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Probst

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[54] **MEANS FOR AUTOMATICALLY DISPENSING PRESELECTED VOLUMES OF A BEVERAGE**

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[52] **U.S. Cl.** **222/70,** 222/145

[51] **Int. Cl.** **B67d 5/08**

[58] **Field of Search** 222/55, 70, 129.1, 129.2, 222/129.3, 129.4, 23, 173, 36, 37, 52, 129, 145

[56] **References Cited**

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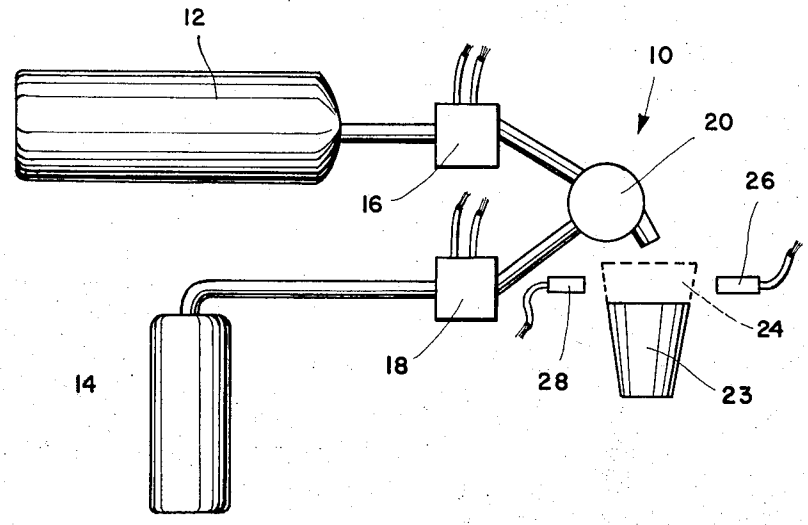
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[57] **ABSTRACT**

A control circuit for a beverage dispenser such as a soft drink dispenser. The closing of a push button actuates the dispensing solenoids and a time delay relay. The solenoids remain energized for a period of time determined by the relay and means are provided for selecting one of two time intervals to dispense either large or small drink. Counters are also provided to record the number of large and small drinks dispensed.

5 Claims, 4 Drawing Figures



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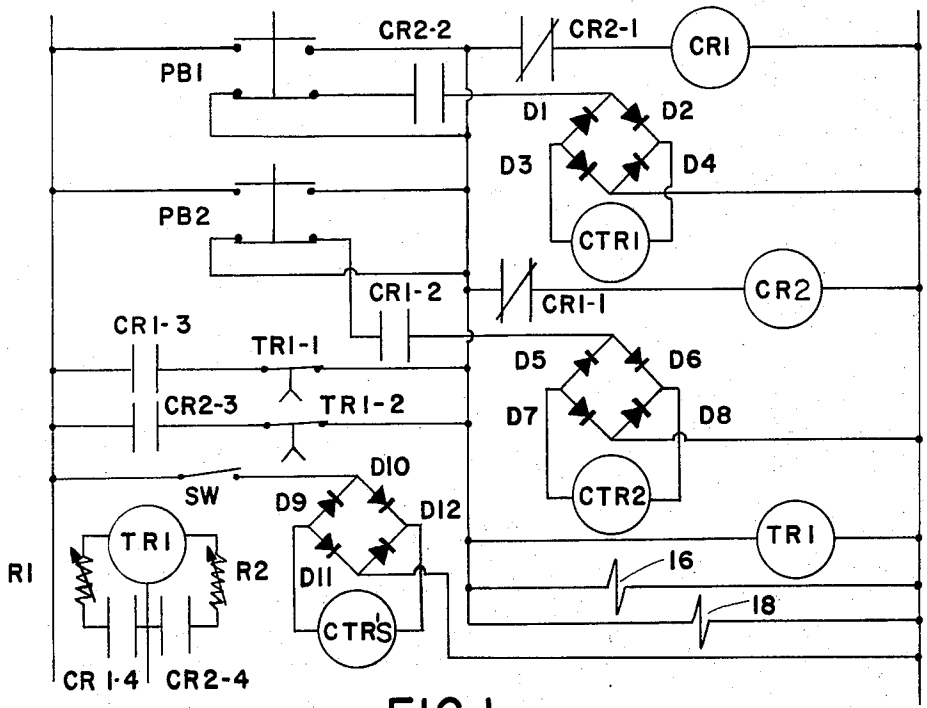


