Feb. 18, 1947. C. C. BAUERLEIN ET AL 2,415,861

PRESSURE OPERATED MIXED DRINK DISPENSER

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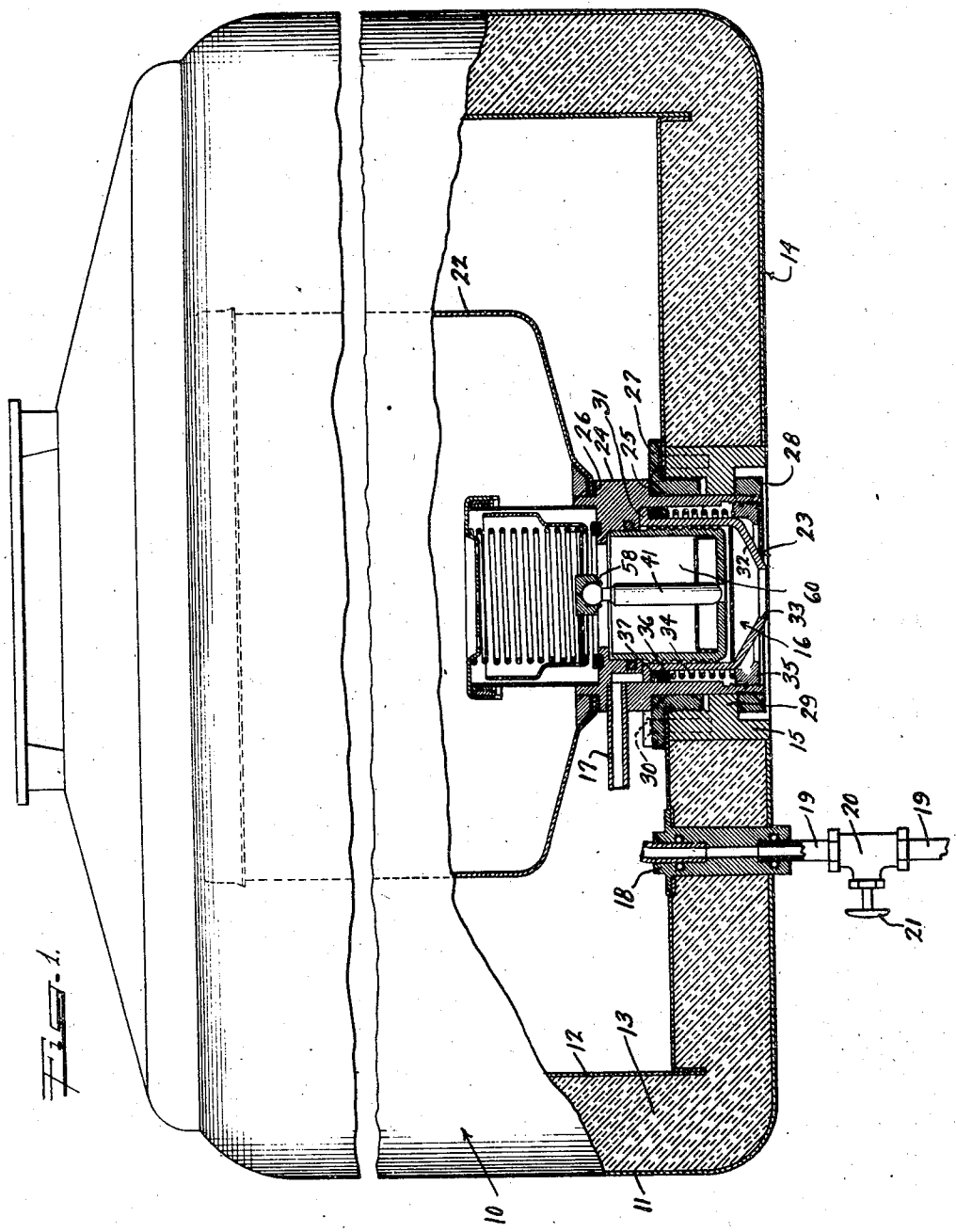


Fig. 1.

