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McMillin

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[54] **BEVERAGE DISPENSER**

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[51] **Int. Cl.** **F25d 17/00**

[58] **Field of Search** ..... 222/76, 1, 23, 129, 129.3, 222/129.4, 134, 135, 148, 145, 146 C; 137/238; 239/112, 113, 428.5, 419.5; 62/177

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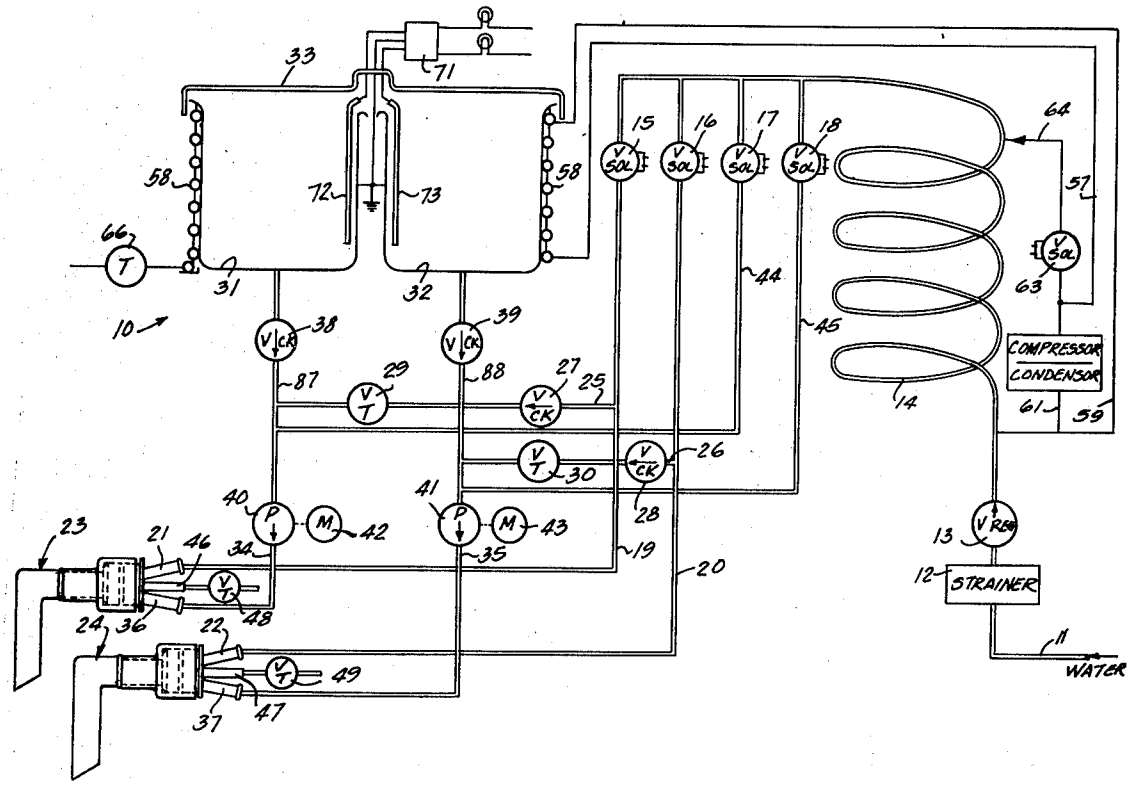
[57] **ABSTRACT**

A beverage dispenser is arranged to be connected to a source of potable water and an electric power supply and also to receive thawed-out beverage ingredient such as juice concentrate. The dispenser is thus arranged to store the concentrate, to cool water, to mix the concentrate and the water in the proper ratio. An important feature includes a flushing system to flush those portions that handle the beverage ingredient such as juice, such portions being those that are downstream of the beverage ingredient storage means.

