

[54] DISPENSER ASSEMBLY

[75] Inventor: William R. Donahue, Jr., Batavia, Ill.

[73] Assignee: Eaton Corporation, Cuyahoga County, Ohio

[22] Filed: Dec. 20, 1971

[21] Appl. No.: 210,008

[52] U.S. Cl.: 222/129.2, 222/144.5, 222/571

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

[58] Field of Search: 222/129.1, 129.2, 222/135, 129.3, 57, 132, 133, 145, 144.5, 571; 137/599.1, 604

[56] References Cited

UNITED STATES PATENTS

2,658,645	11/1953	Harris, Jr.	222/133 UX
3,382,897	5/1968	Skiera et al.	222/129.1 X
3,104,823	9/1963	Hayes	137/599.1 X
3,511,413	5/1970	Fuqua	222/129.1
2,750,076	6/1956	Welty et al.	222/129.1
3,258,177	6/1966	Ellis	222/566
3,503,541	3/1970	Jacobs et al.	222/129.1

3,295,723 1/1967 Welty..... 222/129.1 X

Primary Examiner—Robert B. Reeves

Assistant Examiner—Joseph J. Rolla

Attorney—Teagno & Toddy

[57]

ABSTRACT

An improved dispenser assembly includes a single control lever or three independent levers which are selectively operated to dispense either cold water or a mixture of water and a selected one of a plurality of drink concentrates. A pair of control knobs are provided for independently varying the ratio of the two drink concentrates to water in the dispensed mixture. To enable the mixture of concentrate and water to be varied, a by-pass passage is provided around the throat of a venturi to a mixing zone or chamber where the concentrate and water are mixed. The concentrates are supplied to the mixing zone from a pair of removable containers. The removable containers, venturis, dispensing nozzles and by-pass controls can be readily removed to facilitate cleaning.

17 Claims, 8 Drawing Figures

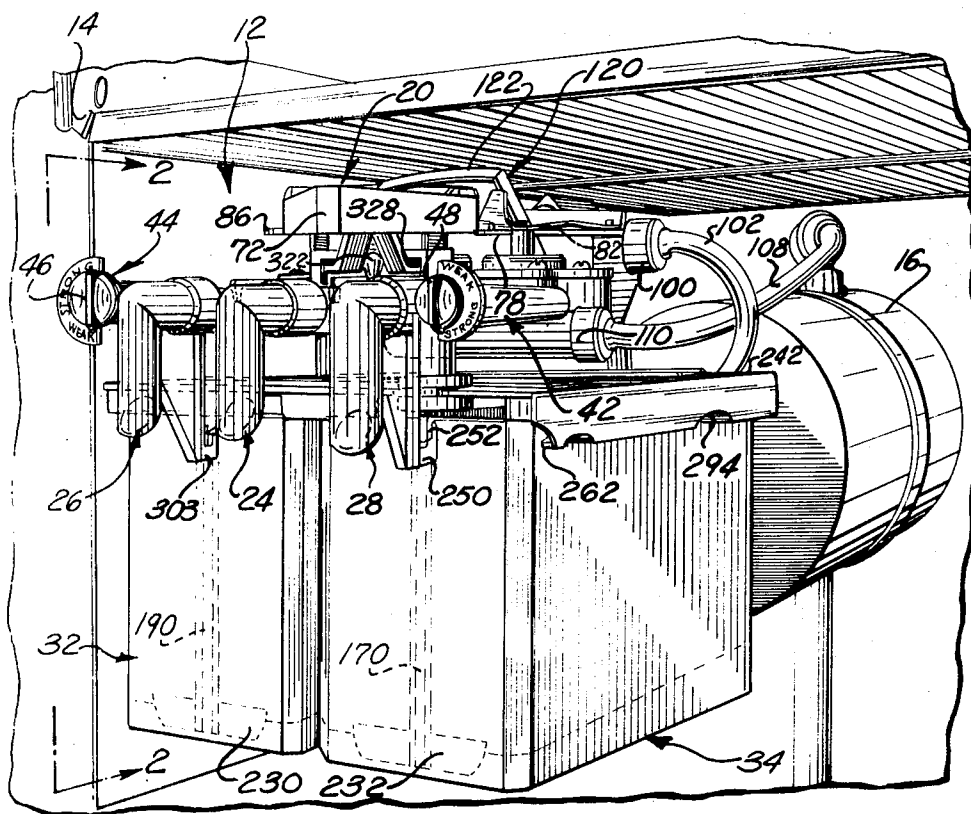


FIG. 1

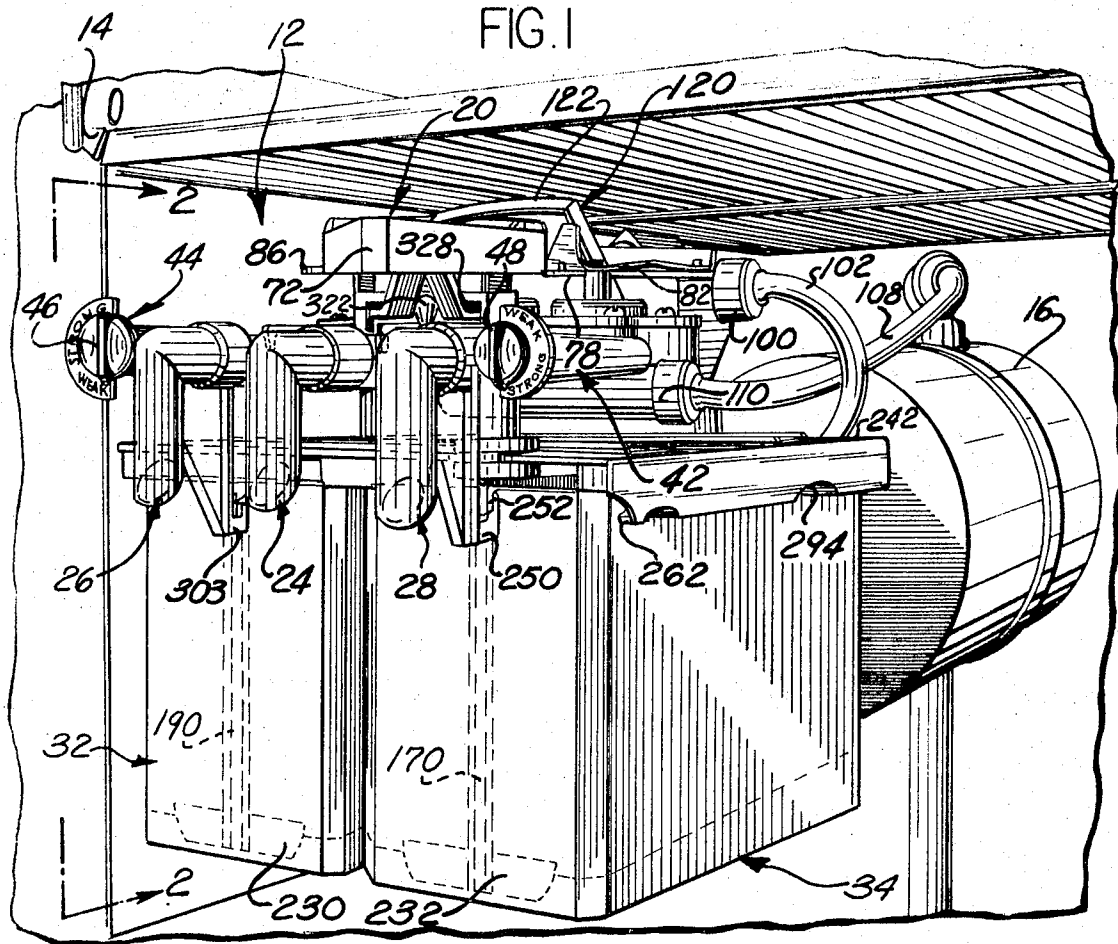
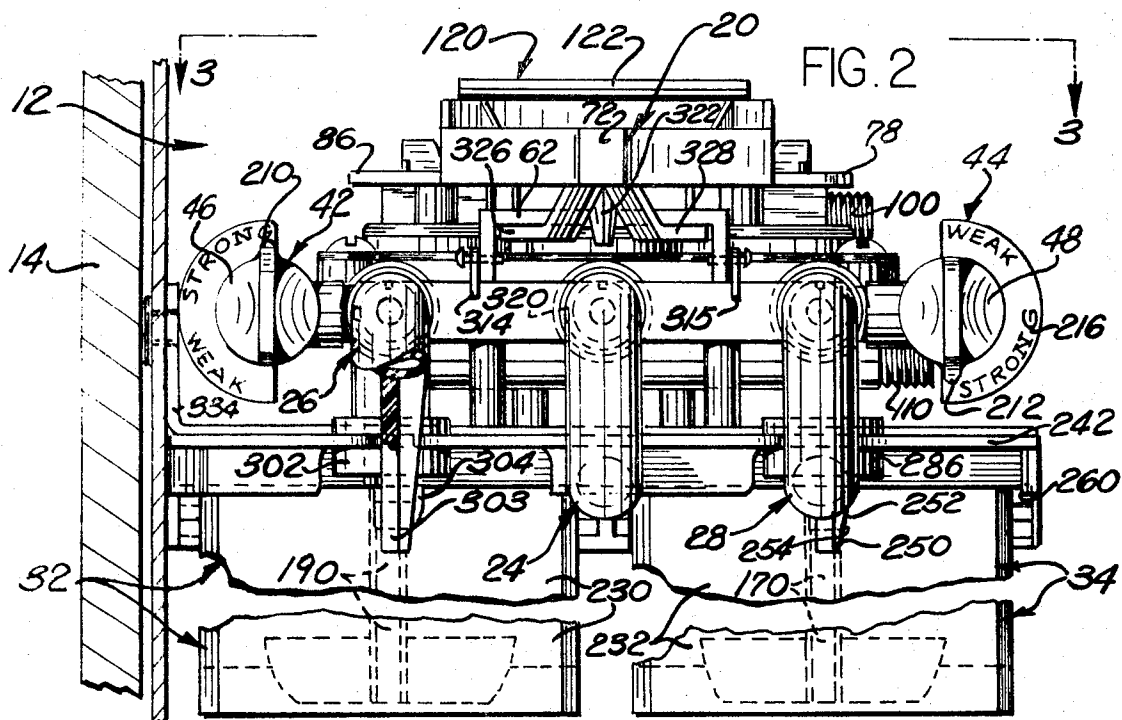


