

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 17038-WO-ABP	<b>FOR FURTHER ACTION</b>	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. <b>PCT/US2018/048222</b>	International filing date ( <i>day/month/year</i> ) <b>28 August 2018 (28.08.2018)</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) 29 August 2017 (29.08.2017)
Applicant <b>ARMSTRONG WORLD INDUSTRIES, INC.</b>		

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 43.6bis(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, 15, 25, 32, 56, 61, 65, 72, 74, 86, 87  
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:  
See the extra sheet
  
3.  Claims Nos.: 7, 9-14, 24, 26-31, 36-43, 47-55, 60, 62-64, 66, 71, 73, 75-85  
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.

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2018/048222****A. CLASSIFICATION OF SUBJECT MATTER****B05D 7/24(2006.01)i, C09D 125/14(2006.01)i, C09D 131/04(2006.01)i, C09D 7/43(2018.01)i, C09D 7/45(2018.01)i, C09D 7/61(2018.01)i, B05D 1/02(2006.01)i, E04B 9/04(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)

B05D 7/24; B32B 17/06; B32B 37/24; B32B 5/16; C01G 23/053; C08G 2/00; C09B 67/04; C09B 67/20; C09D 11/322; E04B 1/84; F04B 1/32; C09D 125/14; C09D 131/04; C09D 7/43; C09D 7/45; C09D 7/61; B05D 1/02; E04B 9/04

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) &amp; keywords: building panel, pigment, binder, pH, Tg, viscosity modifier, humectant, ester-containing compound, liquid carrier, dispersant

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015-0330072 A1 (ARMSTRONG WORLD INDUSTRIES, INC.) 19 November 2015 See paragraphs [0001], [0048]-[0057]; and claims 1, 13-17.	1-6, 16-23, 57-59
Y		33-35, 44-46, 67-70
Y	KR 10-2007-0097155 A (CHUNG, W. C.) 04 October 2007 See paragraph [0065]; and claims 1, 3, 5.	33-35, 44-46
Y	US 5526628 A (KNUDSON, G. A.) 18 June 1996 See claim 1.	67-70
X	US 2010-0196701 A1 (BOTTY, G. et al.) 05 August 2010 See paragraphs [0039], [0062]; claims 1, 3, 13.	1, 2, 5, 6, 18, 19, 22 , 23, 57-59
Y		33-35, 44-46, 67, 68
A	US 4906726 A (CUMMINGS, L.) 06 March 1990 See the whole document.	1-6, 16-23, 33-35 , 44-46, 57-59, 67-70
A	US 2016-0221836 A1 (HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.) 04 August 2016 See the whole document.	1-6, 16-23, 33-35 , 44-46, 57-59, 67-70

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

13 December 2018 (13.12.2018)

Date of mailing of the international search report

**13 December 2018 (13.12.2018)**

Name and mailing address of the ISA/KR

International Application Division  
Korean Intellectual Property Office  
189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer

LEE, Dal Kyong

Telephone No. +82-42-481-8440



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2018/048222**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2015-0330072 A1	19/11/2015	AU 2015-259115 A1	10/11/2016
		AU 2015-259115 B2	29/06/2017
		CA 2947629 A1	19/11/2015
		CN 106255786 A	21/12/2016
		EP 3143217 A1	22/03/2017
		MX 2016014928 A	31/03/2017
		RU 2016149317 A	18/06/2018
		US 2016-0138264 A1	19/05/2016
		US 9243401 B2	26/01/2016
		WO 2015-175733 A1	19/11/2015
		KR 10-2007-0097155 A	04/10/2007
CN 101045826 B	30/11/2011		
CN 101045826 C	03/10/2007		
KR 10-0639790 B1	31/10/2006		
KR 10-0824387 B1	24/04/2008		
KR 10-2006-0081466 A	13/07/2006		
US 5526628 A	18/06/1996	AU 1993-38093 A	19/07/1993
		CA 2126098 A1	24/06/1993
		CN 1075525 A	25/08/1993
		US 5651230 A	29/07/1997
		US 5688095 A	18/11/1997
		WO 93-12301 A1	24/06/1993
		ZA 9209791 A	16/09/1993
US 2010-0196701 A1	05/08/2010	AT 504454 T	15/04/2011
		AU 2008-274532 A1	15/01/2009
		AU 2008-274532 B2	17/10/2013
		BR PI0812659 A2	23/12/2014
		CA 2691808 A1	15/01/2009
		CN 101754864 A	23/06/2010
		CN 101754864 B	05/09/2012
		DK 2167324 T3	20/06/2011
		EA 017396 B1	28/12/2012
		EA 201070109 A1	30/06/2010
		EP 2167324 A1	31/03/2010
		EP 2167324 B1	06/04/2011
		ES 2361647 T3	20/06/2011
		HK 1137970 A1	02/09/2011
		HR P20110480 T1	31/07/2011
		JP 2010-532828 A	14/10/2010
		KR 10-2010-0038376 A	14/04/2010
		PT 2167324 E	05/07/2011
		RS 51863 B	29/02/2012
		SI 2167324 T1	31/08/2011
		SI EP2167324 T1	31/08/2011
		WO 2009-007072 A1	15/01/2009
		ZA 200908216 B	23/02/2011

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2018/048222**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4906726 A	06/03/1990	None	
US 2016-0221836 A1	04/08/2016	BR 112016006612 A2 CN 105593312 A EP 3049482 A1 EP 3049482 A4 US 2018-0072585 A1 US 9878920 B2 US 9981857 B2 WO 2015-047306 A1	01/08/2017 18/05/2016 03/08/2016 28/09/2016 15/03/2018 30/01/2018 29/05/2018 02/04/2015

BOX II 2.

1. Claims 8, 25, 32, 56, 61, 65, 72 and 74 are unclear since they refer to claims which are not searchable due to not being drafted in accordance with third sentence of Rule 6.4(a).
2. Claims 86 and 87 are unclear since they refer to claims which are not searchable due to not being drafted in accordance with second sentence of Rule 6.4(a).
3. Claim 15 does not comply with PCT Rule 6.1(b), because claim 15 is missing in this application.