United States Patent [19]

Zilk

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[45] **Sept. 2, 1975**

[54] **BEVERAGE DISPENSING UNIT**

[76] Inventor: **Carl S. Zilk,** 6312 SE. 48th Ave., Portland, Oreg. 97206

[22] Filed: **Feb. 19, 1974**

[21] Appl. No.: **443,398**

Related U.S. Application Data

[63] Continuation of Ser. No. 274,872, July 25, 1972, abandoned.

[52] **U.S. Cl.** **222/129.1;** 137/607

[51] **Int. Cl.** **B67d 5/56**

[58] **Field of Search** 222/129, 129.1, 129.2, 222/129.3, 129.4, 135, 136, 145, 153; 137/329.1, 329.2, 329.3, 329.4, 594, 604, 607, 608, 609, 614, 614.2, 614.3, 614.19

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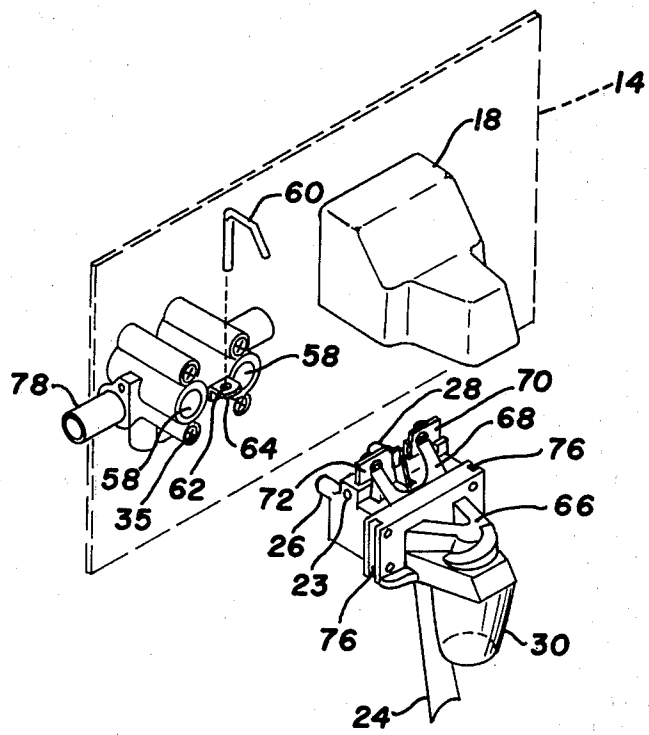
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Primary Examiner—Robert B. Reeves
Assistant Examiner—Larry Martin
Attorney, Agent, or Firm—Orrin M. Haugen

[57] **ABSTRACT**

A beverage dispensing assembly in which a manifold is mounted on the rear surface of a panel, the manifold having first and second inlets adapted to be connected to a source of liquids to be dispensed and first and second female output ports which are arranged to receive corresponding male inlet projections which are located on a flow control valve assembly which can be removably mounted on the front surface of the panel. Disposed between the inlets and the female output ports are spring biased valve seats which are normally urged to the closed position by internal springs. When the male projections of the flow control valve are inserted into the output ports of the manifold, the valve seats are displaced to an open or liquid-passing position. This permits the passage of liquids to the "flow control" valve assembly and from there, through a faucet under control of a manually or electrically operated control valve in the flow control valve assembly.

