

Title (en)

Saturator for injecting a gas in a liquid

Title (de)

Sättiger zum Einspritzen eines Gases in eine Flüssigkeit

Title (fr)

Saturateur pour l'injection de gaz dans un liquide

Publication

**EP 2433706 A1 20120328 (FR)**

Application

**EP 11194936 A 20100810**

Priority

- EP 10172361 A 20100810
- FR 0904185 A 20090903

Abstract (en)

The installation for producing a homogenous gaseous mixture such as soft drinks from liquid and gas constituents for directly supplying to a withdrawing machine without inserting a buffer, comprises a dynamic saturation and mixing loop (5) with a circulating product (1). The loop comprises an inlet connection, a loop pump (PB) that derives, in upstream, constituents to be mixed and flowed on a rising branch of the loop, a saturator (CAH) for injecting gas in the liquid, a gas mass flowmeter, and a static mixer (MEV) with two turbulence rings for homogenizing the mixture. The installation for producing a homogenous gaseous mixture such as soft drinks from liquid and gas constituents for directly supplying to a withdrawing machine without inserting a buffer, comprises a dynamic saturation and mixing loop (5) with a circulating product (1). The loop comprises an inlet connection, a loop pump (PB) that derives, in upstream, constituents to be mixed and flowed on a rising branch of the loop, a saturator (CAH) for injecting gas in the liquid, a gas mass flowmeter, a static mixer (MEV) with two turbulence rings for homogenizing the mixture and driving back to outlet pressure of the loop, an outlet connection for removing the mixture by the withdrawing machine, a valve between the inlet and the outlet, and a liquid flowmeter on the inlet or outlet connection. The pump ensures a minimum constant flow at the upper part of the withdrawing machine. The static mixer comprises a body and a movable core. An inner wall of the mixer body is equipped with two channels and sills. A wall of the core comprises two flanges in the form of movable valves and two channels in addition to the body. Each assembly of the channel body or core comprises a valve and a sill reducing the passage section of the turbulence ring. The shape of the grooves is such that to create a minimum pressure drop with rapid rotation of the fluid in all positions of the core creating a lower cavitation outlet sill. The turbulence ring is produced to obtain a cycle of variation in speed of the fluid with regular acceleration and reduction. The inlet in the conical sill is radially connected from the outside to the inside to reach the turbulence ring. The mixer further includes an adjustment such as a screw or a pneumatic actuator with a rolling membrane to allow manual or automatic adjustment of core position relative to the body. A three-way valve with two inputs and one output is arranged in the installation, where one of the input is connected to the loop in upstream of the output connection and the other to the inlet connection of the loop, and the output of the three-way valve is connected to the loop in a direction of the loop pump. A four-way valve with two inlets respectively aligned with two outputs is arranged in the installation, where the inputs are connected in upstream of the output connection of the loop and the one output is connected to the inlet connection of the loop. The four-way valve is connected to the loop in a direction of the loop pump, where the other output is connected to the supply line of the withdrawing machine. The three-way of for-way valves are provided for assuring: a blend of recycled product in the loop and the raw product; a constant pressure in the output; and a non-return function to prevent the direct passage of the inlet towards the outlet in some phases of operation, and are equipped with a manual or pneumatic control according to the loop type and an actuator with a piston and a rolling membrane. The active section of the membrane is equal to the active section of the valve for assuring a constant pressure on the liquid outlet of the loop. The saturator comprises a transverse horizontal body with a gas injection device at its upper part, a non-return device with a membrane for regular injection of gas and mounted in the circulation zone from top to bottom, a mixer stage with a pre-adjustment device for incorporating the liquid gas, and an upstream outlet cone for reducing the flow speed without cavitation. The liquid flow is partially or totally oriented from top to bottom. The saturator is disposed in upstream of the aspiration of the pump and assembled by a rectilinear pipe section, and further comprises a cylindrical casing of larger diameter according to piping of the loop and a venturi nozzle disposed in the casing. The annular section between an outer cylindrical wall of the venturi nozzle and inner surface of the casing is constant.

Abstract (fr)

L'invention concerne un saturateur (CAH) permettant l'injection de gaz dans un liquide. Le présent saturateur (CAH) est caractérisé en ce qu'il comporte un corps (16) avec une entrée et une sortie, ledit corps (16) étant traversé horizontalement par un flux de liquide depuis l'entrée vers la sortie, ledit flux de liquide étant partiellement ou totalement orienté du haut vers le bas et ressortant horizontalement, et un dispositif d'injection de gaz (17) introduit à l'intérieur du corps (16) du saturateur, au niveau de la partie supérieure de celui-ci, ledit saturateur (CAH) comportant encore un étage (21) de mélangeur à anneaux de turbulence et un cône de sortie aval (24) fixe..

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Citation (applicant)

- US 6439437 B1 20020827 - OLLIER GEORGES [FR], et al
- FR 2772367 A1 19990618 - OLLIER GEORGES [FR]

Citation (search report)

- [A] EP 2060318 A1 20090520 - YARA INT ASA [NO]
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CN105890677A; RU195599U1; WO2020120818A1

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