May 20, 1947. R. YUZA 2,420,850

MIXING FAUCET FOR DISPENSING BEVERAGES

Filed Sept. 21, 1945 4 Sheets-Sheet 1

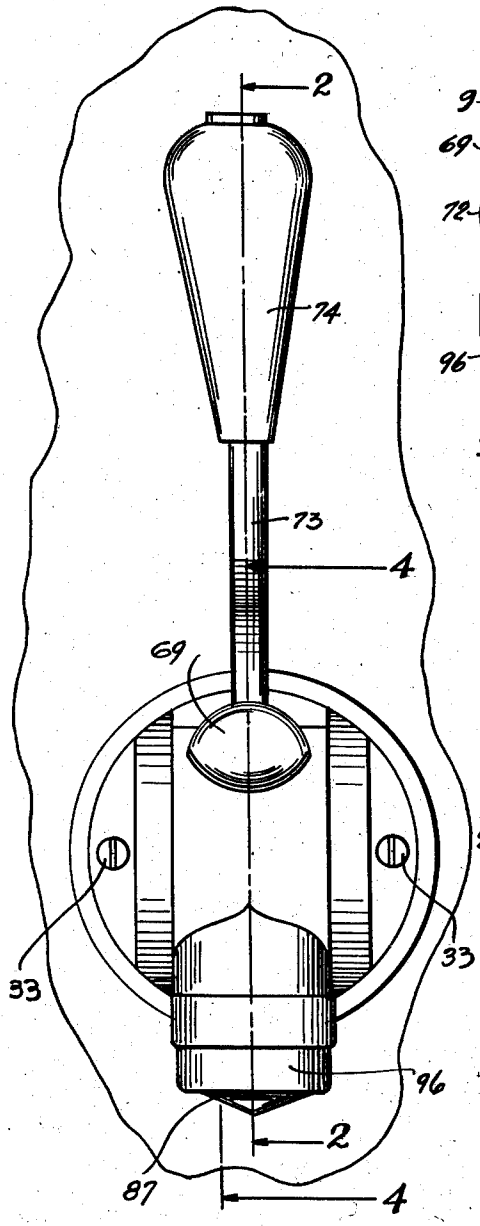


Fig. 1

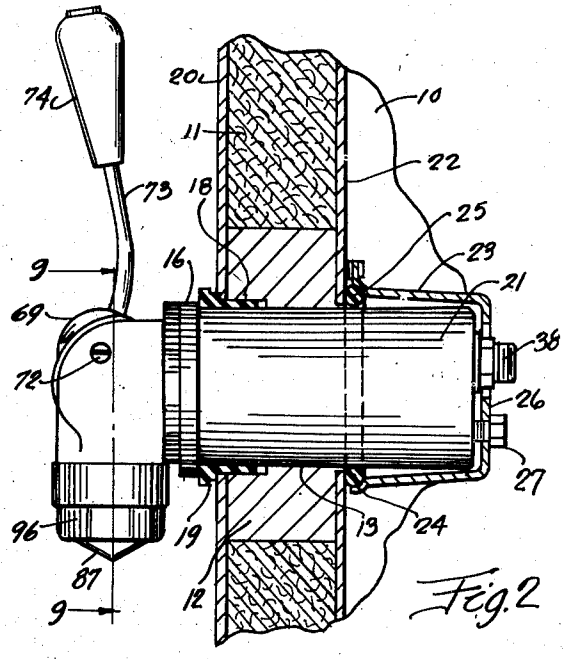


Fig. 2

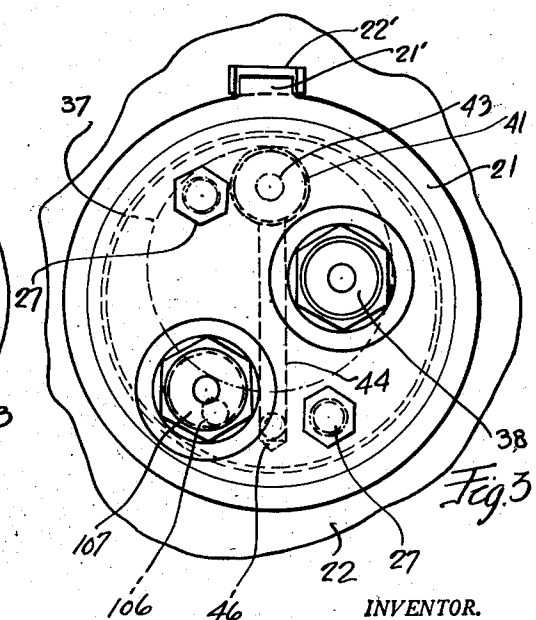


Fig. 3

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MIXING FAUCET FOR DISPENSING BEVERAGES

