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*A61Q 11/02* (2006.01)
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61/5 14,203 2 August 2011 (02.08.2011) US
- (71) **Applicant (for all designated States except US):** **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, Ohio 45202 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **HOKE, Steven, Hamilton, II** [US/US]; 8044 West Gate Park, West Chester, Ohio 45069 (US). **HAUGHT, John, Christian** [US/US]; 8240 Twin Cove Court, West Chester, Ohio 45069 (US). **HESTER, Marc, Alan** [US/US]; 4004 St. John's Terrace, Cincinnati, Ohio 45236 (US). **CLAIR, Brian, David** [US/US]; 1521 Steffen Court, Apt. 11, Ft. Wright, Kentucky 41011 (US).
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
- with international search report (Art. 21(3))
  - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- (88) **Date of publication of the international search report:**  
13 June 2013



(54) **Title:** LIQUID-LIQUID EXTRACTION COMPOSITION USEFUL IN PROCESSING WATER-SOLUBLE SURFACTANTS

(57) **Abstract:** Compositions useful in liquid-liquid extraction processes for improving the taste of water-soluble surfactants, said composition comprising: from about 5% to about 60%, by weight of the composition, of water soluble surfactant; from about 10% to about 90%, by weight of the composition, of water; from about 10% to about 90%, by weight of the composition, of extraction solvent; at least 0.01%, by weight of the composition, of undesirable non-polar materials; wherein the extraction solvent is selected from solvents having individual Hansen solubility parameters of a dispersion force component (?D) ranging from about 15 to about 17 (MPa)<sup>0.5</sup>, a polar component ( $\delta_p$ ) ranging from 0 to about 9 (MPa)<sup>0.5</sup> and a hydrogen bonding component ( $\delta_H$ ) ranging from 0 to about 11 (MPa)<sup>0.5</sup>.

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2012/049314

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. BO1D11/04      A61Q11/02      C11D3/43 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) B01D A61Q C11D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal , WPI Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
<b>Category*</b>	<b>Citation of document, with indication, where appropriate, of the relevant passages</b>	<b>Relevant to claim No.</b>
X	wo 94/09108 AI (UNI LEVER PLC [GB] ; UNI LEVER NV [NL] ; FRUSI ANDREA BRUNO [IT] ; FRY ALAN) 28 April 1994 (1994-04-28) page 9, lines 25-31; claims 1,3,6,7, 13 -----	1-5,7-9
X	us 5 807 816 A (COTTRELL JOHN STUART [GB] ET AL) 15 September 1998 (1998-09-15) column 5, lines 27-63 column 4, line 64 - column 5, line 7 -----	1-8
X	us 2002/010104 AI (EWBANK ERIC [BE] ET AL) 24 January 2002 (2002-01-24) paragraph [0051] ; claim 1 -----	1-5,7 , 8
X	us 2007/123445 AI (TUZI ALEXANDRINE [BE] ET AL) 31 May 2007 (2007-05-31) paragraphs [0042] , [0044] - [0047] ; claims 1,3,6,7 -----	1-8
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents :		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
Date of the actual completion of the international search  4 December 2012		Date of mailing of the international search report  22/04/2013
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  Haderlein, Andreas

**INTERNATIONAL SEARCH REPORT**

International application No

PCT/US2012/049314

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	wo 98/26036 AI (UNI LEVER PLC [GB] ; UNI LEVER NV [NL] ; RENNI E GEORGE KERR [GB] ; YORKE JO) 18 June 1998 (1998-06-18) page 12, line 15 et seqq; claims 1,5 -----	1-8
X	wo 00/06690 AI (COLGATE PALMOLIVE co [US] ) 10 February 2000 (2000-02-10) page 8, line 18 - page 9, line 5; claim 1 -----	1-9
A	wo 2008/005550 A2 (PROCTER & GAMBLE [US] ; HOKE II STEVEN HAMILTON [US] ; HESTER MARC ALAN) 10 January 2008 (2008-01-10) cited in the appl icati on page 27 - page 33; claims -----	1-9

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2012/049314

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos. :
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos. :

1-9

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2012/049314
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**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

The first invention relates to composition useful in liquid-liquid extraction processes.

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2. claim: 10

The second invention relates to the use of a composition in a liquid-liquid extraction process

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