FIG. 1

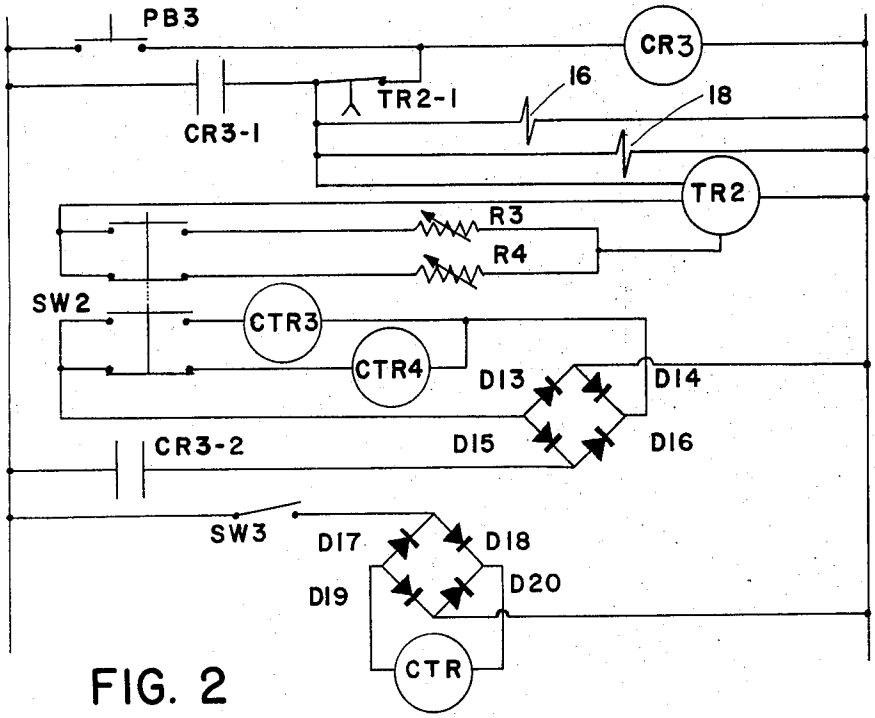


FIG. 2

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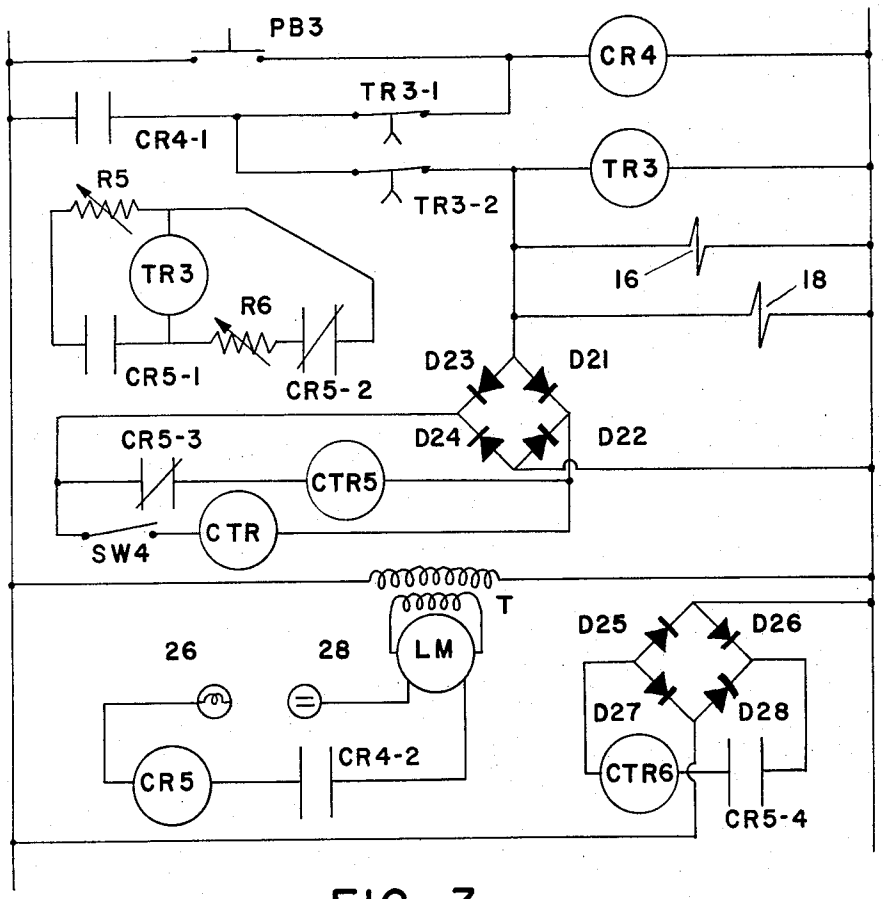


FIG. 3

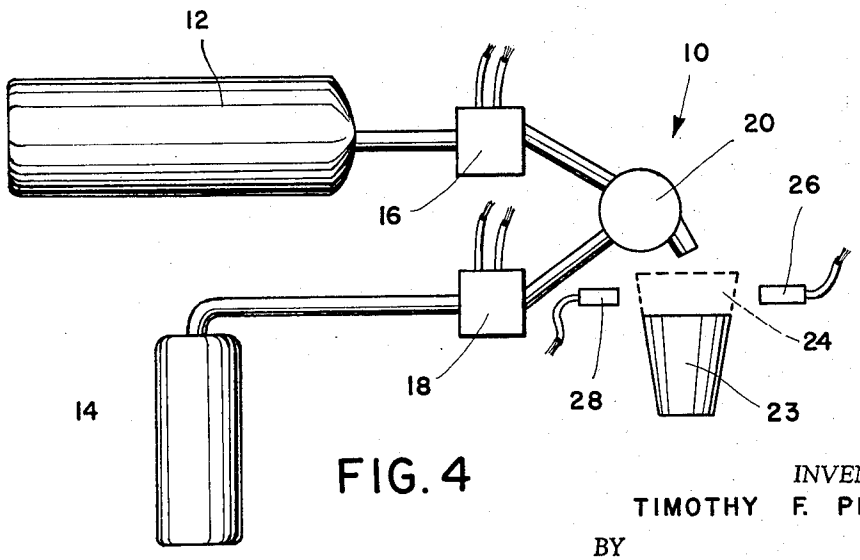


FIG. 4

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MEANS FOR AUTOMATICALLY DISPENSING PRESELECTED VOLUMES OF A BEVERAGE

In many beverage dispensing systems currently in use solenoids are employed to control the amount of carbonated water and of flavoring syrup which are dispensed. In these circuits the solenoids are operated either by a push button or by a switch which is actuated by the cup into which the soft drink is to be dispensed. With these dispensing devices the operator must carefully watch the dispensing operation to assure that the cup is properly filled. Since the proper filling of the cup relies on the operator's judgment, frequently the cup is either under filled, resulting in customer dissatisfaction, or over filled, resulting in waste of the dispensed beverage.

It is the primary object of the present invention to provide a control circuit for a beverage dispensing device which automatically determines the quantity of beverage dispensed to prevent either over or under filling of the cup.

It is also an object of the present invention to provide a control circuit for a beverage dispensing device which permits different quantities of beverage to be dispensed.

A further object of the present invention is a provision of the control circuit for a beverage dispensing device which incorporates counters to record the number of drinks dispensed.