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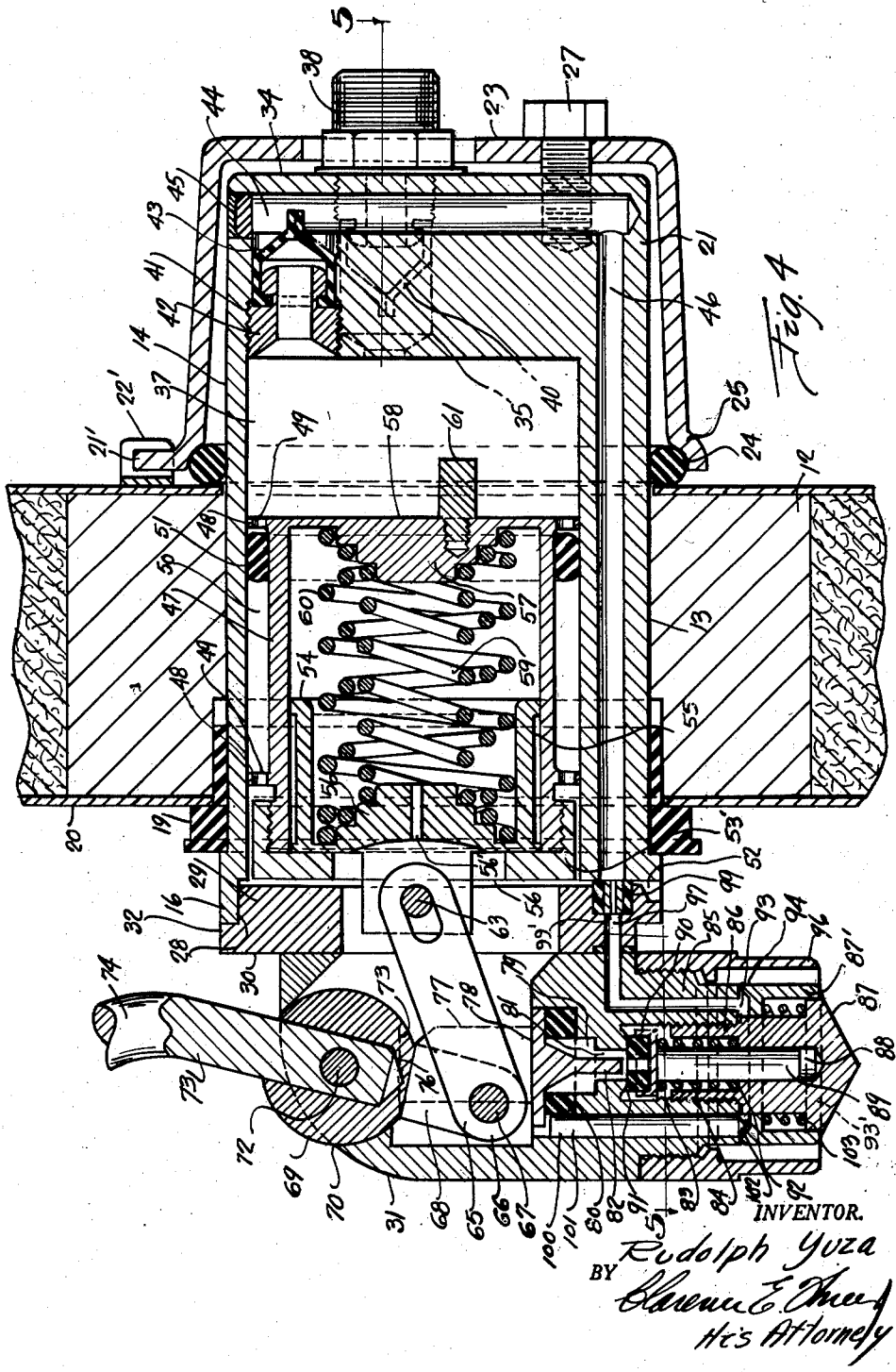


Fig. 4

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MIXING FAUCET FOR DISPENSING BEVERAGES