Inventors
CARL C. BAUERLEIN.
WILLIAM F. CRAMER, JR.

By The firm of Charles H. Hills Attys.

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Fig. 2.

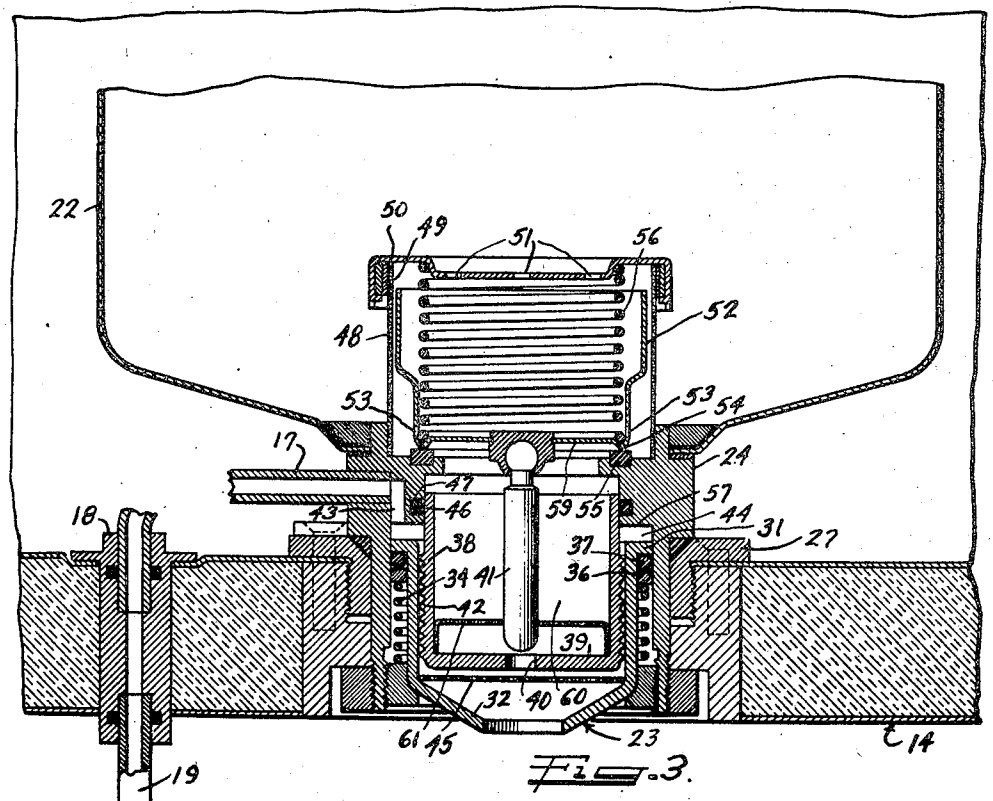
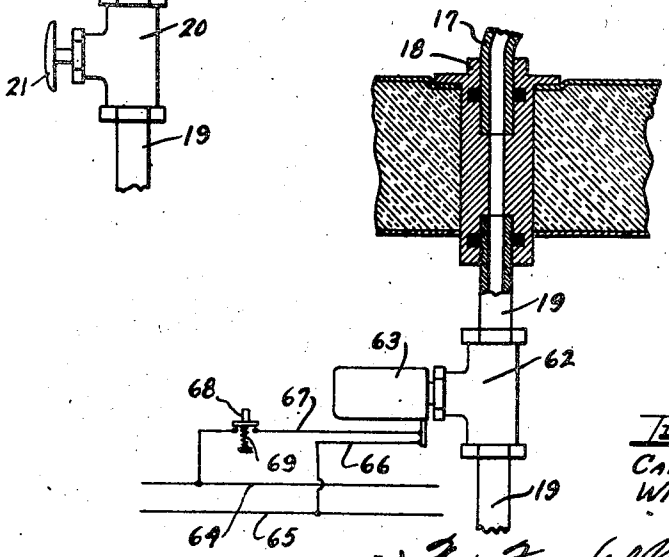


Fig. 3.