FIG. 2



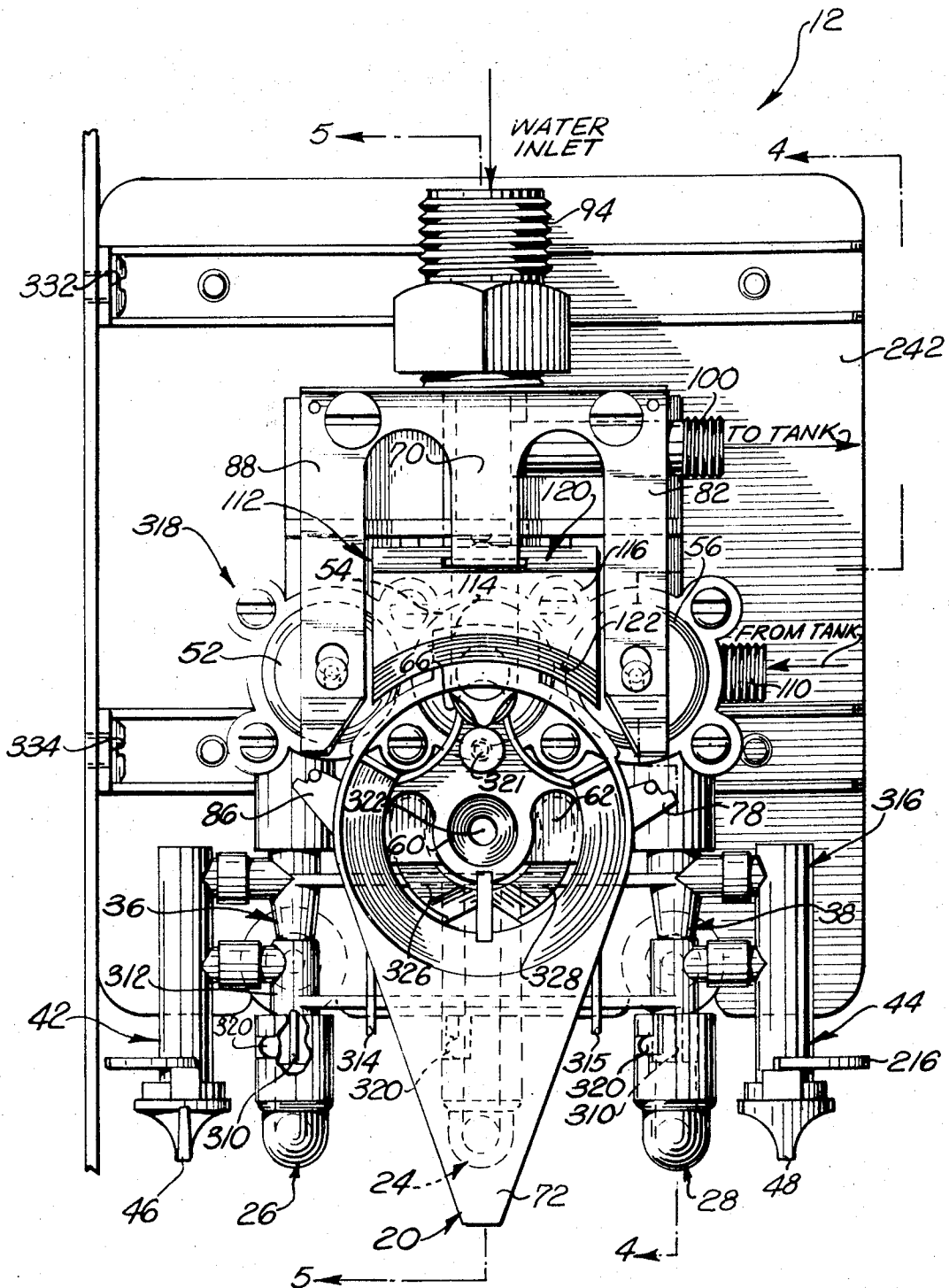
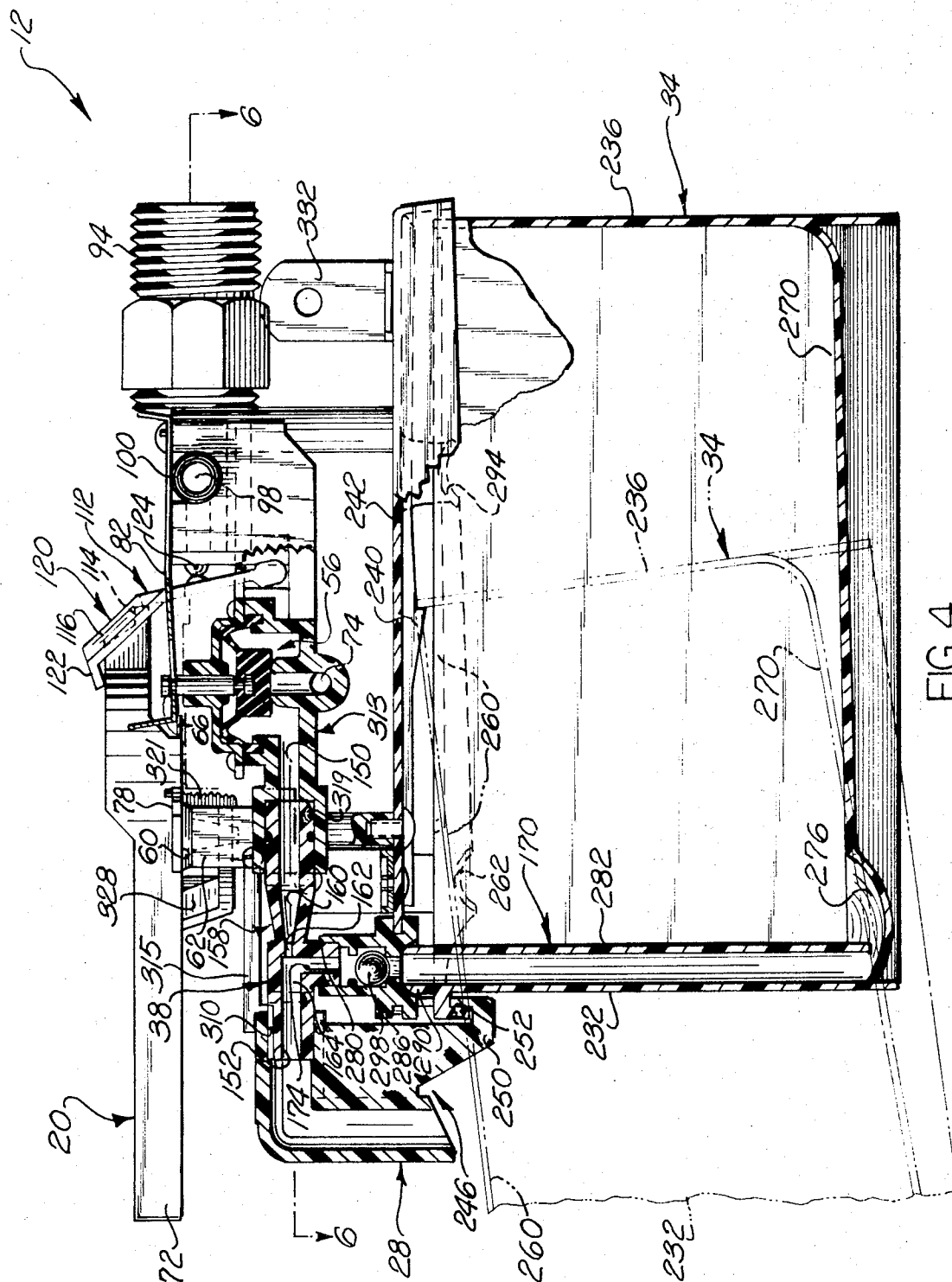
