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(54) **Emulsification device**

(57) There is provided an emulsification device for mixing two different liquids not dissolvable in each other, wherein (1) emulsion droplets can be reduced to micro size without reducing the channel width, which may cause degraded productivity; and wherein (2) a disperse phase can be prevented from adhering to the channel wall surface, thus allowing the device to be operated for a prolonged period of time and a uniform emulsion droplet size to be obtained.

The emulsification device comprises: at least one channel (211) of a first liquid; a channel (210) of a second liquid; and a mixing channel (304) in which the first liquid is joined with the second liquid. In the mixing channel (304), the first liquid has a swirl component in the mainstream direction. The channel of the second liquid is connected to the central portion of the mixing channel, and the second liquid flows at the central portion of at least one swirl flow of the first liquid. In this way, at least one continuous-phase swirl flow is formed around the disperse phase.

FIG.4A

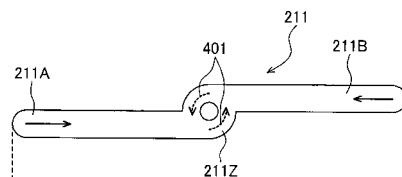
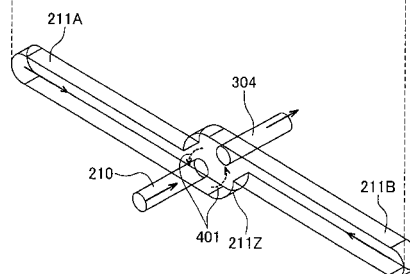


FIG.4B





EUROPEAN SEARCH REPORT

Application Number
EP 09 00 6861

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 September 2010	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			

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EUROPEAN SEARCH REPORT

Application Number
EP 09 00 6861

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search The Hague		Date of completion of the search 16 September 2010	Examiner Real Cabrera, Rafael
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-4

Emulsification device with a plurality of channels having a central axis arranged with an offset from the central axis of the mixing channel.

2. claim: 5

Emulsification device comprising a mixing channel provided with a spiral convex portion on its wall surface.

3. claim: 6

Emulsification device having a channel for a first liquid arranged around a channel for a second liquid and a rotor driven by a rotating mechanism provided in the channel for the first liquid.

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

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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
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82