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DISPENSER ASSEMBLY FOR SODA FOUNTAINS

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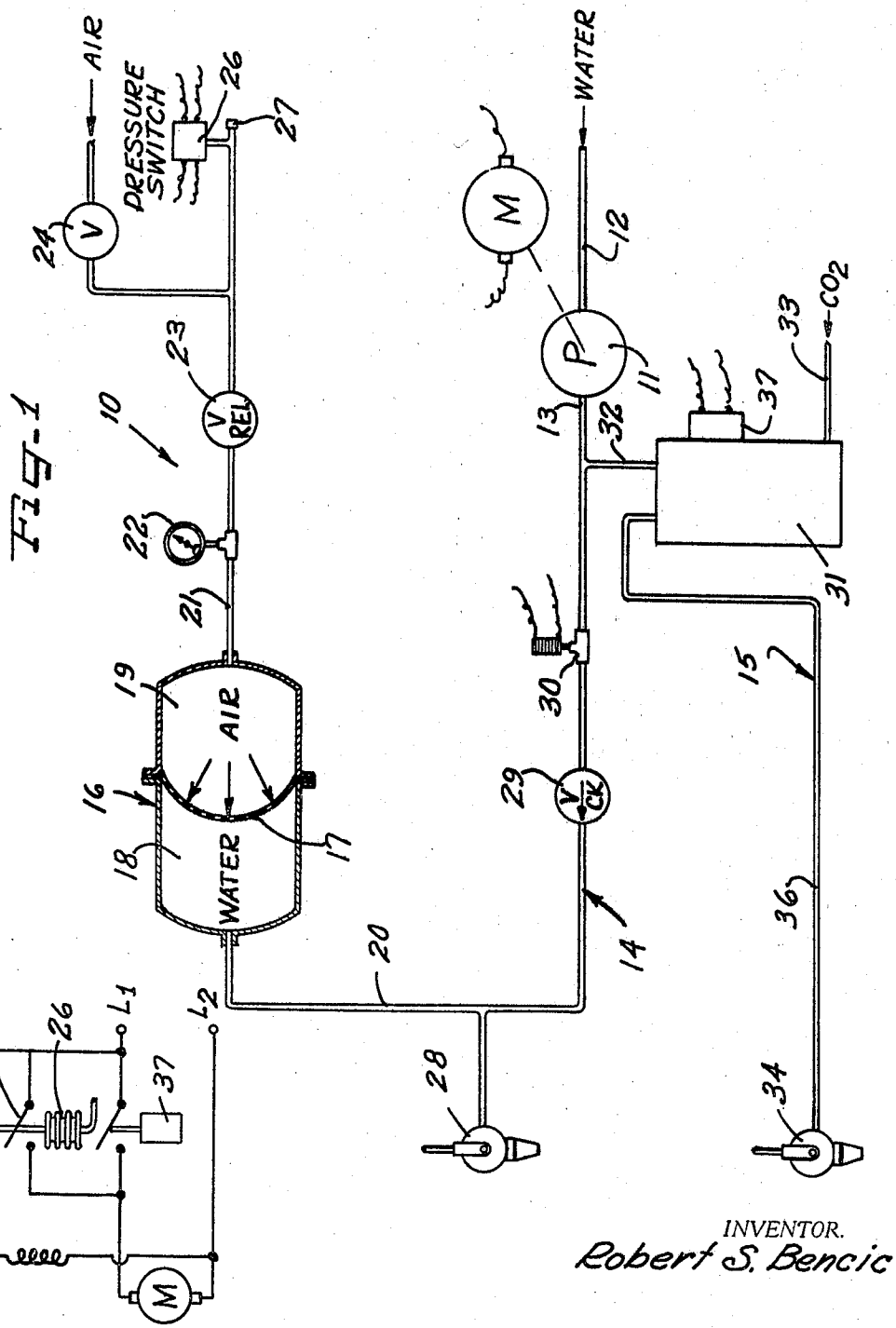


Fig-1

Fig-2

INVENTOR.
Robert S. Bencic

BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

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DISPENSER ASSEMBLY FOR SODA FOUNTAINS

Robert S. Bencic, Chicago, Ill., assignor to The Dole Valve Company, Morton Grove, Ill., a corporation of Illinois

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ABSTRACT OF THE DISCLOSURE

A dispenser assembly for a soda fountain for supplying still water and carbonated water in the mixing and dispensing of soft drinks. A single high pressure water pump is connected to both a still water hydraulic circuit and a carbonated water hydraulic circuit. The still water circuit includes a pressure tank to maintain a predetermined pressure of the still water within the circuit and the carbonated water circuit includes a carbonator tank for adding carbon dioxide to the water. A pair of switches wired in parallel are connected to the pump to operate the pump when either (1) the still water pressure is below a predetermined limit, or (2) the level of water in the carbonator tank is below a predetermined limit.

