March 31, 1970 W. R. FUERST 3,503,540

BEVERAGE DISPENSING SYSTEM

Filed Sept. 27, 1967

Fig. 2

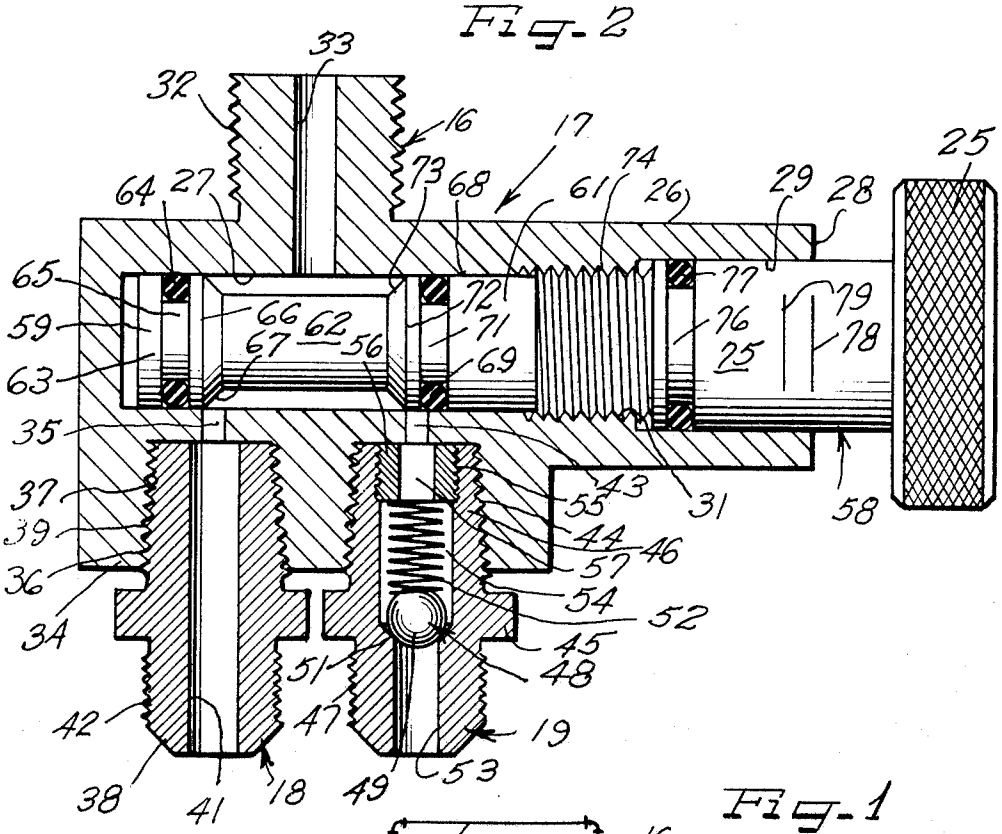
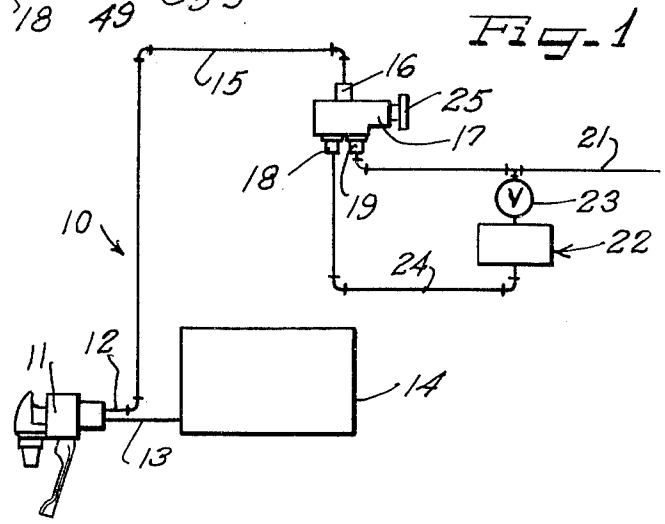


Fig. 1



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United States Patent Office 3,503,540 Patented Mar. 31, 1970

3,503,540

BEVERAGE DISPENSING SYSTEM

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Filed Sept. 27, 1967, Ser. No. 670,914
Int. Cl. B67d 5/56
U.S. Cl. 222—129.1 5 Claims