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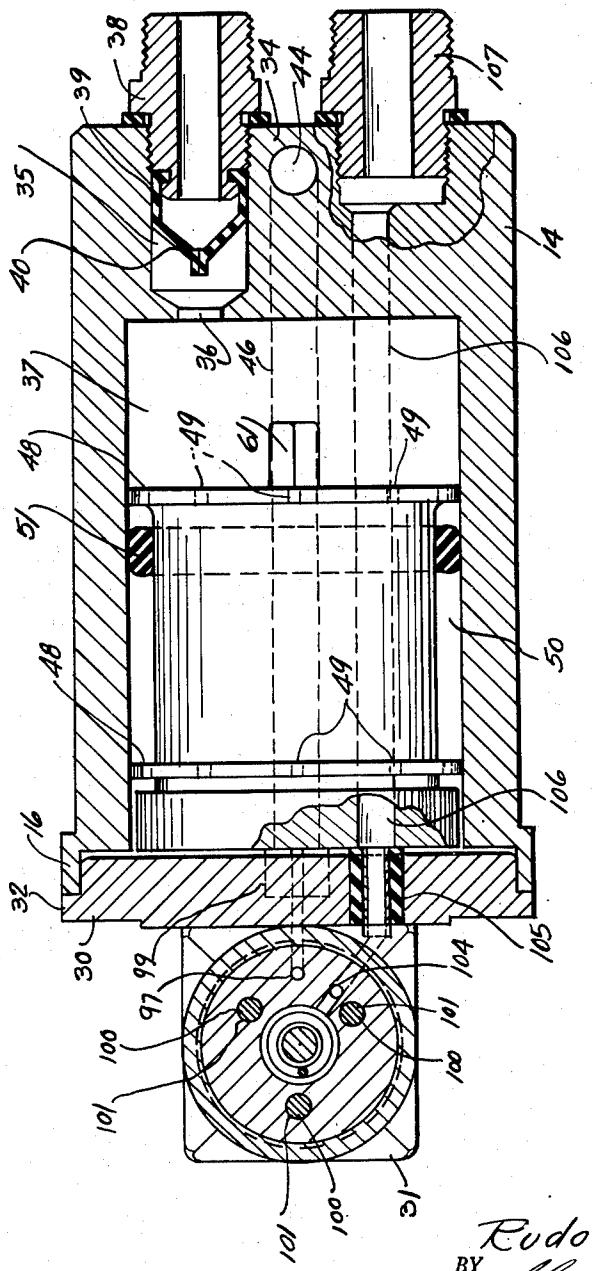


Fig. 5

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MIXING FAUCET FOR DISPENSING BEVERAGES

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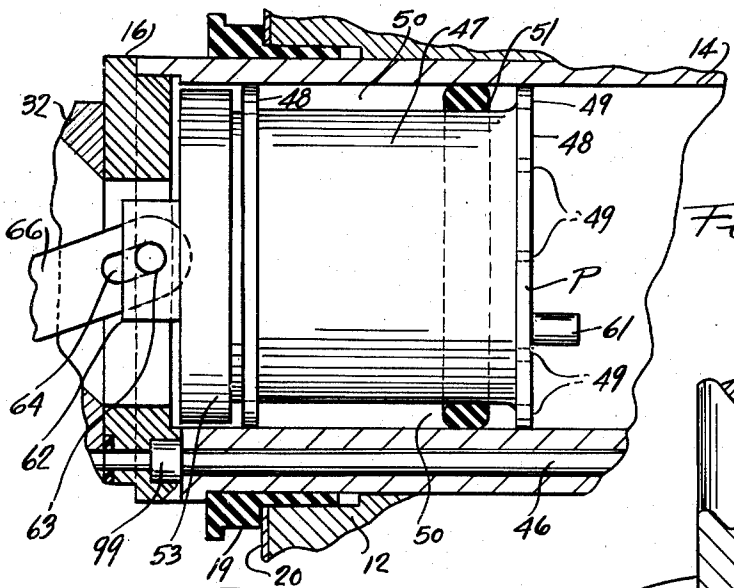


