

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2018EM381	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2019/062816	International filing date (<i>day/month/year</i>) 22 November 2019 (22.11.2019)	(Earliest) Priority Date (<i>day/month/year</i>) 30 November 2018 (30.11.2018)
Applicant EXXONMOBIL CHEMICAL PATENTS INC.		

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 4 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 43.6bis(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. 1

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.

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.: 8,10,12,14,16,19,21
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:
Claims 8, 10, 12, 14, 16, 19 and 21 refer to one of claims which are not drafted in accordance with PCT Rule 6.4(a).

3. Claims Nos.: 5-7,9,11,13,15,17,18,20,22-25
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:

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 any 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.:

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.

A. CLASSIFICATION OF SUBJECT MATTER**C08F 210/02(2006.01)i, C08F 210/16(2006.01)i, C08F 232/02(2006.01)i, C08J 5/18(2006.01)i**

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)

C08F 210/02; B32B 001/02; B32B 007/04; B32B 027/06; C08F 10/04; C08F 232/08; C08F 4/58; C08J 5/18; C08L 45/00; C08F 210/16; C08F 232/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: cyclic olefin copolymer, ethylene, dicyclopentadiene, cyclopentene, cycloheptene, cyclooctene, norbornene, density

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2017-0233516 A1 (EXXONMOBIL CHEMICAL PATENTS INC.) 17 August 2017 paragraphs [0008], [0030], [0041], [0058]; claim 18.	1-4
A	US 2018-0171048 A1 (SABIC GLOBAL TECHNOLOGIES B.V.) 21 June 2018 paragraphs [0027], [0036]-[0054]; claims 6-8	1-4
A	US 2005-0112337 A1 (JESTER, RANDY D.) 26 May 2005 paragraphs [0008], [0028], [0058], [0059]; claims 1, 4-7.	1-4
A	US 2002-0160135 A1 (CHRISTOPHERSON, ROY et al.) 31 October 2002 paragraphs [0011]-[0018]; claims 1, 8.	1-4
A	US 2008-0071046 A1 (LECLERC, MARGARETE K. et al.) 20 March 2008 paragraphs [0007], [0018]; claim 1.	1-4

 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

"D" document cited by the applicant in the international application

"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

26 March 2020 (26.03.2020)

Date of mailing of the international search report

26 March 2020 (26.03.2020)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2019/062816

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017-0233516 A1	17/08/2017	CN 108602928 A	28/09/2018
		EP 3414272 A1	19/12/2018
		EP 3578581 A1	11/12/2019
		US 9982081 B2	29/05/2018
		WO 2017-138981 A1	17/08/2017
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		EP 3112384 A1	04/01/2017
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		US 10494463 B2	03/12/2019
		US 2018-0223018 A1	09/08/2018
		WO 2017-001151 A1	05/01/2017
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		EP 1687355 A1	09/08/2006
		JP 2007-515511 A	14/06/2007
		JP 4542105 B2	08/09/2010
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		WO 2008-033197 A2	20/03/2008
		WO 2008-033197 A3	05/06/2008