A still further object of the present invention is a provision of an automatic control circuit for a beverage dispensing device which may be readily adapted to existing dispensing units with a minimum of modification thereto.

The above and other objects of the invention which will become apparent in the following detailed description are achieved by providing a control circuit which consists, essentially, of a push button, a first relay energized by the push button and having contacts providing energizing circuit for the dispensing solenoids, a time delay relay also energized by the first relay and operative to deenergize the solenoids after a fixed period of time, means to select one of a number of time delays for the time delay relay to control the quantity of the beverage dispensed, and counters for recording the number of large and small drinks dispensed.

For a more complete understanding of the invention and the objects and advantages thereof reference should be had to the following detailed description and the accompanying drawings wherein there is shown a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a diagrammatic view of a first embodiment of the control circuit of the present invention;

FIG. 2 is a diagrammatic showing of a second embodiment of the control circuit of the present invention;

FIG. 3 is a diagrammatic showing of a further modification of the control circuit of the present invention; and

FIG. 4 is a schematic showing of a beverage dispensing system employing the control circuit of the present invention.

The dispensing apparatus designated generally by the reference number **10** and illustrated in FIG. 4 consists of a carbonated water source **12**, a flavoring syrup source **14**, solenoid valves **16** and **18** for controlling the

flow of carbonated water and of syrup, respectfully, and a mixing valve **20** for mixing the carbonated water and syrup together for dispensing into a cup **23**. The present invention provides an automatic control circuit for regulating the operation of the solenoid valves **16** and **18** to precisely determine the quantity of beverage dispensed into the cup **23**. As will become apparent below, the circuit of the present invention controls the valves **16** and **18** so that uniform quantities of beverage are dispensed at each dispensing cycle.

One form of the control circuit is illustrated in FIG. **1**. In this circuit push buttoms PB1 and PB2 are provided for dispensing either a large or small drink, respectfully. The push button PB1 controls a first relay CR1 while the button PB2 controls a second relay CR2. Pressing the button PB1 provides an energizing circuit across the normally closed contact CR2–1 to the relay CR1. When the relay CR1 is energized the contact CR1–3 closes to provide a holding circuit across the normally closed contact TR1–1 of the time delay relay TR1 for the relay CR1. Closing of the contact CR1–3 also provides an energizing circuit for the time delay relay TR1 and for the dispensing solenoids **16** and **18**. An additional contact CR1–4 of the relay CR1 also closes to place a variable resistance R1 in the circuit of the time delay relay TR1 to determine the time interval at which this relay will operate. At the termination of the time interval as determined by the variable resistor R1 a relay TR1 operates opening the contact TR1–1 to open the circuit of the relay CR1, the time delay relay TR1, and the solenoids **16** and **18** thus terminating the dispensing cycle and restoring the control circuit to its ready condition.

The push button PB2 provides an energizing circuit for a second relay CR2 which, through the contact CR2–3 is provided with a holding circuit and which energizes the time delay relay TR1 and the solenoid **16** and **18**. A contact CR2–4 associated with the relay CR2 places a second variable resistor R2 in the circuit of the time delay relay TR1 so that the relay will operate for a different interval of time when the push button PB1 was selected. Thus, closing of the PB2 rather than the button PB1 will result in a different time interval and, as a result, a different quantity of beverage being dispensed. If the time interval determined by the variable resistor R1 is greater than that determined by the resistor R2 a larger drink will be dispensed when the button PB1 is selected rather than when the button PB2 has been selected. Each of the relays CR1 and CR2 includes a normally closed contact which is in series connection with the other of the two relays. Thus, a contact CR1–1 associated with the relay CR1 is in series connection relay CR2 while a contact CR2–1 is in series connection with the relay CR1. These two contacts assure that only one relay can be energized at a given time and that pushing of either button during a dispense cycle will have no effect on the cycle since only the previously selected relay will be operating and its associated contact CR1–1 or CR2–1 will be open to prevent the other relay from operating.

