

[54] DISPENSING VALVE

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[52] U.S. Cl.**137/114, 137/604, 137/607, 222/129.2, 222/144.5, 251/24**

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

[58] Field of Search.....137/114, 604, 111, 607; 222/129.2, 144.5; 251/24

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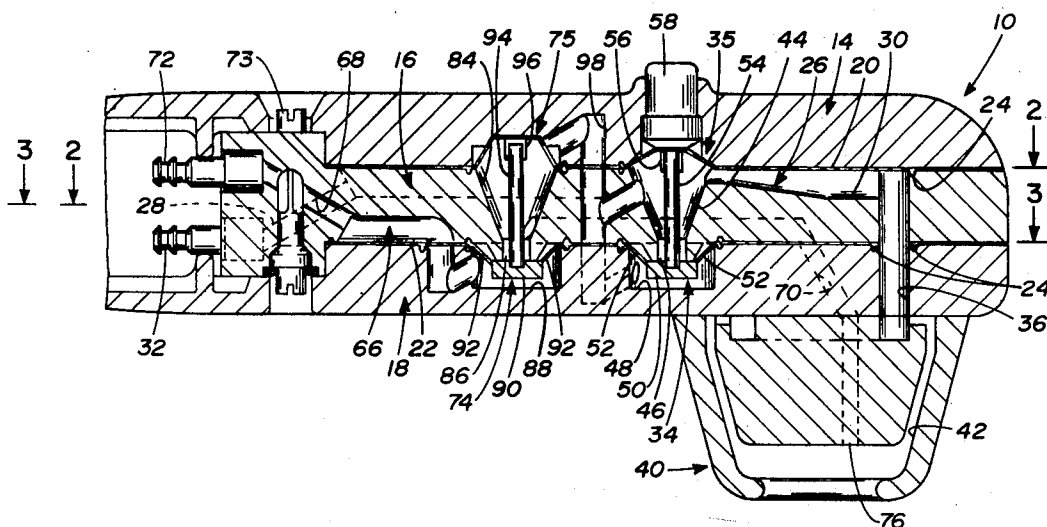
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[57] ABSTRACT

A dispensing valve includes a housing comprising upper, center and lower members, and gaskets positioned between the members. A plurality of water valves and a plurality of corresponding syrup valves are formed in the housing. Each valve includes a portion of one of the gaskets for normally preventing flow between the lower member and the center member of the housing, and a rod for disengaging the gasket portion and thereby permitting flow. The rods of the water valves are activated by pushbuttons mounted in the upper member of the housing while the rods of the syrup valves are actuated by the pressure of water flowing through the corresponding water valves.

