

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CM4583M-DW	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2017/054816	International filing date ( <i>day/month/year</i> ) 3 October 2017 (03-10-2017)	(Earliest) Priority Date ( <i>day/month/year</i> ) 3 October 2016 (03-10-2016)
Applicant  THE PROCTER & GAMBLE COMPANY		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed  
 a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b.  This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.  **Certain claims were found unsearchable** (See Box No. II)

3.  **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant  
 the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant  
 the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_  
 as suggested by the applicant  
 as selected by this Authority, because the applicant failed to suggest a figure  
 as selected by this Authority, because this figure better characterizes the invention
- b.  none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2017/054816

A. CLASSIFICATION OF SUBJECT MATTER  
INV. C11D1/02 C11D3/20 C11D17/06 C11D3/386  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 00/18856 A1 (PROCTER & GAMBLE [US]; TATSUNO TERUAKI [JP]; HARTSHORN RICHARD TIMOTHY) 6 April 2000 (2000-04-06) page 1, paragraph 1 page 2, paragraph 3 page 3, paragraph 6 - page 4, paragraph 1 page 12, paragraph 1 page 13, paragraph 10 page 14, last paragraph - page 21, paragraph 4 page 24, last paragraph - page 25, paragraph 1 page 30, last paragraph - page 46; example 1 page 45, lines 20-21 page 44, lines 1-17 ----- -/--	1-21

Further documents are listed in the continuation of Box C.

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  5 December 2017	Date of mailing of the international search report  13/12/2017
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  Marttin, Emmeline

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2017/054816

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>WO 03/038028 A2 (HENKEL KGAA [DE]; GLUESEN BIRGIT [DE]; LIPHARD MARIA [DE]; KRAUS INGRI) 8 May 2003 (2003-05-08)  page 7, paragraph 1 - pages 10-11; claims 1,3-10,12-20; example 1; table 1  page 1, paragraph 2 - page 2, paragraph 3  pages 8-9 - page 21, paragraph 1  page 8, paragraph 2 - page 9, paragraph 2  page 9, paragraph 3  page 11, paragraph 3  page 12, paragraph 2 - page 13, paragraph 3  page 14, paragraph 3  page 32, paragraph 2 - page 33, paragraphs 1,3  page 23, paragraph 4 - page 30, paragraph 3  page 16, paragraph 1-2 - page 18, paragraph 2  page 19, paragraph 3  page 21, paragraph 3  page 27, paragraph 5 - page 28, paragraph 3</p>	1-21
Y	<p>-----  WO 95/12658 A1 (PROCTER &amp; GAMBLE [US]; MACBEATH FIONA SUSAN [GB])  11 May 1995 (1995-05-11)  page 7, line 21  page 1, paragraph 1; example 1  page 30, line 12 - page 31, paragraph 2;  claims 1,6-9  page 20, paragraph 1-3</p>	5,12,14
Y	<p>-----  WO 91/17232 A1 (PROCTER &amp; GAMBLE [US])  14 November 1991 (1991-11-14)  page 7, line 12</p>	16
Y	<p>-----  WO 2015/169851 A1 (BASF SE [DE]; HENKEL AG &amp; CO KGAA [DE])  12 November 2015 (2015-11-12)  page 1, paragraph 1; examples</p>	17
Y	<p>-----  WO 2013/036662 A1 (SUN PRODUCTS CORP [US]; VANBLARCOM DAVID [US]; SHEVADE MAKARAND S [US]) 14 March 2013 (2013-03-14)  paragraphs [0160] - [0161]</p>	18,20
Y	<p>-----  WO 2007/144857 A1 (PROCTER &amp; GAMBLE [US]; LANT NEIL JOSEPH [GB]; PATTERSON STEVEN GEORGE) 21 December 2007 (2007-12-21)  page 21, paragraph 4</p> <p>-----  -/--</p>	8

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International application No  
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 2 363 455 A1 (PROCTER & GAMBLE [US]) 7 September 2011 (2011-09-07) paragraphs [0001] - [0008], [0013] - [0016], [0019] - [0026]; examples; sequence 1  -----	1-21
Y	EP 2 380 957 A1 (PROCTER & GAMBLE [US]) 26 October 2011 (2011-10-26) paragraphs [0001] - [0010], [0013] - [0023], [0059] - [0060]; claims; example 2  -----	1-21

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