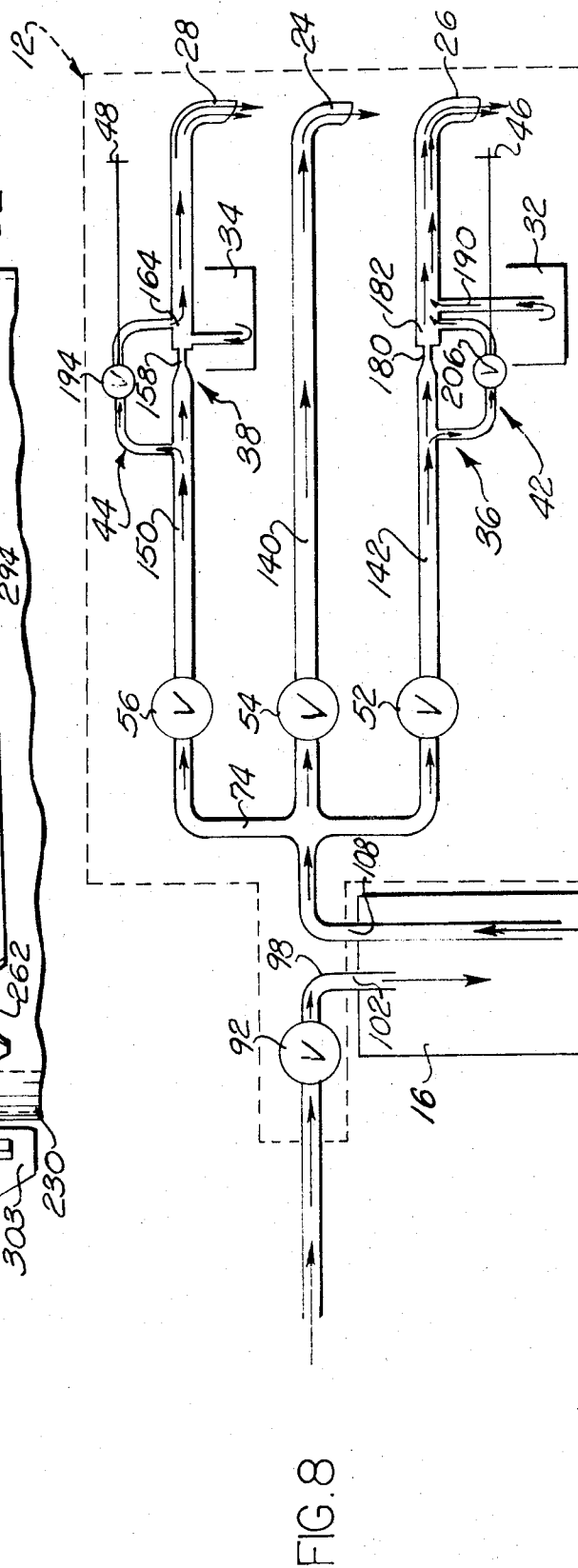
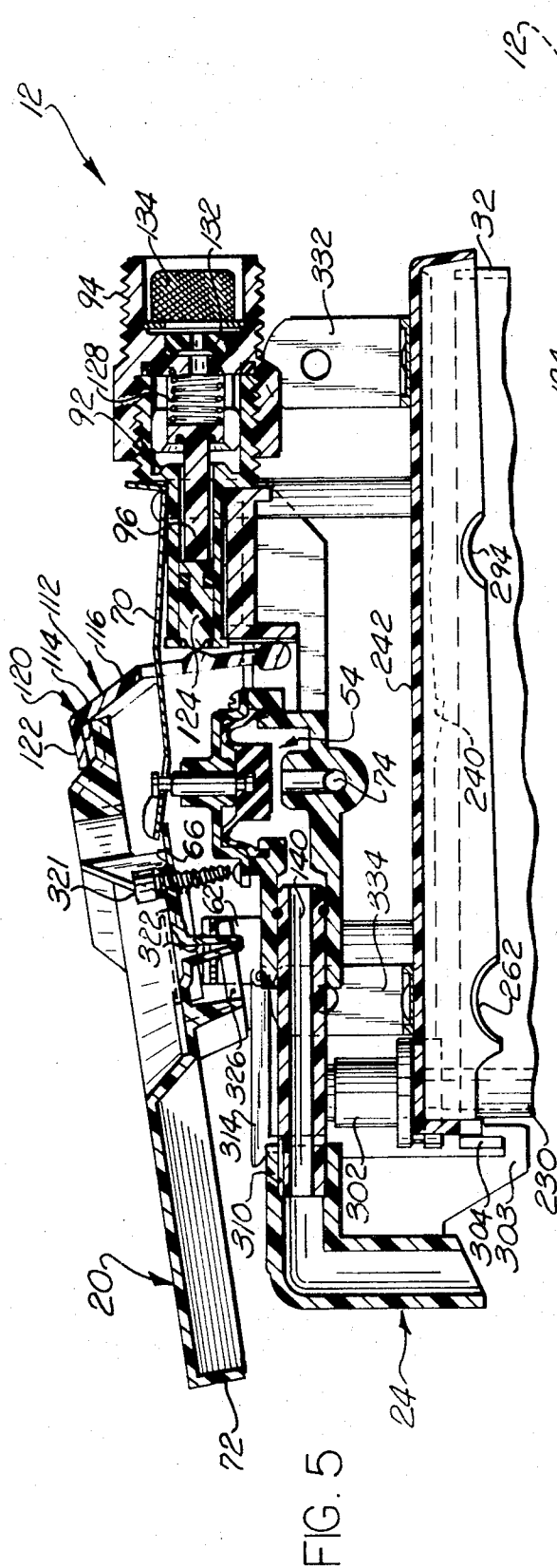