15 Claims, 5 Drawing Figures



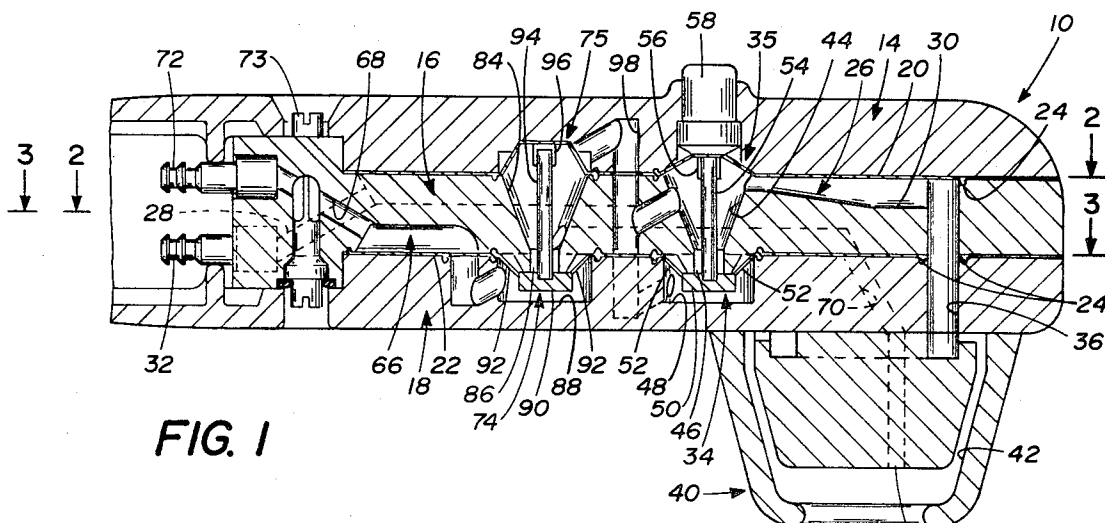


FIG. 1

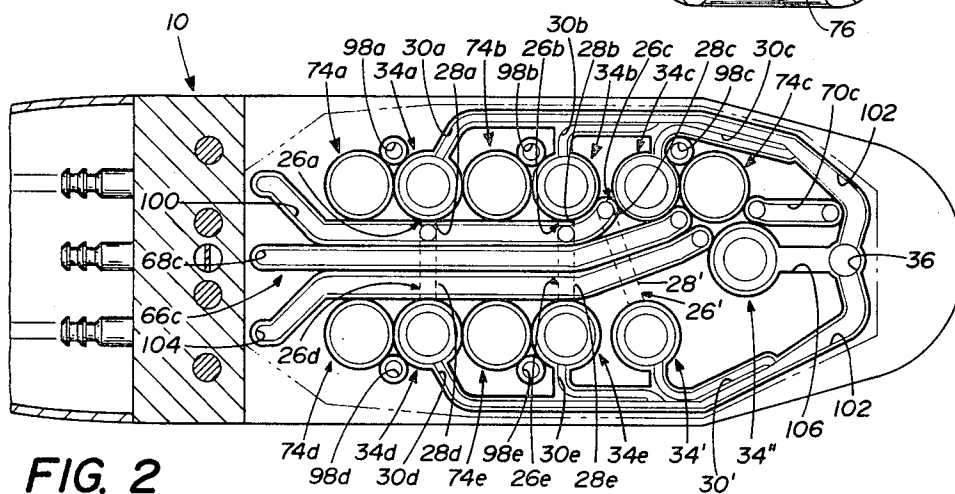


FIG. 2

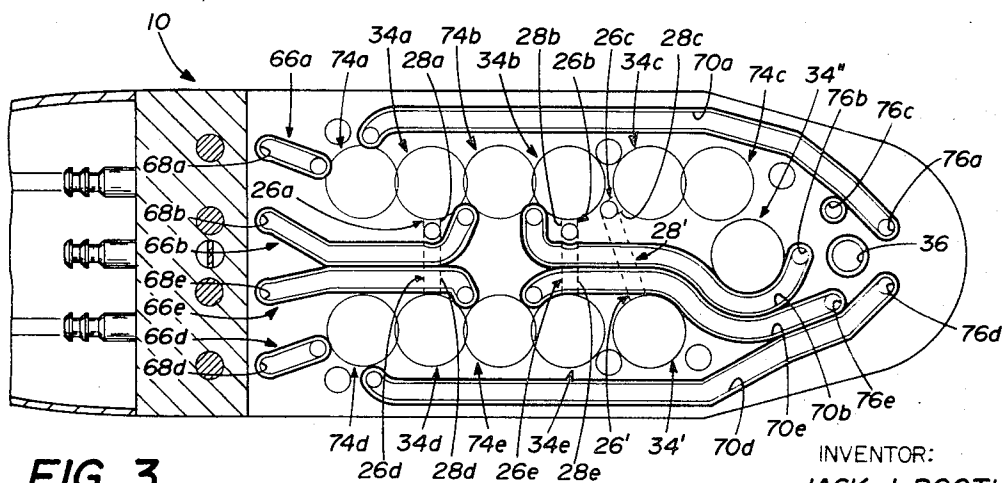
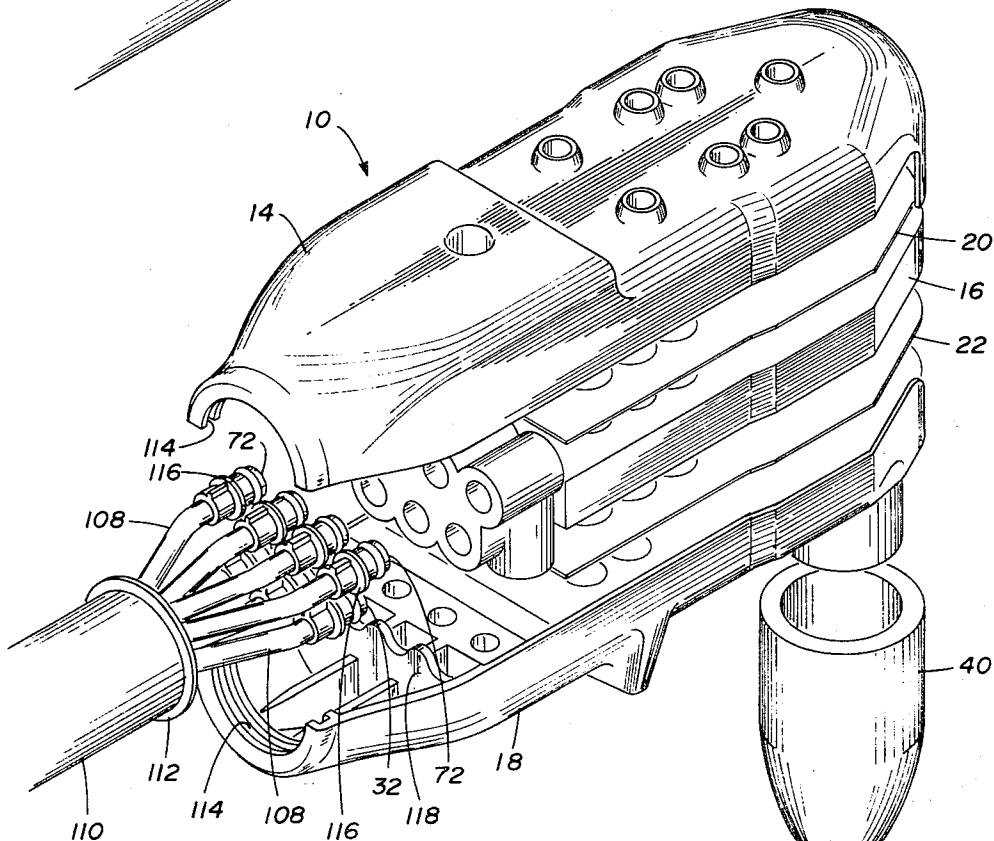
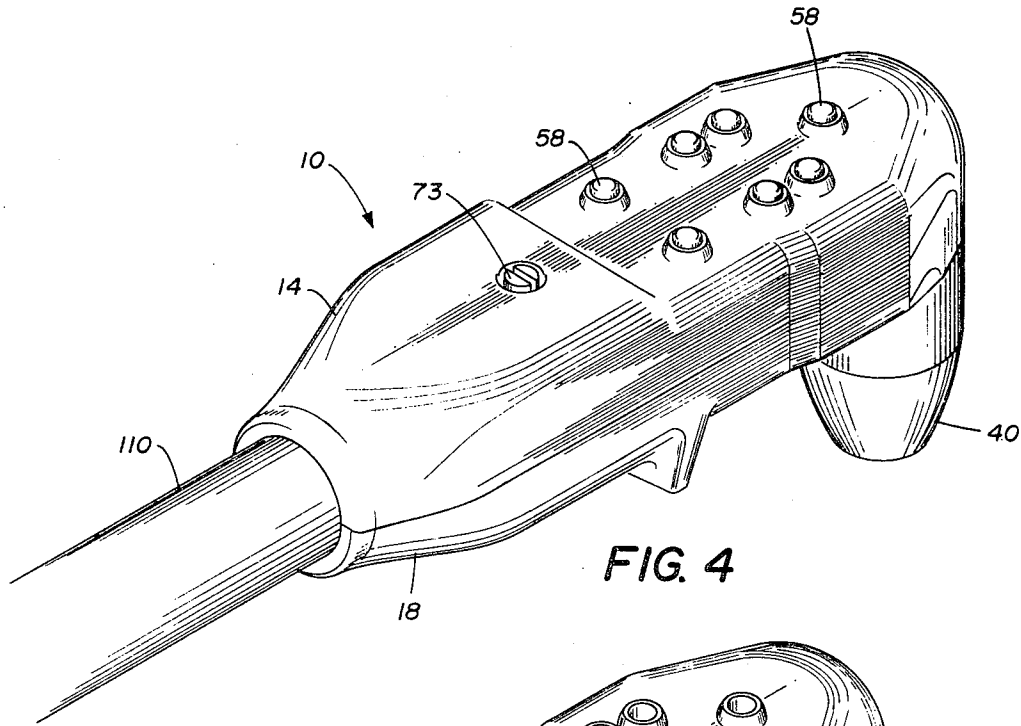


FIG. 3

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DISPENSING VALVE

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a dispensing valve, and more particularly, to a valve for selectively dispensing any one of five flavored syrup-carbonated water mixtures, carbonated water along and/or non-carbonated water alone.

