



US006585405B2

(12) **United States Patent**
Bruno et al.

(10) **Patent No.:** **US 6,585,405 B2**
(45) **Date of Patent:** **Jul. 1, 2003**

(54) **MIXING LIQUIDS AND ENTRAINMENT**
MIXING OF VAPOR INTO LIQUIDS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 34 days.

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(21) Appl. No.: **09/835,254**

(22) Filed: **Apr. 13, 2001**

(65) **Prior Publication Data**

US 2001/0055240 A1 Dec. 27, 2001

Related U.S. Application Data

(60) Provisional application No. 60/196,999, filed on Apr. 13, 2000.

(51) **Int. Cl.**⁷ **B01F 13/08**

(52) **U.S. Cl.** **366/266; 366/274; 366/343; 261/85; 261/91**

(58) **Field of Search** **366/266, 274, 366/273, 318, 342, 343, 169.1, 169.2; 261/85, 91**

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(57) **ABSTRACT**

Disclosed is a fluid mixer that mixes liquids while simultaneously promoting rapid mixing entrainment of vapor in the liquid. The device includes a vertical rotor mounted centrally on a base assembly. The rotor comprises a tube which is hollow from an open top end to a bottom closed end, having an external screw thread in a right-side configuration relative from top to bottom and one or more holes located in the sidewall of the tube at the bottom of the hollow portion of the tube, preferably located centrally between two flanking surfaces of the screw thread. The base assembly comprises a stirbar and a supporting disk which contains a ceramic magnet. The base rests on the floor of a containment vessel. A magnetic stirring motor is centrally located sufficiently close to and beneath the containment vessel as to achieve magnetic flux coupling with the base magnet. Operation of the mixer develops a liquid vortex in the liquid phase material. As the speed increases, the external screw threads generate turbulence and draw vapor into the liquid from above the tube and urge the vapor into intimate contact with the turbulent, droplet-forming liquid. A circulation develops causing a vortex to develop. As the speed of circulation increases, the surface of the liquid is lowered until it matches the hole in the sidewall of the tube. The liquid enters the holes in the sidewall of the tube along with entrained vapor, and rises through the liquid in the hollow tube, and exits the open top end.

22 Claims, 3 Drawing Sheets