7 Claims, 10 Drawing Figures



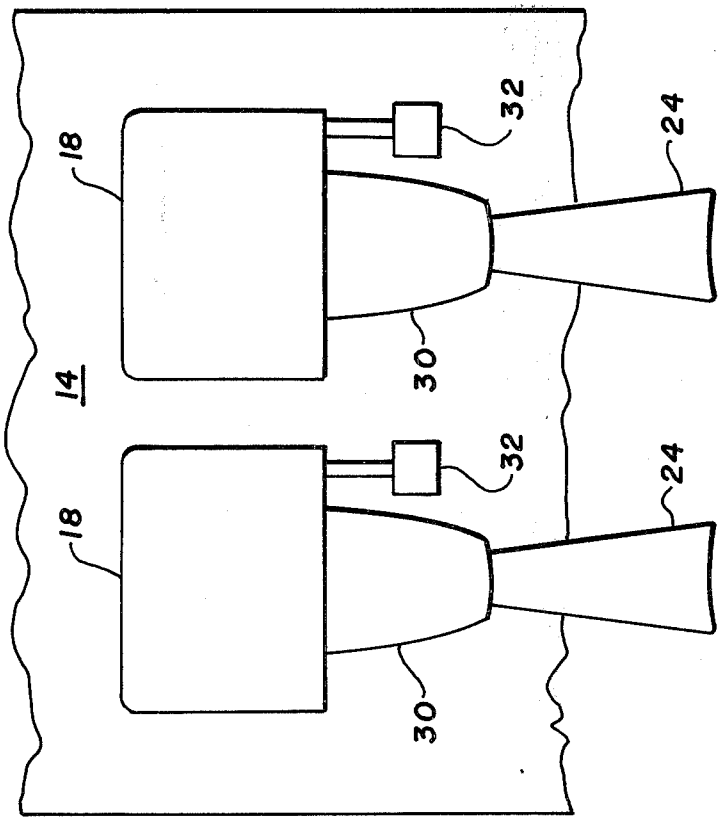


FIG. 2

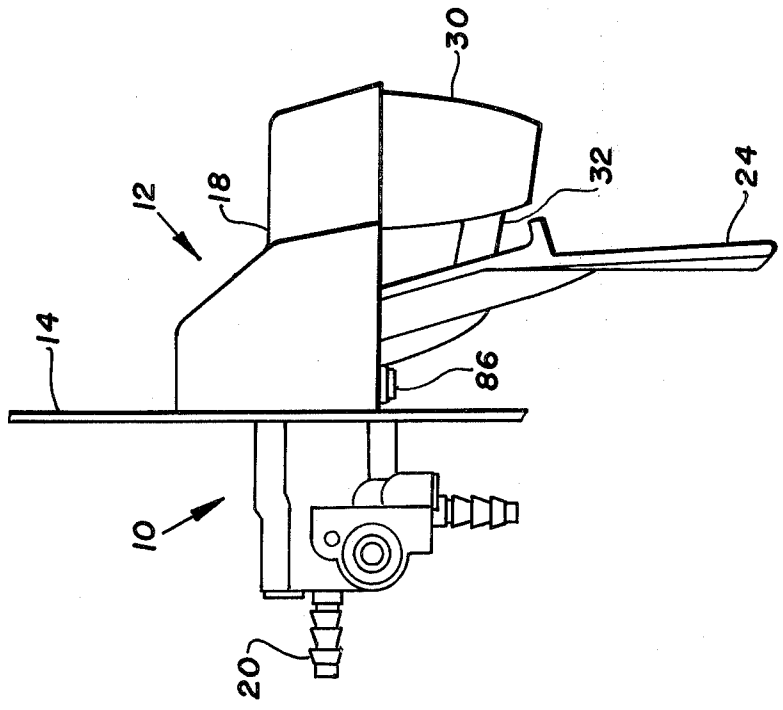


FIG. 1

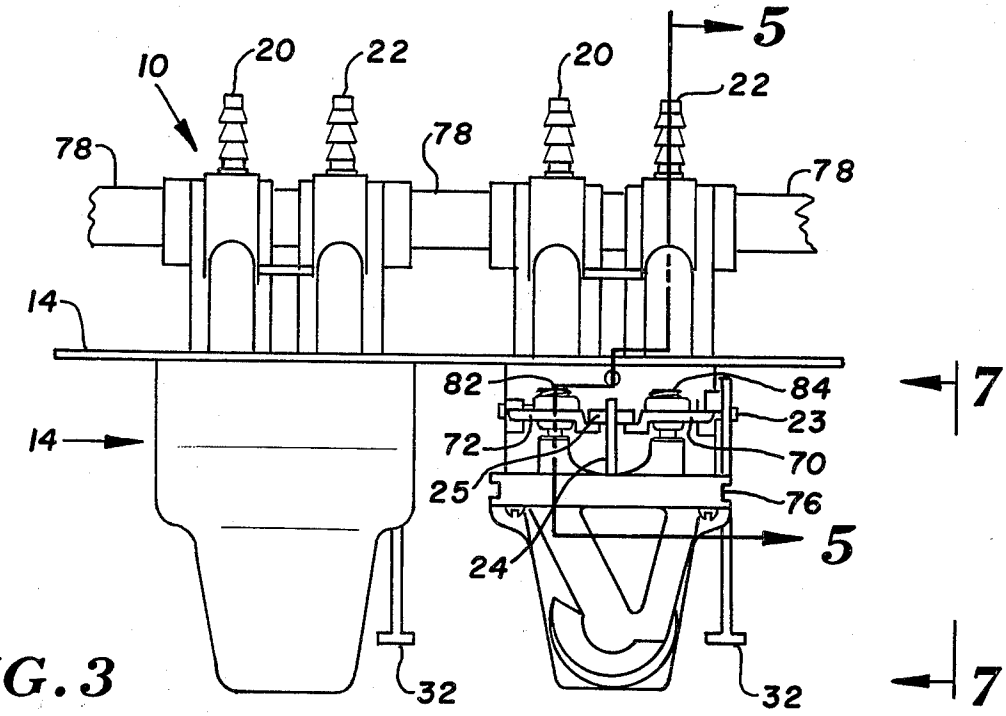

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FIG. 3

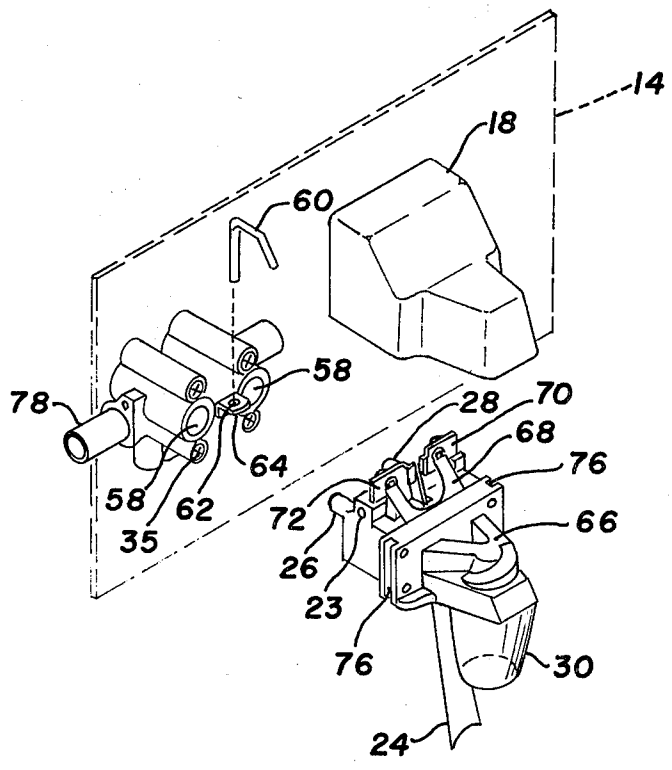

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FIG. 4

FIG. 5

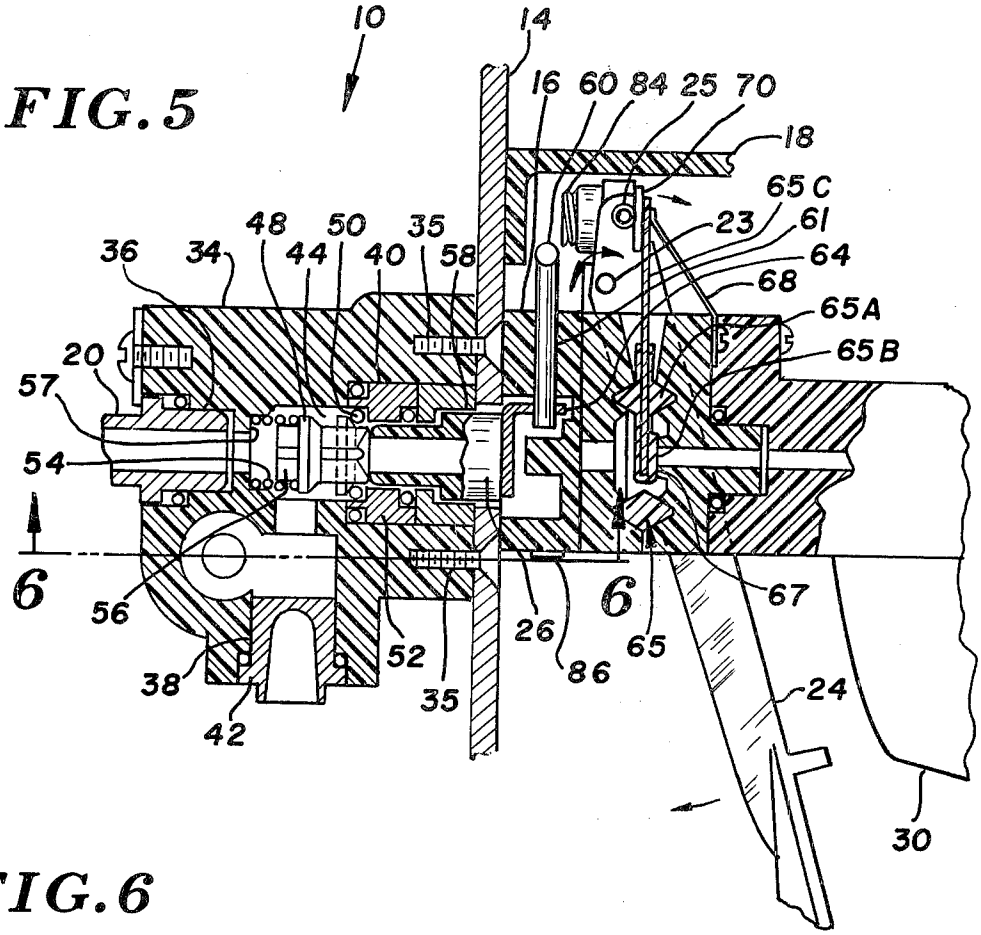


FIG. 6

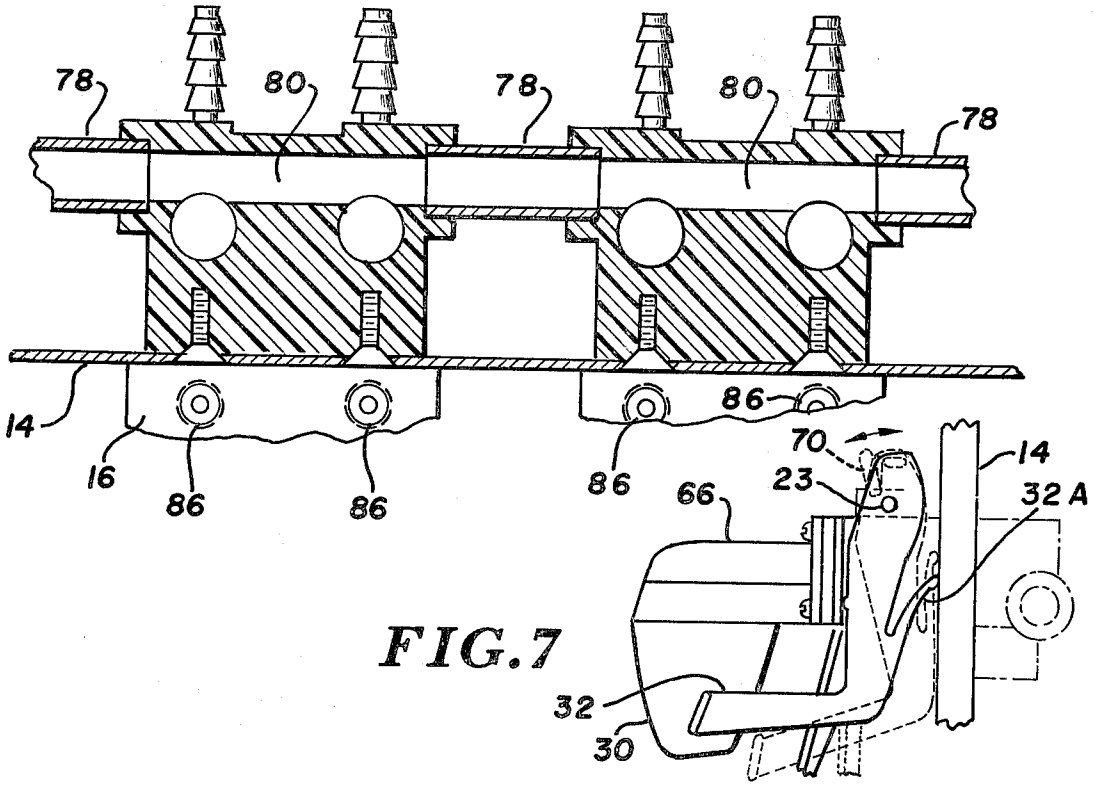


FIG. 7

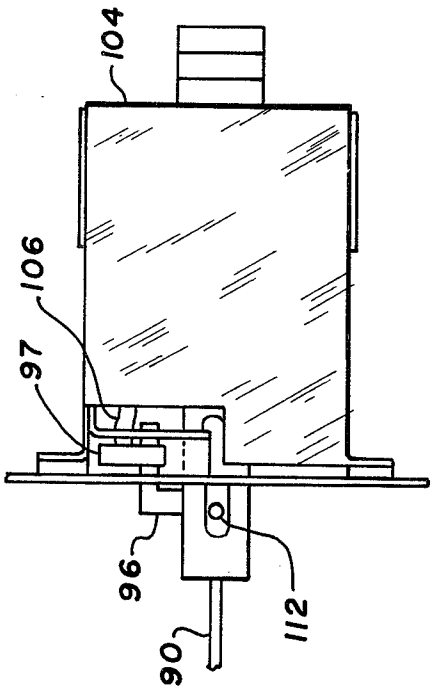


FIG. 8

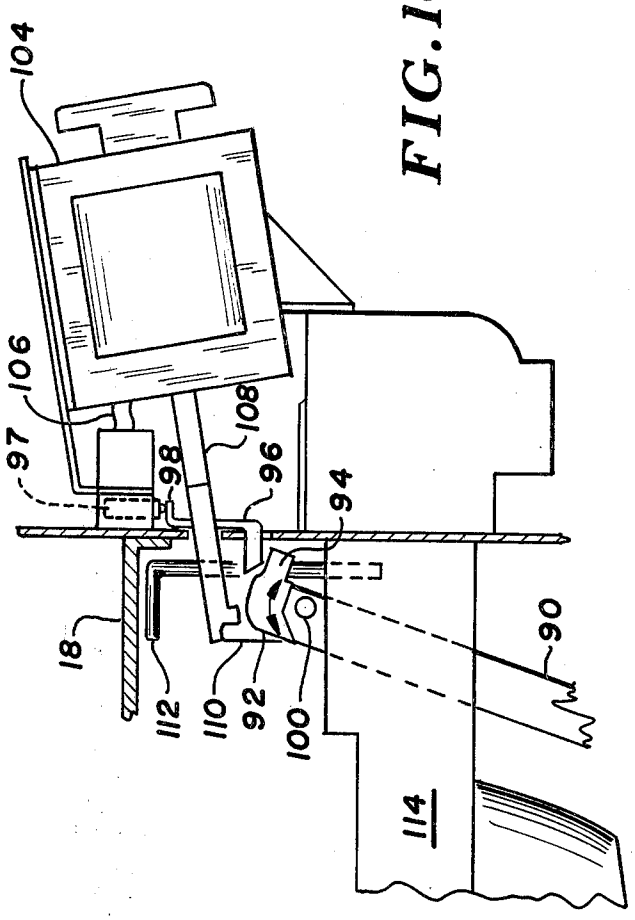


FIG. 10

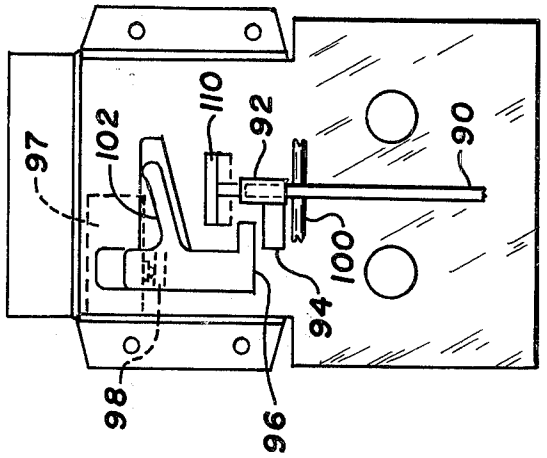


FIG. 9

BEVERAGE DISPENSING UNIT

CROSS-REFERENCE TO RELATED APPLICATION

This is a continuation of application Ser. No. 274,872, filed July 25, 1972 now abandoned.

BACKGROUND OF THE INVENTION

This invention relates generally to beverage dispensing apparatus, and more specifically to an improved liquid mixing and dispensing assembly which is easy to disassemble and clean and therefore quite simple to maintain.

Many bars, restaurants and soda fountains which sell soft drinks utilize a mixture of a flavoring syrup and another liquid to be mixed therewith, usually water or water charged with carbon dioxide gas. This approach is found to reduce costs and to minimize the materials handling problems attendant with bottled beverages. Many forms of mixing and dispensing valves are known in the prior