April 30, 1957 S. KRESBERG 2,790,580

SELECTIVE BEVERAGE DISPENSER

Filed Nov. 18, 1955 3 Sheets-Sheet 1

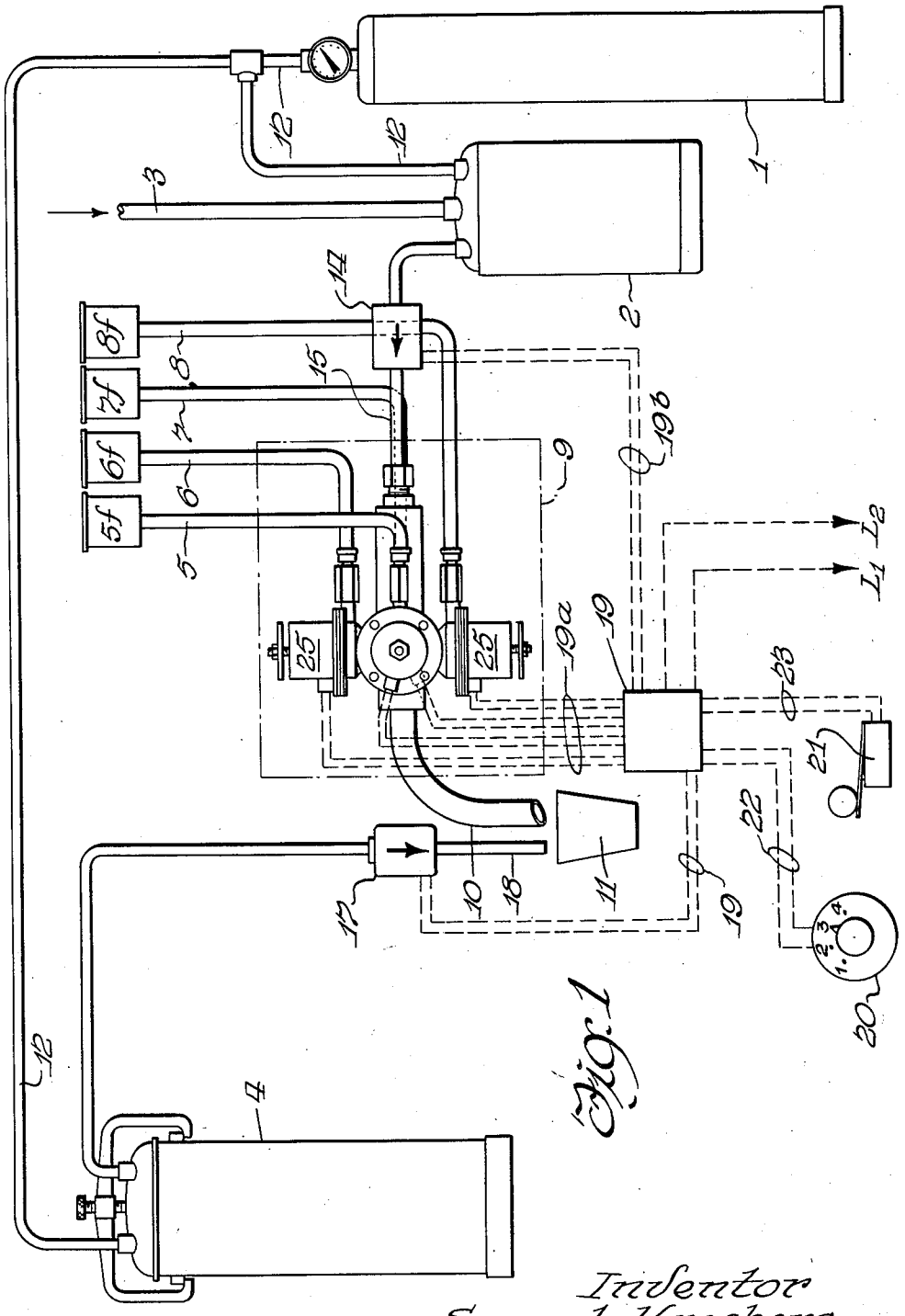

