



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
11.11.2009 Bulletin 2009/46

(51) Int Cl.:
B01F 3/08 (2006.01) **B01F 13/00** (2006.01)
B01F 5/06 (2006.01) **B01F 13/10** (2006.01)

(43) Date of publication A2:
11.03.2009 Bulletin 2009/11

(21) Application number: **08014632.7**

(22) Date of filing: **18.08.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **06.09.2007 JP 2007230922**

(71) Applicant: **Hitachi Plant Technologies, Ltd.**
Toshima-ku
Tokyo 170-8466 (JP)

(72) Inventors:
• **Suzuki, Mio**
Tokyo 100-8220 (JP)
• **Togashi, Shigenori**
Tokyo 100-8220 (JP)
• **Miyamoto, Tetsuro**
Tokyo 100-8220 (JP)
• **Endo, Yoshishige**
Tokyo 100-8220 (JP)

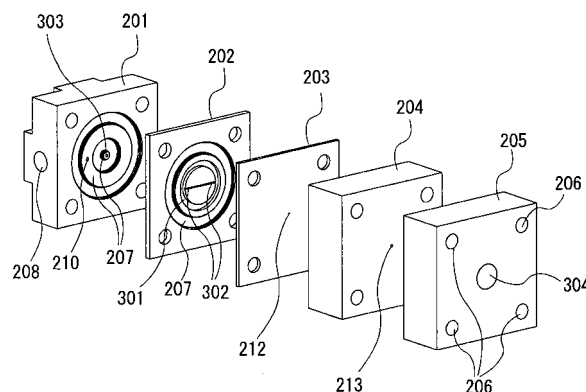
(74) Representative: **Beetz & Partner**
Patentanwälte
Steinsdorfstrasse 10
80538 München (DE)

(54) **An emulsification apparatus**

(57) An emulsifying apparatus (104), for emulsifying a first liquid and a second liquid, which is dissoluble in the first liquid, comprises: a first flow channel (210), through which the first liquid flows; and a second flow channel (211), through which the second liquid flows, the first flow channel (210) and the second flow channel (211) being provided on a same plane, while intersecting each other in directions thereof, wherein the first and second liquids are mixed with at a portion where the first flow channel and the second flow channel intersects each other, thereby obtaining emulsion thereof; further compris-

es: a first member, on which a groove is formed in such a direction that it intersects the first flow channel (210); and a second member, which covers the groove and had a hole penetrating through the first flow channel (210), being laminated on the first member (201), wherein the first member is connected with an introductory member for introducing the first and second liquids, and the second member is connected with a delivery member for delivering an emulsified liquid therefrom, and the first flow channel (210) is communicated with in a direction of laminating the first member (201) and the second member (202).

FIG 3





EUROPEAN SEARCH REPORT

Application Number
EP 08 01 4632

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	EP 1 930 070 A1 (FUJIFILM CORP [JP]) 11 June 2008 (2008-06-11) * paragraph [0001] - paragraph [0002] * * paragraph [0012] - paragraph [0015] * * paragraph [0017] - paragraph [0018] * * paragraph [0058] - paragraph [0066] * * figures *	1-9	INV. B01F3/08 B01F13/00 B01F5/06 B01F13/10
X	----- NAGASAWA H; AOKI N; MAE K: "DESIGN OF A NEW MICROMIXER FOR INSTANT MIXING BASED ON THE COLLISION OF MICRO SEGMENTS" CHEMICAL ENGINEERING AND TECHNOLOGY, WEINHEIM, DE, vol. 28, 1 January 2005 (2005-01-01), pages 324-331, XP001248809 ISSN: 0930-7516 * page 324, column 1, paragraph 2 - column 2, paragraph 3 * * figures 1,2 *	1-9	
A,D	----- SHIH-HAO HUANG; WEI-HEONG TAN; FAN-GANG TSENG; SHOJI TAKEUCHI: "A monolithically three-dimensional flow-focusing device for formation of single/double emulsions in closed/open microfluidic systems; A monolithically three-dimensional flow-focusing device for formation of single/double emulsions" JOURNAL OF MICROMECHANICS & MICROENGINEERING, INSTITUTE OF PHYSICS PUBLISHING, BRISTOL, GB, vol. 16, no. 11, 1 November 2006 (2006-11-01), pages 2336-2344, XP020104810 ISSN: 0960-1317 * the whole document *	1-9	TECHNICAL FIELDS SEARCHED (IPC) B01F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 October 2009	Examiner Real Cabrera, Rafael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03 82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 4632

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/172476 A1 (STONE HOWARD A [US]; ANNA SHELLEY L [US]; BONToux NATHALIE [FR]; LINK) 11 August 2005 (2005-08-11) * the whole document * -----	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 October 2009	Examiner Real Cabrera, Rafael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03/02 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 01 4632

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-10-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
EP 1930070	A1	11-06-2008	WO 2007037007 A1	05-04-2007
			US 2009034362 A1	05-02-2009

US 2005172476	A1	11-08-2005	NONE	