art for combining the flavoring syrup and the liquid to be mixed therewith. However, a common defect of these prior art designs is that they often present problems in cleaning away excess syrup and/or the mixed beverage which necessarily builds up through spillage in normal use of the equipment.

In establishments where several different types or flavors of carbonated beverages are to be sold, the prior art mixing and dispensing valve assemblies required as many connections to sources of carbonated water as there were types of flavors to be offered. This necessitated rather costly plumbing and added to the complexity of the routing and interconnections, often creating an unsightly arrangement.

The present invention obviates these two drawbacks and results in a beverage dispensing system which is easy to maintain and which does not require complicated interconnection patterns to the products to be dispensed. In the preferred embodiment of this invention, these advantages are obtained through the unique design of a manifold and a flow-control valve assembly which utilize self-sealing, quick-disconnect valve seats in conjunction therewith such that when the parts are disassembled for cleaning, the flow of fluids therethrough are automatically halted and the surface on which the parts are normally mounted is free of protruding parts and therefore easy to sponge clean.

The design of the manifold assembly, which is an integral part of the system of this invention, allows a single source of carbonated water or other fluid to be used in conjunction with a plurality of different beverage dispensing nozzles, thereby reducing the amount of plumbing over that required by prior art systems of equal size in terms of varieties to be offered.

SUMMARY OF THE INVENTION

Accordingly, it is the principal object of this invention to provide a novel beverage dispensing assembly and system.

Another object of the invention is to provide a beverage dispensing and mixing apparatus which may be readily disassembled for purposes of cleaning.

Still another object of this invention is to provide a beverage dispensing system which is simple and therefore less expensive to install and which uses a minimum of external connections to the supply of liquids to be dispensed.

Yet another object of the invention is to provide a novel beverage mixing and dispensing valve which permits two or more liquids to be mixed in any desired proportion.

Yet still another object of this invention is to provide a beverage dispensing and mixing apparatus which may be activated by an attendant through the use of an electrical circuit including a solenoid.

The novel features that are considered characteristic of this invention are set forth with particularity in the appended claims. The invention itself, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description when read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view of one embodiment of the invention;

FIG. **2** is a front elevation of the apparatus of FIG. **1**;

FIG. **3** is a plan view of the apparatus of FIGS. **1** and **2**;

FIG. **4** is a blown-apart perspective view of the preferred embodiment;

FIG. **5** is a cross-sectional view taken through one of the inlet and outlet ports of the manifold;

FIG. **6** is a sectional view taken along the line **6—6** of FIG. **5**;

FIG. **7** is a side elevational view showing the motion of a lever element which is associated with only one of the flow control valves in the assembly;

FIG. **8** is a top elevational view of a portion of a valve prepared in accordance with the present invention, and designed to be electrically actuated;

FIG. **9** is an elevational view of the structure shown in FIG. **8**, that is, with the valve base removed from the panel; and

FIG. **10** is a side elevational view, partially broken away, of the structure of the present invention equipped with an electrical solenoid actuating element.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the figures, the details of construction of the preferred embodiment will be described. Common parts appearing on the several views will be marked with the same identifying numeral.

