

June 11, 1963

R. M. HEDEMAN
BEVERAGE DISPENSER NOZZLE

3,093,316

Filed Aug. 14, 1961

2 Sheets-Sheet 1

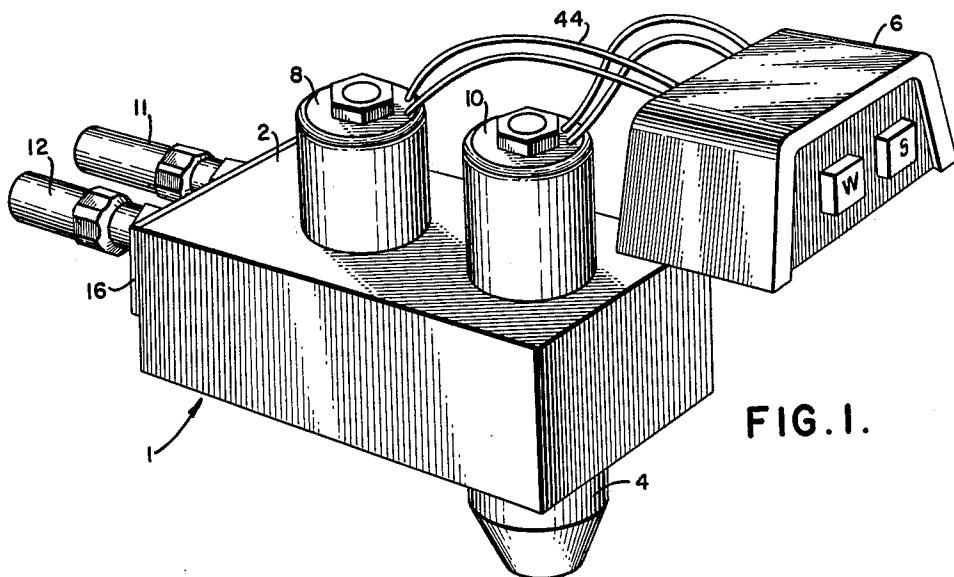


FIG. 1.

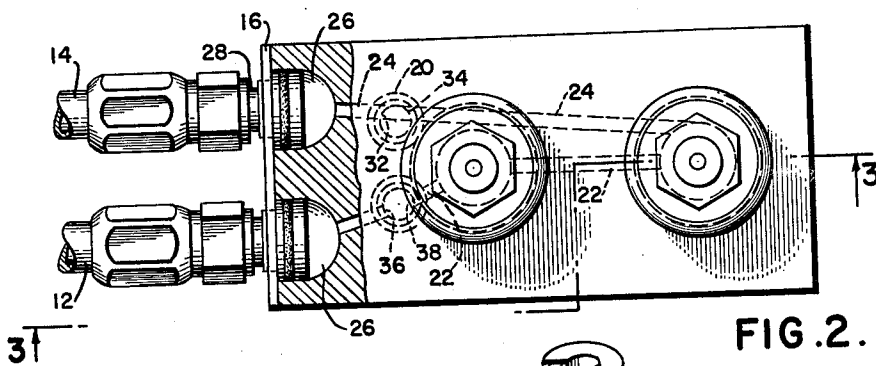


FIG. 2.

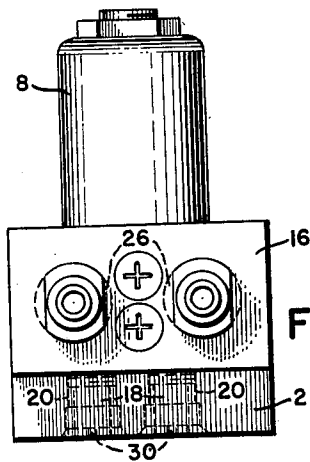


FIG. 4.

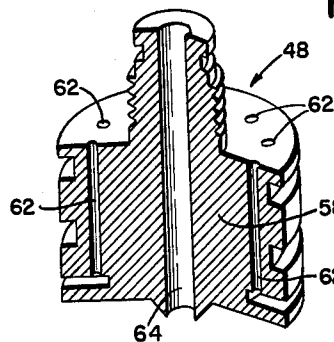


FIG. 6.