Inventors
CARL C. BAUERLEIN.
WILLIAM F. CRAMER, JR.

By Geo. Tennyson & Charles K. Wilkinson
Attys.

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PRESSURE OPERATED MIXED DRINK DISPENSER

Carl C. Bauerlein, Glencoe, and William F. Cramer, Jr., Chicago, Ill., assignors to The Dole Valve Company, Chicago, Ill., a corporation of Illinois

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9 Claims. (Cl. 225—26)

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This invention relates to a drink dispenser and more particularly to a dispensing device of the type wherein one fluid, such as a syrup, is arranged to be mixed with a second carbonated liquid to form a carbonated beverage.

In the production of a beverage in which carbonated water is mixed with a flavoring syrup, it is highly desirable that the uniformity of the resulting drink be maintained with fidelity in order to assure uniformity in the taste of each successive drink. The maintenance of the proper proportions of the component liquids combined to form the drink is determinative of its resulting taste and uniformity of mixture. The proportions of the liquids employed in the drink are altered by such factors as changes in the pressure of the carbonated water and variations in the viscosity of the syrup.

In view of the fact that it is usually desirable to serve the drink in a chilled condition, it is extremely important that the measuring and valving arrangement for the syrup be constructed and arranged in such a manner that the flow of syrup into the mixing area will not be unduly impeded. It has been found extremely desirable to provide a valving and measuring arrangement for the syrup in which the syrup has only a very short flow passage following the point where the valve is opened into the area where it is mixed with the carbonated water.

It is further desirable that a simple operating arrangement be provided for opening and closing the valves which mix the carbonated liquid with the syrup, and discharge the resulting mixture.

One of the principal features and objects of the present invention is to provide a novel drink dispenser in which the valves are operated by fluid under pressure.

It is a further object of the present invention to provide a novel drink dispenser for mixing a carbonated liquid with a flavoring syrup in which the fluid pressure of the carbonated liquid is employed to open the syrup valve.

A still further object of the present invention is to provide a novel drink dispenser in which the admission of carbonated liquid to the syrup mixing valve automatically opens the syrup valve and admits a predetermined quantity of syrup.

Another object of the present invention is to provide a drink dispenser of novel construction which is economical to manufacture and which is extremely effective and efficient in use.

Still another and further object of the present invention is to provide a novel mixing valve unit for mixing two fluids together.

It is a further object of the present invention to provide a drink dispenser in which means is provided to prevent drawing soda water or syrup alone.

The novel features which we believe to be characteristic of our invention are set forth with particularity in the appended claims. Our invention itself, however, both as to its manner of construction and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

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Figure 1 is a side elevational view partly in section showing a drink dispensing device embodying the novel features of the present invention:

Figure 2 is an enlarged fragmentary elevational view of the mixing valve unit of the drink dispenser shown in Figure 1 but with the respective parts in their beverage discharging position; and

Figure 3 is a fragmentary view partly in section of the carbonated liquid supply line showing an electrically operated valve therein in place of the manually operated valve shown in the embodiment of the invention in Figures 1 and 2.

The embodiment of the invention illustrated in Figures 1 and 2 of the drawings comprises a casing or cabinet 10 having an outer shell 11 and an inner shell 12 spaced from each other by some suitable heat insulating material 13. The casing or cabinet 10 is arranged to accommodate a suitable temperature changing medium, such, for example, as ice, as well as to accommodate the mixing and dispensing apparatus now to be described.

Mounted in the base wall 14 of the casing 10 is a collar 15 which supports the mixing and dispensing apparatus generally designated by the reference character 16. A carbonated liquid, such as carbonated water, is supplied to the mixing and dispensing head 16 through a metal tubing 17 which is broken away for purposes of clarity of illustration but which will be understood to be folded back and forth within the casing 10 and preferably along the interior surface of the base wall 14.