37 Claims, 6 Drawing Figures



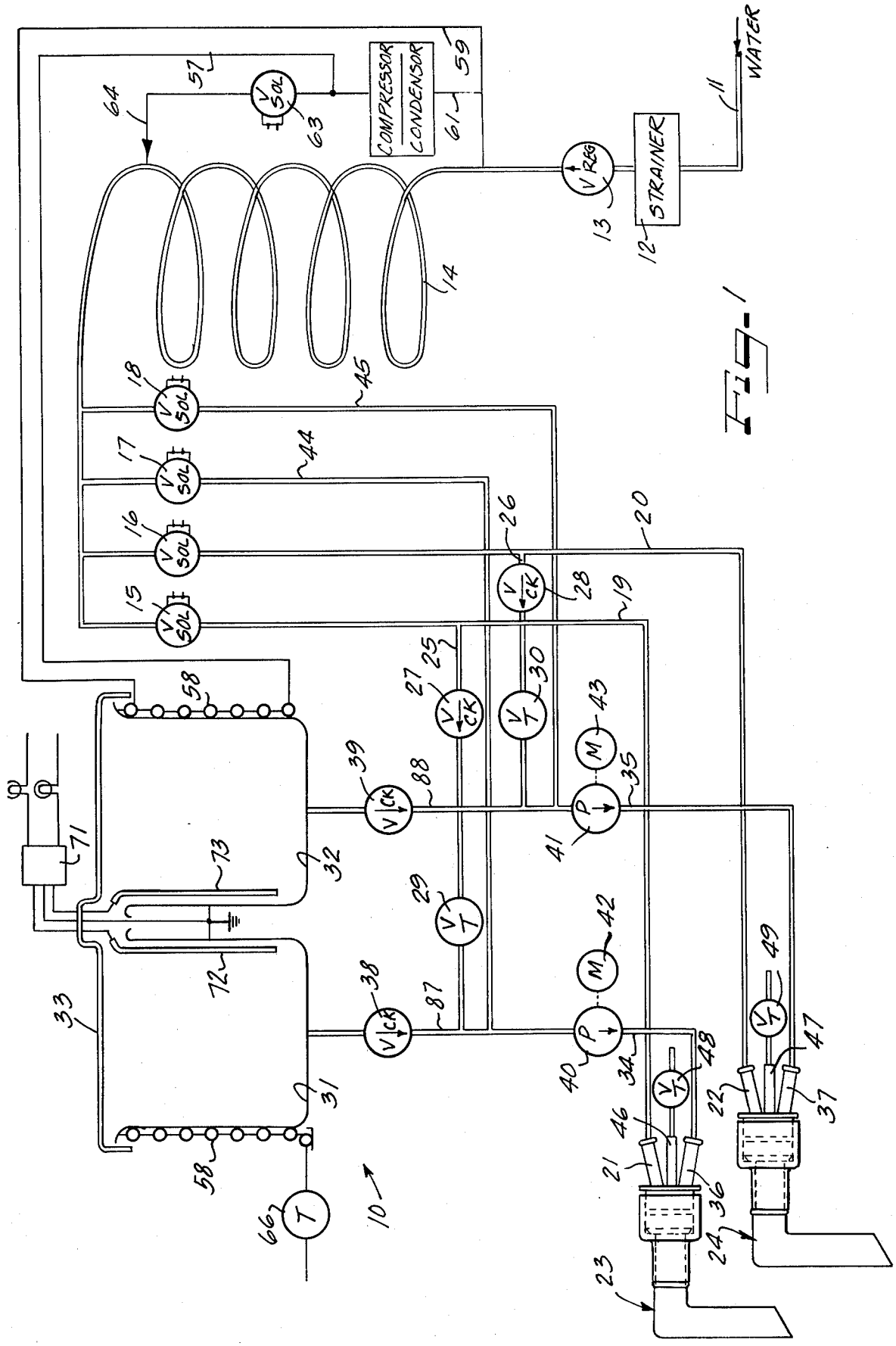


Fig. 1

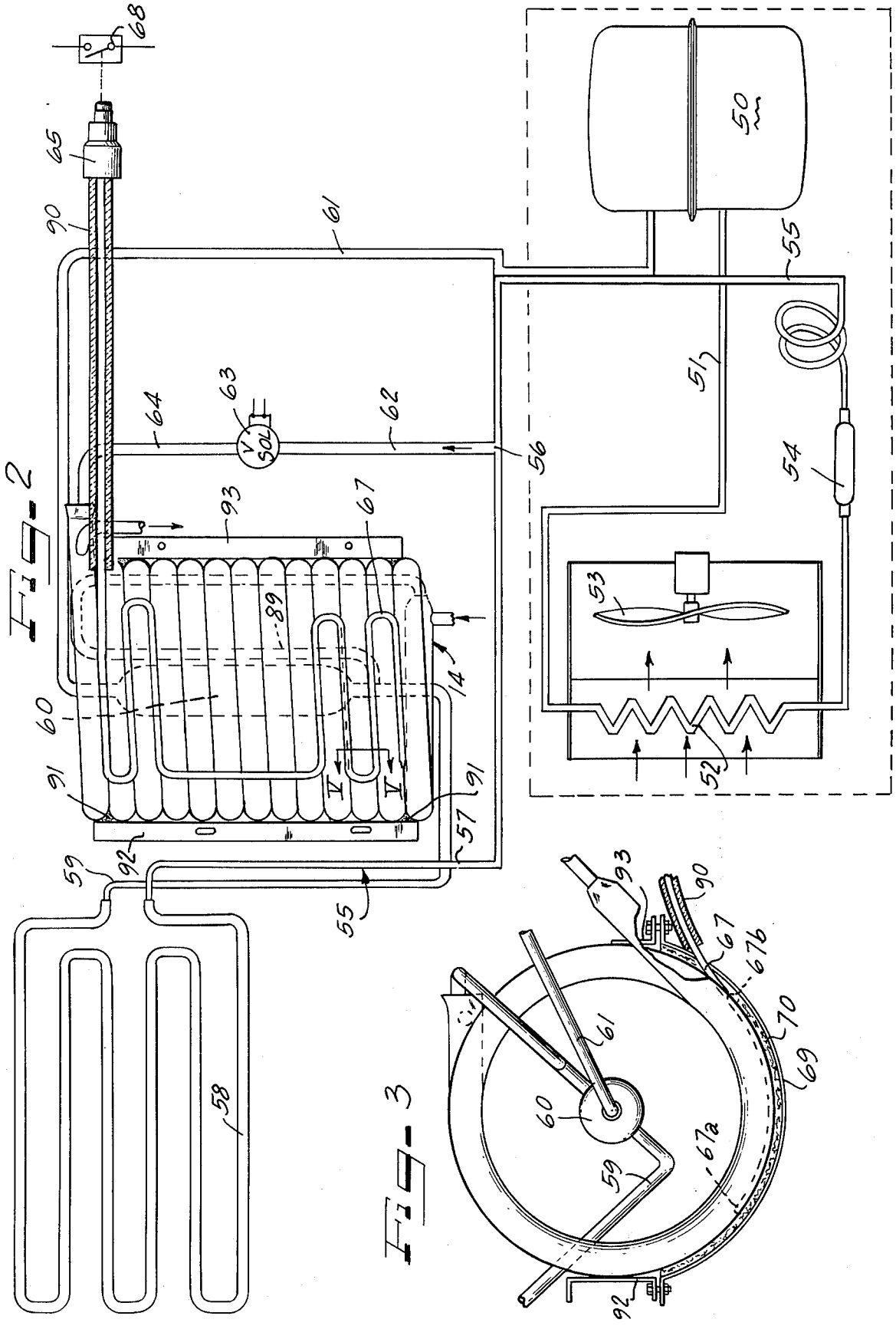

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Fig. 2

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Fig. 3

Fig. 4

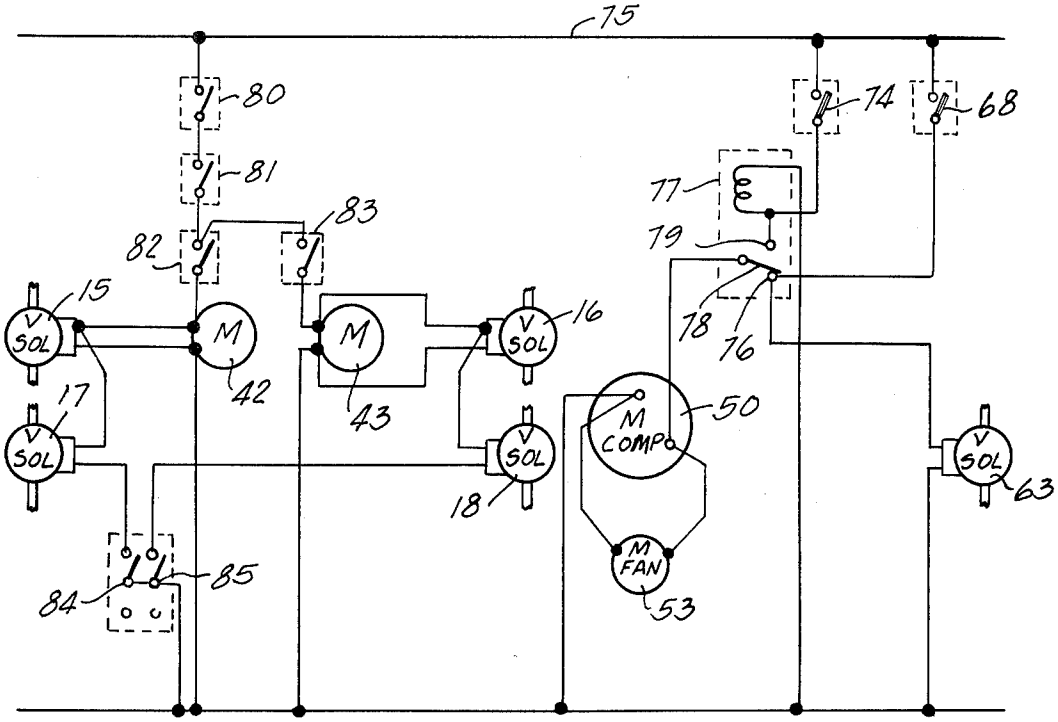