INVENTOR

Robert M. Hedeman

BY *Clive H. Bramson*

ATTORNEY

June 11, 1963

R. M. HEDEMAN
BEVERAGE DISPENSER NOZZLE

3,093,316

Filed Aug. 14, 1961

2 Sheets-Sheet 2

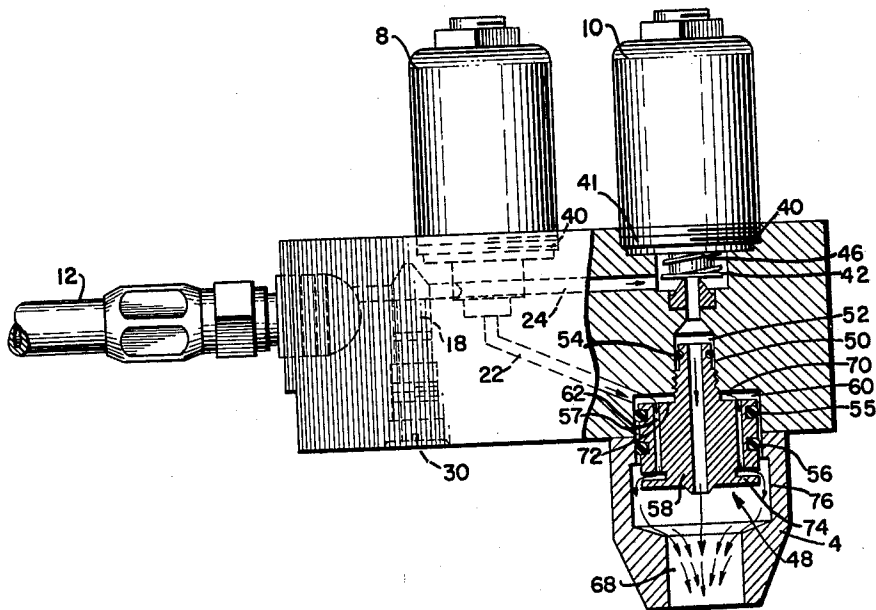


FIG. 3.

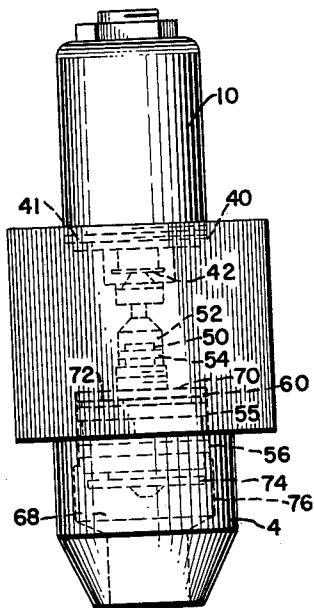


FIG. 5.

INVENTOR

Robert M. Hedeman

BY

Clive H. Bramson

ATTORNEY

1

3,093,316

BEVERAGE DISPENSER NOZZLE
Robert M. Hedeman, 14 Foxwood Road,
Kings Point, N.Y.

Filed Aug. 14, 1961, Ser. No. 131,342
4 Claims. (Cl. 239—445)

This invention relates generally to beverage dispensing machines and more particularly to a nozzle therefor wherein flavoring syrup and/or liquor and carbonated water are mixed and dispensed therefrom into a receptacle with little loss of carbonation.

Carbonated fluids under pressure presently being used in the carbonization of soft drinks require careful treatment, particularly with respect to controlling their flow attitudes during the period involving the combination thereof with syrups or other flavored liquids. Specifically, in order to obtain a satisfactory result, the pressurized fluid must be released properly, that is, slowly and without undue agitation thereby precluding loss of the effervescent characteristics desired in the beverage. Attempts at obviating undue gas releasing agitation, spurling and splashing have been multiplicitious as evidenced by the prior art, the nozzle configuration disclosed in my co-pending application Serial No. 27,409, filed May 6, 1960, now Patent No. 3,009,653, being one of the most effective means heretofore devised. Primarily, resolution of the stated problem has been sought through the prevention of any abrupt or excessive changes in velocity of the pressurized carbonated fluid through keeping this fluid in substantially calm liquid condition to effectuate retention of the activating gases therein.

According to the present invention, carbonated water, which has been educted along a path subject to refrigeration which preferably includes a water cooler, is ultimately dispensed from an exit nozzle wherein the flow of the carbonated fluid is first directed downwardly through a plurality of circularly oriented and downwardly disposed orifices, said flow being further directed upon an annular shoulder located normally and in spaced relation with respect to the outlets of said plurality of orifices. By virtue of said shoulder, the water is uniformly channeled horizontally and radially against the inside peripheral wall of the said exit nozzle, the water being guided thereby through the outlet portion of the said exit nozzle, flavor syrup being introduced and interspersed with said water at the discharge region.

In accordance with the foregoing, the instant invention has for an object the provision of a dispensing nozzle wherein measured quantities of water and flavor fluid are uniquely directed within a mixing chamber to thoroughly intersperse the products as they are discharged from the dispenser.