FIGS. **1, 2** and **3** clearly depict the external appearance of the beverage dispensing apparatus of this invention. The apparatus is principally comprised of two main parts, the manifold assembly identified generally by the numeral **10** and the flow control valve assembly indicated generally by the numeral **12.** The forward surface of the manifold assembly is secured to the rear surface of a mounting panel **14** and is normally hidden from the view of a customer, with the forward surface of the manifold being coplanar with the rear surface of panel **14.** The flow control valve **12** is mounted on the front surface of mounting panel **14** and is, therefore, the portion which is normally visible. The operative portion of the flow control valve assembly can best be seen in the exploded view of FIG. **4** and is identified by numeral **16.** A decorative cover **18** normally conceals the assembly **16** from view. The fluids to be dispensed are applied under pressure to the inlet connections **20** and/or **22** of the manifold assembly **10.** The barbed input connections are adapted to receive suitable tub-

ing which leads to the reservoir of the liquid or liquids to be dispensed.

As is illustrated in FIG. 2, any desired number of liquid mixing and dispensing valve assemblies may be mounted on the panel 14 and while only two are illustrated, it should be understood that additional units may be employed in a system.

Associated with each flow control valve assembly 12 is a manually displaceable lever 24 which is pivotally mounted with respect to a mounting rod 23 coupled through a linkage 25 to a pair of flow control valves disposed in the assembly 16 between the male inlet connections 26 and 28 thereof and the output nozzle 30 (FIG. 4). The levers 24 are slightly curved as can best be seen in FIG. 1. The curvature of this lever is such that it conforms to the side of a glass in which the beverage is to be allowed to pour. If desired, it is possible to eliminate the manual lever actuator 24 and replace it with the armature of an electrical solenoid so that the dispenser apparatus can be actuated by a push-button contact. All that is required is a linkage which will convey the motion of the armature to the flow control valves disposed in the assembly 16 between the male inlet projections 24 and 26 and the outlet nozzle 30.

Attention is now directed to FIGS. 3 and 7 wherein another feature of the invention is illustrated, this being the inclusion of a second manually positionable lever 32 which is associated with only one of the flow control valves in the assembly 16. Specifically, the manual depression of the lever 32 will cause the valve seat associated with the carbonated water supply to be operated independently of the valve associated with the flavoring syrup supply so that, if desired, one can add additional carbonated water to the beverage without adding additional syrup. As is apparent from FIG. 3, actuation of the lever 32 in a counter-clockwise direction, such as is illustrated in phantom in FIG. 7, opens the valve associated with this lever and the carbonated water is dispensed. In order to provide a resilient return for lever 32, an arm or flexible segment 32A is provided which abuts the surface of panel 14 as indicated in FIG. 7. A similar lever may be provided for adjacent units.

Referring now to FIG. 5, the details of the construction of the novel manifold assembly of this invention will be described. The manifold is preferably formed from a buitable plastic such as nylon by a molding process and generally includes a block of such material 34 having a plurality of apertures such as bores 36, 38 and 40 formed therein.

The bores, such as 36 and 38 formed in the walls of the block 34 which are not contiguous with the mounting panel 14, are adapted to receive either barbed tubular input connectors 20 or 22 or a simple plug 42. Each of the bores 36 and 38 communicates with a valve seat chamber 44 also formed in the manifold block 34. This valve seat chamber 44 communicates with the output port located within the bore 40. The manifold assembly 10 is adapted to be secured to the mounting panel 14 by means of machine screws 35 which pass through apertures formed in the panel 14 and into threaded receptacles in the block 34. Located within the valve seat chamber 44 is a valve seat 48 which is normally biased rightwardly to a closed position in contact with an O-ring seal 50 also disposed in the chamber 44 in abutment with an annular spacer member 52. The valve seat 48 is urged to the right by means of the compression spring 54 which is concentric with the stem 56 of the valve seat 48 and which abuts a shoulder 57 formed in the block 34. When the valve seat 48 is in its rightmost position, it blocks the female outlet port 58 formed in the outlet bore 40. Hence, liquids applied to the input connections 20 and 22 are precluded from flowing through the valve seat chamber 44 and the female outlet port 58.