The tube 17 is of sufficient length within the casing 10 so that an adequate quantity of carbonated liquid is subjected to the influence of the temperature changing medium within the casing 10. One end of the tubing 17 is connected to the mixing head 16 while the other end is connected to a member 18 which extends through the base wall 14 of the casing 10. The other end of the passage member 18 is connected to a carbonated liquid supply line 19 which is provided with a valve 20 therein. The valve 20 may be of any suitable construction or design and is illustrated as being of the type wherein a push-button operating member 21 is arranged to open the valve when the button 21 is manually pushed toward the valve proper.

In the embodiment of the invention illustrated in Figures 1 and 2 the drink dispenser is shown

as being of a type wherein a flavoring syrup is arranged to be mixed with carbonated water. The flavoring syrup is stored in a jar or syrup tank 22 which is mounted on top of the mixing and dispensing unit 16. In a manner which will presently be explained, the syrup is arranged to be metered and fed to a region within the unit 16 where it is mixed with the carbonated water and then discharged through the lower end of the head 23 of the unit 16.

The unit 16 includes a housing member 24 having a shoulder 25 and a second shoulder 26 on the exterior surface thereof. The shoulder 25 is seated on a flange member 27 which is threaded into the collar 15 and the base wall 14 of the casing 10. The lower end of the depending sleeve portion of the housing 24 is both externally and internally threaded. A clamping ring 28 is threaded on the exterior surface thereof up against the intermediate flange portion 29 of the collar 15. This pulls the shoulder 25 tightly against the flange member 27. The flange member 27 is secured to the collar 15 by means of bolts 30.

The discharge head 23 previously referred to is in the form of a sleeve having a flanged top 31, and a tapered lower end 32 having a relatively large opening 33 at the extreme lower end thereof. The discharge head 23 is biased upwardly by means of a coil spring 34 which extends between a lower annular member 35 which is threaded into the housing 24 and an annular ring 36 which is an integral part of the head 23. A resilient sealing member 37 is disposed on the under side of the flanged top 31 and the ring or shoulder 36 of the head 23. The flanged top 31 makes a close sliding fit with the interior wall of the housing member 24 for a reason which will presently be explained.

Firmly secured within the main cylindrical portion of the discharge head 23 is an exteriorly threaded hollow member 38 which is open at the top and closed at the bottom by a bottom wall 39. The bottom wall 39 has a small opening 40 therein which lies opposite the end of an elongated valve member 41. By virtue of the fact that the interior surface of the body portion of the head 23 is smooth, while the exterior surface of the member 38 is threaded, it will be seen that a spiral passageway 42 is provided by this construction.

The carbonated water supply tube 17 is connected into the housing 24 in the enlarged upper portion thereof. The portion of the housing 24 to which the tube 17 connects is provided with an interior passage 43 which opens into the space opposite the flanged portion 31 of the discharge head 23. It will thus be apparent that when carbonated water is admitted into the tubing 17 by depressing the push-button 21 this water under pressure enters the interior passageway 43 of the housing 24 and pushes against the flange portion 31 of the discharge head 23. Since the discharge head 23 is slidably mounted within the housing 24, it will be moved downwardly against the action of the biasing spring 34. The downward movement of the discharge head 23 admits carbonated water to the region 44 immediately above the flange portion 31 (as shown in Figure 2), and is thus free to pass down through the capillary passage 42 to the lower end of the discharge head 23. A baffle member, such, for example, as a wire screen 45, is disposed within the discharge head 23 at the point where the cylindrical body portion merges into the lower

tapered portion 32. For a reason which will be discussed presently, this effects a finer mixture of the carbonated water and the flavoring syrup.

In order to prevent the carbonated water from passing up from the region 44 between the upper end of the member 38 and the inner wall of the housing 24, a sealing ring 46 is disposed in an annular recess 47. This annular recess 47 is preferably slightly shallower than the normal diameter of the resilient sealing ring 46, but slightly greater in width. This type of sealing allows a slight kneading action of the material forming the resilient sealing ring 46 and prolongs the life thereof, while at the same time providing a more effective seal. This latter effect is due to the fact that any fluid under pressure seeping between the parts will only tend to compress the sealing ring in a direction parallel to its axis and expand it in a radial direction within its own plane.