In the beverage industry, soft drinks are supplied in the form of flavored syrups which must be mixed with carbonated water. Typically, mixing is accomplished in a dispensing valve that selectively discharges the proper proportions or Brix of carbonated water and syrup in such a way as to cause mixing of the two ingredients. Heretofore, dispensing valves suitable for use in the beverage industry have been characterized by large numbers of complicated parts, and therefore have been expensive to purchase. For example, certain types of dispensing valves include solenoids, microswitches, transformers, and the structure necessary to insulate the related electrical circuits and to keep them operable.

The present invention comprises a dispensing valve that overcomes the disadvantages of the prior art in that it is inexpensive to purchase and yet is capable of dispensing a number of flavored syrup-carbonated water mixtures. In accordance with the preferred embodiment of the invention, a dispensing valve includes a plurality of syrup valves each for controlling the flow of flavored syrup through a syrup passageway, and a plurality of water valves each for controlling the flow of water through a water passageway. Each syrup valve has a companion water valve and is actuated in response to the flow of water through its companion water valve. The dispensing valve preferably comprises an upper member, a center member and a lower member, and gaskets positioned between the members. The gaskets seal the various passageways of the valve one from another, and include valving members which normally prevent flow through the dispensing valve, and which are selectively activated to permit flow therethrough.

DESCRIPTION OF THE DRAWING

A more complete understanding of the invention may be had by referring to the following Detailed Description when taken in conjunction with the drawings, wherein:

FIG. 1 is a longitudinal sectional view of a dispensing valve employing the invention;

FIG. 2 is a sectional view taken generally along the line 2—2 in FIG. 1 in the direction of the arrows;

FIG. 3 is a sectional view taken generally along the line 3—3 in FIG. 1 in the direction of the arrows;

FIG. 4 is a perspective view of the dispensing valve shown in FIG. 1, and

FIG. 5 is an exploded view of the valve.

DETAILED DESCRIPTION

Referring now to the drawing, and particularly to FIG. 1 thereof, a dispensing valve 10 employing the present invention is shown. In accordance with the preferred embodiment of the invention, the dispensing valve 10 selectively dispenses any one of the five

flavored syrup-carbonated water mixtures, carbonated water alone, or non-carbonated water alone. However, in order to facilitate an understanding of the invention, the features of the dispensing valve 10 relating to the dispensing of a particular flavored syrup-carbonated water mixture are illustrated in FIG. 1, and the features of the dispensing valve 10 relating to the dispensing of the remaining flavored syrup-carbonated water mixtures, and to the dispensing of carbonated water along and non-carbonated water alone, are omitted.

The dispensing valve 10 includes an upper member 14 which may be formed from any suitable material, such as plastic, metal, etc. A center member 16 and a lower member 18 are similarly formed and cooperate with the member 14 to form a unitary valve body. A pair of gaskets 20 and 22 extend through the valve body between the upper member 14 and the center member 16, and between the center member 16 and the lower member 18, respectively. The gaskets 20 and 22 are preferably formed from rubber, and include beads 24 which cooperate with channels formed in the mating surfaces of the members 14, 16 and 18 to seal the various sections of the valve body.

A restricted carbonated water passageway 26 is formed in the valve 10 and includes an inlet portion 28 and an outlet portion 30. The inlet portion 28 of the restricted passageway 26 extends from a carbonated water inlet fitting 32 to a diaphragm valve 34 of a carbonated water controller 35 and the outlet portion 30 extends from the valve 34 to a downspout 36. The downspout 36 in turn extends to a nozzle 40, including a water outlet passageway 42. The valve 34 is normally closed, and is selectively actuated to permit the flow of carbonated water from the carbonated water inlet fitting 32 through the valve and out the nozzle 40.

More particularly, the carbonated water controller 35 includes a valving chamber 44 that extends through the center member 16 to a valving aperture 46. A carbonated water inlet chamber 48 is formed in the lower member 18 and extends to the valving aperture 46. A valving member 50 is normally positioned in sealing engagement with the valving aperture 46 by a plurality of resilient ribs 52. Preferably, both the valving member 50 and the ribs 52 are formed integrally with the gasket 22.