Fig. 6

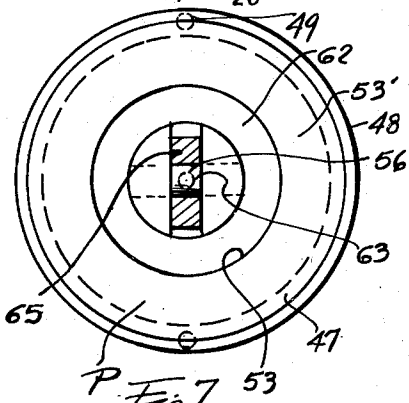


Fig. 7

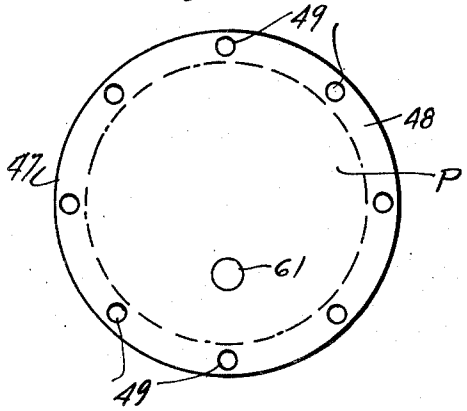


Fig. 8

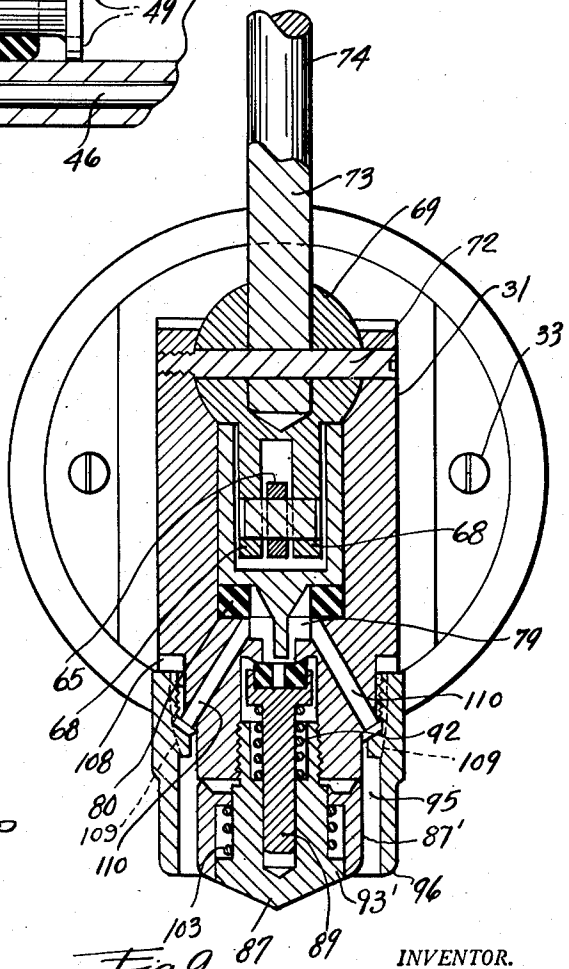


Fig. 9

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Patented May 20, 1947

2,420,850

UNITED STATES PATENT OFFICE

2,420,850

MIXING FAUCET FOR DISPENSING BEVERAGES

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Application September 21, 1945, Serial No. 617,709

6 Claims. (Cl. 225—26)

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This invention relates to a dispensing apparatus particularly though not necessarily designed for use in connection with soda fountains from which a beverage from a mixture of liquids is dispensed. In this aspect of the invention, a principal object is to provide an apparatus of the character described hereinafter which will be highly efficient in use and economical in manufacture and of a simplified and improved construction.

A still further and equally important object of the invention is the provision for moving the syrup ejecting piston by resilient pressure, resulting from and by reason of a spring connection between the driving piston and the driven piston, with the resulting structure affording a predetermined movement of the driving piston prior to the movement of the driven piston, against a body of syrup previously drawn into a measuring chamber.

Yet another and equally important object of the invention is the provision of a dispensing apparatus of the character hereinafter described, wherein there is obtained a high volume of gas in the carbonated water at the dispensing area, resulting in the dispensing of a highly carbonated drink, with the minimum amount of foam.

Still a further object of the invention is the provision of an apparatus of the character hereinafter described which, by its employment, assures a rapid dispensing of a mixed drink, usually consisting of a syrup and carbonated water. It is common knowledge that delay is encountered in preparing and serving a mixed drink by reason of the fact that in the dispensing of a drink consisting of a syrup and carbonated water, a large or deep foam head results, with the consequence that the operator must wait until the foam is substantially dissipated before adding to the drink additional carbonated water and syrup to provide a mixed drink of proper volume. With this in mind, it is an object of the invention to dispense the syrup and carbonated water in the drinking glass in a manner such that a relatively small foam head is formed, during the mixing operation, thereby facilitating rapid succession in the dispensing of the mixed drink.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

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Fig. 1 is an elevational view of the dispensing apparatus embodying my invention;

Fig. 2 is a sectional detail view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a rear view of the same;

Fig. 4 is a sectional detail view taken substantially on line 4—4 of Fig. 1;

Fig. 5 is a sectional detail view taken substantially on line 5—5 of Fig. 1;

Fig. 6 is a fragmentary elevational view illustrating the piston within its cylinder as embodied in the invention;

Fig. 7 is a front elevational view of the piston embodied in the invention;

Fig. 8 is a rear elevational view of the piston embodied in the invention; and

Fig. 9 is a sectional detail view taken substantially on line 9—9 of Fig. 2.

Referring to the drawings illustrating the preferred form of construction by means of which the several objects of the invention are accomplished, a refrigerator is indicated at 10, and it is within this refrigerator that a container containing the syrup and a container containing the carbonated water are arranged, said containers not being shown in the drawings as they may be of any conventional type of construction and do not constitute any part of this present invention.