ABSTRACT OF THE DISCLOSURE

A beverage dispensing system in which the desired level of carbonation in the water is obtained by mixing plain water with a carbonated water source in the desired portions, including a mixing device with a valve which allows the selection of different proportions between the carbonated water and plain water to obtain different levels of carbonation. A mixing device comprises a housing having a cylindrical bore extending in from one end and threaded at the one end, with a pair of spaced inlets in communication with the bore and an outlet disposed between the spaced inlets and in communication with the bore. A valve means threaded to be engaged in the threaded bore is slidably disposed in the chamber and has a pair of spaced valve members disposed adjacent to the spaced inlets to open and close the inlets as the valve means is moved axially within the chamber. The spacing between the valve members is greater than the spacing between the inlets so that when one valve member is closing one inlet the other inlet is in an open position and the axial movement of the valve members will start to close the opened inlet as the closed inlet is opened.

BACKGROUND OF THE INVENTION

Field of the invention

This invention pertains to a dispensing system for a beverage which is provided with a selection of various carbonation levels and to a mixing device for obtaining the various levels.

Prior art

In the beverage dispensing field, a beverage dispensing device which dispenses various types of beverages such as colas and fruit drinks has a requirement for carbonated water of different carbonation levels. For example, a cola drink requires a high level of carbonation in the water to be mixed with the syrup whereas most fruit drinks require a carbonated water having a low level of carbonation to be mixed with the syrup.

Prior art devices designed to obtain different levels of carbonation have utilized a separate carbonator in the dispensing device for each level of carbonation desired. Welty et al. in U.S. Patent No. 3,263,864 describes a dispensing device in which a carbonated water of a fixed level is mixed with plain water to obtain a second carbonated water source of a lower level to be used to make beverages such as fruit drinks. Both of the above systems provide water at a fixed level of carbonation and are not easily adjusted to change the level once the device has been installed.

SUMMARY

The present invention entails a dispensing system in which the water source for the dispensing valve is obtained by mixing a carbonated water source of a fixed level with a plain water source in a mixing device which may be adjusted to provide a variation in the carbonation level of the water source delivered to the dispensing valve. The dispensing system utilizes a mixing device having a chamber in which a sliding valve means is disposed to coact with a pair of spaced inlet means to determine the amount of fluid from each of the inlet means that is discharged through an outlet means which is spaced in the chamber between the two inlet means. The mixing device is provided with an adjustment to position the valve means in any position within the chamber to allow a selection of the proportions of the fluids that are mixed in the chamber.

Accordingly, it is an object of the present invention to provide a beverage dispensing device which includes a means of varying the carbonation level of the water supplied to the water inlet of the dispensing valve.

Another object of the present invention is to provide a beverage dispensing device having means which is adjustable to provide a wide selection of carbonation levels for the water inlet of the dispensing valve.

A still further object of the present invention is to provide a beverage dispensing device in which includes a mixing valve having an adjustable valve means which controls the amount of fluid entering the mixing chamber from each of the inlet sources.

Yet another object of the present invention is to provide a mixing device capable of mixing two fluids in any preselected proportions.

A still further object of the present invention is to provide a mixing device having an adjustable valve means which regulates the amount of fluid entering from each of the inlets and is adjustable so that the proportions may be changed when desired.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and accompanying sheet of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of the beverage dispensing system of the present invention; and

FIG. 2 is a detailed cross section of the mixing device used in the beverage dispensing system of FIG. 1.

AS SHOWN ON THE DRAWINGS

The principles of the present invention are best illustrated by referring to FIG. 1 which illustrates a schematic diagram of a beverage dispensing system generally indicated at **10**.

The dispensing system **10** comprises a dispensing valve **11** having a water inlet **12** and a syrup inlet **13**. A source of syrup **14** is connected to the syrup inlet of the dispensing valve **11**.

The water inlet **12** of the beverage dispensing valve **11** is connected by a line **15** to an outlet **16** of a mixing device **17** which has a pair of spaced inlets **18** and **19**. A plain water source enters the mixing device **17** by a line **21** which is connected to the inlet **19**. As illustrated, the plain water line **21** is connected to a carbonator **22** through a valve **23** which may be a check valve to prevent the backing up of the pressures developed in the carbonator **22** into the water line **21**. The carbonator **22** is connected to the other inlet **18** by a line **24**.