BACKGROUND OF THE INVENTION

This invention relates generally to the field of soft drink dispensers and more particularly to apparatus for supplying still water and carbonated water in the mixing and dispensing of soda fountain drinks.

In known arrangements involving apparatus of the type generally described two separate hydraulic circuits are used in supplying still water and carbonated water. The two circuits each include a separate water pump to increase the pressure of the incoming supply water to a satisfactory level. The pressure of the still water is desirably in the range of about 60–70 p.s.i. and the pressure of the carbonated water is desirably in the range of about 100–110 p.s.i.

The two separate circuits increase the cost of a dispenser unit and of course increase the operation and maintenance problems because of the duplication of the pumps.

SUMMARY OF THE INVENTION

The present invention improves upon prior arrangements by maintaining the pressure of still water at a given level without continuously operating the pump as the water is being drawn off, and by additionally interconnecting the still water and the carbonated water circuits and supplying both by means of a single high pressure water pump. A pressure tank divided into a water side and an air side is connected into the still water circuit at the outlet side of the pump to maintain the pressure at the still water tap within predetermined limits, as the water is being drawn off without the necessity for continuously operating the pump. The operation of the pump is controlled as a function of the pressure in the air side of the pressure tank, which varies according to the pressure in the water side. A carbonator tank is connected into the carbonated water circuit at the outlet side of the pump and the operation of the pump is also controlled as a function of the level of water in the carbonator tank. A solenoid valve is mounted in the still water circuit to close the circuit when the pressure of the water therein is within the predetermined range, thereby diverting water from the pump into the higher pressure carbonator water circuit and the carbonator tank when the water level in the tank is low.

Briefly, then, the present invention may be summarized as comprising apparatus for providing mixing water in the dispensing of soda fountain drinks including a high pressure water pump for connection to a source of water, hydraulic circuitry for dispensing still water comprising a pressure tank having a movable member partitioning the interior of the tank into a still water side and an air side, conduit means communicating said pressure tank to the outlet of said pump, tap means in said conduit means for tapping off still water, and switch means connected to said pump for controlling the operation of the pump as a function of water pressure at the still water tap.

Additional features of the invention comprise a check valve in the conduit means between the pump and the tap means for preventing back flow of the still water from the pressure tank to the pump. Another feature includes an air pressure gage for indicating the pressure of air in the air side of the tank.

Another salient feature of the invention comprises hydraulic circuitry for dispensing carbonated water including a carbonator tank having a water inlet connected to the outlet of the pump and a carbonated water outlet for connecting to a carbonated water tap, means for pressurizing the carbonator tank with carbon dioxide and water level switch means connected to the pump in parallel with the still water pressure switch means for controlling the operation of the pump as a function of the level of water in the carbonator tank.

It is, therefore, an object of the present invention to provide an improved soda fountain dispenser unit wherein the pressure of the water at a still water tap is maintained at a relatively constant value.

Another object is to provide a dispenser unit including a still water tap and a carbonated water tap both of which are serviced by a single high pressure water pump.

Another object is to provide a still water hydraulic circuit connected to a high pressure water pump with a pressure tank partitioned by a movable member such as a flexible diaphragm into a still water side and a closed air side for maintaining the pressure of the water at a still water tap within predetermined limits regardless of whether the pump is continuously operating.

Another object is to provide a dispenser system including a still water circuit and a carbonated water circuit both of which are serviced by a single high pressure water pump, the operation of which is controlled both as a function of water pressure in the still water circuit and the volume of water in the carbonator water circuit.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a generally schematic showing of a dispensing system constructed in accordance with the principles of the present invention.

