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6 January 2011

(54) Title: PROCESS FOR THE PREPARATION OF THE TOP COAT LAYER OF AN AUTOMOTIVE OEM MULTI-LAYER COATING

(57) Abstract: A coating process wherein a pre-coated automotive substrate is OEM top coated with an aqueous two-component polyurethane top coating composition prepared by static mixing a non-aqueous hydrophobic polyisocyanate crosslinker component and an aqueous binder component having a binder solids content comprising at least one water-dilutable hydroxyl-functional binder and 5 to 30 wt.-% of a urethane compound A with at least two terminal urethane groups (-NHC(O)OR; R = hydrocarbyl residue of a monoalcohol) and having a number-average molar mass (Mn) of from 400 to 5,000.



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**A. CLASSIFICATION OF SUBJECT MATTER***C09D 175/06(2006.01)i, B05D 1/02(2006.01)i, B05D 7/14(2006.01)i, C23C 4/04(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)

C09D 175/06; B05D 3/02; C08L 75/04; B32B 27/30; C08L 33/10; C08G 18/00; C07C 265/04; B32B 27/36

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: OEM multi-layer coating, polyurethane, polyisocyanate, hydroxyl-functional and static mixing

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0035471 A1 (FLOSBACH CARMEN et al.) 05 February 2009 See paragraph 7-8, 42, 50, 51; claims 1, 12-14	1-3
A	US 6410147 B1 (CHUNG; DING-YU et al.) 25 June 2002 See column 8, lines 44-49; claim 1	1-3
A	US 2009-0018254 A1 (HUSTER INGE et al.) 15 January 2009 See paragraph 115, 116, 119; claims 8, 9, 12	1-3
A	US 2002-0165334 A1 (MARTIN MELCHIORS et al.) 07 November 2002 See claims 1, 5, 11	1-3
A	US 2003-0023114 A1 (JOCHEM HENKELMANN et al.) 30 January 2003 See paragraph 33; claims 5-12	1-3

 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 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

12 OCTOBER 2010 (12.10.2010)

Date of mailing of the international search report

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Name and mailing address of the ISA/KR

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2010/025724**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0035471 A1	05.02.2009	None	
US 6410147 B1	25.06.2002	CA 2348187 C CA 2348187-A1 EP 1184434 A2 MX PA01008312A	17.05.2005 24.02.2002 06.03.2002 09.04.2002
US 2009-0018254 A1	15.01.2009	EP 1987073 A1 JP 2009-526104 A WO 2007-090640 A1	05.11.2008 16.07.2009 16.08.2007
US 2002-0165334 A1	07.11.2002	AT 302222 T AU 2001-87658 A1 BR 0113228 A CA 2418805-A1 DE 10052875 A1 EP 1311571 B1 ES 2246339 T3 JP 2004-515571 A KR 10-0788530 B1 MX PA03001313A PL 365914 A1 SK 1662003A3 WO 02-14395 A3	15.09.2005 25.02.2002 08.07.2003 10.02.2003 28.02.2002 17.08.2005 16.02.2006 27.05.2004 24.12.2007 02.04.2004 10.01.2005 01.07.2003 21.02.2002
US 2003-0023114 A1	30.01.2003	AT 265482 T AU 2001-52127 A1 BR 0108422 A EP 1263832 A1 US 6740726 B2 WO 01-60885 A1	15.05.2004 27.08.2001 25.03.2003 11.12.2002 25.05.2004 23.08.2001

**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.: 4-12  
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 fee, this Authority did not invite payment of any additional fee.
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.