Carbonated water supplied by the carbonator **22** enters the mixing device **17** through the inlet **18** and is mixed with plain water which enters the inlet **19**. The mixture of the carbonated water and plain water passes through the outlet **16** and through the line **15** of the water inlet **12** of the dispensing valve **11**. The mixing device **17** is provided with an adjusting knob **25** which allows the adjustment of the proportions of carbonated water and plain water so that any desired level of carbonation may be attained in the water supplied to the water inlet **12** to be mixed with the syrup that is supplied to the syrup inlet **13**. The presence of the mixing

device 17 in the water supply line for the water inlet 12 of the dispensing valve 11 allows a variation of the carbonation level of the water supplied to the dispensing valve 11. Therefore, the dispensing valve 11 may be originally installed to dispense a beverage requiring a relatively high level of carbonation and if desired by making the appropriate adjustments in the mixing device 17 the dispenser may be converted to dispense a beverage in which a lower or low level of carbonation is desired. In other words, the addition of the mixing device 17 into the water source for the water inlet 12 allows an in the field adjustment in the degree of carbonation that is delivered to the water inlet side of the water inlet 12 of the dispensing valve 11.

The mixing device 17 as best illustrated in FIG. 2 consists of a housing 26 which has an axially extending cylindrical bore 27 extending inward from an end 28. The bore 27 has an enlarged portion 29 adjacent the end 28 and a threaded portion 31 adjacent to the enlarged portion 29 forming a portion of an adjusting means.

The outlet 16 comprises a threaded projection 32 having a bore 33 which is in communication with the cylindrical bore or chamber 27. The outlet 16 is connected to the conduit 15 by any suitable coupling engaging the threaded projection 32.

The housing 17 is provided with a thick portion 34 in which the inlets 18 and 19 are formed. The inlet 18 comprises a port or opening 35 which has an enlarged portion 36 which is threaded at 37. A coupling 38 having a threaded end 39 is received in the threaded enlarged portion 36 and has a passageway 41 in communication with the opening 35. The coupling 38 is provided with a threaded end 42 for receiving a coupling from a fluid conduit which conveys the carbonated water of the system illustrated in FIG. 1.

The inlet 19 comprises an opening 43 and a threaded enlarged portion 44. A coupling 45 having a threaded end 46 is secured in the threaded bore or enlarged portion 44. The coupling 45 has an exposed threaded end 47 for receiving a coupling from a water line such as the line 21 of FIG. 1.

The coupling 45 is provided with an integral check valve means 48 which comprises a ball 49 urged or biased on a seat 51 by a resilient means such as a spring 52. The seat 51 is formed between the bore 53 and a large counterbore portion 54 which receives the ball 49 and the spring 52 and is provided with threads 55 for receiving a threaded retaining means 56 which holds the spring and ball in the counterbore 54. The retaining means 56 has an axial bore 57 which is in alignment with the passage or opening 43.

The openings or bores 35 and 43 are spaced apart and axially disposed on either side of the passageway 33 of the outlet 16. The openings 35 and 43 have substantially the same shape and if they are circular bores have the same diameter.

Disposed in the chamber 27 is an adjustable valve means 58 which comprises a pair of opposed valve members 59 and 61 which are interconnected by a reduced portion 62. The valve member 59 is provided with a cylindrical surface 63 which has a sealing means shown as an O-ring 64 disposed in a groove 65. The surface 63 terminates in an edge 66 which is formed by the intersection of the surface 63 with a frusto-conical surface 67 which interconnects the reduced portion 62 to the surface 63 of the valve member 59. The valve member 61 has a cylindrical surface 68 which has a sealing means comprising an O-ring 69 disposed in an annular groove 71. The surface 68 terminates adjacent the reduced portion at an edge 72 which is the intersection of the frusto-conical portion 73 which interconnects the reduced portion 62 to the surface 68. At an end opposite the edge 72 the surface 68 has a threaded portion 74 which is received in the threads 31 and adjacent to the threads 74 is a cylindrical portion 75 which terminates in the knob 25. The threaded portion 74 and knob 25 cooperate with the threaded portion 31 to define an adjusting means for the value means 58. The surface 75 has a sealing means to seal it with the portion 29 of the chamber 27 which comprises a groove 76 containing an O-ring 77.