Fig. 1

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Fig. 2

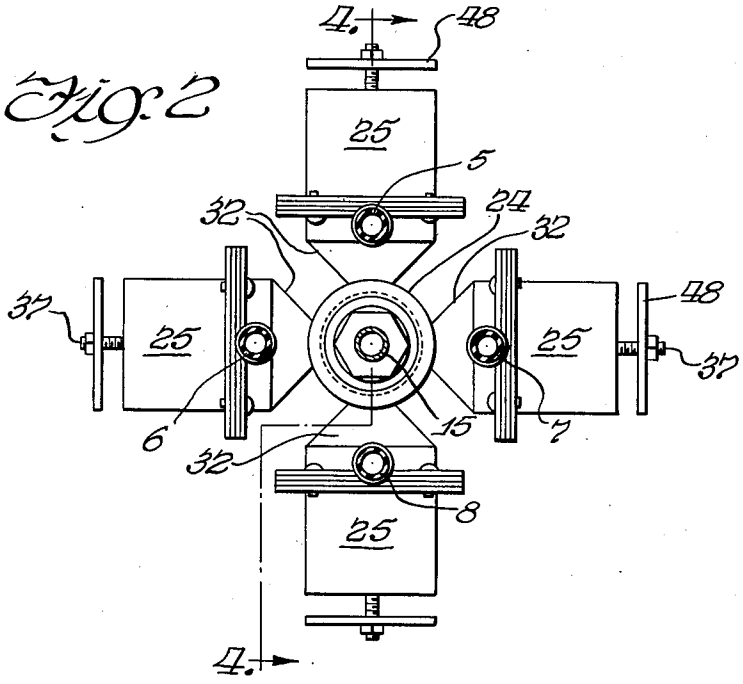
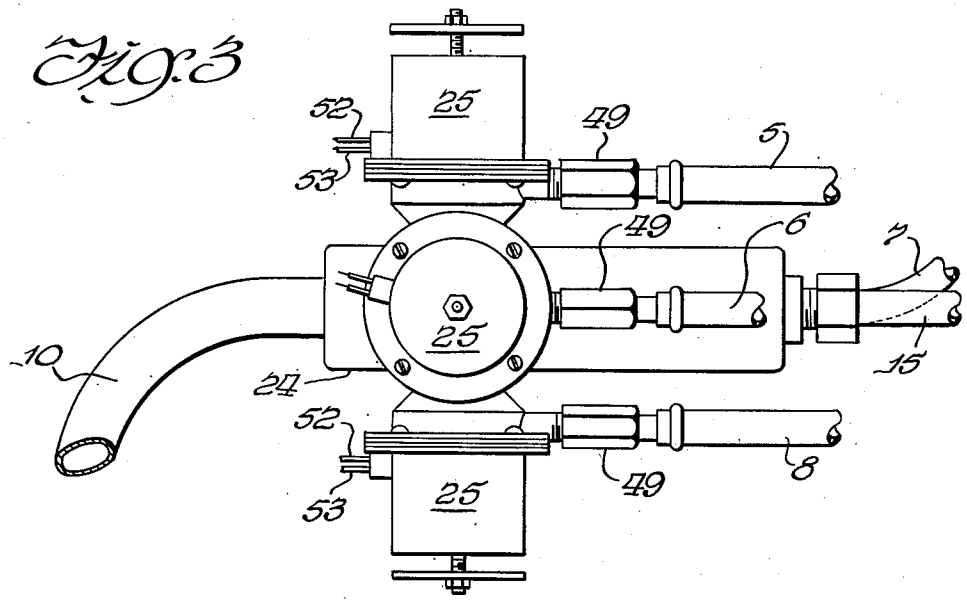