The syrup tank 22 which has previously been referred to, is secured in any suitable manner to the upper end of the housing member 24. Mounted within the syrup tank 22 is a tubular screen portion 48 which is provided with a reinforcing ring 49 at its upper end. A cap 50 having a plurality of openings 51 therein, is secured to the top of the tubular screen 48. Within the tubular screen member 48 is a cup member 52 which is open at the top and which is provided with an annular series of openings 53 at the bottom. The lower end of the cup 52 is crimped in such a manner as to provide a flange ring 54 which is seated on a ring member 55. This ring member 55 is preferably formed of a resilient material such as rubber or the like.

Mounted within the cup 52 is a coil spring 56. This coil spring 56 extends between the cap 50 and the bottom of the cup 52. The effect of the spring 56 is to bias the cup 52 in a downward direction thus causing it to be seated on the resilient seating member 55. This spring 56, however, is relatively light compared with the spring 34, and it will thus be understood that when no carbonated fluid is flowing through the tube 17 the coil spring 34 has forced the flanged upper portion 31 of the discharge head 23 upwardly until it is seated against the inner shoulder 57 of the housing 24. This upward movement of the discharge head 23 carries the member 38 with it, since the member 38 is press-fitted within the discharge head 23. Upward movement of the member 38 causes the base wall 39 thereof to move into engagement with the elongated valve member 41 to close the opening 40. This base wall 39 is so positioned relative to the elongated valve member 41 that the opening 40 is closed prior to the time when the flanged upper portion 31 strikes the shoulder 57. The result is that the elongated valve member 41 which is carried through a universal connection 58 on the base wall 59 of the cup 52, carries the cup member 52 up off of the seat 55, as shown in Figure 1.

Syrup passes through the screen member 48 and thence down past the seating ring 55 into the chamber 60 formed by the member 38. The capacity of the chamber 60 represents the desired amount of flavoring syrup for each glass of carbonated beverage. When the elements are in the position as shown in Figure 1 nothing flows out from the discharge head due to the fact that the passage of fluid is blocked by the seating engagement of the base wall 39 against the elongated valve member 41 and by the valve 20 being closed.

When a glass of carbonated beverage is desired, the push-button 21 is depressed and carbonated water is admitted under pressure to the passageway 43 within the housing 24. This water under pressure forces the discharge head downwardly, thus freeing the opening 40 in the base wall 39 and permitting syrup to pass through this opening. As the discharge head 23 moves downwardly, the cup 52 is moved downwardly by its own biasing spring 56 and is seated on the seating member 55. No syrup can thus pass from the syrup tank 22 through the tubular screen member 48 and down into the discharge head. Only the quantity of syrup within the chamber 50 can flow through the opening 40 irrespective of how long the valve 20 is maintained in its open position. This assures an adequate quantity of syrup for each glass of carbonated beverage. As the carbonated water passes down through the capillary passage 42, it mixes with the syrup flowing through the opening 40 in the lower end of the discharge head 23. The resulting mixed drink or carbonated beverage is then discharged through the lower opening 33 in the discharge head 23. A glass or some other suitable receptacle is, of course, disposed below the opening 33 in order to receive the beverage being dispensed.

A second baffle or screen member 61 may be provided within the member 38 in the manner shown in Figures 1 and 2 of the drawings.

Figure 3 illustrates a modification of the embodiment of the invention shown in Figures 1 and 2 of the drawings. More particularly, the manually operated valve 20 is replaced by an electrically operated valve 62 which is controlled through a solenoid or electromagnet 63. The electromagnet 63 is energized from a suitable source of electric energy represented by the power supply lines 64 and 65. The solenoid 63 is connected to the power supply line 65 through a conductor 66 and to the power supply line 64 through a conductor 67 and a push-button switch 68, which is preferably resiliently biased to its open circuit position by a spring diagrammatically represented at 69. Upon depression of the push-button switch 68 the solenoid 63 is energized, which in turn opens the valve 62. This provides an extremely simple and easy remote control of the valve in the carbonated liquid supply line 19 when such is desired.

