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- (71) **Applicant:** PPG INDUSTRIES OHIO, INC. [US/US];  
3800 West 143rd Street, Cleveland, Ohio 44111 (US).
- (72) **Inventors:** OKEL, Tim, Allen; 111 Old Gate Road, Traf-  
ford, Pennsylvania 15085 (US). VOTRUBA-DRZAL,  
Peter, Lawrence; 119 Yorkshire Drive, Pittsburgh,  
Pennsylvania 15208 (US). MARTIN, Justin, Jonathan;  
145 Birchwood Way, Irwin, Pennsylvania 15642 (US).  
KOLLAH, Raphael; 311 Frey Drive, Wexford,  
Pennsylvania 15090 (US). WILT, Truman; 154 Sandy  
Drive, Clinton, Pennsylvania 15026 (US). REARICK,  
Brian; 1335 Parkview Drive, Allison Park, Pennsylvania  
15101 (US). EDELMAN, Clint, Steven; 1358 Pocono  
Street, Pittsburgh, Pennsylvania 15218 (US). ANDER-  
SON, Linda, K.; 4119 Northampton Drive, Allison Park,  
Pennsylvania 15101 (US). WANG, Feng; 2217 Manordale  
Drive, Export, Pennsylvania 15632 (US). OLSON, Kurt;  
3935 Bakerstown Road, Gibsonia, Pennsylvania 15044  
(US).
- (74) **Agents:** FORTNEY, Lester, N. et al.; The Webb Law  
Firm, One Gateway Center, 420 Ft. Duquesne Blvd., Suite  
1200, Pittsburgh, Pennsylvania 15222 (US).
- (81) **Designated States** (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,  
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KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,  
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PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,  
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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,  
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(54) **Title:** TREATED FILLERS, COMPOSITIONS CONTAINING SAME, AND ARTICLES PREPARED THEREFROM

(57) **Abstract:** The present invention includes a process for producing treated filler that includes (a) treating a slurry that includes untreated filler where the untreated filler has not been previously dried, with a treating composition that includes a treating agent, thereby forming a treated filler slurry, and (b) drying the treated filler slurry to produce treated filler. The treating agent can include a polymer having (i) at least one first group that interacts with the untreated filler and (ii) at least one second group that interacts with a rubber matrix into which the treated filler is incorporated. The present invention also is directed to treated filler prepared by the process, as well as rubber compounding compositions and tires including the treated filler.



WO 2015/054118 A9

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2014/059277

A. CLASSIFICATION OF SUBJECT MATTER  
 INV. C09C1/30 C09C3/06 C09C3/08 C08K9/00  
 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)  
 C09C  
 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, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/136938 A1 (KOSTER GEORGES [LU] ET AL) 9 June 2011 (2011-06-09)	1-9, 16-27, 37,38
Y	paragraphs [0010] - [0066]; examples 1-2	10-15, 28,29
A	-----	30-36
X	US 2011/136970 A1 (KOSTER GEORGES [LU] ET AL) 9 June 2011 (2011-06-09)	1-5,7-9, 16-22, 24-27, 37,38
Y	paragraphs [0014] - [0061]; examples 1-2	10-15, 28,29
A	----- -/--	30-36

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

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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  Corrias, M

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2014/059277

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ZHOU W ET AL: "Preparation and properties of poly(styrene-co-maleic anhydride)/silica hybrid materials by the in situ sol-gel process", JOURNAL OF POLYMER SCIENCE PART A: POLYMER CHEMISTRY, JOHN WILEY & SONS, INC, US, vol. 36, no. 10, 30 July 1998 (1998-07-30), pages 1607-1613, XP002562964, ISSN: 0887-624X [retrieved on 2000-01-21] "Experimental", "Scheme 1" -----	16,37
X	JOSÉ BONILLA-CRUZ ET AL: "Towards Controlled Graft Polymerization of Poly[styrene-co-(maleic anhydride)] on Functionalized Silica Mediated by Oxoaminium Bromide Salt. Facile Synthetic Pathway Using Nitroxide Chemistry", MACROMOLECULAR RAPID COMMUNICATIONS, vol. 28, no. 13, 2 July 2007 (2007-07-02), pages 1397-1403, XP055159935, ISSN: 1022-1336, DOI: 10.1002/marc.200700182 "Experimental part" -----	16,37
Y	US 2013/079445 A1 (MARTIN JUSTIN J [US] ET AL) 28 March 2013 (2013-03-28) paragraphs [0012] - [0103]; claims 1-22 -----	10-15, 28,29

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2014/059277
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2011136938	A1	09-06-2011	NONE	
US 2011136970	A1	09-06-2011	NONE	
US 2013079445	A1	28-03-2013	AR 087988 A1	30-04-2014
			AU 2012312296 A1	10-04-2014
			CA 2849706 A1	28-03-2013
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			US 2013079445 A1	28-03-2013
			WO 2013043955 A1	28-03-2013

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-38(partially)

Present claim 1 relates to a process for the formation of a treated filler by contacting it with a treating agent which comprises "a polymer comprising (i) at least one first group that interacts with the untreated filler and (ii) at least one second group that interacts with a rubber matrix into which the treated filler is incorporated".

The treating agent comprises an extremely large number of possible compounds namely any type of polymer. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only a very small proportion of the above mentioned polymers such as those present in claim 4.

Furthermore the definition of the first second group that should be present in the polymer used as treating agent is not clearly defined and is open to an extremely large number of possibilities. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only the "first group" defined in claims 7 and 8 and the "second group" defined in claim 9.

The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of claim 1 (PCT Guidelines 9.19 and 9.23).

The search of claim 1 was restricted to treating agents comprising a polymer selected from acrylic polymers, styrene butadiene latexes, natural rubber latexes or combinations thereof comprising a "first group" selected from an ester, carboxylic acid, imide, anhydride, diacid, lactone, oxirane, isocyanate, alkoxy silane, hydrolysis products thereof, salts thereof, or combinations thereof, formyl, keto, thiol, sulfido, halo, amino, alkenyl, alkynyl, alkyl, hydrolysis products thereof, salts thereof, or combinations thereof and comprising a the "second group" is selected from hydroxyl, anhydride, oxirane, hydrolysis products thereof, salts thereof, or combinations thereof.

The search of claims 2 to 38 was also limited accordingly.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.