The valve seat member 48 is adapted to be moved to the left (its open position) by the introduction of the male inlet connections 26 and 28 of the flow control valve assembly 16 into the female output ports 58. Specifically, when the flow control valve assembly 16 is in place, the male inlet connections 26 and 28 pass through apertures formed in the mounting panel 14 and slidably fit into the female outlet ports 58 of the manifold 34. The flow control valve assembly 16 is removably secured to the mounting panel by means of a locking pin 60, which passes through an aperture 61 formed in the upper surface of the flow control valve assembly 16 and into a corresponding aperture 62 formed in an L-shaped bracket 64 secured to the panel 14. The horizontal portion of bracket 64 fits into a slot (not shown) in the rear surface of block 16. Liquids will be permitted to flow through the manifold from the input connections 20 and 22 and into the male input connections 26 and 28 of the flow control valve assembly 16 only when the assembly 16 is in place on the front of the panel 14. Thus, when the manually operated lever 24 is pressed rearwardly toward mounting panel 14, the upper tip end thereof causes actuation of the valve generally designated 65. Specifically, valve 65 comprises an outer annular ring member 65A through which a centrally disposed pallet member 65B is coupled to the assembly. Actuating lever 65C extends radially outwardly from valve 65, and, as indicated in FIG. 5, is associated with the linkage including actuating linkage members 68 and 70, which are more fully described hereinafter. As is apparent in FIG. 5, the pallet 65B of valve 65 seats against seat 67, and thus controls flow of fluid through the apparatus. Thus, when pallet 65B is unseated, flow control valve assembly 16 will be opened and the liquids will be allowed to flow through the mixing chamber 66 and out of the nozzle 30.

Referring still to FIG. 4, the thin, flat U-shaped member 68 is formed from a suitable material so as to constitute a leaf-type spring which normally urges the top ends of the linkages 70 and 72 in a rearward direction (toward panel 14) about the pivot rod 23. As a result, the portion of the linkages 70 and 72 below the pivot rod 23 act upon arms 65C and thus control the disposition of pallet member 65B disposed between the male inlet connections 26 and 28 and the mixing chamber 66. The rearward depression of the flow control lever 24 moves cross-link 25 forward to act against the force exerted by the leaf spring 68 and tips the linkages 70 and 72 in a forward direction, thereby allowing the pallets 65B located in the flow control assembly 16 to unseat, which in turn, allows the flow of liquids therethrough. Other resilient biasing means such as a coil spring or the like may be substituted for leaf spring 68.

One of the principal advantages of the present invention is the ease with which the dispenser system may be cleaned. In doing so, one merely lifts upwardly on the cover member 18 which is arranged to slip into the notches 76 in the mixing chamber 66 to expose the flow control valve assembly 16. The operator next pulls upward on the latch pin 60 removing it from the bracket

normally prevent the flow of liquids through said manifold means;

c. a flow control valve assembly having first and second inlet tubes and a single outlet with a normally closed spring biased valve disposed between each of said first and second inlet tubes and said single outlet;

d. means for simultaneously removably mounting said flow control valve assembly from the front face of said mounting panel with said first and second inlet tubes of said flow control valve passing through said apertures in said panel into said outlet ports of said manifold means to thereby displace said valve seat means from said normally closed position to an open position; and

e. actuator means operatively connected to said normally closed spring biased valves in said flow control valve assembly for opening same, said actuator means being located on the front side of said panel.

2. Apparatus as in claim **1** wherein said actuator means comprises a manually operated lever and linkage means coupling said lever to said spring biased valve means of said flow control valve assembly.

3. Apparatus as in claim **1** wherein said flow control valve assembly includes adjustment means for controlling the time sequence between the start of the flow of syrup and the flow of the fluid to be mixed therewith when said actuator means is operated.

4. Apparatus as in claim **3** wherein said flow control valve assembly further includes additional adjustment means for setting the volume rate of flow of either said syrup or said fluid to a desired value.

5. Apparatus as in claim **1** wherein said flow control valve comprises a generally torroidal outer sealing ring with sealing pallet means disposed generally coaxially within said outer ring.

6. Apparatus as in claim **5** wherein said sealing pallet means is provided with a single seat within said single outlet.

7. Apparatus as in claim **1** wherein said actuator means comprises a manually operated lever, first linkage means coupling said lever to an electrically operated solenoid having push rod means operatively associated with the armature thereof, and second linkage means coupling said push rod means to said flow control valve assembly.

* * * * *

64 such that the flow control valve assembly block **16** may be pulled outward from the mounting panel **14.** When the male inlet projections **26** and **28** are removed from the female output ports **58** of the manifold block **34,** the valve seats **48** therein will move to their closed position to seal off the flow of any further liquids from the reservoir to the female outlet port. The front surface of the mounting panel **14** is therefore free of any projections (except the small L-shaped bracket **64**) and can be readily sponged clean. The nozzle **30** is secured to the mixing chamber **66** by a friction fit and can readily be removed. Since no screw threads or unusual sealing rings or the like are employed, the nozzle is also easily cleaned. The flow control valve assembly **16** and its attached mixing chamber **66** can be totally immersed in water for cleaning purposes without damage. Also, back-flushing of water through the nozzle **30** can be readily accomplished to further facilitate cleaning.