Fig. 3



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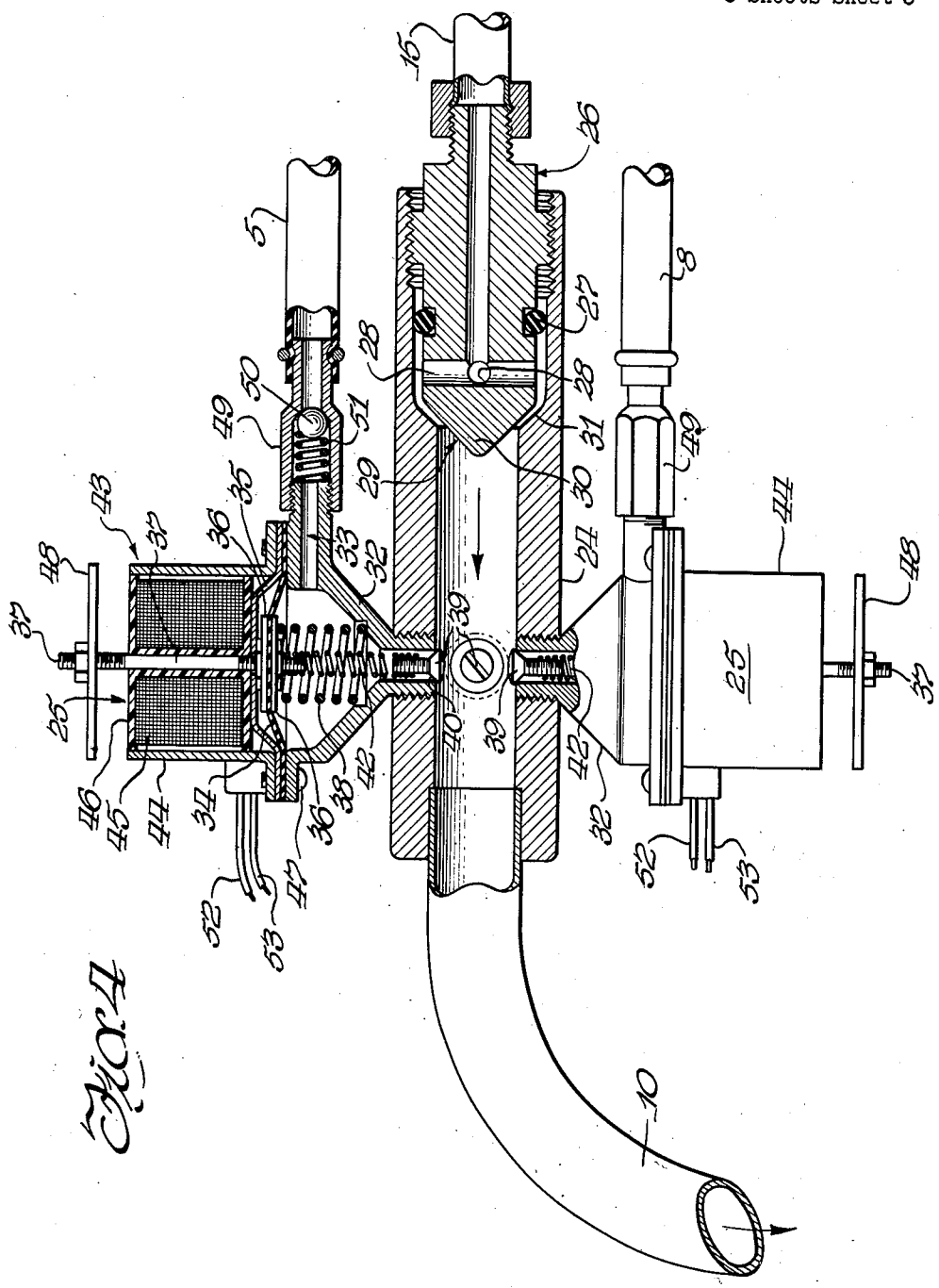

Fig. 4

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SELECTIVE BEVERAGE DISPENSER

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3 Claims. (Cl. 222—129.4)

This invention in general relates to beverage dispensing machines and more particularly to automatic cup type beverage dispensing machines from which a plurality of different flavors may be manually selected and automatically dispensed.

Prior to this invention selective beverage dispensers included a plurality of tanks for holding syrups of different flavors and a source of carbonated water for automatic blending with each selected syrup of different flavors. Usually each flavor syrup is blended with carbonated water in a ratio of one to five by volume.

