CLAIMS

1. Mixing nozzle for mixing a beverage concentrate and a diluent and dispensing the beverage mixture comprising :

- a mixing chamber comprising an input end with an inlet opening for the concentrate and a discharge opening at an output end thereof, said mixing chamber having an axial bore extending from the input end to the discharge opening,

- a toroidal chamber around said mixing chamber having a diluent inlet conduit to introduce diluent in said toroidal chamber, said toroidal chamber presenting multiple openings in the internal lateral wall of the toroidal chamber for directing the diluent from said toroidal chamber concentrically about the axial bore,

wherein :

- the mixing chamber inlet opening is opened so that a flow of concentrate can freely be directed though the input end along the mixing chamber axial bore and collide with the diluent emerging from the multiple openings of the toroidal chamber, and

- the mixing chamber section surface narrows at its output end~~.~~, and

- at the output end of the mixing chamber, the section surface of the axial bore presents small indentations, and

- the toroidal chamber is positioned in the upper part of the mixing chamber.

2. Mixing nozzle according to Claim 1 wherein the input end of the diluent inlet conduit is parallel to the axial bore of the mixing chamber.

~~3. Mixing nozzle according to Claim 1 or 2 wherein the toroidal chamber is positioned in the upper part of the mixing chamber.~~

~~4~~3. Mixing nozzle according to any one of the precedent claims wherein the mixing chamber section successively narrows and then expands between the opened input end and the toroidal chamber multiple openings.

~~5~~4. Mixing nozzle according to any one of the precedent claims wherein the multiple openings in the internal lateral wall of the toroidal chamber are inclined in direction of the output end of the axial bore.

~~6~~5. Package assembly comprising a concentrate container, a flexible tube and a mixing nozzle according to any one of Claims 1 to ~~5~~4.

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~~7~~6. Package assembly according to the precedent claim wherein the flexible tube is positioned relatively to the mixing nozzle so that the outlet end of the flexible tube is positioned at the inlet opening of the mixing chamber and is centred on the axis XX' of the axial bore.

~~8~~7. Method of making a beverage, the method comprising :
- providing a mixing nozzle according to any one of Claims 1 to ~~5~~4,
- dispensing a flow of concentrate through the opened input end of the mixing chamber and a diluent through the diluent inlet conduit of the mixing chamber, the concentrate and the diluent being mixed and dispensed through the mixing chamber to form the beverage.

~~9~~8. Method according the precedent claim wherein the flow of concentrate is dispensed through the opened input end of the mixing chamber in a state of free fall along the mixing chamber axial bore.

~~10~~9. Method according Claim ~~8~~ 7 or ~~9~~ 8 wherein the diluent is introduced with a flow configured for creating jets of diluent emerging out of the toroidal chamber multiple openings, said jets being able to hit the flow of concentrate flowing through the opened input end of the mixing chamber.

~~11~~10. Method according to any one of Claims ~~8~~ 7 to ~~10~~ 9 wherein the concentrate is stored in a bag-in-box container having a flexible tube connected to a container outlet and pumped by a peristaltic pump cooperating with the flexible tube.

~~12~~11. Method according the precedent claim, wherein the output end of the flexible tube emerges above the opened input end of the mixing chamber so that a flow of concentrate freely flows in the mixing chamber.

~~13. Method according to any one of claims 8 to 12, wherein the diluent is water and the concentrate presents a viscosity of at least …~~

~~14~~12. Beverage preparation machine comprising :
- a source of concentrate, said source of concentrate comprising a container and a flexible tube, said tube being configured for dispensing the concentrate from the container,
- a source of diluent,

- a mixing nozzle according to any one of Claims 1 to ~~5~~4, wherein the mixing nozzle and the flexible tube of the source of concentrate are positioned one to the other so that the outlet end of the flexible tube is positioned just above the inlet opening of the mixing chamber of the mixing nozzle and is centred on the axis XX' of the axial bore of said mixing chamber.