rod having its upper end engageable with said water valve to lift it from its seat when said rod is operated, said casing having a mixing chamber at the bottom thereof, a discharge outlet below said mixing chamber, said rod having on its lower end a discharge plug engaging said discharge outlet, means to conduct syrup from said measuring chamber to said mixing chamber, and a passage to conduct soda water from said water inlet to said mixing chamber.

2. The invention defined in claim 1, in which provision is made of a spring for resiliently holding said main valve tightly upon the discharge port to prevent dripping.

3. The invention defined in claim 1, in which spring means are provided to resiliently press said water valve upon its seat.

4. The invention defined in claim 3, in which a guide plug is provided at the top of said casing for holding said water valve in centralized position.

5. The invention defined in claim 1, in which said lower cap is adjustably secured to said casing by a plurality of nut rings screwed upon the outside of said casing.

6. The invention defined in claim 1, in which the means for conducting the syrup from said measuring chamber to said mixing chamber comprises an annular passage surrounding said water passage.

7. The invention defined in claim 6, in which said syrup conducting annular passage is separated from said water passage by a fixed sleeve connected rigidly to said casing and concentric with said rod.

8. The apparatus defined in claim 1, in which a flat circular collar is provided on the bottom of said annular measuring chamber for controlling the rate of flow of syrup therefrom.

9. The invention defined in claim 8, in which said flat collar is connected at its free end to a screw rod, the upper end of which extends to the top of said casing.

10. The invention defined in claim 1, in which said main valve plug is tubular and has opposed apertures for admitting the syrup and water mixture.

11. The invention defined in claim 1, in which said main valve plug has a loose connection to said slidable vertical operating rod.

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No references cited.