The carbonated water controller 35 further includes a rod 54 positioned in the valving chamber 44. The rod 54 is supported in a cup 56 formed integrally with a gasket 20, and extends through the valving aperture 46 into a cup formed in the valving member 50. A pushbutton 58 is slidably supported in the upper member 14 and extends into engagement with a portion of the gasket 20 positioned opposite the rod 54. Thus, upon depression of the pushbutton 58, the rod 54 is moved downwardly and the valving member 50 is moved out of engagement of the valving aperture 46. This permits the flow of carbonated water from the carbonated water inlet fitting 32 through the inlet portion 28 of the restricted passageway 26, through the carbonated water inlet chamber 48, around the ribs 52, through the valving aperture 46, through the valving chamber 44, through the outlet portion 30 of the restricted passageway 26, through the downspout 36, and out the nozzle 40.

A syrup passageway 66 is also formed through the valve 10, and includes an inlet portion 68 and an outlet portion 70. The inlet portion 68 extends from a syrup inlet fitting 72 through an adjustment valve 70 to a diaphragm valve 74 of a syrup controller 75, and the outlet portion 70 extends from the valve 74 to a discharge aperture 76 located in the nozzle 40. The valve 74 is normally closed and is opened in response to back pressure created upon the flow of carbonated water through the restricted passageway 26 to permit the flow of syrup from the syrup inlet fitting through the valve 74 and out the nozzle 40.

More particularly, the syrup controller 75 includes a valving chamber 84 formed in the center member 16 and extending to a valving aperture 86. A syrup inlet chamber 88 is formed in the lower member 18 and extends to the valving chamber 86. A valving member 90 is normally positioned in sealing engagement with the aperture 86 and is connected to the gasket 22 by a plurality of resilient ribs 92. Preferably, both valving member 90 and the ribs 92 are formed integrally with the gasket 22.

The controller 75 further includes a rod 94 mounted in the valving chamber 84. The rod 94 is mounted in a cup 96 comprising a portion of the gasket 20 and extends through the valving aperture 86 into a cup formed in the valving member 90. A valving passageway 98 extends through the center member 16, the gasket 20 and through the upper member 14 from a point in communication with the valving chamber 44 of the carbonated water valve 34 to a gasket 20 positioned opposite the rod 94. It will be noted that the outlet portion 30 from the passageway 26 includes a restriction at the outlet of the valve 34. Thus, whenever the pushbutton 58 is actuated to permit the flow of carbonated water into the valving chamber 44, back pressure is generated in the chamber 44. This back pressure operates through the valving passageway 98 to move the rod 94 downwardly. The rod 94 moves the valving member 90 out of engagement with the valve seat at the aperture 86. Thereupon, syrup flows from the syrup inlet fitting 72, past valve 73, through the passageway 66 to the syrup inlet chamber 88, around the ribs 92, through the valving aperture 86, through the valving chamber 84, through the passageway 70 and out the nozzle 40 through the aperture 76. It will be noted that because the gasket 20 forms a seal between the upper portion of the valving chamber 84 and the valving passageway 98, carbonated water from the valving chamber 44 does not commingle with syrup in the valving chamber 84.

Referring now to FIGS. 2 and 3, the overall layout of the dispensing valve 10 is shown. The dispensing valve 10 includes five syrup valves 74a-74e each corresponding to a different flavored syrup. Five carbonated water valves 34a-34e correspond to the syrup valves 74a-74e, respectively, and are connected to their respective syrup valves through five valving passageways 98a-98e. The dispensing valve 10 further includes a carbonated water valve 34' and a non-carbonated water valve 34''. The valves 34' and 34'' are constructed similarly to the valve 34 shown in FIG. 1, but do not actuate syrup valves, and are therefore not provided with valving passageways.

Five different flavored syrups are directed through the dispensing valve 10 by five syrup passageways 66a-66e. The syrup passageways 66a-66e include inlet portions 68a-68e, respectively, which extend to the syrup valves 74a-74e. The syrup passageways 66a-66e further include outlet portions 78a-78e, respectively, which extend from the syrup valve 74a-74e to a plurality of individual discharge apertures 761-76e. The apertures 76a-76e are positioned in a circle around the downspout 36.

