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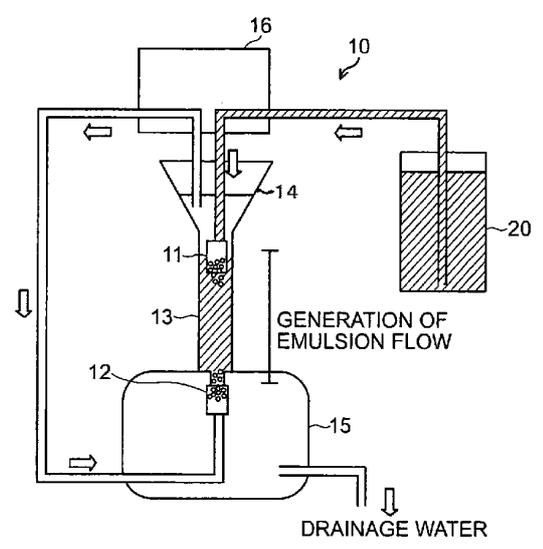
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(54) **Continuous collection method of particle component in aqueous solution and apparatus therefor**

(57) The particle components may be collected by using a phenomenon that the particle components in the aqueous phase aggregate at the liquid-to-liquid interface. Both of the particle components and the dissolved components in the aqueous phase may be simultaneously collected if combined with liquid-liquid extraction phenomenon that the dissolved components in the aqueous phase are collected into the solvent phase through the liquid-to-liquid interface. The aggregation phenomenon of the particle components at the liquid-to-liquid interface may be promoted by using an emulsion flow method, a method of applying mechanical external forces (such as stirring and vibrating) or another method combining both the above-mentioned methods.

**FIG. 2A**



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EUROPEAN SEARCH REPORT

Application Number  
EP 09 25 2285

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	US 4 126 551 A (COGNEVICH DIMITRY J) 21 November 1978 (1978-11-21) * column 4, lines 55-3; figures 1,2 * * column 5, lines 5-35 * -----	1-9	INV. B01D11/04 B01D21/24 B03D1/00 C02F1/54
X	US 6 500 232 B2 (DORLAC JEROME P [US] ET AL) 31 December 2002 (2002-12-31) * column 2, lines 31-53; figure 1A * -----	1-9	
X	US 3 822 999 A (POPE B) 9 July 1974 (1974-07-09) * column 3, lines 15-34; figures * -----	10-14	
X	DE 29 13 331 A1 (CHEM PRO EQUIPMENT CORP) 11 October 1979 (1979-10-11) * pages 11-13; figure 1 * -----	10-14	
A	US 2003/217953 A1 (XU ZHENGHE [CA] ET AL) 27 November 2003 (2003-11-27) * paragraphs [0109] - [0111]; figure 6 * -----	1-9	
A	US 6 180 394 B1 (BISSCHOPS MARC A T [NL] ET AL) 30 January 2001 (2001-01-30) * claims 1,3 * -----	1-9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) B01D B03D C02F
Place of search Munich		Date of completion of the search 12 May 2010	Examiner Haderlein, Andreas
<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</p> <p>&amp; : member of the same patent family, corresponding document</p>			

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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: 1-9

The first invention concerns a method for collecting particles contained in an aqueous solution by contacting the aqueous solution with a hydrophobic solvent and removing the solids aggregated at the liquid-to-liquid interface.

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2. claims: 10-14

The second invention concerns a counter-current type emulsion flow continuous liquid-liquid extraction apparatus.

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**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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12-05-2010

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