While we have shown particular embodiments of our invention, it will, of course, be understood that we do not wish to be limited thereto, since many modifications may be made, and we, therefore, contemplate by the appended claims to cover all such modifications as fall within the true spirit and scope of our invention.

We claim as our invention:

1. A device for mixing a syrup with a carbonated liquid for dispensing a carbonated beverage comprising a casing having a syrup tank mounted in an upper portion thereof, a mixing head housing mounted below said tank, a discharge head slidable within said housing between upper and lower positions, said discharge head including a cup-like member arranged to receive syrup from said tank, said tank including a port opening into said cup, a port closing member, means resiliently biasing said port closing member into port closing position, said cup-like member having an opening in the base thereof, an elongated valve member projecting downwardly from said port closing member into proximity with said cup opening, said valve member being of such length that said port closing member is seated on said port to close the same and said cup opening is free from said valve member when said discharge head is in said lower position and said port closing member is lifted off of said port and said cup opening is closed against the end of said valve member when said discharge head is in said upper position, said discharge head also including a nozzle portion below said cup-like member into which syrup flows when said cup opening is free from said valve member, and means for conducting a carbonated liquid into said nozzle portion, whereby said carbonated liquid mixes with said syrup and the mixed beverage is then discharged from said nozzle portion.

2. A device for mixing a syrup with a carbonated liquid for dispensing a carbonated beverage comprising a casing having a syrup tank mounted in an upper portion thereof, a mixing head housing mounted below said tank, a discharge head slidable within said housing between upper and lower positions, said discharge head including a cup-like member arranged to receive syrup from said tank, said tank including a port opening into said cup, a port closing member, means resiliently biasing said port closing member into port closing position, said cup-like member having an opening in the base thereof; an elongated valve member projecting downwardly from said port closing member into proximity with said cup opening, said valve member being of such length that said port closing member is seated on said port to close the same and said cup opening is free from said valve member when said discharge head is in said lower position and said port closing member is lifted off of said port and said cup opening is closed against the end of said valve member when said discharge head is in said upper position, said discharge head also including a nozzle portion below said cup-like member into which syrup flows when said cup opening is free from said valve member, and means for conducting a carbonated liquid into said nozzle portion, valve means for interrupting the flow of carbonated liquid to said nozzle portion, and means responsive to the flow of carbonated liquid to said nozzle portion for moving said discharge head from its said upper position to its said lower position.

3. A device for mixing a syrup with a carbonated liquid for dispensing a carbonated beverage comprising a casing having a syrup tank mounted in an upper portion thereof, a mixing head housing mounted below said tank, a discharge head slidable within said housing between upper and lower positions, means biasing said discharge head to said upper position, said discharge head including a cup-like member arranged to receive syrup from said tank, said tank including a port opening into said cup, a port closing member, means resiliently biasing said port closing member into port closing position, said cup-like member having an opening in the base thereof, an elongated valve member projecting downwardly from said port closing member into proximity with said cup opening, said valve member being of such length that said port closing member is seated on said port to close the same and said cup opening is free from said valve member when said discharge head is in said lower position and said port closing member is lifted off of said port and said cup opening is closed against the end of said valve member when said discharge head is in said upper position, said discharge head also including a nozzle portion below said cup-like member into which syrup

flows when said cup opening is free from said valve member, and means for conducting a carbonated liquid into said nozzle portion, valve means for interrupting the flow of carbonated liquid to said nozzle portion, and means responsive to the flow of carbonated liquid to said nozzle portion for moving said discharge head from its said upper position to its said lower position.