FIG. 3





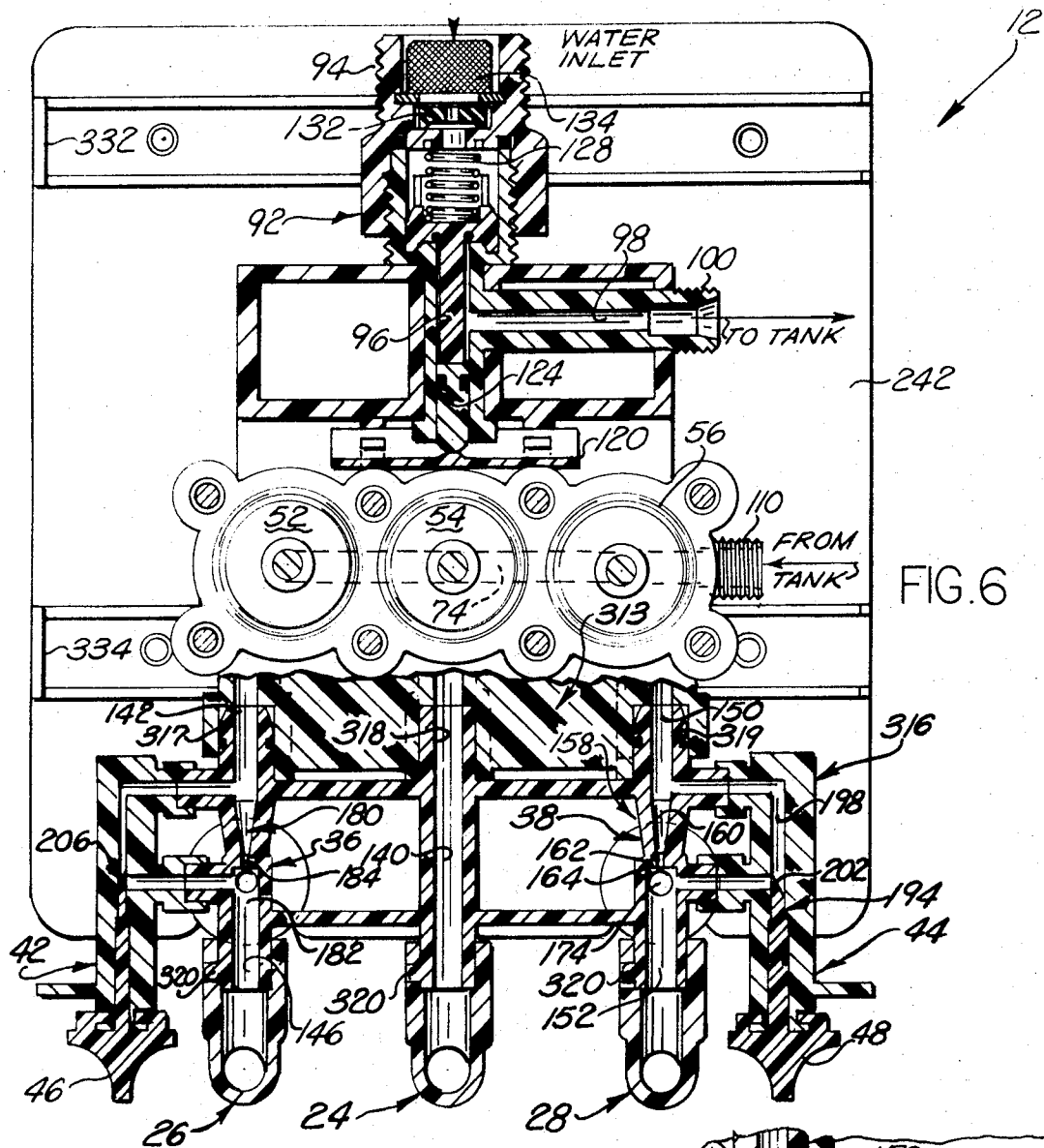


FIG. 6

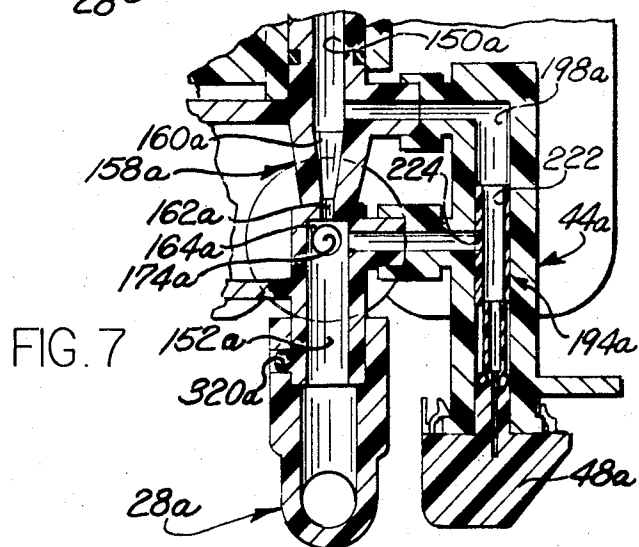


FIG. 7

DISPENSER ASSEMBLY

The present invention relates generally to a dispenser assembly and more particularly to a dispenser assembly which is capable of dispensing a selected one of a plurality of beverages.

Several known types of dispenser assemblies have been utilized in refrigerators to dispense either water or a mixture of water and a drink concentrate. One of these known dispenser assemblies is disclosed in U.S. Pat. No. 2,823,833 to Bauerlein. While known dispenser assemblies have been generally satisfactory in operation, certain problems have been encountered in manufacturing and using them.

The operation of a known drink dispenser has been somewhat unsatisfactory in that the ratio of drink concentrate to cold water can be adjusted only by varying the strength of the concentrate in a supply container for the dispenser. In addition, difficulties have been encountered in using a known drink dispenser due to a dripping of water and/or drink mixture from the dispensing nozzles and concentrate pick-up tubes. Other problems which are encountered to a greater or lesser extent during the operation of known drink dispensers relate to filling of the concentrate containers and cleaning the dispenser. Finally, many of the known drink dispensers have been relatively difficult to assemble and clean.

Accordingly, it is an object of this invention to provide a new and improved dispenser assembly having a drink strength control for varying the ratio of drink concentrate to water in a dispensed mixture.

Another object of this invention is to provide a new and improved dispenser assembly for use in dispensing either water or a mixture of water and a selective one of a plurality of drink concentrates where a single control lever or multiple levers are utilized to select and dispense either water or a mixture of water and a desired one of a plurality of drink concentrates.

Another object of this invention is to provide a new and improved dispenser assembly having vented nozzles to insure a complete discharge of liquid from the nozzles without subsequent dripping and also aeriate the mixed product to enhance flavor.

Another object of this invention is to provide a new and improved dispenser assembly having apparatus for mixing a selected one of a plurality of drink concentrates with water and selectively dispensing them and wherein the dispenser assembly can be readily disassembled for cleaning.

Another object of this invention is to provide a new and improved drink dispenser assembly having concentrate containers which can be moved between a retracted position in which the concentrate containers are connected in fluid communication with apparatus for mixing drink concentrates with water and an extended position in which the interior of the containers is readily accessible to allow the level of concentrate to be checked and the container filled with additional concentrate if necessary.

Another object of this invention is to provide a new and improved dispenser assembly for dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates wherein the dispenser assembly includes a first drink strength control device for varying the ratio of a first drink concentrate to water in a dispensed mixture and a second drink strength con-

trol device for varying the ratio of a second drink concentrate to water in a dispensed mixture.

Another object of this invention is to provide a new and improved dispenser assembly as set forth in the next preceding object and wherein the mixing and drink strength controls each include a venturi or similar means for inducing a flow of concentrate to a mixing zone and means for bypassing water around a throat to the venturi to the mixing zone to enable the ratio of water to drink concentrate to be varied.

These and other objects of the features of the invention will become more apparent upon a consideration of the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is an illustration of a drink dispenser assembly construction in accordance with the present invention in association with a tempering tank or reservoir which holds refrigerated water;

FIG. 2 is a fragmentary elevational view, taken generally along the line 2—2 of FIG. 1, illustrating the relationship between a pair of concentrate containers, dispensing nozzles, and drink strength control knobs;

FIG. 3 is a plan view taken generally along a line 3—3 of FIG. 2, illustrating a plurality of control valves which are operated one at a time by a selector lever to direct a flow of cold water to either a water dispensing nozzle or to one of a pair of mixing devices in which water is mixed with a drink concentrate;

FIG. 4 is a sectional view, taken generally on line 4—4 of FIG. 3, illustrating a closed control valve for controlling a flow of water to a mixing device, a conduit arrangement for conducting drink concentrate from a container to the mixing device, and a dispensing nozzle for dispensing a mixture of water and drink concentrate, the selector lever being shown in an unactuated position;

FIG. 5 is a sectional view, taken generally along the line 5—5 of FIG. 3, illustrating a flow path of water from an open control valve to a dispensing nozzle, the selector lever being shown in an actuated position;

FIG. 6 is a sectional view, taken generally along the line 6—6 of FIG. 4, illustrating the relationship between venturis in the mixing devices and drink strength control valves which are operable to vary the ratio of drink concentrate to water in a mixture conducted from the mixing devices;

FIG. 7 is an enlarged fragmentary sectional view illustrating a second embodiment of the drink strength control device; and

FIG. 8 is a schematic illustration depicting the flow of water and drink concentrate through the dispenser assembly.

A drink dispenser assembly 12 for dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates is illustrated in FIG. 1 in a refrigerator 14 in association with a cold water reservoir or tempering tank 16. A single manually operable control or selector lever 20 is selectively operable between an unactuated position (FIG. 4) and an actuated or dispensing position (FIG. 5) to dispense either cold water from a nozzle 24 (FIG. 1), a mixture of a first drink concentrate and cold water from a nozzle 26, or a mixture of a second drink concentrate and cold water from a nozzle 28. The two drink concentrates are stored in separate containers 32 and 34 and are mixed with cold water in an associated one of a pair of mixing devices 36 or 38 (see FIG. 6), upon suitable actuation

of the selector lever 20. The ratio of drink concentrate to water dispensed from the nozzles 26 and 28 can be selectively controlled by means of drink strength control devices 42 and 44 having control knobs 46 and 48 which are readily accessible from the front of the dispenser assembly 12.

In accordance with a feature of the invention, the selector lever 20 is manually operable to actuate a selected one of a plurality of control valves 52, 54 or 56 (see FIGS. 3 and 6) to dispense either water or a mixture of water and a selected one of the drink concentrates. To enable the selector lever 20 to actuate any one of the control valves 52, 54 or 56, the selector lever is pivotally and rockably mounted at a swivel connection 60 (see FIGS. 3, 4 and 5) on a support member 62. When the selector lever 20 is in the centered position of FIG. 3, an actuator arm or projection 66 is disposed in abutting engagement with the lower side of a spring finger or arm 70 which biases the central water flow control valve 54 toward the closed position. When a handle portion 72 of the selector lever 20 is depressed from the unactuated position of FIG. 4 to the actuated position of FIG. 5, the projection 66 lifts the spring finger 70 and opens the valve 54. Opening the valve 54 enables water to flow from a manifold passage 74 through the valve 54 to the nozzle 24. Of course, when the selector lever 20 is released, the spring finger 70 pivots or rocks the selector lever 20 in a clockwise direction (as viewed in FIG. 5) about the swivel connection 60 to close the valve 54 and interrupt the flow of water to the nozzle 24.

When it is desired to dispense a mixture of water and one of the two drink concentrates, the selector lever 20 is pivoted from the centered position of FIG. 3 toward the nozzle from which the desired mixture of water and drink concentrate is to be dispensed. If a mixture of water and the second drink concentrate from the container 34 is to be dispensed, the selector lever 20 is rotated in a counterclockwise direction (as viewed in FIG. 3) toward the dispensing nozzle 28. This rotational movement of the selector lever 20 moves the actuator arm 66 out from under the spring finger 70 and moves a second actuator arm or projection 78 to a position beneath a second spring finger 82. The spring finger 82 biases the valve 56 to the closed position of FIG. 4. Therefore, when the handle 72 of the selector lever 20 is pivoted or rocked downwardly from the unactuated position of FIG. 4 towards the actuated position of FIG. 5, the projection 78 lifts the end of the spring finger 82 and opens the control valve 56.