This refrigerator 10 may be of any approved construction having insulated walls 11 for obvious purposes. In the front wall of the refrigerator is arranged a mounting block 12 having a central opening 13. Through this opening 13 is arranged the cylinder body 14 of my improved dispensing apparatus. This cylinder body 14 at its forward end portion is provided with a collar 16. Between the cylinder body 14 and the block 12 is an insulating sleeve 18 formed preferably of rubber or the like and having a flange 19 disposed between the collar 16 and the outside wall plate 20 of the wall 11. The inner end portion 21 of the cylinder body 14 projects inwardly beyond the inner wall plate 22 of the wall 11. Disposed over this end portion of the cylinder body 14 is a cap 23 having an annular seat 24 formed therein in which a sealing ring 25 is positioned and bears against the wall plate 22. In the end portion 26 of the cylinder body 14 are threaded a pair of bolts 27 which draw the cylinder body 14 in a direction to compress the collar 16 against the flange 19 and the annular seat 24 against the sealing ring 25, thus effecting a complete seal between the cylinder body 14 and the wall 11.

The collar 16 has an internal recess 28 into which seats the inner portion 29 of a head plate

30 formed as an integral part of a nozzle head 31. This plate 30 provides an annular peripheral flange 32, which, when the plate is connected to the cylinder body 14 by means of screws 33, is tightly drawn up against the edge of the collar 16, as shown in Figs. 1 and 4.

The cylinder body 14 provides a substantially thick rear wall 34 having formed therein, as shown in Fig. 5, a bore 35, the inner end portion of which is reduced to provide an orifice 36 communicating with a measuring chamber 37, hereinafter more fully described.

In this bore 35 is threaded a nipple 38. Carried by the inner end of this nipple 38, as at 39, is a check valve 40 of a well-known and approved construction. To this nipple is adapted to be connected a supply conduit (not shown) leading from a syrup container (not shown) for the admission of syrup through the nipple and orifice into the measuring chamber 37. The arrangement is such that the syrup is permitted by the check valve to be drawn into the measuring chamber 37, but when the syrup is ejected from the measuring chamber through an outlet bore, the check valve will automatically close because of its resilient structure, and prevent flow of the syrup from the measuring chamber 37 back into the container.

In this end wall 34, there is formed a bore 41, and mounted in this bore 41 is a nipple 42 carrying, as in the case of the nipple 38, a check valve 43. This nipple 42 communicates with a vertical bore 44 formed preferably though not necessarily by a drilling into the wall 34, with a plug 45 closing the bore 44 at its upper end portion. This bore 44 communicates with a horizontal delivery passage 46 formed in the side wall of the cylinder body 14, also preferably though not necessarily by a suitable drilling operation.

The arrangement is such that the measured syrup may be forced into the bore 44 through check valve 43, but cannot be drawn back into the measuring chamber by reason of the closing of check valve 43 in a manner well-known in the art.

The means for drawing the syrup into the measuring chamber 37 and for ejecting the measured syrup therefrom, will now be explained.

In the cylinder body 14 is arranged a piston assembly P consisting of outer piston 47. This piston 47 at its rear end portion and immediately adjacent its forward end portion, is provided with annular flanges 48 which have slidable engagement with the inner walls of the cylinder body 14 and are provided with a number of openings 49 to permit the escape of air so as to allow freedom of movement of the piston assembly in the cylinder body 14. Embracing the outer piston 47 and having rolling engagement with the inner walls of the cylinder body 14, is a resilient piston ring 51 of a construction and form similar to that shown in United States Letters Patent No. 2,317,034, dated April 20, 1943, for providing an effective seal between the outer piston 47 and the cylinder body 14.

In the lower end portion of the collar 16 is provided an opening 52 which communicates with the interior of the head 31 and with the space 50 between the cylinder body 14 and outer piston 47 for the dual purpose of permitting the exit of air from within the head 31 and the space 50 to permit the freedom of movement of the piston 47 by means hereinafter described and for the additional purpose of allowing exit through the weep hole 52 of any condensation which might form in the head 31 or in the space 50.

The outer piston 47 has a cap 53' threaded thereon constituting the front wall of the piston 47, and this front wall is provided with an opening 53. Arranged within the outer piston 47 is an inner piston 54 having its side walls partially relieved as at 55 from the inner walls of the piston 47 to facilitate by reduction of friction the movement of the inner piston by means hereinafter set forth. This inner piston 54 provides a mounting stud 56 in line with a mounting stud 57 formed on the rear wall 58 of the piston 47. In the stud 56 is an escape opening 56' which allows for the escape of air from within the piston assembly when the inner piston is moved relatively to the outer piston.