Fig. 5

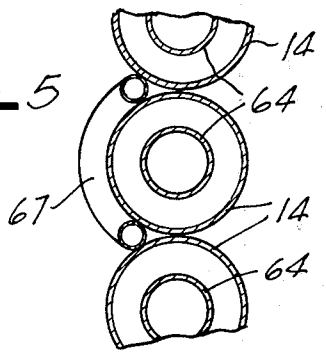
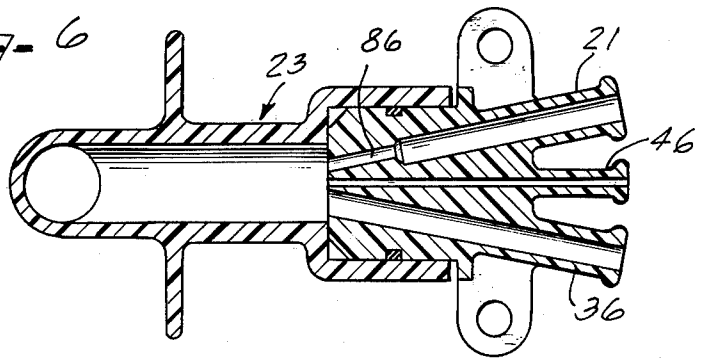


Fig. 6



BEVERAGE DISPENSER

BACKGROUND

This invention pertains to a beverage dispenser of the type that mixes a concentrated beverage ingredient with water and dispenses the same.