Another object of the present invention is the provision of an improved exit nozzle adapted to intercept and modify the flow pattern of a downwardly directed stream of carbonated water in such manner as to overcome the tendencies toward turbulence thereby effectuating a calm downward flow and subsequent intimate intermingling with flavor fluid with little loss of carbonation.

Another general object of the present invention is to provide improved means for mixing and delivering mixed beverages, avoiding loss of carbonation during the mixing period; foaming in the receiving receptacle, preventing contamination of one flavor by another, and insuring maximum cleanliness, purity of flavor, and reliability over prolonged periods of use.

Other objects and advantages of the invention will become apparent upon reading the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of the metering and dis-

2

pensing assembly including conduit block, inlet connections and electrical control members;

FIG. 2 is a top plan view of the conduit block and inlet connections, certain parts thereof being shown in horizontal section;

FIG. 3 is a side elevation view of the nozzle assembly taken in section along line 3—3 of FIG. 2;

FIG. 4 is a back end vertical elevation of the conduit block showing the inlet connections thereto;

FIG. 5 is a front end vertical elevation of the conduit block showing the beverage dispenser nozzle therein; and

FIG. 6 is a perspective isolated view of the beverage dispenser nozzle showing a fragmentary vertical section thereof.

Referring now in detail to the present preferred embodiment of the invention illustrated by way of example in the accompanying drawings, FIGURE 1 generally shows the metering and dispensing assembly indicated by numeral 1 and includes a main conduit block 2, a delivery nozzle 4 depending therefrom and a drink selection control panel 6 supported by said main conduit block. In the embodiment shown, two buttons, W and S are utilized, one for a portion of carbonated water and one for a portion of flavor syrup or liquor, respectively. As disclosed in my aforementioned co-pending application, a plurality of flavor selection buttons may be employed as well. Solenoid actuated valves 8 and 10 project upwardly of conduit block 2, the flow of fluids through passageways integral within said conduit block being regulated thereby. Product lines 12 and 14, partially shown in FIGURES 1—3, are removably connected to conduit block 2 through back plate 16 and provide the source of syrup and water to delivery exit nozzle 4 wherein syrup and water are ultimately mixed. Metering valves 18 adapted to be received by openings 20 in conduit block 2 provide additional means for regulating fluid flow to the said exit nozzle.

FIGURES 2 and 3, being partially sectioned top and side elevation views, respectively, provide greater detail with respect to the cooperation of the elements of the combination. Accordingly it will be seen that fluids W and S under pressure enter passages 22 and 24 respectively, said passages having their origin at counter-sunk cavities 26, said cavities also serving as retaining wells or sockets for terminal nipples 28. Metering means 18 and solenoid valves 8 and 10 interposed between cavities 26 and exit nozzle 4 regulate and control the flow of fluids through said passages 22 and 24.

Each of the said metering means 18 is essentially a valve member threadedly received within bores 20 and annularly sealed therein by virtue of O-rings (not shown). Kerfs 30 facilitate inward or outward movement of said valve member in the ordinary manner of a machine screw. In performing its regulatory function, the inner ends of said metering means are adapted for adjustably reducing flow through ports 32, 34, 36 and 38 of said bores 20.

Subsequent to flow through said metering means 18, fluid flow or positive shut-off is controlled by said solenoid valves 8 and 10, the latter for flavor fluid control and typical of solenoid valves generally employed, is shown partially sectionalized in FIGURE 3 of the drawings. Threaded portion 41 of valve 10 is connected to conduit block 2 within well 40 thereby bringing valve seat 42 into operative position. A cylindrical casing encloses the coil of the solenoid, which also comprises the armature (not shown). Suitable leads 44 are provided for energizing the coil as hereinafter described, and the armature is biased downwardly by the action of a plunger spring which is seated between a shoulder of the armature and a cylindrical sleeve positioned within the solenoid coil and extending outwardly from beneath said threaded portion 41. Said valve seat element 42 which serves as a fluid communication passage is removably positioned as shown,

within the conduit block 2 to cooperate with a resilient seating element positioned in the lower end of said armature. Communication is established through the valve seat and the obstructed duct by retraction of the lower end of the armature therefrom upon energization of the said coil. Carbonated water and/or flavor fluid, under pressure and under control of said solenoid operated valves, is thus conducted to the dispensing nozzle.

