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2,548,641

APPARATUS FOR MIXING AND DISPENSING BEVERAGES

Filed Sept. 23, 1949

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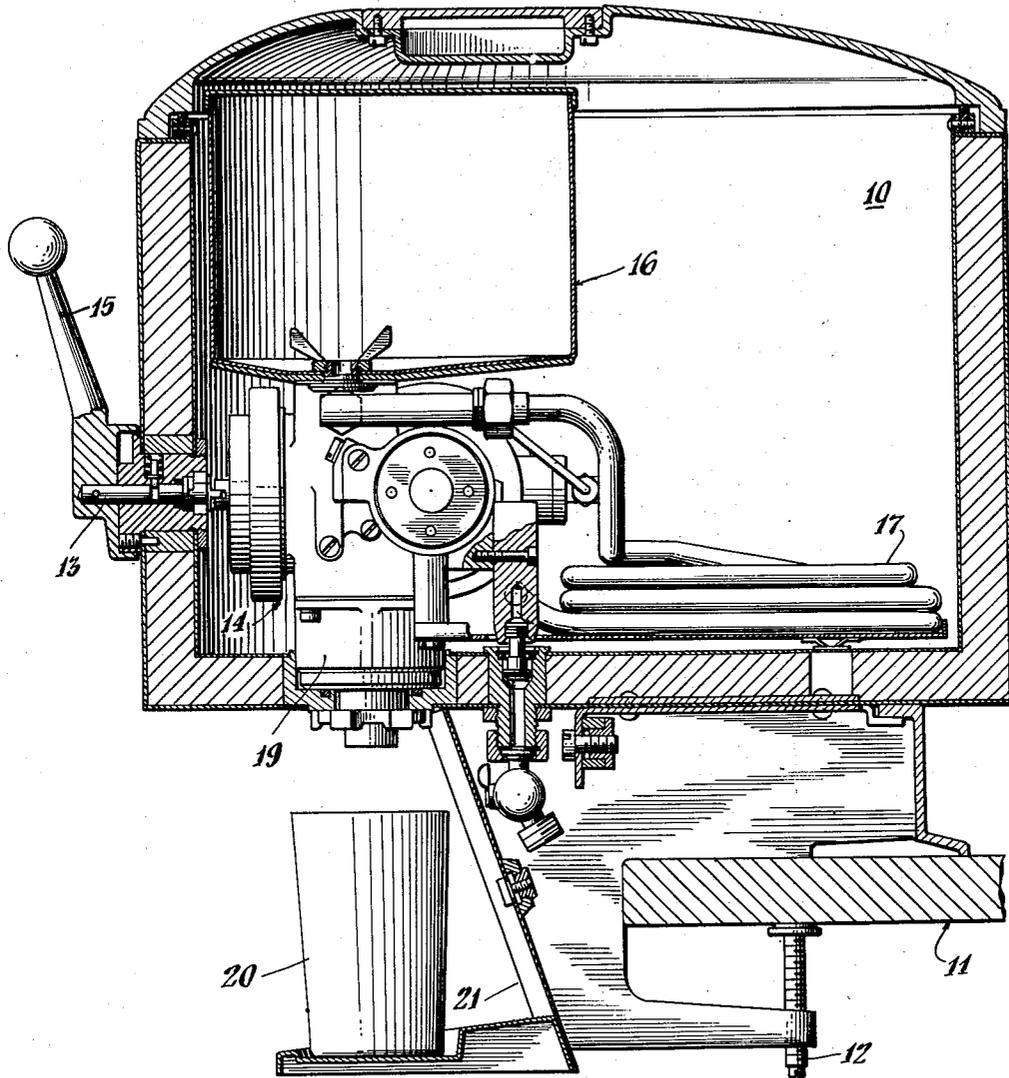
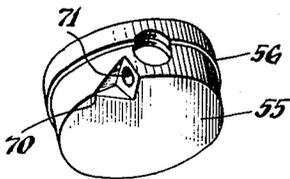


Fig. 5

Fig. 1



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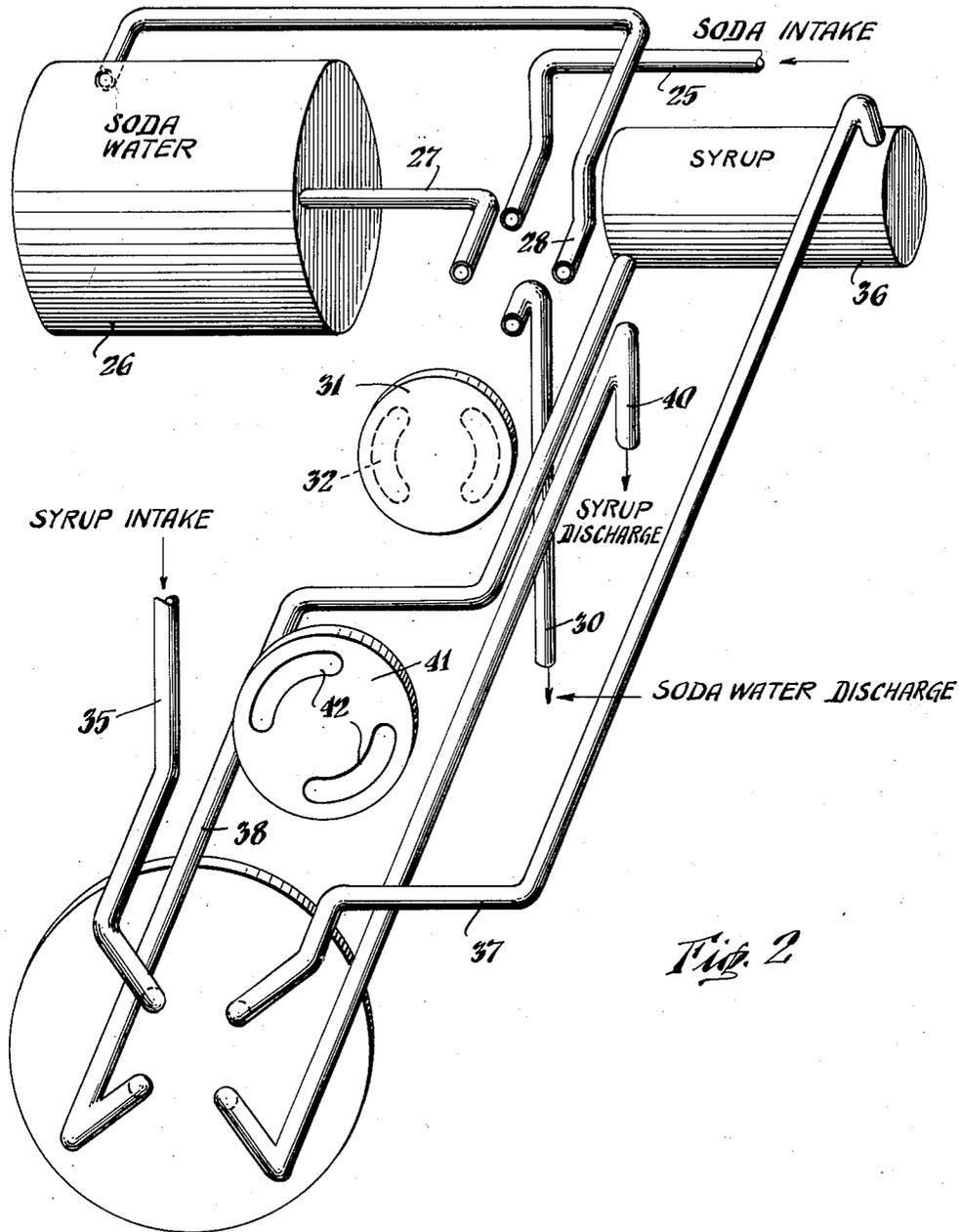


Fig. 2

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Fig. 4

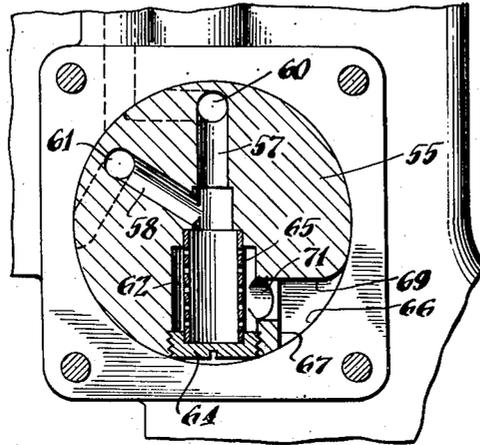
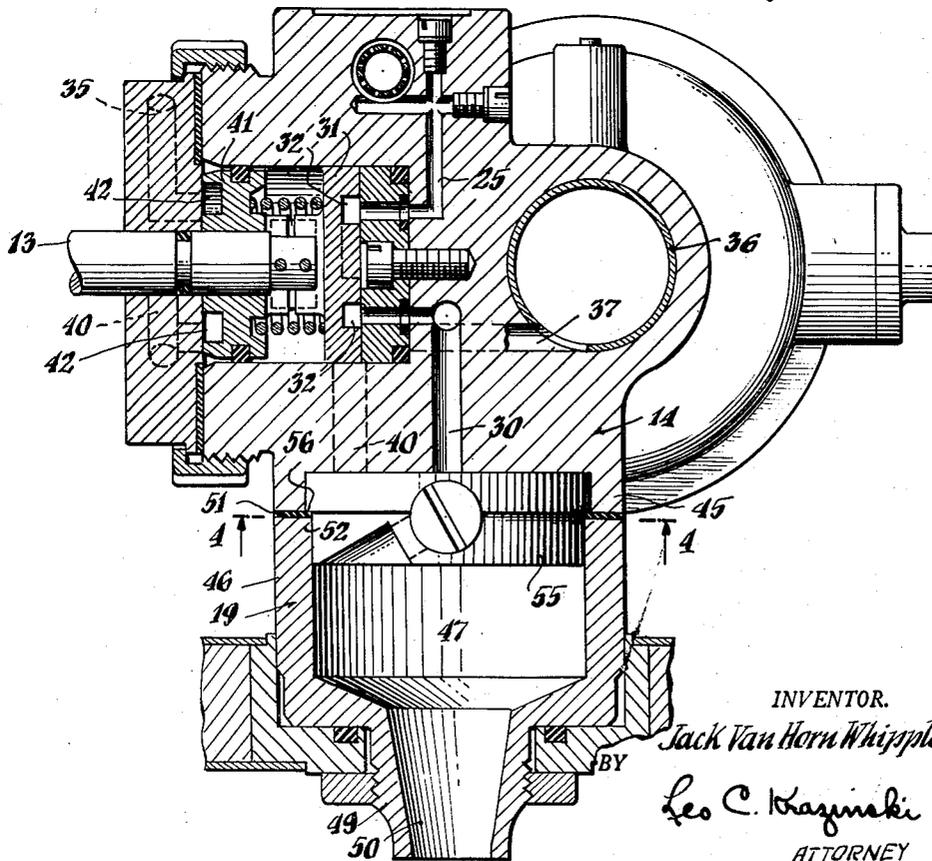


Fig. 3



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2,548,641

APPARATUS FOR MIXING AND DISPENSING BEVERAGES

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12 Claims. (Cl. 259-4)

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The present invention relates to liquid dispensing, and, more particularly, to apparatus for mixing and dispensing beverages.

The present invention is primarily concerned with such apparatus which automatically measures a charge of carbonated water or the like and a charge of syrup, flavoring material, or the like, wherein the water and syrup are thoroughly mixed prior to being dispensed into a drinking receptacle.

Accordingly, an object of the present invention is to provide improved mixing means for apparatus of the foregoing character.

Another object is to provide such mixing means which are simple and practical in construction and do not materially increase the cost of the apparatus.

A further object is to provide such mixing means which can readily be taken apart for cleaning and can be replaced with a minimum of effort.

A still further object is to provide such mixing means wherein the water and syrup are subject to extreme turbulence to produce a thoroughly mixed beverage which requires no further stirring after being dispensed.

Other and further objects will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the invention, the foregoing objects are accomplished by providing a beverage dispensing apparatus comprising a valve assembly (including water and syrup measuring means) having an outlet port for the water and an outlet port for the syrup, a housing removably secured to the valve assembly over the ports having a mixing chamber provided with a dispensing outlet, and mixing means between the chamber and the ports having a pair of inlet ports in fluid flow connection with the outlet ports and having an outlet passage in fluid flow connection with the inlet ports which is formed with an opening constructed and arranged to direct a mixture of water and syrup against the inner wall of the chamber to swirl the mixture within the chamber and thoroughly mix the same. In order to further increase the mixing action to which the water and syrup are subject, means are provided for producing turbulence before and/or after the mixture leaves the opening.

In a preferred embodiment of the invention, the valve assembly and the mixing chamber housing are constructed and arranged to mount a mixing element therebetween. In this embodiment, a disc-like body comprises the mixing element having passages for uniting the water and syrup which change direction to produce turbulence and

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are provided with additional means for effecting mixing.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a side elevational view, partly in section, of beverage dispensing apparatus embodying the present invention.

Fig. 2 is a schematic perspective view of the carbonated water and syrup conduits of the apparatus shown in Fig. 1.

Fig. 3 is a fragmentary sectional view of the mixing chamber and the mixing element which is shown in elevation.

Fig. 4 is a sectional view taken along the line 4-4 of Fig. 3 in the direction of the arrows illustrating the interior of the mixing element.

Fig. 5 is a perspective view of the mixing element as viewed from the underside thereof.

Referring to the drawings in detail and more particularly to Fig. 1 thereof, there is shown apparatus for measuring, mixing and dispensing beverages which generally comprise a cooling tank 10 adapted to be attached to a counter 11 by a clamp 12, a measuring valve assembly 14 controlled by a handle 15 for operating a shaft 13, a syrup receptacle 16 connected to the valve assembly and positioned within the tank, a cooling coil 17 positioned in the bottom of the tank having one end connected to the valve assembly and having its other end arranged for connection to a source of carbonated water (not shown) and a mixing chamber housing 19 attached to the valve assembly for dispensing the beverage into a drinking vessel 20 supported beneath the chamber by means of a bracket 21.

The valve assembly 14 is of the type disclosed in United States Letters Patent 2,427,429, September 16, 1947, which is adapted to measure a charge of carbonated water and a charge of syrup when the handle is moved into one operating position and is adapted to measure a second charge of carbonated water and a second charge of syrup while causing the first charges of water and syrup to be directed to the dispensing outlet of the apparatus when the handle is moved into another operating position.

Fig. 2 schematically illustrates such a charge measuring system which is embodied in the valve assembly 14. This system generally comprises a carbonated water intake conduit 25 connected to the coil 17, a water measuring cylinder 26 having conduits 27 and 28 connected to the respective ends thereof, a water discharge conduit 30 extending to the mixing chamber housing a valve element 31 on the shaft 13 (Figure 3) under the control of the handle 15 having passages 32 therein for alternately connecting the conduits 27 and

28 to the conduits 25 and 30, a syrup intake conduit 35 connected the syrup supply receptacle 16, a syrup measuring cylinder 36 having conduits 37 and 38 connected to the respective ends thereof, a syrup discharge conduit 40 extending to the mixing chamber housing and a valve element 41 on the shaft 13 (Figure 3) under the control of the handle 15 having passages 42 therein for alternately connecting the conduits 37 and 38 to the conduits 35 and 40.

The cylinders 26 and 36 each have a connected piston therein (not shown) which is moved to one side by the pressure of the carbonated water to admit charges of water and syrup, respectively, by way of conduits 27 and 37, for example, while expelling charges of water and syrup respectively, by way of conduits 28 and 38. Since such mechanism is illustrated in Patent No. 2,427,429, detailed illustration and description thereof herein are believed to be unnecessary.

As shown in Fig. 3, the valve assembly 14 has a depending sleeve section 45 surrounding the outlet ports of the water and syrup conduits 30 and 40 against which the mixing chamber housing 19 is positioned. The mixing chamber housing comprises an upper hollow body section 46 having a mixing chamber 47 formed therein, and a lower nozzle section 49 provided with a dispensing outlet 50 under which the receptacle 20 is positioned. The upper edge of the body section 46 is sealed against the lower edge of the sleeve section 45 by a gasket 51, and has an inwardly extending portion 52 providing a shoulder for supporting a mixing element 55 about to be described.

The mixing element 55, in accordance with the present invention, is in the form of a disc-like body having an enlarged upper section fitting into the sleeve section 45 and providing an outwardly extending shoulder portion 56 supported on the portion 52, and having a lower section fitting into the upper end of the mixing chamber 47 (Figure 3).

The element 55 (see Fig. 4) has a pair of radial passages 57 and 58 in fluid flow communication with each other at the inner ends thereof, approximately at the center of the body, which passages are provided with inlet ports 60 and 61 at the upper face of the body, respectively, in fluid flow connection with the conduits 30 and 40 in the valve assembly. An enlarged passage or chamber 62 is in radial alignment with the passage 57, and has its inner end in fluid flow connection with the passage 57 and has its outer end sealed off by a plug 64 screw threaded therein. A baffle member such as a perforated tubular sleeve 65, is mounted in the passage 62 and is retained therein by the plug 64.

The lower face of the body is formed with a notch-like recess 66 having a vertical wall 67 substantially parallel to the axis of the passage 57 and a curved wall section 69 extending from the side of the lower body section to the lower face of the body and converging at 70 (Figure 5). An outlet port 71 of smaller diameter than the passage 62 extends from this passage through the wall 67 in a downwardly and tangential direction into the recess 66, whereby the recess 66 is adapted to cooperate with the inner wall of the mixing chamber housing 19, as about to be described.

In operation, when charges of carbonated water and syrup are respectively expelled from their cylinders 26 and 36 and flow through the conduits 30 and 40, these charges enter the respective passages 57 and 58 and merge at the juncture

of passages 57 and 58 within the mixing element and are next directed into the enlarged passage 62. As the carbonated water and syrup enter the passage 62 expansion of the gas in the water takes place which produces turbulence and a mixing action, and such turbulence is enhanced by the perforated sleeve baffle element 65 and the inner face of the plug 64 against which these charges are impinged and caused to change direction. The mixed charges are then directed through the restricted outlet port 71 which increases the velocity of the mixing and impinges the same against the wall section 69 to produce further turbulence.

The curved converging wall section 69 and the inner wall of the mixing chamber housing surrounding the recess 66, cooperate to impart swirling motion to the stream of the mixture issuing from the port 71, whereby the stream is swirled with a rotary motion around the inner wall of the mixing chamber 47 to so thoroughly mix the carbonated water and syrup prior to leaving the outlet 50 that further mixing in the drinking vessel 20 is unnecessary.

From the foregoing description, it will be seen that the present invention provides a simple, practical and effective mixing device for dispensing flavored carbonated beverages and the like from apparatus of the type described herein. The mixing element is readily removed and taken apart for cleaning to maintain it in sanitary condition without any inconvenience.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matters are to be interpreted as illustrative and not in any limiting sense.

What is claimed is:

1. In a beverage dispensing apparatus, the combination of a valve assembly having a water outlet port and a syrup outlet port, a housing secured to said valve assembly over said ports having a mixing chamber provided with a dispensing outlet, and mixing means between said chamber and said ports having a pair of intersecting inlet passages with respective inlet ports in fluid flow connection with said outlet ports and having an outlet passage in fluid flow connection with said inlet passages formed with an opening constructed and arranged to direct water and syrup against the inner wall of said mixing chamber.

2. In beverage dispensing apparatus, the combination of a valve assembly having a water outlet port and a syrup outlet port, a housing secured to said valve assembly over said ports having a mixing chamber provided with a dispensing outlet, mixing means between said chamber and said ports having a pair of intersecting inlet passages with respective inlet ports in fluid flow connection with said outlet ports and having an outlet passage in fluid flow connection with said inlet passages formed with an opening constructed and arranged to direct water and syrup against the inner wall of said mixing chamber, and means in said outlet passage between said inlet ports and said opening for producing turbulence.

3. In beverage dispensing apparatus, the combination of a valve assembly having a water outlet port and a syrup outlet port, a housing secured to said valve assembly over said ports having a mixing chamber provided with a dis-

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dispensing outlet, mixing means between said chamber and said ports having a pair of intersecting inlet passages with respective inlet ports in fluid flow connection with said outlet ports and having an outlet passage in fluid flow connection with said inlet passages formed with an opening constructed and arranged to direct water and syrup against the inner wall of said mixing chamber, and baffle means in said outlet passage.

4. In beverage dispensing apparatus, the combination of a valve assembly having a water outlet port and a syrup outlet port, a housing secured to said valve assembly over said ports having a mixing chamber provided with a dispensing outlet, and mixing means between said chamber and said ports having a pair of intersecting inlet passages with respective inlet ports in fluid flow connection with said outlet ports and having an outlet passage in fluid flow connection with said inlet passages formed with an opening constructed and arranged to direct water and syrup against the inner wall of said mixing chamber, said opening being substantially tangentially disposed with respect to the wall of said chamber to swirl the water and syrup mixture within said chamber.

5. In beverage dispensing apparatus, the combination of a valve assembly having a water outlet port and a syrup outlet port, a housing secured to said valve assembly over said ports having a mixing chamber provided with a dispensing outlet, and a mixing element between said chamber and said ports having a pair of inlet ports in fluid flow connection with said outlet ports and having a pair of inlet passages connected respectively with said inlet ports, said passages intersecting each other to form a single passage, said mixing element also having an outlet passage in fluid flow connection with said single passage formed with an opening constructed and arranged to direct water and syrup against the inner wall of said mixing chamber, said mixing element being formed with a wall portion adjacent said opening cooperating with said chamber wall to provide a deflector upon which the mixture of water and syrup is impinged.

6. In beverage dispensing apparatus, the combination of a valve assembly having a depending sleeve section and having a water outlet port and a syrup outlet port within said section, a housing connected to said section formed with an inwardly extending portion at its upper end and having a mixing chamber therein provided with a dispensing outlet at the lower end thereof, and a mixing body having an outwardly extending portion supported by said inwardly extending portion to mount said body between said mixing chamber and said valve assembly, said body having a pair of inlet ports in fluid flow connection with said outlet ports and having an outlet passage in fluid flow connection with said inlet ports, said outlet passage having an opening for directing water and syrup outwardly against the wall of said chamber.

7. A water and syrup mixing element comprising a disc-like body having a pair of radial passages in fluid flow connection at the inner end thereof and each formed with an inlet port at one face of said body, said body having a passage in fluid flow connection at one end thereof with said pair of passages and formed with an outlet port adjacent the other face of said body adja-

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cent its periphery and facing in a substantially tangential direction with respect to said body.

8. A water and syrup mixing element comprising a disc-like body having a pair of radial passages in fluid flow connection at the inner end thereof and each formed with an inlet port at one face of said body, said body having a passage in fluid flow connection at one end thereof with said pair of passages and formed with an outlet port adjacent the other face of said body adjacent its periphery and facing in a substantially tangential direction with respect to said body, and baffle means in said last mentioned passage between said pair of passages and said outlet port.

9. A water and syrup mixing element comprising a disc-like body having a pair of radial passages in fluid flow connection at the inner end thereof and each formed with an inlet port at one face of said body, said body having an enlarged passage in fluid flow connection at one end thereof with said pair of passages and formed with an outlet port of smaller diameter than said passage adjacent the other face of said body adjacent its periphery and facing in a substantially tangential direction with respect to said body, and a perforated sleeve in said enlarged passage of smaller diameter than said passage.

10. A water and syrup mixing element comprising a disc-like body having a notch-like recess at the periphery on one face thereof including a wall portion formed with an outlet port facing said recess, said body having a pair of passages connected at their inner ends and each formed with an inlet port at their outer ends and having a passage connecting said pair of passages and said outlet port.

11. A water and syrup mixing element comprising a disc-like body having a notch-like recess at the periphery on one face thereof including a wall portion formed with an outlet port facing said recess, said body having a pair of passages connected at their inner ends and each formed with an inlet port at their outer ends and having a passage connecting said pair of passages and said outlet port, and baffle means in said last mentioned passage.

12. A water and syrup mixing element comprising a disc-like body having a notch-like recess at the periphery on one face thereof including a wall portion formed with an outlet port facing said recess, said body having a pair of passages connected at their inner ends and each formed with an inlet port at their outer ends and having an enlarged passage connecting said pair of passages and said outlet port, and a perforated sleeve in said enlarged passage of smaller diameter than said passage.

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