As is best shown in FIG. 2, carbonated water is directed to the carbonated water valves 34a-34e through a common carbonated water inlet passageway 100 which extends to five carbonated water passageways 26a-26e and a carbonated water passageway 26'. The carbonated water passageways 26a-26e and the carbonated water passageway 26' include inlet portions 28a-28e and 28' and outlet portions 30a-30e and 30', respectively. The outlet portions 30a-30e and 30' are connected to the downspout 36 through a pair of common carbonated water outlet passageways 102. Finally, a non-carbonated water inlet passageway 104 extends to the non-carbonated water valve 34'', and a non-carbonated water outlet passageway 106 extends from the valve 34'' to the downspout 36.

Referring now to FIGS. 4 and 5, it will be seen that the upper member 14 and the lower member 18 of the dispensing valve 10 receives the center member 16 and gaskets 20 and 22 and are shaped to provide a valve that is readily adapted to one-handed manipulation. Similarly, the various pushbuttons 58 of the dispensing valve are positioned for index finger actuation during one-handed manipulation of the valve. By this means, beverages are easily discharged directly from the nozzle 40 directly into a glass or cup.

As is best shown in FIG. 5, various flavored syrups, carbonated water and non-carbonated water are delivered to the dispensing valve 10 in a plurality of separate tubes 108 all of which are enclosed in a conduit 110. The conduit 110 terminates in a flange 112 which is received in cooperating grooves 114 formed in the upper and lower members 14 and 18 to secure the conduit 110 to the dispensing valve 10. Similarly, the fittings 32 and 72 are provided with flanges 116 that are engaged with lips 118 formed in the upper and lower member 14 and 18 to secure the tubes 108 to the dispensing valve 10.

In use, the dispensing valve 10 is mounted at any convenient location, and the various tubes 108 are connected to sources of flavored syrup, carbonated water, and non-carbonated water. Thereafter, whenever one of the pushbuttons 58 corresponding to one of the carbonated water valves 34a-34e is depressed, a selected flavored syrup-carbonated water mixture is dispensed from the nozzle 40. Similarly, when the pushbuttons corresponding to the valves 34' and 34'' are depressed, carbonated water and non-carbonated water are dispensed, respectively. It will be understood that the dispensing valve 10 is not limited as to the number of syrup valves, and can be provided with a greater or a lesser number of syrup valves, if desired. It will be further understood that the design of the dispensing valve 10 can be modified to provide actuation of selected syrup valves 74 upon the flow of non-car-

bonated water through the corresponding water valves 34. Also, the dispensing valve 10 can be arranged to provide actuation of selected syrup valves 74 upon actuation of either of two valves 34, one of which dispenses carbonated water and the other of which dispenses non-carbonated water.

Those skilled in the art will immediately realize that the valve 10 can be employed to dispense liquids other than flavored syrup-carbonated water mixtures. For example, pre-mixed beverages can be dispensed from the valve, in which case the dual valving feature illustrated in FIG. 1 may be unnecessary. Another very important use of the valve is in the dispensing of alcoholic beverages. It will be appreciated that the arrangement shown in FIG. 1 is readily adapted liquor-mixer mixtures, i.e., Scotch and soda. In the latter case it may be desirable to direct the liquor through a flow meter, whereby the exact quantity of liquor dispensed may be accurately noted.

From the foregoing, it will be understood that the present invention comprises a dispensing valve including a plurality of syrup valves, a plurality of water valves each corresponding to one of the syrup valves, and structure for actuating the syrup valves in response to flow through the corresponding water valves. In accordance with the preferred embodiment of the invention, the dispensing valve comprises a housing including a first member having valving chambers formed in it, a second member having an inlet chamber formed in it, and a gasket positioned between the members and including valving members that normally prevent flow between the inlet chambers and the valving chambers. Valve actuators mounted in valving chambers permit flow between the inlet chambers and the valving chambers upon movement relative to the housing. The valve actuators of the syrup valves are operated by fluid pressure in the valving chambers of the water valves.

Although the preferred embodiment of the invention has been illustrated in the drawing and described herein, it will be understood that the invention is not limited to the embodiment disclosed, but is capable of rearrangement, modification and substitution of parts and elements without departing from the spirit of the invention.

What is claimed is:

1. A dispensing valve comprising:
 - a valve body comprising upper, center, and lower members and having a plurality of syrup passageways and a plurality of corresponding water passageways extending through it along the intersections of the members,
 - gaskets positioned between the members for sealing the passageways one from another;
 - a plurality of normally closed syrup valves each for controlling the flow of syrup through one of the syrup passageways;
 - a plurality of normally closed water valves each from controlling the flow of water through the water passageway corresponding to one of the syrup passageways, and
 - means responsive to the opening of the water valves for opening the corresponding syrup valves.
2. The dispensing valve according to claim 1 wherein one of the gaskets includes the portions of the syrup valves and the water valves that normally prevent flow through the syrup and water passageways.