Prior to delivery from the dispensing nozzle, however, carbonated water is subjected to an especial treatment according to this invention whereby substantial minimization of carbonation loss, and substantial elimination of frothing and foaming of the drink is accomplished. To that end delivery exit nozzle core 48, illustrated in perspective cross section in FIGURE 6 and in operative position in FIGURE 3, is provided. Threadedly secured by stem 50 within upper annular cavity 52, the said delivery exit nozzle core is positioned vertically within conduit block 2 and functions uniquely both as a guide for flavor fluid and to establish the novel and desirable flow pattern in the carbonated water stream. O-ring seals 54 and 55 positioned peripherally with respect to said stem 50 and peripheral wall 57 of cylindrical core body 53 provide additional support for said delivery nozzle core within said upper annular cavity 52 and within substantially larger lower annular cavity 60, both cavities being coaxial with respect to one another. Sealing support is provided for exit nozzle 4 by O-ring 56. Orifice 64 extending axially the length of said stem and core body provides communication between said flavor fluid passage 24 and mixing zone 68 situated directly below said core body 53 within said delivery exit nozzle 4. To obtain the said desired flow pattern in the carbonated water stream, cylindrical core body 53 is provided with a plurality of circularly oriented and downwardly disposed orifices 62. Subsequent to entering that part of lower annular cavity 60 lying between wall 70 of said cavity and shoulder 72 of core body 53, the carbonated water stream is substantially uniformly divided among said orifices 62 wherefrom a plurality of streams impinge directly against annular shoulder 74 located in a plane horizontal with respect to said orifices and in spaced relation with respect thereto. Its flow having been divided and its course abruptly altered, the plurality of streams are reunited at said annular shoulder 74, the flow pattern therefrom being horizontal and radial against inside peripheral wall 76 of said exit nozzle 4. Thereafter the flow pattern assumes the downward contour of said wall for ultimate interspersal with a portion of flavor fluid educted through orifice 64 into said mixing zone 68. Thus, a calm substantially cylindrical descent within the dispensing nozzle is achieved, such result being attributable to the afore-described treatment of the carbonated water stream. In lieu of collision of mixing of flavor fluid and pressurized water, the said fluid is centrally directed into an annular substantially cylindrical and gentle downstream of calm pretreated water, complete interspersal being accomplished, carbonization of the drink being held to a maximum and frothing and foaming having been minimized.

Operation

The function of the beverage dispenser nozzle of the invention will be understandable from the description already given. However, the operation of the apparatus in its entirety will herein be described.

Depression of button S on control panel 6 illustrated in FIGURE 1 of the drawings will activate a cycle whereby a predetermined portion of a flavored drink will be dispensed. As previously noted, the dispensing apparatus may be equipped with more than one flavor selection button thereby enabling a wide choice of flavors. In either case, depression of a flavor selection button will establish communication among flavor tank (not shown), carbonated water tank (not shown), and exit nozzle, flavor fluid and water being automatically regulated and

dispensed with respect to predetermined quantities and portions thereof.

Activation of a dispensing cycle effectuates energization of electrical solenoid valve 8 intermediate of the carbonated water flow path and of electrical solenoid valve 10, intermediate the flavor fluid flow path.

Accordingly, depression of button S permits carbonated water contained within a tank under pressures of approximately 30-100 p.s.i. to flow through product line 12 through conduit block 2 and into mixing zone 68 of exit nozzle 4. Similarly contained under pressure, but of a substantially lesser pressure than the carbonated water, flavor fluid is released for flow through its corresponding product line, through the energized opened port of solenoid valve 10 and calmly through central orifice 64 of delivery exit nozzle core 48 to mixing zone 68 of exit nozzle 4.

While the time cycle function responsible for the volumetric content of a drink may be widely varied, a most frequently desired drink quantity has been found to be 6 ounces. The metering means having been adjusted for flow rates of 2 ounces per second, a 6 ounce drink could be dispensed in 3 seconds, the proportionate ratio of water to flavor fluid being 5 to 1.

In the event a drink consisting of only carbonated water be desired, depression of the button designated W would singly energize solenoid 8 for a 3 second period, the resulting dispensed drink being carbonated water only, as desired.

Both the structural and operational characteristics of the invention having been described, it will be understood that the delivery exit nozzle assembly according to the invention may be adapted to beverage dispensing machines of private as well as of commercial nature, specific applications thereof including, but not being limited to amusement park concessions (both coin and non-coin operated embodiments thereof), automated food and drink vending installations, and to home utilization, e.g., den, recreation room and the like applications.

Changes may be made in the form, construction and arrangement of parts from that disclosed herein without in any way departing from the spirit of the invention or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended hereto.