Similarly, when a mixture of water and the first drink from the container 32 is to be dispensed, the selector lever 20 is rotated in a clockwise direction, as viewed in FIG. 3, to move a third actuator arm or projection 86 beneath a spring finger 88 which biases the control valve 52 towards the closed position. Of course, this pivotal movement of the selector lever 20 moves the actuator arm 66 from beneath the central spring finger 70. A subsequent depressing of the selector lever handle 72 causes the actuator arm 86 to lift the free end of spring finger 88 and open the flow control valve 52.

Whenever one of the water flow control valves 52, 54 or 56 is opened by the selector lever 20, cold or refrigerated water flows from the tempering tank 16 and through the open valve to effect a dispensing of either cold water from the nozzle 24 or a mixture of cold water and drink concentrate from one of the nozzles 26

or 28. To promote this flow of cold water from the tempering tank 16, a main or inlet water control valve 92 is operated from the closed position of FIG. 6 to the open position of FIG. 5 whenever the selector lever 20 is actuated. Opening the water inlet valve 92 enables tap water to flow from an inlet connection 94 through the water inlet control valve 92, along a valve actuator stem 96 and through a passage 98 (FIG. 6) to an outlet connection 100. The connection 100 is connected in fluid communication with the tempering tank 16 by a flexible conduit or hose 102 (FIG. 1).

This flow of tap water under pressure into the tempering tank 16 causes relatively cold water to flow from the tempering tank to the control valves 52, 54 and 56. Accordingly, the tempering tank 16 is connected by a flexible hose or conduit 108 (see FIG. 1) to a connection 110 leading to the manifold passage 74 and valves 52, 54 and 56 (FIG. 6). Since only one of the valves 52, 54 or 56 can be opened at a time by depressing the selector lever 20, the cold water will flow from the manifold passage 74 through the open valve toward the associated one of the nozzles 24, 26 and 28.

To provide for actuation of the water inlet valve 92 each time the selector lever 20 is depressed to open one of the control valves, 52, 54 and 56, the selector lever and inlet valve are interconnected by a linkage 112 (FIGS. 4 and 5). The linkage 112 is actuated by an arm or projection 114 on the selector lever 20. This arm 114 is disposed beneath a cam section or portion 116 of a pivotally mounted actuator lever 120. The cam section 116 of the actuator lever 120 has such an extent that the arm 114 remains beneath the cam section 116 during pivotal movement of the selector lever 20 in moving either the arm 78 beneath the spring finger 82 or the arm 86 beneath the spring finger 88. Therefore, when the selector lever 20 is depressed to open one of the valves 52, 54 or 56 the inlet valve actuator lever 120 is pivoted rearwardly by camming action of the arm 114 against the cam section 116. As the inlet valve actuator lever 120 is pivoted rearwardly, the arm 114 slides upwardly along the cam section 116 until the arm engages a stop lip or section 122.

This rearward movement of the actuator lever 120 opens the water inlet valve 92 as one of the control valves 52, 54 or 56 is opened. Thus, as the lever 120 is pivoted in a clockwise direction as viewed in FIGS. 4 and 5, a water inlet valve pin 124 is moved rearwardly from the position shown in FIGS. 4 and 6 to the actuated position of FIG. 5. This movement of the valve pin 124 moves the valve stem 96 and opens the water flow control valve 92 against the influence of a biasing spring 128. The resulting flow of tap water through the open control valve 92 is maintained substantially constant regardless of pressure variations by a water flow control device 132 constructed in the manner described in U.S. Pat. No. 2,891,578 to Dahl et al. A screen 134 is provided in the water flow to remove water born dirt and other particles.

From the foregoing, it is apparent that the single selector lever 20 is operable to dispense either water or a mixture of water and a selected drink concentrate. To select either water or a mixture of water and a particular drink concentrate, the selector lever 20 is pivoted to move an operating arm 66, 78 or 86 beneath the spring finger 70, 82 or 88 for one of the control valves 52, 54 or 56. The selector lever 20 is then depressed to open the selected one of the control valves. Depressing

the selector lever 20 also opens the main water inlet valve 92 to provide a uniform flow of water from the tempering tank 16 through the open one of the control valves 52, 54 or 56.

When the control valve 54 is opened by operating the selector lever when it is in the center position of FIG. 3, cold or refrigerated water flows directly through a water conduit or passage 140 to the central nozzle 24 (See FIGS. 5 and 6). However, if lever 20 is positioned to open control valve 52, water flows through a conduit or passage 152 (FIG. 6) to the mixing device 36 where it is mixed with a first drink concentrate from the container 32 (FIG. 2). This mixture of the first drink concentrate and water then flows through a passage 146 to the dispensing nozzle 26. Similarly, when the selector lever 20 is positioned to open control valve 56, water flows through a passage 150 to a mixing device 38 where it is mixed with a second drink concentrate from the container 34. This mixture of water and the second drink concentrate then flows through the passage 152 to the dispensing nozzle 28 (see FIG. 4).

The mixing device 38 promotes an even mixing of the cold water and drink concentrate. To this end, the second mixing device 38 induces a flow of drink concentrate from the container 34 at a rate which is proportional to the flow of water through the mixing device 38. The flow of concentrate is advantageously induced by means of a venturi 158 having a conical inlet 160 through which water from the passage 150 flows to a cylindrical throat 162 and into a mixing chamber or zone 164. Since the conical entrance portion of the venturi 158 tapers toward the throat 162 which has a relatively small diameter, water flows into the mixing zone 164 at a relatively high speed. This high speed flow of water induces a pressure reduction below atmospheric pressure which induces a flow of the drink concentrate along a conduit 170 (FIG. 4) and into the mixing zone 164 through a circular opening 174. The mixture of drink concentrate and water then flows from the mixing zone 164 through the passage 152 to the nozzle 28.

The flow control device 36 (FIG. 6) is of the same construction as the flow control device 38 and includes a venturi 180 which is connected with a mixing chamber or zone 182, through a throat 184. The first drink concentrate is conducted from the container 32 (see FIGS. 1 and 2) to the mixing chamber or zone 182 through a conduit 190. Of course, the mixture of drink concentrate and water flows from the mixing device 36 through the passage 146 (FIG. 6) to the nozzle 26. Since the general principle of operation of the mixing devices 36 and 38 is well known, the manner of operation of the mixing devices 36 and 38 will not be further described herein to avoid prolixity of description. However, it should be understood that although it is preferred to utilize well formed venturis 158 and 180 to induce a flow of the concentrate into the mixing zones 164 and 182, orifices of a somewhat different configuration could be utilized as long as they induce sufficient pressure reduction and the resulting requisite concentrate flow.

It is contemplated that during use of the dispenser assembly 12, it will be desirable to dispense drinks of different strengths, that is drinks containing different percentages of drink concentrate. Accordingly, the drink strength control devices 42 and 44 are operable to vary the ratio of drink concentrate to water in the mixture

conducted from the mixing devices 36 and 38 to the associated nozzles 26 and 28. To provide different ratios of water to drink concentrate, the drink strength controls 42 and 44 are operable to conduct water directly to the mixing zones 182 and 164 without passing the water through the venturi throats 184 and 162. Of course, this additional or bypassed water tends to reduce the rate flow of drink concentrates from the containers 32 and 34 to the mixing chambers 182 and 164 with the result that somewhat weaker drinks are dispensed from the nozzles 26 and 28.

To enable the drink strength control device 44 to vary the ratio of drink concentrate to water in a mixture dispensed from the nozzle 28, the control device includes a valve 194 which is operated from a closed position (shown in FIG. 6) through a range of partially opened positions to a fully opened position by rotation of the knob 48. When the valve 194 is in the closed position, it blocks a flow of water from the passage 150 through a passage 198 to the mixing chamber or zone 164. Therefore, when the valve 194 is closed a relatively strong drink is dispensed from the nozzle 28 upon actuation of the selector lever 20 to open the valve 56.

If the knob 48 is rotated through half a turn, the valve 194 is fully opened and a relatively large flow of water is conducted to the mixing zone or chamber 164 without passing through the throat 162. This flow of water is conducted to the mixing zone through a bypass passage 198. This bypassed water tends to reduce the rate at which concentrate flows into the mixing zone 164 to reduce the ratio of drink concentrate to water in the mixture dispensed from a nozzle 28. Therefore, a relatively weak drink is dispensed from the nozzle 28 when the valve 194 is open.