PRIOR ART

Beverage dispensers of the mixing type have been used for years, particularly where the concentrate being utilized constitutes one of the well known beverage syrups. However, when a concentrated fruit juice is utilized, dispensing becomes somewhat more difficult not only because of the pul that one finds such as in orange juice, but also the keeping ability of a thawed-out juice concentrate is relatively poor. Once there is spoilage the dispenser must be appropriately cleaned, and a careful operator would much prefer to clean the dispenser sooner. Further, local ordinaces require daily cleaning, and with known type of dispensers, a considerable amount of time and labor can be expended during the time that the dispenser is out of service.

SUMMARY OF THE INVENTION

The present invention is directed to a beverage dispenser that is particularly useful with concentrated fruit juices for restoring them to the original strength by admixing concentrate with the proper amount of water. The dispenser includes built-in means for flushing or cleaning the lines and components that carry such juice concentrate from a storage container to the dispensing spout.

Accordingly, it is an object of the present invention to provide a beverage dispenser which can to a large extent be selfcleaning, including a method for mixing and dispensing a beverage.

Another object of the present invention is to provide a beverage dispenser that is particularly adapted for use with a water supply and a concentrated beverage ingredient.

Another object of the present invention is to provide means by which the amount of air that becomes entrained in the mixed beverage can be regulated.

A further object of the present invention is to provide a two-flavor beverage dispenser that is so constructed that the water-handling components, the beverage ingredient handling components, the components which handle flushing water, refrigeration system and the electrical system can be conveniently packaged in a housing that can be disposed upon a serving counter.

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 the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

ON THE DRAWINGS

FIG. 1 is a diagrammatic view of a beverage dispenser provided in accordance with the principles of the present invention showing the water and beverage concentrate systems;

FIG. 2 is a diagrammatic view of the refrigeration system of the dispenser of FIG. 1;

FIG. 3 is a top plan view of a portion of FIG. 2;

FIG. 4 is a diagram of the electrical circuitry utilized in the dispenser of FIG. 1;

FIG. 5 is an enlarged cross-sectional view taken along line V—V of FIG. 2; and

FIG. 6 is a horizontal cross-sectional view in enlarged scale of a mixing spout shown in FIG. 1.

AS SHOWN ON THE DRAWINGS

The principles of the present invention are particularly useful when embodied in a beverage dispenser such as diagrammatically illustrated in FIG. 1, generally indicated by the numeral **10**. The beverage dispensing system has a water inlet **11** for being connected to a supply of pressurized potable water. The inlet **11** leads to a strainer **12** which is connected to a pressure regulating valve **13** from which a water line **14** extends in the form of a helical coil. Downstream of the water line coil **14**, the line is connected to a first main or dispensing valve **15**, a further main or dispensing valve **16**, a flushing valve **17** and a further flushing valve **18**. The dispensing valves **15, 16** communicate through a pair of lines **19, 20** with a water inlet **21, 22** forming part of a mixing and dispensing spout **23, 24**. Water from the dispensing valves **15, 16** is also carried by a pair of bypass lines **25, 26**, each of which has a check valve **27**, 28 and a manually adjustable throttling valve **29, 30**. Each of the dispensing spouts **23, 24** has a flow restrictor **86** by which a back pressure is created.

The beverage dispensing system **10** further includes a pair of storage tanks **31, 32** which may be constructed as a partitioned unit with a single cover **33**. The cover enables air to enter the tanks **31, 32** as liquid flavored beverage ingredient is withdrawn therefrom. Each of the tanks **31, 32** is also referred to herein as a source of liquid flavored beverage ingredient. Each of the sources **31, 32** is connected by a line **34, 35** to the beverage ingredient inlet **36, 37** of the spouts **23, 24**. The ingredient lines **34, 35** each have a check valve **38, 39** preferably disposed as close to the tank **31, 32** as possible, and the bypass lines **25, 26** are connected to the ingredient lines **34, 35** as close to such check valves **38,** 39 as is practicable. Each of the ingredient lines **34, 35** further includes a control member **40, 41**, such control members here comprising a pump, such as of the peristaltic type driven by an electric motor **42, 43.**

The flushing valves **17, 18** are connected by a pair of flushing lines **44, 45** with the beverage ingredient lines **34, 35** close to the point where the bypass lines **25, 26** join the ingredient lines **34, 35**, such connection being upstream of the control member **40, 41.**

Each of the dispensing spouts **23, 24** has an air inlet **46, 47** which is connected to an air throttling valve **48,** 49 which enables a selected amount of air to be drawn into the mixing and dispensing spouts **23, 24**, such as air being at atmospheric pressure and obtained from any suitable ambient location. (The down-turned portion of the spouts **23, 24** should really be illustrated as extending downwardly, perpendicular to the plane of the drawing as shown in FIG. **6** in horizontal cross sectional view).