Counters CTR1 and CTR2 are provided for recording the number of large and small drinks dispensed. When the button PB1, for example, is selected a circuit is provided across the push button PB1 and the normally closed contacts of the push button PB2 to the contact CR1–2 of the relay CR1 and to the bridge rectifier composed of the diodes D5–D8. Thus, the counter

CTR2 will be energized upon the closing of the push button PB1 and will record the dispensing of one drink.

A switch SW energizes a bridge rectifier composed of the diodes D9–D12 to effect the resetting of both of the counters CTR1 and CTR2 when desired.

In the embodiment of the invention shown in FIG. 2 a two position selector switch SW2 determines the variable resistance R3 or R4 which governs the time interval during which the time delay relay TR2 operates and, hence determines the size of the drink dispensed. The switch SW2 also selects one of the counters CTR3 or CTR4 corresponding to a small or large drink, respectfully. The circuit of FIG. 2 operates in essentially the same manner as that previously described. Thus, the closing of the push button PB3 energizes the relay CR3. The contact CR3–1 then closes to provide a holding circuit through the normally closed contact TR2–1 for the relay CR3 as well as providing a circuit for the solenoids 16 and 18 and for the time delay relay TR2. The relay TR2 operates at the end of the time interval determined by the one of the variable resistors R3 or R4 which has been selected by the switch SW2. When the relay TR2 operates the contact TR2–1 opens deenergizing the relay CR3 causing the contact CR3–1 to return to its open state which deenergizes the solenoids 16 and 18 and the time delay relay TR2 to terminate the dispensing cycle and to return the circuit to its ready condition. The one of the counters CTR3 or CTR4 which has been selected by the switch SW2 is energized when the relay CR3 operates through the contact CR3–2 and the bridge rectifier composed of the diodes D13–D–6 to record the number of large or small drinks dispensed. A reset circuit operated by the switch SW3 is again provided for resetting the counters CTR3 and CTR4, when desired.

FIG. 3 illustrates a further modification of the circuit in which the size of the drink to be dispensed is automatically determined by the size of the cup placed at the dispensing nozzle. In this arrangement a light source 26 and a photocell 28 are positioned at the dispensing nozzle so that a small cup 23 does not interrupt the light beam from the light source 26 to the photocell 28 while a larger cup 24, indicated in dotted outline in FIG. 4, does intersect the light path to block light from the photocell 28. This circuit is actuated by a push button PB3 to energize the relay CR4 to in turn energize the time delay relay TR3 and the dispensing solenoids 16 and 18. The relay TR3 operates after an interval determined either by the variable resistor R5 or the variable resistor R6 to open the circuit terminating the dispensing cycle. The variable resistors R5 and R6 are connected in series with normally open relay contact CR5–1 and normally closed contact CR5–2, respectfully. A relay CR5 is in series connection with the light source 26 and the photocell 28 and is energized as long as the light path between the source 26 and the photocell 28 is not broken. Thus, when a small cup 22 is placed at the dispensing nozzle 20 the relay CR5 will be energized so that the variable resistor R6 determines the time interval after which the relay TR3 operates. If a larger cup 24 is placed below the nozzle 20 the light source will be blocked from the photo-detector 28 and the relay CR5 will be deenergized. The contact CR5–1 now closes while the contact CR5–2 opens so that the variable resistor R5, rather than the variable resistor R6, establishes a longer operating interval so that additional beverage is dispensed to fill the larger container 24. The circuit again includes a pair of counters CTR5 and CTR6 to count, respectfully, the number of small and large drinks dispensed, relay contacts CR5–3 and CR5–4 determining the one of the counters CTR–5 or CTR6 which is to be operated, depending on the size of the drink to be dispensed. A switch SW4 is again provided to permit the counters to be reset when desired.

The variable resistors which determine the length of the dispensing cycle in each of the embodiments described permit the cycle length to be adjusted precisely to assure proper filling of the cup or glass. Normally, these adjustments are made at the time of installation and the person operating the dispenser does not have access to these controls.