As illustrated in FIG. 2, the edges 66 and 72 are spaced apart a distance equal to the distance between the openings 35 and 43 plus the diameter of the opening 35. Thus, when the valve means 58 is in the position illustrated in FIG. 2, the surface 63 of the valve member 59 is entirely free from the opening or orifice 35 of the inlet means 18 whereas the surface 68 of the valve member 61 completely covers or blocks the orifice or opening 43 of the inlet means 19. Thus, when the valve member 58 is in the position as illustrated, the discharge from the outlet 16 consists of only the fluid that is entering the chamber 27 through the inlet means 18 because the inlet means 19 is completely closed by the valve member 61. This position is marked on the enlarged stem portion 75 by a mark 78.

If the valve means 58 were axially threaded to an outward position, the valve member 59 would completely close the opening or orifice 35 and the valve member 61 would be completely free from its blocking position of the orifice 43, and all the fluid exiting the outlet 16 would enter via the inlet means 19. Such a position is indicated by the mark 79 on the shaft or enlarged portion 75.

The marks or proportion-of-mix indicia 78 and 79 indicate the two limits of 100% of one of the two fluids entering the chamber 27 and exiting through the outlet means. Any position between the two marks 78 and 79 will provide a mixing of the two fluids in the chamber 27. The proportion of the fluids being mixed together is determined by the amount in which the respective orifices 35 and 43 are uncovered and unblocked by the respective valve members 59 and 61. Thus, by adjusting the axial position of the valve means 58, the proportion of the fluids entering through the inlets 18 and 19 may be changed from any position in the range of 100% of the fluid from the inlet 18 to 0% with a corresponding change of 0% to 100% in the range of the fluid entering through the inlet 19.

As described hereinabove, the inlet means 19 is provided with a check valve to prevent the backing up of fluid from the inlet 18 into the inlet 19 and its associated conduits or water lines. The reason that a check valve is necessary in the mixing device 17 is that the carbonated water in the line 24 which enters the inlet 18 is at a higher pressure than the plain water which is in the conduit line 21.

It should be noted that the surfaces 63 and 68 of the valve members 59 and 61 respectively must have a fluid tight sliding fit with the cylindrical surface of the chamber 27 in order for the mixing device to operate properly. Since the surfaces involved are cylindrical, such a fit is easily obtained by using existing finishing equipment.

The provision of the mixing device 17 in the water line for the dispensing valve 11 allows the system illustrated in FIG. 1 to be adjusted after installation to select the desired level of carbonation for the beverage that is being dispensed. It should be noted that flow control devices may be installed in the conduit line 15 so that the volume of fluid flowing from the outlet 16 will be constant regardless of pressure.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to employ within the scope of the patent warranted hereon, all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A beverage dispensing system comprising a beverage dispensing valve having a water inlet and a syrup inlet, a source of syrup connected to said syrup inlet and a source of water connected to said water inlet, the im-

provement comprising said source of water having a mixing device interconnecting a source of carbonated water and a source of plain water for mixing said carbonated water with said plain water to obtain a desired level of carbonation, said mixing device including a single adjustable means to allow a change in the amounts of each fluid entering said mixing device to vary the selected level of carbonation in the water source connected to said water inlet so that the percentage of plain water in the source of water at the water inlet of the dispensing valve can be selected to be in a range of 0–100%.

2. A beverage system according to claim **1**, in which said mixing device further includes a cylindrical chamber having a pair of spaced inlets in communication with said chamber and an outlet in communication with said chamber and disposed between said spaced inlets, said adjustable means including a valve means having a pair of spaced valve members interconnected by a reduced portion, said valve members being spaced apart a distance greater than said inlets so that when one of said valve members closes one of said inlets the other valve member is clear of the other inlet, and said valve member being positioned in said chamber by an adjustment means which allows the variation of the axial position of said valve means to vary the proportions of each of the fluids entering through said inlets.

3. A beverage dispensing system according to claim **1**, which further includes a check valve disposed in one of said inlets.

4. A beverage dispensing system according to claim **1**, wherein said adjustable means includes a pair of valve members, one of the valve members controlling the flow in the source of carbonated water and the other valve member controlling the flow in the source of plain water, said pair of valve members being interconnected so that as that one valve member is adjusted to increase the flow of carbonated water from said source of carbonated water, the other valve member is adjusted to decrease the flow of plain water from its source.

5. A beverage dispensing system according to claim **4**, wherein said adjustable means further includes means indicating the position of the pair of valve members so that the proportion of each fluid in the mixture is known.

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U.S. Cl. X.R.

137—553, 625.4; 222—13.4