A drink of intermediate strength can be dispensed from the nozzle 28 by merely rotating the knob 48 part way from the relatively strong position shown in FIG. 2 toward the relatively weak position. This will cause a tapered end portion 202 (FIG. 6) of the valve 194 to partially block the passage 198. Therefore, a limited flow of water is bypassed around the throat 162 of the venturi 158. Although it is preferred to utilize water bypassed from upstream of the venturi 158, it should be understood that the water could be obtained from other sources.

The drink strength control device 42 is of substantially the same construction as the drink strength control 44 and includes a valve 206 which is operated between a fully closed position (illustrated in FIG. 6) through a plurality of partially open positions to a fully open position to vary the ratio of drink concentrate to water in the drink dispensed from the nozzle 26. The knobs 46 and 48 are advantageously provided with pointers 210 and 212 which cooperate with indicia 216 (see FIG. 2) indicating the relative ratio of water to drink concentrate to be dispensed from the nozzles 26 and 28.

A second embodiment of the drink strength control device is illustrated in FIG. 7. The drink strength control device of FIG. 7 differs from the drink strength control device 44 of FIG. 6 in the construction of the valve utilized to control the flow of water through the bypass passage. Since the embodiment of the drink strength control device illustrated in FIG. 7 is generally similar to the embodiment of FIG. 6, similar elements will be designated with similar numerals, the suffix let-

ter "a" being associated with the numerals of FIG. 7 to avoid confusion.

The drink strength control device 44a of FIG. 7 includes a control valve 194a which controls a flow of water through a bypass passage 198a to a mixing chamber 164a. The valve 194a includes a tubular valve wall 222 having an opening 224 through which water can pass to the mixing chamber 164a when the valve 194a is in the open position shown in FIG. 7. Of course, rotation of the knob 48a gradually moves the opening 224 out of alignment with the portion of the passage 198a leading to the mixing chamber 164a to gradually block a flow of water through the passage 198a. Thus, it can be seen that although the valve 194a is constructed somewhat differently than the valve 194, it functions to vary the rate of flow of water through the bypass passage 198a to vary the strength of the drink dispensed from the nozzle 28a in much the same manner as in which the valve 194 varies the strength of the drink dispensed from the nozzle 28. Of course, many other known types of valves could be substituted for the valves 194 and 194a if desired.

After the dispenser assembly 12 has been utilized for a period of time the containers 32 and 34 will have to be refilled with drink concentrate. To enable the level of drink concentrate in the containers 32 and 34 to be inspected and to facilitate filling of the containers, the containers are movable one at a time from the retracted positions shown in FIG. 1 to an extended position (shown in dashed lines in FIG. 4). In the extended position front or leading walls 230 and 232 of the containers 32 and 34 are disposed forwardly or outwardly of the nozzles 24, 26 and 28 to provide access to the interior of the containers. Thus, as the container 34 is moved forwardly from the retracted position (shown in solid lines in FIG. 4) toward the extended position (shown in dashed lines in FIG. 4), a rear or trailing wall 236 of the container 34 is moved forwardly until the trailing or rear wall 236 engages a stop member or projection 240 which is integrally formed with a base or mounting plate 242 of the dispenser assembly 12.

The container 34 is held or retained in the retracted position, shown in solid lines in FIG. 4, by a latch or retainer device 246 which is connected with the nozzle 28. The retainer device 246 includes a holding or hook arm 250 which engages a downwardly projecting flange 252 on the front wall 232 of the container 34 when the container is in the retracted position. The hook or retainer arm 250 is swung beneath the front flange 252 on the container 34 (see FIGS. 1 and 4) to hold the front portion of the container upwardly in the position shown in solid lines in FIG. 4. The front flange advantageously includes a cam surface 254 (FIG. 2) which is engaged by the retainer arm 250 to force the container 34 upwardly to the dispensing position as the hook arm 250 engages the flange 252 to insure proper positioning of the container.

When the nozzle 28 is pivoted in a counterclockwise direction (as viewed in FIG. 2) the hook arm 250 is swung out from beneath the flange 252 on the front wall 232 of the container 34. This releases a front end portion of the container for downward movement to enable an elongated guide flange or lip 260 to move downwardly and into engagement with an arcuate guide member 262 (as shown in dashed line in FIG. 4). The container 34 is then supported in a downwardly sloping position with the front wall 232 clear of the

nozzle 28 and a front lip on the baseplate 242. When the container 34 is in this downward sloping position, the rear wall 236 of the container is raised upwardly so that it will engage the stop member 240 when the container 34 reaches the fully extended position shown in dashed lines in FIG. 4.

When the container 34 is in the extended position, the interior of the container can be readily inspected and drink concentrate added to the container 34. The container 34 is advantageously made out of a translucent material so that the level of drink concentrate in the container can be visually ascertained with the container in the retracted position. If desired, when the container 34 is in the extended position the front portion of the container can be raised slightly to move the rear wall 236 downwardly away from the stop member 240. Once the rear wall 236 has cleared the stop member 240, the container 34 can be withdrawn from the baseplate 242 for cleaning or filling at a remote location.

It should be noted that when the container 34 is in the retracted position as shown in solid lines in FIG. 4, a bottom wall 270 of the container slopes downwardly toward a recess 276 which is connected in fluid communication with the conduit 170. Therefore, when the level of drink concentrate is relatively low, it will accumulate in the recess 276 to enable the dispenser assembly 12 to be operated for a relatively long time without refilling of the container 34, and minimize unused concentrate.

To enable the container 34 to be moved between the retracted and extended positions, the conduit 170 includes a fixed upper section 280 (FIG. 4) which is connected with the base 242 and leads to the mixing zone or chamber 164 and a movable lower section 282 which is integrally formed with the front wall 232 of the container 34. The upper and lower conduit sections 280 and 282 are connected in fluid communication by a resilient sleeve coupling 286. To provide for a fluid tight connection between the lower conduit section 282 and the upper conduit section 280, the lower conduit section includes a cylindrical upwardly extending portion 290 which is telescopically received in the coupling 286. It is understood that coupling 286 may be received in portion 290. This telescopic engagement between the coupling 286 and conduit section 282 is maintained by the latch arm 250 which holds the front portion of the container 34 upwardly by engaging the outwardly projecting flange 252 on the front wall of the container 34. Although the coupling 286 is disposed on the mounting plate 242 and the container 34 is moved relative to the coupling, it should be understood that the coupling could be moved with the container relative to the upper conduit section 280 if desired.

When the container 34 is to be moved to the extended position, the nozzle 28 is rotated, in the counterclockwise direction as shown in FIG. 2, to move the retainer arm 250 out of engagement with the flange 252. This enables the front portion of the container to be moved downwardly to move the lower conduit section 282 out of telescopic engagement with the coupling 286. The front guide 262 is somewhat lower than a rear guide 294 so that the upwardly projecting end portion 290 of the conduit section 282 clears the coupling sleeve 286 when the guide flange 260 rests on the front guide. A check valve 298 is provided in the coupling 286 to prevent dripping when the container 34 is

moved to the extended position and to maintain liquid in the mixing device 38.

The container 32 is constructed in the same manner as is the container 34 and cooperates with a resilient sleeve coupling 302 on the baseplate 242 in the same manner as in which the container 34 cooperates with the sleeve coupling 286. The nozzle 26 can be rotated in a counterclockwise direction, as viewed in FIG. 2, to disengage a hook arm 303 from a flange 304 and release the container 32 for outward movement from the retracted position to the extended position after a lower conduit section which is integrally formed with the container 32 has cleared the coupling 302 in the manner previously explained in connection with the container 34. A stop member, similar to the stop member 240, is engaged by a rear wall of the container 32 when it is in the extended position.

During operation of the dispenser assembly, dripping is prevented from the nozzles 24, 26 and 28 by venting the upper ends of the nozzles to the atmosphere. This venting of the upper ends of the nozzles 24, 26 and 28 releases the liquid in the nozzles for flow into a glass or other receiving container at the end of a dispensing operation. To provide for the venting action, a vent passage 310 (FIG. 3) is formed in an outer wall 312 of a tube or conduit leading from the mixing device 36 to the nozzle 26. This vent passage results in the application of atmospheric pressure to both sides of the liquid in the nozzle 28 so that the liquid can flow freely from the nozzle. Similar vent passages 310 are formed in the conduits or tubes leading to the nozzles 24 and 28 (FIGS. 4 and 5). Since the vent passages 310 enable the liquid to flow freely from the nozzles 24, 26 and 28, the nozzles do not tend to drip after the selector lever 20 is released and the open one of the valves 52, 54 or 56 has closed under the influence of the associated one of the spring fingers 70, 82 or 88.