Embracing the outer end portions of these mounting studs 56 and 57, is an expansion spring 59 arranged within an expansion spring 60 having its end portions mounted upon the base portion of the mounting studs 56 and 57. The arrangement is such that the inner piston 54 will be free to move a predetermined distance to compress the springs 59 and 60 to a condition whereby the springs, upon further movement of the piston 54, will impart movement to the piston 47 against a body of syrup previously drawn into the measuring chamber 37. The piston assembly P together with the walls of the cylinder body 14, provide the measuring chamber 37. Rearward movement of this piston assembly is limited by a pilot stud 61, the length of which may be varied according to the distance of movement of the piston assembly in the cylinder body 14 in a direction toward the rear wall 34.

Provided by the piston 54 and projecting through the opening 53, is a bifurcated lug 62 carrying a pintle 63 projecting through an elongated slot 64 of a connecting link 65.

This connecting link 65 has its end portion 66 pivotally connected by means of a pintle 67 to a bifurcated lug 68 formed as an integral part of a ball-shaped element 69 arranged for rotation in the slotted end portion 70 of the head 31 upon a pivot pin 72 carried by the head 31 as shown in Figs. 2 and 4. To this pivot pin 72 is also connected the end portion 73 of an operating handle 74. The ball-shaped element 69 has a cam face 75 adapted to engage the top edge 76 of a pair of spaced projections 77 formed as an integral part of a valve operating disc 78. In this head 31 there is provided a distributing chamber 79 in which is seated a resilient ring 80 preferably formed of compressible material such as rubber or the like, and this valve operating disc 78 rests upon this ring 80 as shown in Fig. 4. The distributing chamber 79 has a connecting orifice 81 into which the stem 82 of the disc 78 projects. This orifice 81 communicates with a valve chamber 83 provided at the base of an exterior bore 84 formed in the neck portion 85 of the head 31. Threaded into the lower end portion of this exterior bore 84 is a sleeve 86 formed as an integral part of a nozzle tip 87. This nozzle tip 87 is provided with a bore 88 into which there is slidably mounted the stud shaft 89 formed as an integral part of a valve cup 90 supporting a valve disc 91, which, when in the position shown in Fig. 4, closes communication between the orifice 81 and the valve chamber 83. This valve disc 91 is normally held in valve-closing position through the medium of an expansion spring 92 mounted in the nozzle tip as shown in Fig. 4. The nozzle tip 87 provides an enlarged portion 93' having slidably arranged thereon a valve

sleeve 87' having a valve head 94 controlling outlet of syrup from a syrup well 93 formed in the valve sleeve 87'. Communicating with this well 93 is an outlet 97 having communication through a combined sealing ring and restricting duct, with the delivery passage 46. This combined sealing ring and restricting duct includes a rubber sleeve 99 embracing a short metal duct 99' and compressed against an adjacent wall of the body 14 to prevent leakage of the syrup from the passage 46.

Threaded upon the reduced end portion of the valve head is a nozzle cap 96 providing together with the valve sleeve 87' an outlet orifice 95 for the mixed drink into the drinking glass (not shown).

At predetermined points radially with respect to each other, there are formed in the neck 85 vertical openings 100. Positioned in these openings 100 are control pins 101 the upper ends of which, as shown in Fig. 4 are disposed below and in slightly spaced relation with respect to the valve disc 78 and are adapted to be engaged by this disc 78 to bear the tapered end portions 102 against the valve sleeve 87' to move the sleeve 87' against the action of the spring 103 whereby to open the syrup outlet 97. While I have shown three of these control pins 101, it is manifest that there may be less or more in number of the same.

Communicating with the bore 79 is a passage 104, and this passage in turn through a sealing ring 105, similar to the sealing ring 98, has communication with a passage 106 formed in the cylinder body 14 and communicating with a nipple 107 (Fig. 5) to which is attached the conduit leading from the carbonated water tank.

As shown in Fig. 9, there is formed in the upper periphery of the cap 96 one or more openings 108, and communicating with these openings are vertical slots 109 to liberate for reasons hereinbefore set forth, excess gas in the carbonated water during drawing of the drink and its passage through the outlet orifice.

To expedite and facilitate locating the valve head 31 in its proper position with respect to the cylinder body 14 and with the handle 74 and the nozzle 38 in a substantially vertical plane, I provide as shown in Figs. 2, 3 and 4, on the cabinet 23 a locating finger 21'. This locating finger 21' for the purpose of locating the valve aforesaid, cooperates with a U-shaped projection 22' carried by the inside wall plate 22 of the wall structure 11.