FIGURE 2 is a schematic wiring diagram of the system shown in FIGURE 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGURE 1, a dispensing system for preparing soda fountain drinks constructed in accordance with the principles of the present invention is indicated generally at reference numeral **10** and comprises a high pressure water pump **11** having an inlet **12** for connection to a source of water and an outlet **13** connected both to a still water circuit and a carbonated water circuit indicated respectively at **14** and **15**.

The still water circuit **14** is more particularly characterized as comprising a pressure tank **16** partitioned interiorly by a pressure responsive movable member such as a flexible diaphragm **17** into a first chamber or water side **18** and a second chamber or air side **19**. The water side **18** is connected in fluid communication with

the outlet 13 of the pump 11 by suitable conduit as indicated at 20.

Another conduit 21 is connected to and forms an extension of the air side 19 and has mounted thereon an air pressure gage 22, a pressure relief valve 23, an air fill valve 24 and a pressure responsive electric switch 26. The distal end of the conduit 21 is capped as at 27.

A still water tap 28 is connected into the conduit 20 between the pressure tank 16 and the pump 11 for drawing off still water. The tap 28 may be located on a soda fountain assembly, for example, in the usual manner. One-way flow imposing means such as a check valve 29 is mounted in the conduit 20 between the tap 28 and the pump 11 and a solenoid operated shut-off valve 30 is mounted between the check valve 29 and the pump 11.

The carbonated water circuit 15 is more particularly characterized as comprising a carbonator tank 31 connected to the outlet 13 of the pump 11 upstream of the solenoid valve 30 by means of a conduit 32. The carbonator tank 31 is of a type generally known in the art and is charged with carbon dioxide in the usual manner from a conduit 33. Carbonated water delivered from the tank 31 is conveyed to a carbonated water tap 34 through a conduit 36. The carbonated water tap 34 may be located on a soda fountain in proximity to the still water tap 28, as will be understood by those skilled in the art.

The still water drawn from tap 28 does not, of course, have any carbonation but is desirable in the mixing and dispensing of soft drinks using non-carbonated or still water that the pressure of the still water at the tap be maintained within a predetermined range, for example, between about 60–70 p.s.i. The carbonated water tap 34 dispenses water which has been charged with carbon dioxide in mixing other kinds of soft drinks and is desirably maintained at a pressure of about 100–110 p.s.i.

It is apparent that the desirable pressure ranges of both the still water and the carbonated water are well above the pressures available from a city water line or the like source of water. This necessitates the use of the high pressure water pump 11 which is driven by an electric motor indicated at reference character M. The pressure rating of the pump 11 is, of course, above the maximum desirable pressure in either the still water circuit 14 or the carbonated water circuit 15, or in excess of about 110 p.s.i. in the case of the exemplary ranges set forth herein.

The purpose of the pressure tank 16 is to maintain the pressure of the still water at the tap 28 within the desirable range regardless of whether the pump 11 is operating at the time the tap 28 is opened. In operation the air side 19 of the tank 16, including the conduit 21, is filled with air through the air fill valve 24. The pump 11 is then operated to fill the water side 18 of the tank 16. During this filling operation the diaphragm 17 flexes toward the air side 19 as the pressure in the water side 18 builds up to compress the air in the air side 19. The pressure responsive switch 26 is connected to the pump motor M to deenergize the pump after the pressure in the air side 19 (and correspondingly, the pressure in the water side 18) has attained a predetermined level, for example, 70 p.s.i. Subsequently, as still water is drawn from the tap 28, the pressure in the air side 19 will act against the diaphragm 17 to maintain a substantially constant pressure of the still water. After the pressure in the air side 19 has been reduced to a predetermined level, for example, 62 p.s.i., the switch 26 will again energize the pump 11 to pump water into the water side 18 of the pressure tank 16 until once again the pressure in the air side 19 attains a level of approximately 70 p.s.i.

The solenoid valve 30 is also connected to the switch 26 to open when the contacts of the switch 26 are closed to energize the pump 11, and to close when the contacts of switch 26 are opened. Thus the solenoid valve is only open when the switch 26 calls for more water in the water side 18 of the pressure tank 16.

It is also desirable to maintain the level of water in the carbonator tank 31 within predetermined limits, and for this purpose another electric switch 37 which is responsive to the level of water in the carbonator tank 31 is also connected to the pump motor M. The water level switch 37 is electrically connected in parallel with the pressure responsive switch 26 so that when the contacts of either switch are closed the pump 11 will operate.

