

Title (en)

GAS INTRODUCING/RETAINING DEVICE, GAS INTRODUCING/RETAINING METHOD, AND GAS RELEASE HEAD

Title (de)

GASZUFUHR-/AUFNAHMEVORRICHTUNG, GASZUFUHR-/AUFNAHMEVERFAHREN UND GASFREISETZUNGSKOPF

Title (fr)

DISPOSITIF D'INTRODUCTION/RETENUE DE GAZ, PROCÉDÉ D'INTRODUCTION/RETENUE DE GAZ, ET TÊTE DE LIBÉRATION DE GAZ

Publication

EP 3424588 A4 20191030 (EN)

Application

EP 16892499 A 20160301

Priority

JP 2016056247 W 20160301

Abstract (en)

[origin: EP3424588A1] [Object] To provide a gas introducing/retaining device and a gas introducing/retaining method capable of increasing the amount of a gas dissolved in a liquid, and a gas discharge head used in the gas introducing/retaining device. [Solution] The present invention is provided with: a liquid storage tank 10 in which a liquid is stored; a gas discharge head 20 having a large number of micropores each having a pore size not larger than 2.5 μm ; gas supply means 30 that supplies a gas to the gas discharge head 20; and oscillation application means 40 having an oscillator 41 that applies oscillation to the gas discharge head 20. The gas is discharged from the gas discharge head 20 while oscillation is continuously applied to the gas discharge head 20 immersed in the liquid. The oscillation applied to the gas discharge head 20 by the oscillator 41 is set to have a frequency not lower than 30 kHz and an amplitude not greater than 1 mm. The amount of the gas supplied to the gas discharge head 20 is adjusted so as to satisfy (the amount of the gas [$\mu\text{m}^3/\text{min}$] discharged from one micropore of the gas discharge head 20)/(oscillation frequency [Hz] of the oscillator 41) \geq 300.

IPC 8 full level

B01F 3/04 (2006.01); **B01F 11/00** (2006.01); **B01F 15/02** (2006.01)

CPC (source: EP US)

B01F 23/23123 (2022.01 - EP US); **B01F 23/231265** (2022.01 - EP); **B01F 23/2373** (2022.01 - EP); **B01F 23/2375** (2022.01 - EP US); **B01F 23/238** (2022.01 - EP); **B01F 2215/0409** (2013.01 - EP); **B01F 2215/0431** (2013.01 - EP); **B01F 2215/045** (2013.01 - EP); **B01F 2215/0454** (2013.01 - EP)

Citation (search report)

- [A] US 2015343399 A1 20151203 - KIM JONG MIN [KR], et al
- [A] JP 2013180265 A 20130912 - MAKUTA HISANORI
- [XA] WO 2008013349 A1 20080131 - KOREA INST SCI & TECH [KR], et al
- [XA] US 6398195 B1 20020604 - SHERMAN JEFFREY H [US]
- See references of WO 2017149654A1

Cited by

CN113087108A; CN113182268A; CN110980915A; CN113172041A

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

EP 3424588 A1 20190109; **EP 3424588 A4 20191030**; **EP 3424588 B1 20210526**; ES 2879870 T3 20211123; JP 6039139 B1 20161207; JP WO2017149654 A1 20180308; PT 3424588 T 20210706; WO 2017149654 A1 20170908

DOCDB simple family (application)

EP 16892499 A 20160301; ES 16892499 T 20160301; JP 2016056247 W 20160301; JP 2016556331 A 20160301; PT 16892499 T 20160301