As soon as the flow control valve assembly **16** is again secured in place on the mounting panel **14** by the locking pin **60,** the valve seats **48** in the manifold block **34** will again be moved to the open position because of the rearward force applied by the male inlet projections **26** and **28** to permit the flow of fluid therethrough under control of the valves contained in the flow control valve assembly **16.**

The plan view of FIG. **3** shows an inlet connection **22** for each of the dispenser valve assemblies mounted on the panel **14.** In practice, it has been found that the amount of external connections can be considerably reduced by providing a single inlet connection for attachment to the source of carbonated water or other liquid which is to be used as the mix. This is achieved by providing a molded tubular interconnection **78** between manifold blocks **34** of adjacent beverage dispensing units which communicate with a continuous tubular channel **80** formed through the manifold block **34.** Ports located in the rear or bottom surfaces of the manifolds **34** can be selectively blocked with plugs **42** to preclude the flow of liquid from the tubular passage **80** to one of the valve seat chambers **44** in any one of the several manifold block assemblies which may be mounted on the panel **14.** Thus, if a source of liquid, such as carbonated water, is connected to a single one of the inlets **22,** it can be supplied to each of several dispenser valve assemblies which may be mounted on the panel **14** by way of the interconnecting tubes **78.** Alternatively, the flow to any particular assembly can be blocked by a plug **42** and a different liquid supply (such as tap water) can be connected directly to that unit by way of its inlet connection **22.**

In operation, it is generally desired that the mixing liquid begin to flow through the nozzle **30** before the syrup is allowed to mix therewith. The relative timing between the introduction of the mixing liquid and the initiation of the flow of flavoring syrup following depression of the flow control lever **24** is adjustable and is accomplished by turning the set screws **82** and **84** so that they protrude by differing extents from the valve linkages **70** and **72.** The more the set screw is inserted, the sooner its associated valve seat will be opened upon depression of lever **24.**

Adjustment is also available in the volume rate of flow through the valves. This allows the operator to set the flow rate at a desired valve to insure the proper ratio of flavoring syrup to mixing liquid. Referring to FIG. **1,** located in the bottom surface of the flow control valve blocks **16** are first and second set screws **86** which are adapted to cooperate with the channels between the male inlet projections **26** and **28** and the valve seat chambers (not shown) in assembly **16.** The screw can be made to partially obstruct this passage by a desired and predetermined amount.

Electrical operation is available for the apparatus of the present invention, with such a unit shown in FIGS. **8, 9** and **10.** The operational features of this structure are, nevertheless, the same as those shown in the device illustrated in FIGS. **1–7,** with the exception being the electrical actuation. With specific attention now being directed to FIGS. **8, 9** and **10,** lever **90,** which coincides essentially with lever **24,** is provided with a switch actuating cap **92** having an extension arm **94** extending therefrom. Arm **94** makes contact with switch bar **96** which, in turn, strikes the actuating pin of switch **97** through upper switch pad **98.** Lever **90,** as indicated, is pivotally mounted on pivot pin **100.** Return spring **102,** preferably fabricated from plastic, is provided to maintain lever **90** in a clockwise extended disposition.

As is apparent in the drawing, solenoid **104** is provided for accomplishing the valve actuation. Solenoid **104,** coupled to switch **97** through leads **106,** has a push-bar **108** coupled thereto, with push-bar **108** being utilized to strike soda and syrup activators **110** upon outward travel of push-bar **108.** Pin **112** is provided, as shown in FIG. **10,** to permit removal of the forwardly extending portion of the assembly, shown generally at **114.** Thus, the complete valve unit can be removed completely independently of the electrical portion, to permit periodic cleaning, as required. Also, it will be appreciated that the complete electrical portion of the system can be easily removed from back of the panel in order to permit inspection and repair. Since switch failures are more frequently experienced, the switch is preferably rendered more accessible. Conventional voltage and current requirements are available, and low voltage, such as **24**-volt supplies, may be utilized if desired.

Thus, it can be seen that the present invention provides a means whereby the various objects and advantages previously referred to can be accomplished. Various modifications can be made in the details of construction. Hence, the scope of the invention is to be determined by the following claims.

I claim:

1. In beverage dispensing apparatus of the type wherein a flavoring syrup and a fluid to be mixed therewith are applied under pressure to a pair of inlets and are permitted to pass through a common mixing outlet upon the operation of first and second flow control valves, the improvement comprising, in combination:

a. a mounting panel having a front and rear face and at least two apertures therethrough;

b. manifold means mounted on the rear face of said mounting panel having first and second outlet ports aligned with said two apertures in said panel, the plane of the surface of the manifold forming said ports being substantially coplanar with the plane of said panel, said manifold means further including at least two inlets adapted to be connected respectively to a supply of flavoring syrup and a supply of fluid to be mixed therewith and spring biased valve seat means disposed in said manifold between said first and second outlet ports and said two inlets to