Machines of this type are excessively large because of the space required by the syrup containers particularly when a large number of selections is required. This type of machine is also difficult to service because of the necessity of transporting and re-filling a larger number of large syrup containers.

The principal feature of the present invention is the provision of a new blending device in which all of the different flavors are supplied to and stored in the machine in the form of concentrated fluid extracts which extracts will produce a satisfactory beverage when blended with a mixture of simple syrup and carbonated water in ratios from as much as 50 to 1, to 100 to 1 by volume. Thus a single container of simple syrup and a group of relatively small containers of the fluid extracts of different flavors in the machine is all that is required for blending each of the selected extracts with carbonated water and simple syrup for dispensing a beverage of pre-selected flavor.

A further object of the invention is the provision of a selective blending device responsive to a manual selective system whereby each selected concentrated fluid extract will be blended with carbonated water and simple syrup in predetermined ratio without contamination by previously different selected flavors.

A further object of the invention is the provision of a selective blending device responsive to a manual selective system whereby each selected concentrated fluid extract will be blended with carbonated water and simple syrup in predetermined ratio without contamination by previously different selected flavors.

A further object of the invention is the provision of a blending device electrically responsive to an electric selecting system for blending predetermined volumes of flavor fluid extracts and carbonated water through a dispensing faucet.

A further object of the invention is the provision of a magnetically operated injector for introducing a precise predetermined quantity of gravity fed fluid extract into a stream of carbonated water when momentarily energized.

Another object of the invention is the provision of a faucet for delivering carbonated water in which a plurality of injectors are attached for injecting selected fluid extracts into the inner periphery of said faucet when operated.

These and other objects and advantages of the invention are described and shown in the specification and drawings in which

Fig. 1 is a diagrammatic illustration of the principal components in the beverage dispenser;

Fig. 2 is a rear elevation of the blending device, shown Fig. 1;

Fig. 3 is a side elevation of the blending device shown Fig. 2; and

Fig. 4 is an enlarged cross sectional view taken through section line 4—4 Fig. 2.

Referring to the diagram shown Fig. 1, and for the purposes of simplification, refrigeration, pressure control and liquid level control apparatus required in beverage dispensing is omitted. The principal components in the beverage dispenser are shown, in which tank 1 contains compressed carbon dioxide which is used for carbonating water and to supply the hydraulic pressure required to flow the simple syrup and carbonated water through the system and deliver the finished beverage.

A carbonator 2 illustrates well known means for supplying carbonating water to the system from a source of fresh water 3. A relatively large sealed tank 4 represents the container for a supply of simple syrup.

Each of the concentrated flavor fluids are contained in separate vessels 5*f*, 6*f*, 7*f* and 8*f*. A blending device is shown within dotted outline and has an outlet faucet 10 connected thereto for supplying a mixture of carbonated water and a selected flavor fluid to a cup 11. It is understood in machines of this character that automatic means are used to sequentially deliver a separate cup for each beverage dispensed.

A conduit 12 connected to tank 1 is adapted to supply carbon dioxide gas to both the carbonator 2 and the syrup tank 4 at a predetermined pressure. A conduit 13 is connected to the outlet of the carbonator 2 to the inlet of an electric control valve 14. The outlet of this valve is connected to the blender by conduit 15, for supplying carbonated water to the blender.

Conduits 5, 6, 7 and 8 provide a separate gravity feed for each flavor fluid to the blender 9. Conduit 16 connects the outlet of the syrup tank 4 to the inlet of an electric valve 17. The outlet of valve 17 is connected to a discharge spout 18 directed into cup 11 for supplying predetermined amounts of simple syrup.

An electric automatic recycling time 19 connected to a source of electric power L_1 and L_2 is provided to electrically control valves 14 and 17 and the injectors 25 in predetermined sequence by well known circuit means not shown. The connections are illustrated as conductors 19*a*, 19*b* and 19*c*. The blender is selectively responsive to pre-setting of a manual selector switch 20 and the momentary operation of a coin switch 21 by conductors 22 and 23 connected to the timer circuit.