3. The dispensing valve according to claim 2 wherein the syrup valves and the water valves each include a rod mounted between the gasket for movement relative to the valve body to permit flow through its respective passageway.

4. The dispensing valve according to claim 3 wherein the syrup valve opening means comprises means responsive to the flow of water through the water valves for moving the rods of the corresponding syrup valve relative to the valve body and thereby opening the corresponding syrup valves.

5. The dispensing valve according to claim 4 wherein the water passageways extend through the valve body from a common water inlet to a common water outlet, wherein the syrup passageways extend through the valve body from separate syrup inlets to separate syrup outlets, and wherein the common water outlet and the separate syrup outlets are contained within a common nozzle.

6. A dispensing valve comprising:

- a valve body having a pair of valving chambers formed in it which extend to valving apertures, and having a pair of inlet chambers formed in it which extend to the valving apertures;
- a single gasket means mounted in the valve body for normally sealing both of the valving apertures;
- a pair of valve actuators mounted in the valving chambers for opening the valving apertures and thereby permitting flow between the inlet chambers and the valving chambers of the valve body, and
- means responsive to back pressure generated by flow through one of the valving chambers for operating the valve actuator corresponding to the other valving chamber.

7. The dispensing valve according to claim 6 wherein the gasket means includes valving members normally positioned in sealing engagement with the valving apertures of the valve body, and wherein the valve actuators disengage the valving members from the valving apertures.

8. The dispensing valve according to claim 7 wherein the valve body comprises a first member having the valving chambers formed in it and a second member having the inlet chambers formed in it, and wherein the gasket means comprises a gasket positioned between the first and second members of the valve body.

9. The dispensing valve according to claim 8 wherein the valve actuators comprise rods mounted in the valving chambers for movement through the valving apertures to disengage the valving members therefrom.

10. The dispensing valve according to claim 9 wherein the valve actuator operating means comprises means for applying fluid pressure from one of the valving chambers against the rod in the other valving chamber.

11. The dispensing valve according to claim 10 further including a second gasket mounted in the valve body for sealing the ends of the valving chambers remote from the valving apertures, wherein the rods extend between the gaskets, and wherein the pressure applying means comprises a passageway formed through the valve body from a point in one of the valving chambers to a point on the side of the second gasket opposite the rod in the other valving chamber.

12. A dispensing valve comprising:

a valve body including a center member having a pair of valving cavities formed in it that extend to valving apertures, and outer members positioned on opposite sides of the center member;

gasket means mounted in the valve body between the center member and the outer members for normally sealing the valving cavities and the valving apertures thereof;

a pair of valve actuators mounted in the valving cavities for movement relative to the valve body to open the valving apertures;

means mounted in the valve body for moving one of the valve actuators relative to the valve body and thereby opening one of the valving apertures, and

means responsive to the opening of said one of the valving apertures for moving the other valve actuator relative to the valve body and thereby opening

the other of the valving apertures.

13. The dispensing valve according to claim 12 wherein the gasket means comprises gaskets positioned on opposite sides of the center member of the valve body, and wherein one of the gaskets includes portions that normally seal the valving apertures.

14. The dispensing valve according to claim 13 wherein the valve actuators comprise rods extending between the gaskets.

15. The dispensing valve according to claim 14 wherein the means for moving the other valve actuator comprises a passageway formed through the valve body from a point in communication with the valving cavity corresponding to the said valve actuator to a point in communication with the side of the other of the gaskets opposite said other of the valve actuators.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,703,187 Dated November 21, 1972

Inventor(s) Jack J. Booth

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

- Col. 1; line 8, "along" should be --alone--;
line 23, "an" should be --and--.
Col. 2, line 9, "along" should be --alone--.
Col. 3, line 33, before "gasket" insert --point in communication
with a diaphragm portion of the--;
Col. 4; line 3, "66a-66" should be --66a-66e--;
line 8, "76l-76e" should be --76a-76e--;
line 18, "26a-26" should be --26a-26e--.
Col. 5, line 28, "he" should be --the--.

Signed and sealed this 15th day of May 1973.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents