MIXING NOZZLE FITMENT AND MIXED LIQUID DISPENSER

~~BACKGROUND~~ TECHNICAL FIELD OF THE INVENTION

The present disclosure generally relates to beverage dispensing devices. More specifically, the present disclosure relates to mixing nozzle fitments for dispensing beverages.

BACKGROUND OF THE INVENTION

There are a variety of beverage dispensers currently on the market. Some beverage dispensers operate by dispensing a hot or cold ready-to-drink fluid directly into a container such as a cup. Other beverage dispensers operate by dispensing a powdered or liquid concentrate along with a separate diluent through a beverage dispensing nozzle and into a container or cup to form the drink.

The present invention relates to post-mix dispensers in which a liquid concentrate is stored and is automatically combined at the time of dispensing with a diluents such as water at a predetermined ratio. The combination is usually operated in a mixing chamber in which the concentrate and the diluents emerge. The relative flows of the concentrate and diluent can be controlled to maximize the qualities of the beverage such as mixing and foam production. This mixing chamber can be a mixing tee fitment such as described in WO 01/21292 and US 7,111,759. In these prior arts the mixing tee fitment comprises a horizontal diluent inlet portion joined to vertical beverage outlet portion by an elbow and a vertical concentrate inlet emerging in the horizontal diluent inlet portion.

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

It has been observed that the above type of fitment could lead to accumulation of concentrate in dead zones. This accumulation can lead to hygienic problems if the beverage concentrates are sensible to bacteria such as milk. This problem is emphasized if the dispenser is intermittently used. In addition the concentrate could also get into the water inlet stream and create problems from a hygienic point of view, especially since the water inlet valve is part of the machine and not easily cleanable.

The present invention aims at solving the hygiene issues relative to this kind of mixing tee fitment.

~~SUMMARY~~MEANS FOR SOLVING THE PROBLEM

In a first aspect the present disclosure relates to mixing nozzle fitments and beverage dispensing devices using the mixing nozzle fitments. In a general embodiment, the mixing nozzle fitment includes a first shaft defining an inlet

passage, a second shaft defining a curved outlet passage and attached to the first shaft, and a coupling member attached to the second shaft. A flexible tube is attached to the coupling member. The coupling member defines a passage that leads into the curved outlet passage of the second shaft. The design of the mixing nozzle fitment minimizes concentrate accumulation within the mixing nozzle fitment to improve the hygienicity of the mixing nozzle fitment.

In an embodiment, the second shaft is the shape of a curved horn.

In an embodiment, the second shaft is almost perpendicular to the first shaft near its end portion of the second shaft opposed to the attachment with the first shaft.

In an embodiment, the coupling member is positioned on the second shaft at a location ranging anywhere from a second end of the first shaft to about half way down the second shaft.

In an embodiment, the second shaft includes a flange.

In an embodiment, the first shaft and/or the second shaft includes a textured grip.

In an embodiment, the first shaft and/or the second shaft includes a cylindrical shape.

In an embodiment, the first shaft includes a first end ~~at its inlet~~ and a second end, and the first end having a section that is ~~smaller~~ larger than the section of the second end.

In an embodiment, the second shaft includes a first end and a second end ~~at its outlet~~, and the first end having a section that is ~~smaller~~ larger than the section of the second end.

In an embodiment, a handle is attached to the second shaft.

In a specific embodiment, the present disclosure provides a mixing nozzle fitment including a first cylindrical shaft defining an inlet passage, a second cylindrical shaft defining a curved outlet passage and attached to the first shaft, a coupling member attached to the second shaft, a flexible tube attached to the coupling member and a handle attached to the second shaft. The coupling member defines a passage that leads into the curved outlet passage of the second shaft.

In an embodiment, the coupling member includes a one-way visco-elastic valve. A so-called one-way visco-elastic valve usually comprises a valve body; the valve also comprises an elastomeric cylinder having an internal section smaller than the section of the valve body so that the elastomeric cylinder is tightly fitted over the valve seat. The dispensing with this sort of valve is accomplished by exerting a

and dispensing portions of concentrate through the mixing nozzle fitment of the package and a diluent through the diluent dispenser nozzle, the concentrate and the diluent being mixed in and dispensed out of the curved outlet passage of the mixing nozzle fitment to form the beverage.

Usually the diluent and the concentrate are delivered simultaneously.

In a preferred alternative, in a first step the diluent and the concentrate are delivered simultaneously, and in a second step, only diluent is delivered. During this second step diluent rinses the coupling member.

An advantage of the present disclosure is to provide an improved mixing nozzle fitment.

Another advantage of the present disclosure is to provide an improved dispensing device.

Still another advantage of the present disclosure is to provide a hygienic mixing nozzle fitment.

Yet another advantage of the present disclosure is to provide a mixing nozzle fitment that eliminates dead zones for product concentrates to collect in.

In addition, another advantage of the present disclosure is to provide an improved method of making a beverage.

Additional features and advantages are described herein, and will be apparent from, the following ~~Detailed Description and the figures.~~

BRIEF DESCRIPTION OF THE ~~FIGURES~~DRAWINGS

FIG. 1 illustrates a perspective view of a part of the mixing nozzle fitment in an embodiment of the present disclosure.

FIG. 2 illustrates a top view of the part of the mixing nozzle fitment shown in FIG. 1.

FIG. 3 illustrates a cross section view take along line III-III of the part of the mixing nozzle fitment shown in FIG. 1.

FIG. 4 illustrates a mixing nozzle fitment in an embodiment of the present disclosure.

FIG. 5 illustrates a cross section view of a dispensing device having a mixing nozzle fitment in an embodiment of the present disclosure.

FIG. 6 illustrates a perspective view of a mixing nozzle fitment in another embodiment of the present disclosure.

FIG. 7 illustrates a cross section view of a package in an embodiment of the present disclosure.

FIG. 8a, 8b illustrate how the valve used in the embodiment of FIG.7 works.

~~DETAILED DESCRIPTION~~MODE FOR CARRYING OUT THE INVENTION

The present disclosure relates to mixing nozzle fitments and beverage dispensing devices using the mixing nozzle fitments. In alternative embodiments, the present disclosure can provide low cost and disposable mixing nozzle fitments for hygienic mixing and delivery of beverage products from concentrates in a dispensing system. The mixing nozzle fitments can be used to mix and dispense a diluent such as water and a beverage concentrate while avoiding dead zones in the mixing nozzle fitments where the beverage concentrate can accumulate. Because the mixing nozzle fitment can be disposed of when a depleted bag of concentrate is thrown away, the need for a dispensing system having an electrically operated mixing bowl or mixing chamber that requires specific cleaning-in-place or cleaning after disassembly can be eliminated.

In a general embodiment illustrated in FIGS. 1-3, a mixing nozzle fitment includes a first shaft 20 defining a first passage 22 and a second shaft 30 defining a second curved passage 32 and attached to the first shaft 20. Second shaft 20 further includes a coupling member 40 and a handle 50. First shaft 20 and coupling member 40 act as a fluid inlet and second shaft 30 acts as a fluid outlet.

In the illustrated embodiment, first shaft 20 has a cylindrical shape with a first end 24 that has a larger width or diameter than a second end 26 of first shaft 20. Similarly, second shaft 30 has a cylindrical shape having an oval or elliptical cross-section with a first end 34 that has a larger width or diameter than a second end 36 of second shaft 30. Second end 26 of first shaft 20 is attached to second end 36 of second shaft 30 at joint 60.

The dimensions of mixing nozzle fitment 10 can be any suitable size. For example, a key diameter for mixing nozzle fitment 10 can be based on the interface of a water valve it has to mate with. Other dimensions of mixing nozzle fitment 10 can be based on manufacturing ease.

In another embodiment, second shaft 30 can be designed to incorporate one or more fins (not shown) along its inner walls at an angle to enable better mixing of the concentrate. In yet another embodiment, second shaft 30 may be designed to incorporate a circuitous path (e.g. passage) such that the concentrate and diluent is mixed well by going through a circular path with a downward gradient through second shaft 30.

- a pump operatively connected to the flexible tube.

A concentrate is dispensed through the concentrate tube, and a diluent is dispensed through the diluent dispenser nozzle. The concentrate and the diluent are mixed in and dispensed out of the curved outlet passage of the mixing nozzle fitment to form the beverage.

The diluent can be water. The concentrate can be in a suitable form such as a paste, liquid or a combination thereof. The concentrate can have any suitable flavor or combination of flavors as well.

According to a first mode the method can comprise the preliminary steps of providing a mixing nozzle fitment as defined above and attaching the flexible tube 120 to a concentrate container 110 and the first shaft 20 to the diluent dispenser nozzle.

According to a second mode the method can comprise the preliminary steps of providing a package as defined above and attaching the first shaft to the diluent dispenser nozzle.

It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the ~~spirit and~~ scope of the present subject matter and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

CLAIMS

1. Mixing nozzle fitment comprising :
- a first shaft (20) defining an inlet passage (22) ;
- a second shaft (30) defining a ~~curved~~ outlet passage (32) that is curved from one end to the other end and attached to the first shaft ; and
- a coupling member (40) attached to the second shaft, the coupling member defining a passage that leads into a curved portion of the curved outlet passage of the second shaft ; and
- a flexible tube attached to the coupling member (40).

2. The mixing nozzle fitment of Claim 1, wherein the second shaft (30) is the shape of a curved horn.

3. The mixing nozzle fitment of Claim 1 or 2, wherein the second shaft (30) is almost perpendicular to the first shaft near its end portion (34) opposed to the attachment with the first shaft.

4. The mixing nozzle fitment according to any of the precedent claims, wherein the coupling member (40) is positioned on the second shaft (30) at a location ranging from an end of the first shaft to about half way down the second shaft.

5. The mixing nozzle fitment according to any of the precedent claims, wherein the second shaft (30) comprises a flange (38).

6. The mixing nozzle fitment according to any of the precedent claims, wherein the first shaft (20) comprises a first end (24) and a second end (26), the first end having a section that is ~~smaller~~ larger than the section of the second end.

7. The mixing nozzle fitment according to any of the precedent claims, wherein the second shaft (30) comprises a first end (32) and a second end (36), the first end having a section that is ~~smaller~~ larger than the section of the second end.

8. The mixing nozzle fitment according to any of the precedent claims, wherein a handle (50) is attached to the second shaft.

9. The mixing nozzle fitment according to any of the precedent claims, wherein a piercing fitment (121) is included at the end of the flexible tube (120) opposed to the coupling member (40).

10. The mixing nozzle fitment according to any of the precedent claims, wherein the coupling member (40) is ~~a visco-elastic~~ an one-way valve having visco-elasticity attached to the second shaft and emerging into the curved outlet passage of the second shaft.

11. Package (300) comprising a fluid container (110) and a mixing nozzle fitment according to any of claims 1 to 9, wherein the fluid container is in fluid communication with the flexible tube (120) of the mixing nozzle fitment.

12. The package of Claim 11 wherein the coupling member (40) is ~~a visco-elastic~~ an one-way valve having visco-elasticity comprising an expanded member (44) and a catch (46).

13. The package according to the claim 11 wherein the coupling member (40) is ~~a visco-elastic~~ an one-way valve having visco-elasticity comprising a delivery block (441) having an input port (442) for receiving the fluid and an internal channel beginning at the input port and terminating in at least one output port (444), an elastomeric membrane (445) for enveloping the delivery block such that a portion of the elastomeric membrane covers the output port and the downstream end of the elastomeric membrane forms the valve outlet.

14. The package according to claim 13, wherein the ~~visco-elastic~~ one-way valve having visco-elasticity is attached to the second shaft (30) by a snap engagement or by an ultrasonic welding.

15. Package according to any of claims 11 to 14 wherein the container (110) comprises multiple portions of a food or beverage fluid concentrate.

16. Package according to the precedent claim wherein the food or beverage fluid concentrate is a microbiological sensitive fluid.

17. A dispensing device comprising :

- a mixing nozzle fitment according to any of Claims 1 to 10 positioned inside the dispensing device so that the first shaft (20) is almost horizontal and the second shaft