4. In a device for mixing a liquid with a fluid under pressure and for dispensing a mixture of said liquid and fluid, a casing comprising a tank containing said liquid, a mixing chamber associated with said casing and connected to said tank, a discharge head slidable within said chamber, said discharge head including a cup-like member receiving liquid from said tank, said tank including a port communicating with said cup member, a port closing member, means resiliently biasing said port closing member into port closing position, said cup-like member also having a discharge opening and a valve member cooperable with said discharge opening to open and close the same, said valve and port closing members being so interrelated that said port is open and said discharge opening is closed when said discharge head is slid to one position and said port is closed and said discharge opening is open when said discharge head is slid to another position for the dispensing of the mixture, said discharge head also having a nozzle portion below said cup-like member into which liquid flows when said discharge opening is free from said valve member, and means for conducting said fluid under pressure into said nozzle portion for mixture with said liquid discharged into the nozzle portion from said discharge head and for operating said valve member to open said discharge opening and to release liquid from said cup-like member.

5. In a dispenser, including means for supplying fluid under pressure and liquid to be mixed and a discharge opening from which the mixture is dispensed, a control head between said supply means and said discharge opening including a receptacle for receiving a given charge of liquid and means responsive to the pressure of incoming fluid for releasing the charge from said receptacle for mixture with said fluid in advance of passage through said discharge opening, said control head comprising a cup in which said receptacle is slidably nested, said cup and receptacle being relatively movable in response to the admission of fluid under pressure in said head for closing off the supply of liquid to said receptacle and for releasing the charge therein for delivery into said cup and to said discharge opening.

6. In a dispenser, including means for supplying fluid under pressure and liquid to be mixed and a discharge opening from which the mixture is dispensed, a control head between said supply means and said discharge opening including a receptacle for receiving a given charge of liquid and means responsive to the pressure of incoming fluid for releasing the charge from said receptacle for mixture with said fluid in advance of passage through said discharge opening, said head also including an outer spring urged cup in which said receptacle is slidably disposed, there being a capillary passage between the wall of said receptacle and said cup through which fluid under pressure passes to reach said discharge opening.

7. In a dispenser, including means for supplying fluid under pressure and liquid to be mixed

and a discharge opening from which the mixture is dispensed, a control head between said supply means and said discharge opening including a receptacle for receiving a given charge of liquid and means responsive to the pressure of incoming fluid for releasing the charge from said receptacle for mixture with said fluid in advance of passage through said discharge opening, said receptacle having an opening disposed over said discharge opening as well as a plug member for normally closing the same, said control head including spring means for maintaining said receptacle opening closed by said plug member and which spring means is arranged to be operated by the entry of fluid under pressure in said head whereby the receptacle is moved out of engagement with said plug member to close off the supply of liquid to said receptacle and to open said receptacle opening for the discharge of the contents of the receptacle.

8. In a dispenser including means for supplying fluid under pressure and a liquid containing tank for supplying liquid to the fluid, a wall on which said tank is supported having an opening therein, as well as a connection to said supply of fluid under pressure, a control head in said opening including an outer spring supported cup for receiving said fluid under pressure, said outer cup having a dispensing opening, an inner cup slidably disposed in said outer cup for receiving liquid from said tank and provided with a discharge opening through which liquid is delivered to the inside of the outer cup for combination with the fluid in advance of passage through said dispensing opening and means normally closing said discharge opening of the inner cup and establishing a communication between said inner cup and said tank for supplying a given charge of liquid to said inner cup, said means being constructed and arranged to be operated by the pressure of fluid admitted into said outer cup whereby the inner supply of liquid to said inner cup is shut off and its discharge opening is opened to deliver the charge of liquid to the incoming fluid under pressure in advance of passage through said dispensing opening.

9. In a dispenser including means for supplying fluid under pressure and liquid to be mixed and a discharge opening from which the mixture is dispensed, a control head between said supply means and said discharge opening including a receptacle for receiving a given charge of liquid and means responsive to the pressure of incoming fluid for releasing the charge from said receptacle for mixture with said fluid in advance of passage through said discharge opening, said control head including an outer fluid receiving cup in which said liquid receiving receptacle is disposed, and interrelated spring means for controlling the charging of said receptacle and the discharge of liquid therefrom in response to flow of fluid under pressure through said head.

CARL C. BAUERLEIN.
WILLIAM F. CRAMER, JR.

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