The flow of the syrup, under ejection from the measuring chamber, is through the nipple 42, the check valve 43, the port 44 and into the outlet passage 46, through the restricted duct 98 into the outlet ports 97, from whence it flows from the syrup well 93 with the carbonated water over the valve sleeve 87' into the drinking cup or container.

The flow of the carbonated water from a container (not shown) is through the nipple 107, the passage 106, the restricted duct 105, passage 104, into the distributing chamber 79 for passage through the outlet 95, through which outlet the syrup and carbonated water will by capillary action hug the valve sleeve 87' as the mixture flows into the drinking glass.

The diameter of the duct 98 in its comparison with the diameter of the restricted duct 105 is such that the flow of syrup will be commensurate with the flow of the carbonated water to produce a drink of proper and desirable proportion of the mixture as is conducive to a well mixed drink.

In the dispensing of a mixed drink, it is desirable to draw into the drinking glass prior to the dispensing of the carbonated water and syrup a small amount of carbonated water only. This will prevent the syrup from sticking and congealing upon the inside bottom of the drinking glass.

To accomplish this feature of my invention, the slot and pin connection 63 and 64, respectively, between the handle 74 and the piston assembly 47, has been provided. The resulting structure, while opening communication between the outlet ports 110 and the distributing chamber 79 for the discharge of carbonated water, imparts no pivotal movement to the piston assembly upon initial pivotal movement of the handle 74 about the pintle 72 toward its forwardmost position.

To condition the apparatus for the drawing of a drink, it is necessary to draw a portion of the syrup into the measuring chamber 37. This is accomplished by pivoting the handle 74 about its pintle 72 to its extreme forward position, in which position of the handle 74 the piston assembly 47 will be disposed in its innermost position within the cylinder body 14. The handle 74 is then pivoted about its pintle 72 to its innermost position or to the position shown in Fig. 4, and during this pivotal movement of the handle 74, the piston assembly 47 will be moved to its forwardmost position within the cylinder body 14, at which time syrup will be drawn into the measuring chamber 37, through the check valve 43. During this conditioning of the apparatus, only carbonated water will be dispensed through the nozzle assembly.

With the apparatus thus conditioned, a mixed drink may be drawn, and this is accomplished as follows:

The initial movement of the handle 74 about its pintle 72 in a direction toward its forwardmost position, will open the valve disc 78 to allow the flow of carbonated water through the outlet 95 into the drinking glass so as to screen the inside bottom of the drinking glass from the syrup when the syrup and additional carbonated water are dispensed into the glass. Further movement of the handle 74 about its pintle 72 in the above stated direction, will impart movement to the inner piston 54, and this movement will continue until the springs 59 and 60 are compressed to a degree such as will move the outer piston 58 in a direction against the body of syrup previously drawn in the measuring chamber 37. This movement of the piston assembly 47 will force the syrup from the measuring chamber 37 through the check valve 43, into the port 44, passage 46, and restricted passage 98, into the ports 97, and thence through the outlet 95. During this dispensing of the syrup from the measuring chamber 37, the valve disc 78 is retained open, by engagement between the cam surface 75 and the lugs 77, so that carbonated water will flow through the diverging outlet passages 110 into the outlet 95 where it will commingle with the syrup and flow therewith into the drinking glass.

From a reading of the foregoing description, it will become apparent that in the dispensing of the mixed drink by the use of an apparatus constructed in accordance with the disclosure herein, there is a flow of carbonated water before, as well as after, the dispensing of the syrup with the water. This feature of the invention accomplishes the dual function of, first, providing a sufficient amount of carbonated water in the drinking glass to screen the inside bottom thereof from the syrup, reducing to a minimum the for-

mation of a film of syrup thereon, and, second, that of washing any remaining syrup from the nozzle to avoid the presence of a film of syrup thereon which would otherwise attract insects or the like.

As a result of the foregoing construction, a measured mixed drink is drawn by the use of my improved dispensing apparatus, in which there is present high carbonation, with the minimum amount of foam and the maximum volume of water, and that the apparatus thus described reduces to a minimum the time required to draw and serve successive mixed drinks.

From the foregoing description, it is apparent that I have provided an apparatus which is capable of the performance of all of the hereinbefore stated objects and that the same is designed with the viewpoint of economy in manufacture and efficiency in use.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A nozzle for dispensing a plurality of liquids to produce a mixed drink, comprising a structure having separate liquid passages formed therein, and a nozzle tip at one end thereof and providing a valve chamber communicating with one of said passages, a valve sleeve slidably mounted on said tip and providing a valve for the other of the passages, a valve member in said valve chamber and normally closing passage therefrom, a cap mounted on said structure and surrounding said tip and providing together with said tip a mixing chamber having an outlet orifice, said structure having diverging passages formed therein opening communication between said valve chamber and said mixing chamber, and means for moving said valve member and said valve sleeve from and to valve closing position with respect to said valve chamber and said other of the passages, respectively.