In order to understand the dual service of the system 10, assume that the water level in the carbonator tank 31 is within the predetermined limits thereof, but additional water is required in the water side 18 of the pressure tank 16. The electric contacts of the pressure responsive switch 26 then close to open the solenoid valve 30 and to energize the water pump 11. Because of the higher pressure of the carbonator tank 31, all of the water being delivered by the pump 11 will be conveyed by conduit 20 to the pressure tank 16. After the pressure within the tank 16 has risen to the predetermined upper limit thereof, the contacts of the switch 26 open to close the solenoid valve 30 and deenergize the pump 11.

Assume the level of the water in the carbonator tank 31 then falls to the lower limit of the desired range. The contacts of switch 37 then close to energize the pump 11. Since the solenoid valve 30 is closed all of the water delivered by the pump 11 will be conveyed into the carbonator tank 31 through conduit 32.

The check valve 29 prevents the backflow of still water from the pressure tank 16 downstream toward the pump 11. Another check valve may be installed in the conduit 32 between the carbonator tank 31 and conduit 20.

Referring to FIGURE 2, a pair of main power lines are indicated at L_1 and L_2. L_2 is connected directly to one terminal of the pump motor M. L_2 is connected to the pump motor M through the water level switch 37 which is connected in parallel to one pair of contacts 38 of the pressure responsive switch 26. Another pair of contacts 39 which operate in unison with contacts 38 connect solenoid valve 30 to the power lines L_1 and L_2.

Thus either of the switches 26 and 37 can operate the pump 11, but the solenoid valve 30 opens only when the switch 26 energizes the pump 11.

I claim as my invention:

1. A dispensing assembly for supplying mixing water in the dispensing of soda fountain drinks comprising,

a high pressure water pump for connection to a source of water, and

a still water circuit for dispensing still water comprising,

a pressure tank having a movable member partitioning the interior of the tank into a water side and a closed air side whereby the movable member maintains an air pressure in the air side which corresponds to the water pressure in the water side,

conduit means connecting the water side of said pressure tank to the outlet of said pump, tap means in said conduit means for tapping off still water,

electric switch means connected to said pump for controlling the operation of the pump to maintain a predetermined pressure of the water at said tap means, and

a solenoid valve in said conduit means, said air pressure switch means being connected to said pump and to said solenoid valve so as to close the solenoid valve when the pump is deenergized.

2. The dispenser assembly as defined in claim 1 wherein said solenoid valve is located between said tap means and said pump.

3. The dispenser assembly as defined in claim 1 and including

a carbonated water circuit for dispensing carbonated water comprising

a carbonator tank having a water inlet for connection to the outlet of said pump and a carbon-

ated water outlet for connection to a carbonated water tap,

means for pressurizing said carbonator tank with CO_2, and

water level switch means connected to said pump in parallel with said air pressure switch means for controlling the operation of said pump as a function of the level of water in said carbonator tank.

4. A dispensing assembly for supplying mixing water in the dispensing of soda fountain drinks comprising,

a high pressure water pump for connection to a source of water,

a still water circuit for dispensing still water comprising,

a pressure tank having a movable member partitioning the interior of the tank into a water side and a closed air side whereby the movable member maintains an air pressure in the air side which corresponds to the water pressure in the water side,

conduit means connecting the water side of said pressure tank to the outlet of said pump,

tap means in said conduit means between said water side of said pressure tank and the outlet of said pump for tapping off still water,

first electric switch means connected to said pump for controlling the operation of the pump to maintain a predetermined pressure of the water at said tap means,

a check valve in said conduit means between said pump and said tap means for preventing backflow of water from said pressure tank to said pump, a carbonated water circuit for dispensing carbonated water comprising,

a carbonator tank having a water inlet for connection to the outlet of said pump and a carbonated water outlet for connection to a carbonated water tap, means for pressurizing said carbonator tank with CO_2, and water level switch means connected to said pump in parallel with said first switch means for controlling the operation of said pump as a function of the level of water in said carbonator tank.

5. The dispenser assembly as defined in claim 4 wherein said first switch means is operatively responsive to the pressure in the air side of said pressure tank.

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M. CARY NELSON, Primary Examiner

WILLIAM R. CLINE, Assistant Examiner