It should be noted that in each of the embodiments of the control circuit described above the dispensing cycle is automatic. Once the cycle has been initiated by operation of the appropriate push button the cycle proceeds automatically until terminated by the action of the time delay relay and further pressing of the push button during the dispensing cycle does not effect the cycle. Thus, the cycle cannot be accidentally interrupted or extended and uniform sized drinks are obtained. It should also be noted that the solenoid valves 16 and 18 may be those which are supplied with existing dispensing units and the remaining portion of the circuit can be assembled as a package to be connected to the power source and to the solenoid to easily convert existing equipment for automatic operation.

While only the best known embodiments of the invention have been illustrated and described in detail herein it will be understood that the invention is not limited thereto or thereby. Reference should therefore be had to the appended claims in determining the true scope of the invention.

What is claimed is:

1. Beverage dispensing apparatus, comprising:
a source of carbonated water;
a first solenoid valve connected to the source of carbonated water for controlling the quantity of carbonated water dispensed;
a source of flavoring syrup;
a second solenoid valve connected to the source of flavoring syrup for controlling the quantity of flavoring syrup dispensed;
a first switch;
a first control relay connected to and energized by the first switch and having a first normally open contact which, upon energization of the first control relay, closes to actuate the first and second solenoid valves;
a second switch;
a second control relay connected to and energized by the second switch and having a first normally open contact which, upon energization of the second control relay, closes to actuate the first and second solenoid valves, the first and second control relays each having a normally closed contact in series connection with the second and first control relays respectively whereby energization of the first or second control relay causes the associated normally closed contact to open and thus respectively preventing energization of the second or first control relay;

a resistor-type time delay relay connected to second normally open contacts of the first and second control relays and energized by the actuation of either of said control relays, the time delay relay having normally closed contacts, one connected to and providing a holding circuit for each of the control relays, the contacts being respectively operative to open after respective predetermined time intervals to deenergize the associated control relay, terminating the dispensing cycle; and

first and second resistances of different values for determining the operating interval of the time delay relay, an additional normally open contact of the first control relay for connecting the first resistance to the time delay relay, and an additional normally open contact of the second control relay for connecting the second resistance to the time delay relay, the first and second resistances providing means for determining the respective time intervals of operation of the time delay relays.

2. The beverage dispensing apparatus according to claim **1** further including counting means connected to and actuated by the control relays for recording the number of drinks dispensed.

3. A control circuit for a beverage dispensing apparatus of the type having a dispensing nozzle for dispensing a quantity of beverage into a container, a source of carbonated water, a first solenoid valve controlling the flow of carbonated water to the nozzle, a source of flavoring syrup, and a second solenoid valve for controlling the flow of flavoring syrup to the nozzle, comprising:

a first control relay having a first normally open contact which, upon energization of the relay, closes to actuate the solenoid valve;

a first switch connected to and operative for energizing the first control relay;

a second control relay having a first normally open contact which, upon energization of the relay, closes to actuate the solenoid valves;

a second switch connected to and operative for energizing the second control relay;

a time delay device connected to and energized by the closing of the first normally open contacts of the control relays, the time delay device including normally closed contacts to provide holding circuits for the control relays which open after specific time intervals;

time interval selection means connected to the time delay device;

at least two resistors of different values connected to the time interval selection means such that actuation of the time interval selection means is operative to electrically connect one of the two resistors to the time delay device to achieve the specific time intervals; and

wherein the first and second control relays each have normally closed contacts interconnecting the two relays in an operationally mutually exclusive manner whereby actuation of either of the control relays inhibits coincident actuation of the other.

4. The control circuit according to claim **3** further including a counter for each time interval, the means to select being operative to connect the respective counter to the circuit whereby the number of beverages of each quantity dispensed is counted.

5. A control circuit as recited in claim **3** wherein the time interval selection means comprises second normally open contacts of the first and second control relays.

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