Figs. 2 and 3 illustrate rear and side views respectively of the blender assembly 9 illustrated Fig. 1. A main body 24 serves as a housing and support for the entire apparatus with a plurality of fluid injectors 25 positioned about the periphery thereof. This illustration shows four fluid injectors corresponding to the four different flavor containers illustrated in Fig. 1. However, it is apparent that a larger number of injectors may be readily applied to the housing 24 where a larger number of flavors is desired.

Fig. 4 is a cross sectional view of the blender assembly 9. Carbonated water is fed under predetermined pressure through conduit 15 through a faucet valve 26 which is adjustably positioned in one end of the body 24 by means of screw threads and sealed therein with O ring 27. The valve has a coaxial bore terminating in a plurality of ports 28 which permits the carbonated water to flow through a conical aperture 29 between the conical end 30 of the valve and a corresponding flare 31 in

the body 24. Thus carbonated water at a predetermined pressure will flow in the direction shown by arrow through body 24 and discharge through faucet 10.

Each fluid injector consists of a housing member 32 with its outlet connection threaded into body 24, as shown, and having inlet passageway 33 integral therewith. A flat circular diaphragm 34, preferably made of a rubber compound, is hermetically sealed to housing 32 by a retainer plate 35 as shown. A pair of washers 36 threaded on an armature rod 37 on each side of diaphragm are the means by which the diaphragm is reciprocated. Coil spring 38 for urging the diaphragm in its outer rest position is retained as shown by the lower washer 36 at one end and against a recess in the housing at its opposite end. An outlet valve 39 normally rests against a seat 40 in the outlet passageway 41 and is normally retained in closed position by tension spring 42 threaded on valve stem 39 and rod 37.

An electro-magnet 43 having a cylindical outer shell 44 and a winding 45 retained by a non-magnetic washer 46, is secured as shown by screws 47 passing through the diaphragm 34 and the retainer plate 35. A circular armature 48 is adjustably threaded to the outer end of rod 37 and is normally spaced from shell 44 as shown.

An inlet valve comprising a seat member 49 is threaded to housing 32 in coaxial position to inlet passageway 33 and includes a check ball 50 normally retained in closed position by spring 51 as shown.

The conduit 5, for conducting flavor fluid by gravity is connected to inlet seat member 49. The electro-magnet winding 45 terminates in a pair of leads 52 and 53. When the injector is filled with flavor fluid through conduit 5 and the electro-magnet 43 is momentarily energized, the diaphragm will be moved by armature 48 and rod 37 to discharge a predetermined volume of flavor fluid into the passageway of the body 24 against the restraining action of valve 39 and springs 38 and 42. The precise quantity of flavor fluid injected is dependent upon the adjustment of armature 48 on the rod 37 since the armature will move against shell 45 as a stop when the magnet is energized.

When the electro-magnet is de-energized, spring 38 will move the diaphragm 34 upward to its rest position creating a partial vacuum in said housing permitting a further charge of flavor fluid to flow past the check ball 50 through inlet passageway 33 to fill the injector. Although the flavor fluid vessels as shown are adapted to feed the fluid by gravity, it is apparent that the injectors 25 are capable of lifting fluids from a container against the action of gravity.

In operation and assuming that tank 4 contains simple syrup and that tank 1 has been adjusted to provide carbon dioxide gas at proper predetermined pressure and that the carbonator 2 has a maintained level of carbonated water and that each injector is supplied with a different fluid from containers 5*f*, 6*f*, 7*f* and 8*f* and that L_1 and L_2 are connected to a source of power, then the device is ready for operation.

Assuming that the preselector switch 20 is turned to position 3 corresponding with flavor 7*f* and coin switch 21 is momentarily operated then the system will function as follows: The timer 19 will complete one cycle of operation by opening the carbonated valve 14 to be immediately followed by the simple syrup valve 17 which will begin the discharge of both simple syrup and carbonated water into cup 11. At a second predetermined time an injector corresponding to flavor 7*f* will be momentarily energized and inject a predetermined quantity of 7*f* fluid directly into the stream of carbonated water flowing through body 24. The flow of carbonated water will continue after the flow of simple syrup and the injection of the extract in order that no residual flavor remain in the interior portions of the body and the faucet 10.