When the dispensing valve **15** and the control member **40** are simultaneously energized, pressurized water flows through the line **19** into the water inlet **21** and through the flow restrictor **86.** The backpressure in line **19** upstream from the flow restrictor causes water to flow through the bypass line **25,** the check valve **27** and the adjustable throttling valve **29** which are connected

to the suction side of the pump 40 so that a mixture of beverage ingredient from the check valve 38 and water from the throttling valve 29 are drawn into and metered by the control member or pump 40, the outlet of which is connected to the beverage ingredient inlet 36. Within the dispensing spout 23, the stream of water and the stream of partially diluted beverage concentrate engage against each other to further dilute the concentrate to the proper degree, a preselected amount of air being drawn in and also mixed therewith through the air inlet 86. The operation of the dispensing valve 16 and control 41 in bringing water to the dispensing spout 24 and in bringing beverage ingredient from the source 32 to the spout 24 is identical to that explained.

When it is desired to clean the system for sanitizing purposes or for the purpose of changing to a different flavor, the dispensing valve 15 and the control member 40 are operated until the source 31 is empty whereupon the same can be readily wiped out. When the flushing valve 17 is also energized, clear water flows through the flushing line 44, bypassing the check valve 27 and the throttling valve 29, at a flow rate at least equal to the flow capacity of the control member 40. The check valve 27 and the throttling valve 29 do not need to be cleaned because in their ordinary operation, they handle the same water. However, the flushing water is prevented from entering the source 31 by the check valve 38 and is also connected to the upstream side of the control member or pump 40, thereby flushing the beverage ingredient line 34 including the control member 40 and the inlet 36 of the dispensing spout 23. In like manner, the other spout 24 receives flushing water by energization of the flushing valve 18.

The helical water coil 14 and the beverage ingredient sources 31, 32 are refrigerated by a refrigeration system shown in FIG. 2. A hermetically sealed motor-compressor 50 has an output line 51 leading to a condenser coil 52 which is air-cooled by a ventilating fan 53. The line 51 then leads to a strainer-dryer 54 and thence through several feet of a first capillary tubing 55 which typically has an inside diameter of 0.049 inch. The line 55 divides at a point 56 and a second capillary tubing 57 of smaller inside diameter leads to an evaporator coil 58 which is disposed in heat-exchange relationship with the sources 31, 32. The discharge end of the evaporator coil 58 passes through a downwardly directed section line 59 (for draining the evaporator coil 58) to an accumulator 60 which is connected to a suction line 61 leading to the motor-compressor 50. The other branch 62 leads through a solenoid valve 63 to a line 64 which is arranged in the form of a vertical helical coil, the discharge end, as shown in dashed lines, being also connected to the lower end of the accumulator 60 via a vertical loop or trap 89 which prevents backflow of refrigerant into the helical coil 64 from the evaporator 58. The upper and lower loops of the coil 14 are bonded as at 91 to a pair of mounting brackets 92, 93, for a purpose explained below. The helical coil portion of the refrigerant line 64 is disposed within the helical water coil 14 as best seen in FIG. 5. Although the turns of the helical coil of the refrigeration line 64 are shown as being concentric with the individual turns of the water line's helical coil 14, the actual location is at random since the coils are formed after the assembly is made. Refrigerant enters the upper end of the helical coil and exits through the lower end, while the warmer water enters the lower end of the coil 14 and flows in surrounding relation to the refrigerant coil and exits at the upper end. The accumulator 60 is disposed within the helical coil 14, as shown.

To control the refrigeration system which is common to both of the flavor systems, a first thermostatic control 65 is provided which is responsive to the temperature of the water line helix 14, and a second temperature control 66, shown in FIG. 1 is disposed so as to be responsive to the temperature of the beverage ingredient source. The first thermostatic control 65 has a sensing element 67 and an electric switch 68, and is of the limited vapor filled type so that it is responsive to the coldest part of the sensing element. The sensing segment 67 is constructed with a zig-zag portion at the lower end of the helical coil 14 and a shorter zig-zag portion near the upper end thereof. Thus the coldest water which is at the upper end of the helical coil 14 is sensed to open the switch 68 and the warmest water, such as fresh incoming water is sensed at the lower end of the water coil 14 to call for refrigeration. The sensing element 67 extends from the top of the water line 14 and is covered with insulation 90 which shields the elements 67 from the cold air around the water coil 14 which air, during operation of the refrigeration system, will be colder than the water coil 14. As is explained below, the switch 68 is in circuit with the refrigeration solenoid valve 63 which is normally closed so that unless the thermostatic control 65 is calling for refrigeration, the solenoid valve 63 will be closed. When refrigeration is called for, the compressor 50, the fan 53 and the solenoid valve 63 are simultaneously energized.

As seen in FIGS. 2 and 5 the various portions or stretches of the sensing element 67 lies intermediate adjacent turns of the water helix 14 and in direct engagement with both adjacent turns for ensuring good heat transfer and for obtaining accurate sensing of water temperature. To maintain the three legs of the upper zig-zag and the four legs of the lower zig-zag in intimate engagement as described, there is provided an arcuate clamp 69 shown only in FIG. 3 which acts through slightly yieldable insulation 70 to maintain good contact between the sensing element 67 and the water line helix 14, for example, as seen between the points 67a and 67b. With this arrangement, water flowing through the helical water coil 14 has extensive and intimate contact with the helical portion of the evaporator line 64. The bands 91 prevent axial spreading of the loops of the coil 14 when the clamp 69 is tightened.

The evaporator line 58 is in parallel to the lines 62, 64 and is controlled only by the capillary tubing 55 and 57 from a refrigerant gas standpoint, while the second thermostatic control 66 is arranged to turn the compressor 50 and fan 53 on and off. Thus when either thermostatic control 65 or 66 calls for refrigeration, the evaporator coil 58 will receive refrigerant gas. There is no likelihood of freezeup in the sources 31, 32 owing to the sugar content of the beverage ingredient or concentrate, while the thermostatic control 65 which typically operates in the temperature range between 35° and 38° F keeps the temperature of the coldest water above freezing. A liquid level senser 71 has two sensing elements 72, 73, respectively insulatingly disposed for extending into concentrate in the concentrate sources 31, 32. When the liquid level falls below either of them, a circuit is closed to a warning lamp for indicating that the supply of beverage ingredient is low.

The electrical circuitry for operating the beverage dispenser is shown in FIG. 4. The thermostatic control 66 has a switch 74. A line 75 brings power to the switches 74, 68. The water thermostat switch 68 is connected to the normally closed stationary contact 76 of a relay 77 and is also connected to bring power to the solenoid of the refrigeration valve 63. The movable or armature contact 78 of the relay 77 is connected to bring power to the motor of the compressor 50 and to the motor of the fan 53. Thus anytime that the water coil 14 needs refrigerating, the thermostatic control 65 energizes the parallelconnected refrigeration valve 63, compressor 50 and fan 53.

The switch 74 which is a part of the concentrate thermostat 66 brings power to the coil of the relay 77 and also brings power to the normally open stationary contact 79. Thus when the switch 74 is closed alone, power is delivered to the compressor 50 and fan 53.

The circuitry for the refrigeration system is independent of other switches so that if the dispenser 10 is plugged into a power source, it cannot be shut off accidentally.

Power is also brought through a key-controlled switch 80 which when locked is in the open position, thereby preventing unauthorized dispensing. The key-operated switch 80 is in series with a master switch 81 which controls power for the vending of both flavors. The master switch 81 is connected to a pair of dispensing switches 82, 83 which are respectively connected to bring power to the dispensing valve 15 and motor 42, and the dispensing valve 16 and the motor 43 respectively. The solenoids of the flushing valves 17, 18 are also connected to receive power from the dispensing switches 82, 83 but in the return line of each of the solenoid valves 17, 18, there is a flushing switch 84, 85 so that flushing will take place only when the same is closed. If desired, the actuators may be mechanically ganged. With this arrangement, either or both of the systems within the dispenser may be flushed. If desired, the switches 84, 85 could be in series with the other terminal of the flushing valve solenoids.

The adjustability of the throttling means 29, 30 has several advantages. One advantage is that the apparatus can be used with beverages that have reconstitution ratios between 1 to 3 and 1 to 5, whereby such ratio is selected. A second advantage is that beverage ingredients reconstituted at a selected ratio do not all have the same viscosity at a given operating temperature. The control members 40, 41 when comprising peristaltic pumps, have a flexible tube section which decreases in size under suction as a function of viscosity and such decrease is compensatable by the aforesaid adjustability.

As shown, the check valves 38 and 39 in the ingredient lines 34, 35 are preferably spaced upstream by a portion 87, 88 of each such line from the point at which the flush lines 44, 45 are connected. When the beverage ingredient is a citrus concentrate, some pulp will occasionally be trapped against the seat of the check valve 38, 39, thereby slightly holding the check valve 38, 39 open. This condition is of no consequence during ordinary sequential dispensing. However, when one of the flushing valves 17, 18 is actuated, there is a tendency for flush water to leak past such partially open check valve 17, 18. This condition is overcome by the presence of the line portions 87, 88 which contain beverage ingredient and pulp, the liquid portion of which thus slightly leaks past the partially stopped-open check valve 38, 39, but the reverse-flowing pulp, under reverse pressure, seals the leak, thereby avoiding dilution of and hence damage to beverage ingredient upstream of the check valves 38, 39.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody 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 mixing and dispensing system comprising:
   a. a source of flavored beverage ingredient of the liquid concentrate type;
   b. a mixing and dispensing spout;
   c. a line connecting concentrate source to said spout;
   d. a selectively actuatable control member in said concentrate line for controlling flow of the beverage ingredient through said spout;
   e. a normally closed main valve for being connected to a supply of pressurized water and connected to said spout independently of said concentrate line so that the beverage ingredient is mixed with diluting water within said spout when said main valve and said control member are actuated; and
   f. a normally closed flushing valve for being connected to the same supply of water and connected to said concentrate line upstream of said control member, said flushing valve being sized to have a flow rate capacity which is greater than the flow rate capacity of said control member,

whereby beverage is mixed and dispensed when said control member and said main valve are jointly actuated, and whereby at least a portion of said concentrate line, said control member and said spout are flushed when said control member and said flushing valve are jointly actuated.

2. A beverage mixing and dispensing system according to claim 1 including a bypass line having a throttling valve therein, said bypass line being connected between said main valve and said concentrate line upstream of said control member, for partially diluting the beverage ingredient upstream of said spout.

3. A beverage mixing and dispensing system according to claim 1 in which said spout has an inlet open to the atmosphere and an air throttling valve for adjustably controlling the amount of air admixed to the beverage ingredient and water mixture.

4. A beverage mixing and dispensing system according to claim 1 which includes a supply of water, said supply comprising:
   a. a water line for being connected to a pressurized source of water;
   b. a refrigeration system having an evaporator line extending through and along the length of said water line; and
   c. a thermostatic control for said refrigeration system having a sensing element extending along portions of said water line.

5. A beverage mixing and dispensing system according to claim 4 in which said evaporator line is arranged as a helical coil and said water line is arranged as a helical coil surrounding individual turns of the evaporator line coil.

6. A beverage mixing and dispensing system according to claim 5 in which said sensing element has portions disposed intermediate individual turns of the water coil in direct engagement with a pair of adjacent turns.

7. A beverage mixing and dispensing system according to claim 6 in which said thermostatic control is of the limited vapor fill type, a portion of said sensing element engaging turns at the inlet end of the water coil, and another portion of said sensing element engaging turns at the outlet end of the water coil.

8. A beverage mixing and dispensing system according to claim 5 in which said sensing element is arranged in a zig-zag manner in engagement with successive adjacent pairs of the water coil.

9. A beverage mixing and dispensing system according to claim 8 including an arcuate clamp forcing said sensing element into positive engagement with said successive adjacent pairs of the water coil.

10. A beverage mixing and dispensing system according to claim 5 in which the refrigeration system includes an accumulator connecting the evaporator to a suction line, said accumulator being disposed centrally of said water line coil.

11. A beverage mixing and dispensing system according to claim 4, including a second evaporator line connected in parallel with said first-named evaporator line and disposed to refrigerate said source of beverage ingredient, a second thermostatic control for said refrigeration system responsive to the temperature of said source of beverage ingredient, and a valve in said first-named evaporator line under the control of said first-named thermostatic control.

12. A beverage mixing and dispensing system according to claim 11 in which said first-named thermostatic control includes a switch, said valve in said first-named evaporator line being a solenoid valve, and a relay, said switch being connected through a stationary normally closed contact in said relay to said solenoid valve, said second thermostatic control including a switch connected to the coil of said relay and to a stationary normally open contact, the movable contact of said relay being connected to power said refrigeration system.

13. A beverage mixing and dispensing system according to claim 1 in which said main valve is also fluidly connected to said concentrate line upstream of said control member, said main valve and said control member being of electrical types and being electrically connected in parallel, and a dispensing switch connected in series therewith.

14. A beverage mixing and dispensing system according to claim 13 in which said flushing valve is a solenoid valve connected in an electrical circuit parallel to said main solenoid valve and in series with said dispensing switch, and a flushing switch in said parallel electrical circuit.

15. A beverage mixing and dispensing system according to claim 1 in which said control member is a pump.

16. A beverage mixing and dispensing system according to claim 15 including a check valve in said concentrate line upstream of the connection of said concentrate flushing valve to said line.

17. A beverage mixing and dispensing system according to claim 16 in which a portion of the ingredient line is disposed between said check valve and the point where said flushing valve is connected to said line.

18. A beverage mixing and dispensing system comprising:

a. a dispensing spout;

b. a source of liquid flavored beverage ingredient of the concentrate type, including a storage tank, an ingredient line connecting said tank to said spout and a selectively actuatable control member in said line for controlling flow of the beverage ingredient through said spout;

c. a diluent line connected to said spout, including a selectively actuatable main valve and a flow restrictor downstream of said main valve, said line being connectable to a pressurized supply of beverage diluent;

d. a diluent bypass line having throttling means therein, said bypass line being connected to said beverage diluent line intermediate said main valve and said flow restrictor, and to said source of beverage ingredient intermediate said tank and said control member; and

e. means connected to said control member and to said main valve for simultaneously actuating said control member and said main valve.

19. A beverage mixing and dispensing system according to claim 18 including a check valve in said ingredient line intermediate said control member and said concentrate tank.

20. A beverage mixing and dispensing system according to claim 19 including a flush line connected to said ingredient line intermediate said check valve and said control member, said flush line being connectable to a source of water and being sized to provide a flow rate of water at least equal to the flow rate of said control member.

21. A beverage mixing and dispensing system according to claim 20 in which said flush line is connected to said diluent line and includes selectively actuatable valve means.