What is claimed is:

1. A beverage dispenser nozzle for a selective beverage vending machine, comprised of a conduit block having an upper cavity and a substantially larger lower cavity, said cavities being disposed in axial communicative relation, a delivery exit nozzle core having an axial passage therethrough, said nozzle core having a stem and a cylindrical core body depending therefrom, an O-ring annularly connected to said cylindrical core body, said core body having a lower end and a first annular shoulder adjacent said stem, said nozzle core being removably adapted within said upper and lower cavities, a plurality of circularly oriented downwardly disposed orifices within said cylindrical core body, a second annular shoulder integral with said cylindrical core body and spaced adjacent the lower end thereof, said plurality of orifices being normal to the plane of said second annular shoulder and in communicative relation therewith, a delivery exit nozzle having a passage therethrough, said delivery exit nozzle being supported by said cylindrical core body and sealingly connected to said O-ring, said exit nozzle passage and said delivery exit nozzle core passage being disposed in coaxial relation.

2. A beverage dispenser nozzle for a selective beverage vending machine comprised of a conduit block having an upper cavity and a substantially larger lower cavity, said cavities being disposed in axial communicative relation, a delivery exit nozzle core having an axial passage therethrough, said nozzle core having a stem and a cylindrical core body depending therefrom, an O-ring annularly con-

5

nected to said cylindrical core body, said core body having a lower end and a first annular shoulder platform adjacent said stem, said nozzle core being connected within said upper cavity, a plurality of circularly oriented downwardly directed orifices within said cylindrical core body, said orifices being disposed equidistantly with respect to said passage within said cylindrical core body, a second annular horizontally disposed shoulder integral with said cylindrical core body and spaced adjacent the lower end thereof, said plurality of orifices being normal to said horizontally disposed second annular shoulder and parallel to the axis of said core body, said orifices being in communicative relation with said second annular shoulder, a delivery exit nozzle having a passage therethrough, said delivery exit nozzle being supported by said cylindrical core body and sealingly connected to said O-ring, said exit nozzle passage and said delivery exit nozzle core passage being disposed in coaxial relation.

3. A beverage dispenser nozzle for a selective beverage vending machine comprised of a conduit block having an upper cavity and a substantially larger lower cavity, said cavities being disposed in axial communicative relation, a delivery exit nozzle core having an axial passage therethrough, said nozzle core having a stem and a cylindrical core body depending therefrom, an O-ring annularly connected to said cylindrical core body, said core body having a lower end and a first annular shoulder adjacent said stem, said nozzle core being threadedly connected within said upper cavity, a plurality of circularly oriented downwardly directed orifices within said cylindrical core body, said orifices being disposed equidistantly with respect to said passage within said cylindrical core body, a second annular horizontally disposed shoulder integral with said cylindrical core body and spaced adjacent the lower end thereof, said plurality of orifices being normal to said second horizontally disposed annular shoulder and parallel to the axis of said core body, said orifices being in communicative relation with said second annular shoulder, a delivery exit nozzle having a vertically-walled passage and a substantially smaller vertically-walled mixing zone therebelow, said upper de-

6

livery exit nozzle being supported by said cylindrical body and sealingly connected to said O-ring, said delivery exit nozzle core passage, said upper passage and said mixing zone being disposed in coaxial relation.

4. A beverage dispenser nozzle for a selective beverage vending machine comprised of a conduit block having an upper cavity and a substantially larger lower cavity, said cavities being disposed in axial communicative relation, a delivery exit nozzle core having an axial passage therethrough, said nozzle core having a threaded stem and a first O-ring adapted annularly thereto, a cylindrical core body depending from said stem, said core body having a lower end and a first upper annular shoulder, a second O-ring adapted annularly of said cylindrical core body, said nozzle core being connected within said upper and lower cavities in removably sealed relation, a plurality of circularly oriented downwardly directed orifices within said cylindrical core body, said orifices being disposed equidistantly with respect to said passage within said cylindrical core body, a second annular shoulder integral with said cylindrical core body and spaced adjacent the lower end thereof, said plurality of orifices being normal to the plane of said second annular shoulder and parallel to the axial passage of said core, said orifices being in communicative relation with said second annular shoulder, a delivery exit nozzle having a vertically-walled upper passage and a substantially smaller vertically-walled mixing zone therebelow, said delivery exit nozzle being supported by said cylindrical body and sealingly connected to said second O-ring, said delivery exit nozzle core passage, said upper passage and said mixing zone being disposed in coaxial relation.

References Cited in the file of this patent

UNITED STATES PATENTS

954,898	Stenberg	Apr. 12, 1910
1,386,646	Morlok	Aug. 9, 1921
2,179,611	Brown	Nov. 14, 1939
2,657,952	Mendonca	Nov. 3, 1953
2,985,385	Bowers et al.	May 23, 1961