The natural expansion and turbulence of the carbonated water following its release from valve 26 in body 24 will thoroughly blend the flavor extract and water finish the blending with the simple syrup of the final beverage by the turbulent action of the mixture in the cup 11.

Although the blending device 9 is primarily intended for blending concentrated flavor extract in a beverage, it is apparent that the same injectors are fully capable of blending conventional pre-flavored syrups with carbonated water by either increasing the size of the injectors to inject a larger volume of fluid or by modifying the electric timer to provide a plurality of electric impulses to operate an injector a predetermined number of times during the flow of the carbonated water.

It is to be noted that the electrical timing system and the electrical controls for operating the blending device may be modified to fulfill a variety of requirements such as well known post selective devices wherein a coin is first deposited and then a push button circuit operated to obtain a desired selection.

Other modifications adaptable to the blending device include timing adjustment whereby certain of the fluid extract injections may be operated in a concurrent timed relation to provide a beverage of mixed flavors.

Having described my invention, I claim:

1. A blending device for an automatic dispenser comprising a faucet means adapted to conduct and discharge from one end carbonated water therein at a predetermined pressure, said faucet having an adjustable valve means in the opposite end thereof for adjusting the flow of said water fed thereto, an electro-magnet flavor fluid injector having a body means forming a chamber including inlet and outlet passageways therein, the end of said outlet passageway positioned in said faucet in the path of flow of said water, a diaphragm means hermetically secured to said chamber forming one wall thereof, spring means for normally urging said diaphragm into a rest position, an outlet valve means positioned in the end of said outlet passageway and normally retained in closed position by a tension spring means secured thereto, an inlet valve means in said inlet passageway including compression spring means for normally holding said inlet valve in closed position, electro-magnetic means having a movable armature secured to said body means, said armature adapted to displace said diaphragm a predetermined distance when said electro-magnetic means is energized to inject from said chamber a predetermined quantity of flavor fluid into said faucet against the restraining action of said outlet valve to blend said fluid with said water moving in said faucet, and whereby the return of said diaphragm to its said rest position will induce a second said quantity of said fluid into said chamber against the restraining action of said inlet valve when said inlet valve is connected to a source of flavor fluid.

2. In a beverage dispensing machine of the character described a beverage cup, an electro-magnetic fluid valve connected to a source of simple syrup under predetermined pressure, said valve adapted to discharge into a cup said syrup when momentarily energized, a second electro-magnetic fluid valve connected to a source of carbonated water under a predetermined pressure, said valve adapted to discharge carbonated water when energized, a blending faucet means having its inlet connected with the outlet of said second valve and adapted to conduct said water into said cup, a plurality of electro-magnetic flavor fluid injectors connected to said faucet means, each of said injectors having an inlet and outlet means and each of said outlet means positioned in said faucet in the path of flow of said water, a like plurality of flavor fluid containers for retaining a selection of flavor fluids, each of said injector inlets connected to a corresponding one of said flavor containers from its corresponding container into said faucet, electric means for momentarily energizing said valves and selectively

energizing each of said injectors in predetermined sequence whereby the operation of said electric means will discharge a predetermined quantity of simple syrup into said cup and concurrently discharge a predetermined quantity of said water blended with a predetermined quantity of said selected flavor fluid into said cup to form a beverage of predetermined flavor.

3. A blending device for mixing flavor fluids with water comprising a faucet means having an inlet means adapted to be connected to a source of water under predetermined pressure, said faucet having a water passageway therethrough and a discharge outlet at its opposite end, adjustable valve means in said faucet inlet for reducing said pressure to a predetermined lower pressure,

an electro-magnetic injector means on said faucet having a flavor fluid inlet and outlet, said fluid outlet connecting with said water passageway, said fluid inlet connected to a source of flavor fluid, said injector adapted to inject a predetermined quantity of said flavor fluid at a pressure in excess of said lower pressure into water moving in said passageway when momentarily energized to blend a predetermined quantity of flavor fluid with a predetermined quantity of said water.

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