22. A beverage mixing and dispensing system according to claim 18 including a check valve in said bypass line.

23. A beverage mixing and dispensing system according to claim 18 in which said throttling means in said bypass is sized to have a flow rate less than that of said control member.

24. A beverage mixing and dispensing system according to claim 23 in which said throttling means is adjustable.

25. A beverage mixing and dispensing system according to claim 18 in which said spout has an air inlet open to the atmosphere, and an air throttling valve for adjustably varying the effective opening size of said air inlet and therefore the amount of air drawn in with the beverage ingredient.

26. A method of mixing and dispensing a beverage from a supply of flavored liquid beverage ingredient and a separate supply of pressurized diluent, comprising:

a. transferring diluent from the pressurized supply through a line at a predetermined rate of flow to a mixing zone while restricting flow to maintain at least a portion of the supply pressure in the line;

b. transferring ingredient through a line to the mixing zone;

c. transferring additional diluent at a predetermined rate of flow from the diluent line upstream of the

flow restriction into the ingredient line to initially dilute the ingredient;

d. controlling the rate of flow of the initially diluted ingredient to the mixing zone; and

e. mixing the initially diluted ingredient with the first-mentioned transferred diluent to form the beverage.

27. A method of mixing and dispensing a beverage according to claim **26** in which the initially diluted ingredient is positively pumped at a predetermined rate.

28. A method of mixing and dispensing a beverage according to claim **27** in which the step of transferring ingredient is augmented by pumping suction, and in which the step of transferring additional diluent is augmented by said portion of the supply pressure in the diluent line.

29. A method of mixing and dispensing a beverage according to claim **26** in which the transfer rate of diluent into the ingredient line is maintained at less than the controlled rate of flow.

30. A method mixing and dispensing beverage according to claim **26** including the step of checking against flow of concentrate ingredient in the ingredient line to the concentrate ingredient supply.

31. A method of mixing and dispensing a beverage according to claim **26** in which said restricting of diluent flow is at the downstream end of said diluent line to increase its velocity as it enters the mixing zone.

32. A method of mixing and dispensing according to claim **26,** including the steps of:

a. connecting the supply of pressurized diluent directly to the ingredient line; and

b. checking against flow of diluent into the supply of ingredient while also checking against flow of ingredient, to thereby flush a portion of the ingredient line and the mixing zone with diluent.

33. A method of mixing and dispensing a beverage from a supply of liquid flavored beverage ingredient and a separate supply of pressurized diluent, comprising concurrently:

a. transferring diluent from the pressurized supply at a predetermined rate to a mixing zone;

b. transferring ingredient through a line from the ingredient supply to the mixing zone;

c. transferring additional diluent at a predetermined rate from the pressurized supply into said ingredient line to initially dilute the ingredient;

d. controlling the rate of flow of the initially diluted ingredient to the mixing zone; and

e. mixing the initially diluted ingredient and the first-mentioned transferred diluent to form the beverage.

34. A method of mixing and dispensing a beverage according to claim **33** in which the first-mentioned transferring step and the controlling step are simultaneously initiated.

35. A method of mixing and dispensing a beverage from a supply of liquid beverage ingredient and a separate supply of pressurized diluent, comprising:

a. transferring diluent from the pressurized supply at a predetermined rate to a mixing zone;

b. pumping ingredient through a line from the ingredient supply while also pumping additional diluent from the pressurized supply into the ingredient line to both initially dilute the ingredient and to deliver the initially diluted ingredient at a predetermined rate to the mixing zone;

c. checking against flow of initially diluted ingredient into the ingredient supply; and

d. mixing said initially diluted ingredient and diluent in the mixing zone to form the beverage.

36. A beverage mixing and dispensing system comprising:

a. a dispensing spout;

b. a source of liquid flavored beverage ingredient, including a storage tank, an ingredient line connecting said tank to said spout, a check valve in said line intermediate said tank and said spout and a selectively actuatable control member in said line intermediate said check valve and said spout for controlling flow of beverage ingredient through said spout;

c. a diluent line connected to said spout, including a selectively actuatable main valve, said diluent line being connectable to a pressurized supply of diluent;

d. a diluent bypass line having a throttling means and a check valve therein, said bypass line being connected to said diluent line and to said ingredient line intermediate said check valve and said control member; and

e. means connected to said control member and to said main valve for simultaneously actuating said control member and said main valve.

37. A beverage mixing and dispensing system comprising:

a. a dispensing spout;

b. a source of flavored liquid beverage ingredient, including a storage tank, an ingredient line connecting said tank to said spout and a selectively actuatable control member in said line for controlling flow of the beverage ingredient through said spout;

c. a diluent line connected to said spout, including a selectively actuatable main valve, said diluent line being connectable to a pressurized supply of diluent;

d. a diluent bypass line having throttling means therein, said bypass line being connected to said ingredient line intermediate said control member and said vat, and being connected to receive diluent from said diluent line; and

e. means connected to said control member and to said main valve for simultaneously actuating said control member and said main valve, and to thereby control flow in said diluent bypass line.

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