After the dispenser assembly 12 has been used for a substantial period of time, it is contemplated that it will be desirable to clean the various operating components of the assembly. To facilitate cleaning, the mixing devices 36 and 38 drink strength control devices 42 and 44, and nozzles 24, 26 and 28 can be readily disconnected from a main body 313 (see FIG. 6) of the dispenser assembly 12. To disassemble the dispenser assembly 12 for cleaning, the drink concentrate containers 32 and 34 are first removed from the base 242 by moving the rear walls 236 of the containers clear of the stops 240 (FIG. 4) when the containers are in the extended positions. Once the containers 32 and 34 have been removed, retaining fingers or arms 314 and 315 (FIGS. 2 and 3) are swung upwardly from the retaining positions of FIGS. 4 and 5 to release a front or forward section 316 (FIG. 6) which includes the mixing devices 36 and 38 and drink strength controls 42 and 44, for outward movement from the dispensing position of FIG. 6. As the forward section 316 is pulled outwardly, connecting conduits 317, 318 and 319 are moved out of telescopic engagement with mating sockets formed in the main body section 313. Also, the flexible couplings 286 and 302 are moved out of engagement with U-shaped slots formed in the forward portion of the mounting or support plate 242.

Once the front section 316 has been disconnected from the body 313. The front section can be easily disassembled to further facilitate cleaning. Thus, the nozzles 24, 26 and 28 can be disconnected from the pas-

sages 140, 146 and 152 so that they can be cleaned separately. To facilitate disconnection of the nozzles, they are removably secured to the associated conduits by engagement of protuberances 320 with suitably formed slots in the nozzles 24, 26 and 28. The slots in the nozzles 26 and 28 have a generally L-shaped configuration to enable the protuberances 320 to cooperate with the short leg of the L-shaped slots during rotation of these nozzles to move the latch arms 250 into and out of engagement with the flanges 252. In addition, the drink strength flow control valves 194 and 206 can be moved axially outwardly by releasing spring type clip fingers which hold them in their normal operating positions. Of course, the sleeve couplings 286 and 302 can be disconnected from the upper sections of conduit to facilitate cleaning the check valves located within the sleeve couplings.

To further facilitate cleaning of the dispenser assembly, the selector lever 20 can be readily removed from the support member 62. To remove the selector lever or member 20, it is merely necessary to remove a retaining pin or screw 321 (FIG. 5) and slide the selector member forwardly to move a pivot post 322, which is integrally formed with the selector lever 20, out of a forwardly opening U-shaped slot in the support mounting 62. It should be noted that a pair of stop arms 326 and 328 are integrally formed with the selector member 20 to limit its pivotal movement relative to the valves 52, 54 and 56 so that the selector member 20 stops its rotational movement about the pivot post 322 in either a clockwise or counterclockwise direction, as viewed in FIG. 3, with one of the actuator arms 78 or 86 beneath one of the spring arms 82 or 88.

While the dispenser assembly 20 has been designed to be readily disassembled for cleaning purposes, it should be understood that this design enables it to be readily assembled at a factory or other location. To facilitate mounting the dispenser assembly in a refrigerator, support or mounting brackets 332 and 334 (FIG. 3) which are fastened to a refrigerator wall, can be connected to the base 242 with upstanding tabs disposed on either the left or right hand side of the dispenser assembly for either a right or left hand mounting.

From the foregoing description can be seen that the dispenser assembly 12 is operable to dispense either water or a mixture of water and one of a plurality of drink concentrates. To effect a dispensing of a desired drink, whether it is a mixture of water and a concentrate or just water, the selector lever 20 is pivoted to locate an actuator arm 66, 78 or 86 to actuate a selected control valve 52, 54 or 56. Simultaneously with actuation of one of the control valves 52, 54 or 56, the selector lever 20 cams the actuator lever 120 rearwardly to open the main or water inlet flow control valve 92. Opening the main or water flow control valve 92 enables water to flow at a relatively constant rate into and out of the tempering tank 16 in the manner illustrated schematically in FIG. 8.

The flow of water from the tempering tank 16 enters the manifold conduit 74 (FIG. 8) and flows through one of the control valves 52, 54 or 56 which is opened against the influence of its biasing spring by depressing the selector lever 20. If water is to be dispensed from the central nozzle 24, the control valve 54 is opened and water is conducted directly to the nozzle 24 through the conduit 140. However, if a drink mixture of a concentrate from either the container 32 or the

container 34 is desired, one of the valves 52 or 56 is opened to conduct the water to a mixing device 36 or 38. A mixture of water and the selected concentrate then flows to one of the nozzles 26 or 28 and into a glass or other receiving container (not shown).

If a drink made up of a mixture of the concentrate in container 32 is to be dispensed and the ratio of drink concentrate to water is to be varied, the knob 46 is turned to operate the valve 206 to vary the rate at which water is bypassed around the venturi 180. If the strength of the drink is to be increased, that is in larger percentage of drink concentrate is to be added to the drink, the knob 46 is turned to further close the valve 206 to reduce the rate at which water is bypassed around the venturi 180. On the other hand, if the ratio of drink concentrate to water is to be decreased, the knob 46 is turned to increase the rate at which water is bypassed around the venturi 180. The mixing device 38 and drink strength control 40 works in the same manner as does the mixing device 36 and drink strength control 42 to mix a selected ratio of drink concentrate and water in the mixing zone or chamber 164 before it is dispensed from the nozzle 28.

Although the drink dispenser 12 has been illustrated herein in association with two containers 32 and 34 for dispensing only two different drink concentrates from the nozzles 26 and 28, it should be understood that other containers for holding other drink concentrates could be provided. If this was done, the number of operating positions to which the selector lever 20 can be moved would be increased by corresponding amount. However, it should be understood that the number of actuator arms provided in association with the selector lever 20 need not necessarily be increased since one of the existing actuator arms could be utilized to effect actuation of any one of a plurality of valves. Also, it should be understood that the various drinks could be dispensed from a single nozzle if desired. Of course, the particular type of drink concentrate dispensed from the containers 32 and 34 can be varied. For example, a fresh fruit concentrate could be provided in one of the containers and a concentrated syrup provided in the other container.

Having described specific preferred embodiments of the invention, the following is claimed:

1. Dispenser apparatus for dispensing a mixing beverage with a selected one of a plurality of drink concentrates, said dispenser assembly comprising:

- a. a mixing beverage inlet valve having a closed position preventing mixing beverage flow therethrough and an open position permitting flow through its outlet;
- b. a manifold conduit communicating with the outlet of said inlet valve and having first and second valves disposed therein;
- c. manually operable means for actuating said inlet valve with one of said first and second valves including a lever rotatable in a first plane to selectively engage one of said first and second valves and pivotable in a second plane to actuate said selectively engaged valve and said inlet valve;
- d. first and second containers for storing drink concentrates for said first and second valves respectively; and
- e. mixing and nozzle means connecting said first valve with said first drink container and said second valve with said second drink container for mix-

ing and dispensing a selective drink concentrate in predetermined proportion to said mixing beverage when said manually operable means are actuated.

2. The dispenser apparatus of claim 1 wherein said mixing beverage constitutes water and said apparatus further includes a third valve in said manifold conduit and an associated conduit and nozzle therewith for dispensing water.

3. The dispensing apparatus of claim 2 wherein said lever further includes a first and second cammed projection extending therefrom, said second cammed projection disposed further outwardly than said first, said inlet valve has a spring biased valve stem for actuating said valve and adjacent said second projection in all positions of said lever in said first plane and depressed by said lever when said lever is pivoted in said second plane, said first, second and third valves have shelves for actuating said valves which extend over said first projection when said lever is in a selected position, and said manually operable means further includes seating means to permit said lever to rotate and pivot about a fixed point thereon.

4. A dispenser assembly for use in dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates, said dispenser assembly comprising nozzle means for dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates, first mixing means for mixing water and a first drink concentrate, second mixing means for mixing water and a second drink concentrate, a plurality of conduit means including a first conduit means for conducting water to said nozzle means, second conduit means for conducting water to said mixing means and for conducting a mixture of water and the first drink concentrate from the first mixing means to said nozzle means, and third conduit means for conducting water to said second mixing means and for conducting a mixture of water and the second drink concentrate from the second mixing means to said nozzle means, first valve means operable between a closed condition blocking a flow of water through said first conduit means and an open condition enabling water to flow through said first conduit means to said nozzle means, second valve means operable between a closed condition blocking a flow of water through said second conduit means to said first mixing means and an open condition enabling water to flow through said second conduit means to said first mixing means and enabling a mixture of water and the first drink concentrate to flow from said first mixing means to said nozzle means, third valve means operable between a closed condition blocking a flow of water through said third conduit means to said second mixing means and an open condition enabling water to flow through said third conduit means to said second mixing means and enabling a mixture of water and the second drink concentrate to flow from said second mixing means to said nozzle means, and actuator means for operating a selected one of said valve means between the open and closed conditions to effect a flow either water or a mixture of water and a selected one of the drink concentrates to said nozzle means, said actuator means including a manually engageable selector member and mounting means supporting said selector member for movement between a selected one of a plurality of operating positions in each of which said selector member is associated with a selected one of said valve means, said mounting

means also supporting said selector member for movement between an unactuated position and an actuated position when said selector member is in any one of said operating positions to enable said selector member to effect operation of a selected one of said valve means from the closed condition to the open condition to enable either water or a mixture of water and one of the drink concentrates to flow to said nozzle means and said mounting means includes means for supporting said selector member for rotational movement about first axis to a selected one of said plurality of operating positions and means for supporting said selector member for rotational movement about a second axis between said unactuated and actuated positions.