2. A nozzle for dispensing a plurality of different liquids to produce a mixed drink, comprising a structure having separate liquid passages formed therein, and a nozzle tip at one end thereof and providing a valve chamber communicating with one of said passages, a valve sleeve slidably mounted on said tip and providing a valve for the other of the passages, a valve member in said valve chamber and normally closing passage therefrom, a cap mounted on said structure and surrounding said tip and providing together with said tip a mixing chamber having an outlet orifice, said structure having diverging passages formed therein opening communication between said valve chamber and said mixing chamber, and means for moving said valve member and said valve sleeve from and to valve closing position with respect to said valve chamber and said other of the passages respectively, said cap having means for the liberation of excess gas from liquid entering said mixing chamber for passage through said outlet orifice.

3. A nozzle for dispensing a plurality of liquids to produce a mixed drink, comprising a structure having separate liquid passages formed therein,

and a nozzle tip at one end thereof and providing a valve chamber communicating with one of said passages, a valve sleeve slidably mounted on said tip and providing a valve for the other of the passages, a valve member in said valve chamber and normally closing passage therefrom, a cap mounted on said structure and surrounding said tip and providing together with said tip a mixing chamber having an outlet orifice, said structure having diverging passages formed therein opening communication between said valve chamber and said mixing chamber, and means for moving said valve member and said valve sleeve from and to valve closing position with respect to said valve chamber and said other of the passages, respectively, said means including a structure common to said valve sleeve and said valve member for moving said valve sleeve and said valve member simultaneously from said valve closing position.

4. A nozzle for dispensing a plurality of liquids to produce a mixed drink, comprising a structure having separate liquid passages formed therein, and a nozzle tip at one end thereof and providing a valve chamber communicating with one of said passages, a valve sleeve slidably mounted on said tip and providing a valve for the other of the passages, a valve member in said valve chamber and normally closing passage therefrom, a cap mounted on said structure and surrounding said tip and providing together with said tip a mixing chamber having an outlet orifice, said structure having diverging passages formed therein opening communication between said valve chamber and said mixing chamber, and means for moving said valve member and said valve sleeve from and to valve closing position with respect to said valve chamber and said other of the passages, respectively, said means including a structure common to said valve sleeve and said valve member for moving said valve sleeve and said valve member simultaneously from said valve closing position, said means including a structure common to said valve sleeve and said valve member for moving said valve sleeve and said valve member simultaneously from said valve closing position.

5. A nozzle for dispensing a plurality of different liquids to a point of merger below the nozzle, comprising a head structure having a nozzle tip at one end, a slidable valve sleeve on said tip and providing together with said head a valve chamber, a liquid discharge passage communicating with said chamber, said head providing a second valve chamber and having a liquid discharge passage communicating therewith, a valve member in said second chamber and normally closing passage therefrom, a cap mounted on the lower end of said head and having its lower portion spaced from said valve sleeve, said head having diverging passages formed therein opening communication between said valve chamber formed in the head and the space between the cap and the valve sleeve, means for moving said valve member and said valve sleeve from and to valve closing position with respect to said head, said means including a handle pivotally carried by the head, a member having camming engagement with respect to said handle for moving said valve member from valve closing position with respect to the valve chamber in said head, and vertically movable pin members carried by the head and engaging said valve sleeve and adapted to be engaged by said member and be moved by said member to impart movement

to said valve sleeve to valve closing position with respect to said head.

6. A nozzle for dispensing a plurality of different liquids to a point of merger below the nozzle, comprising a head structure having a nozzle tip at one end, a slidable valve sleeve on said tip and providing together with said head a valve chamber, a liquid discharge passage communicating with said chamber, said head providing a second valve chamber and having a liquid discharge passage communicating therewith, a valve member in said second chamber and normally closing passage therefrom, a cap mounted on said structure and surrounding said tip and providing together with said tip a mixing chamber having an outlet orifice, said head having diverging passages formed therein opening communication between said valve chamber formed in the head and said mixing chamber, means for moving said valve member and said valve sleeve from and to valve closing position with respect to said head, said means including a handle pivotally carried by the head, a member having camming engagement with respect to said handle for moving said valve member from valve closing position with respect to the valve chamber in said head, vertically movable pin members carried by the head and engaging said valve sleeve and adapted to be engaged by said member and be moved by said member to impart movement to said valve sleeve to valve closing position with respect to said head, said cap having means for the liberation of excess gas from liquid entering said mixing chamber for passage through said outlet orifice.

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