5. Dispensing apparatus for mixing a beverage with a concentrated beverage to produce a mixed beverage of various proportions thereof and dispensing same comprising:

- a. a first conduit having an upstream portion, a downstream portion and a throat portion interposed said upstream and downstream portions;
- b. means for supplying said mixing beverage to said upstream portion of said first conduit;
- c. means for supplying said concentrated beverage to said downstream portion of said first conduit at a first point therein adjacent said throat portion when and as said mixing beverage flows through said throat portion;
- d. a second conduit having an inlet connected to said upstream portion of said first conduit and an outlet connected to said downstream portion of said first conduit at a second point beyond said first point; and
- e. an adjustable valve in said second conduit regulating the flow of mixing beverage therethrough and correspondingly the flow rate of mixing beverage through said throat section.

6. The dispensing apparatus of claim 5 wherein said adjustable valve comprises a rotatable knob having marked indicia thereon, a shaft secured at one end to said knob and sealing disposed in said second conduit, said shaft having a tapered end portion at its other end adjacent said outlet of said second conduit.

7. The dispensing apparatus of claim 5 wherein said adjustable valve comprises a rotatable knob having marked indicia thereon, a hollow shaft secured at one end to said knob and sealing disposed in said second conduit, said shaft having an opening extending through one of its wall portions and adapted to be in and out of engagement with said outlet of said second conduit when said knob is rotated.

8. A dispenser assembly for use in dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates, said dispenser assembly comprising nozzle means for dispensing either water or a mixture of water and a selected one of a plurality of drink concentrates, first mixing means for mixing water and a first drink concentrate, second mixing means for mixing water and a second drink concentrate, a plurality of conduit means including a first conduit means for conducting water to said nozzle means, second conduit means for conducting water to said first mixing means and for conducting a mixture of water and the first drink concentrate from the first mixing means to said nozzle means, and third conduit means for conducting water to said second mixing means and for conducting a mixture of water and the second drink concentrate

from the second mixing means to said nozzle means, first valve means operable between a closed condition blocking a flow of water through said first conduit means and an open condition enabling water to flow through said first conduit means to said nozzle means, second valve means operable between a closed condition blocking a flow of water through said second conduit means to said first mixing means and an open condition enabling water to flow through said second conduit means to said first mixing means and enabling a mixture of water and the first drink concentrate to flow from said first mixing means to said nozzle means, third valve means operable between a closed condition blocking a flow of water through said third conduit means to said second mixing means and an open condition enabling water to flow through said third conduit means to said second mixing means and enabling a mixture of water and the second drink concentrate to flow from said second mixing means to said nozzle means, and actuator means for operating a selected one of said valve means between the open and closed conditions to effect a flow either water or a mixture of water and a selected one of the drink concentrates to said nozzle means, said actuator means including a manually engageable selector member and mounting means supporting said selector member for movement between a selected one of a plurality of operating positions in each of which said selector member is associated with a selected one of said valve means, said mounting means also supporting said selector member for movement between an unactuated position and an actuated position when said selector member is in any one of said operating positions to enable said selector member to effect operation of a selected one of said valve means from the closed condition to the open condition to enable either water or a mixture of water and one of the drink concentrates to flow to said nozzle means and first bypass means for enabling the ratio of water to first drink concentrate mixed in said first mixing means to be varied, and second bypass means for enabling the ratio of water to second drink concentrate mixed in said second mixing means to be varied.

9. A dispenser assembly as set forth in claim 8 further including first flow regulating means connected with said first bypass means for varying a flow rate of water through said bypass means relative to the flow rate of water through said second conduit means, and second flow regulating means connected with said second bypass means for varying a flow rate of water through said second bypass means relative to the flow rate of water through said third conduit means.

10. A dispenser assembly as set forth in claim 9 wherein said first mixing means includes a first venturi means having an upstream end portion for receiving water from said second conduit means, a throat, and a mixing chamber downstream of said throat connected in fluid communication with a source of the first drink concentrate, said first bypass means including a conduit for conducting water from an area adjacent to the upstream end portion of said first venturi means to an area downstream of said throat, said second mixing means including a second venturi means having an upstream end portion for receiving water from said third conduit means, a throat and a mixing chamber downstream of said throat connected in fluid communication with a source of the second drink concentrate, said second bypass means including a conduit for conducting

water from an area adjacent to the upstream end portion of said second venturi means to an area downstream of said throat of said second venturi means.

11. A dispenser assembly for use in dispensing a mixture of water and a selected one of plurality of drink concentrates, said dispenser assembly comprising a base member, first container means for holding a first drink concentrate, second container means for holding a second drink concentrate, first mixing means for mixing drink concentrate from said first container means with water, second mixing means for mixing drink concentrate from said second container means with water, first conduit means for conducting drink concentrate from said first container means to said first mixing means, second conduit means for conducting drink concentrate from said second container means to said second mixing means, first nozzle means for dispensing a mixture of the first drink concentrate and water, second nozzle means for dispensing a mixture of the second drink concentrate and water, third conduit means for conducting water to said first and second mixing means and for conducting a mixture of water and drink concentrate from said first and second mixing means to said nozzle means, valve means operable between a closed condition blocking a flow of water through said third conduit means to at least one of said mixing means and an open condition enabling water to flow through said third conduit means to at least one of said mixing means, guide means disposed on said base for guiding movement of said first and second container means relative to said base, each of said first and second container means being independently movable relative to said base between a retracted position and an extended position projecting outwardly from said base to provide access to the interior of one of said container means when it is in the extended position, and wherein said first and second conduit means each include a first section of conduit connected with an associated one of said container means for movement therewith relative to said base, a second section of conduit connected with said base, and releasable coupling means for interconnecting said first end sections of conduit, each of said first sections of conduit and the associated one of said container means being movable toward said base when the associated one of said container means is in the retracted position to effect an interconnection of the associated first and second sections of conduit by one of said coupling means and away from said base to effect a disconnection of the associated first and second sections of conduit at said one coupling means to release the associated container means for movement from its retracted position to its extended position.

12. A dispenser assembly as set forth in claim 11 further including first stop means connected with said base for blocking outward movement of said first container means when said first container means reaches the extended position during movement from the retracted position, and second stop means connected with said base for blocking outward movement of said second container means when said second container means reaches the extended position during movement from the retracted position.

13. A dispenser assembly as set forth in claim 11 further including first stop means connected with said base for engaging a trailing wall of said first container means to block outward movement of said first con-

tainer means when said first container means reaches the extended position during movement from the retracted position, and second stop means connected with for engaging a trailing wall of said second container means to block outward movement of said second container means when said second container means reaches the extended position during movement from the retracted position, said guide means including means for enabling the trailing walls of said first and second container means to move away from said base and clear of said first and second stop means.

14. A dispenser assembly as set forth in claim 11 further including first drink strength control means for varying the ratio of the first drink concentrate to water in the mixture conducted from said first mixing means to said first nozzle means, and second drink strength control means for varying the ratio of the second drink concentrate to water in the mixture conducted from said second mixing means to said second nozzle means.

15. A dispenser assembly as set forth in claim 11 further including first retainer means for releasably holding said first container means against movement relative to said base when said first container means is in the retracted position and the associated first and second sections of conduit are interconnected by one of said coupling means, second retainer means for releasably holding said second container means against movement relative to said base when said second container means is in the retracted position and the associated first and second sections of conduit are interconnected by another of said coupling means, said first and second retainer means being selectively operable to release said first and second container means for movement relative to said base to disconnect the associated first and second conduit sections while said first and second container means are in their retracted positions.

16. A dispenser assembly as set forth in claim 15 wherein said first retainer means is connected with said first nozzle means and said second retainer means is connected with said second nozzle means, said first and second nozzle means being movable relative to said base to effect operation of said first and second retainer means to release said first and second container means for movement away from said base.

17. A multibeverage dispenser for mixing water and a selected one of a plurality of drink concentrates and dispensing same, comprising:

- a. a water inlet valve having an inlet connected to a source of tap water and an outlet, a closed position preventing water flow therethrough and an open position permitting water flow out said outlet;
- b. a tempering tank having an inlet connected to said outlet of said inlet valve and an outlet;
- c. a manifold conduit connected to said outlet of said tempering tank and having a first and second valve disposed therein;
- d. manually operable means for actuating said inlet and a selected one of said first and second valves to allow tempered water to flow through said selected valve;
- e. first and second containers for storing drink concentrates for first and second valves respectively;
- f. means for mixing and dispensing one of said drink concentrates with its associated valve when said manually operable means is actuated, said mixing and dispensing means further including first and second nozzles and first and second conduit means

17

connecting said first and second valves with said first and second containers and said first and second nozzles respectively and drip preventing means preventing beverage from dripping from said nozzles when said manually operable means is not ac-

5

18

tuated, said drip preventing means including a vented connection between said and second nozzles and said first and second conduit means respectively.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65