



- (51) International Patent Classification:
B01J 20/06 (2006.01) *B01J 23/00* (2006.01)
- (21) International Application Number:
PCT/US2013/021318
- (22) International Filing Date:
11 January 2013 (11.01.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/585,732 12 January 2012 (12.01.2012) US
13/738,243 10 January 2013 (10.01.2013) US
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- (81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, 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, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

- Published:
— with international search report (Art. 21(3))
- (88) Date of publication of the international search report:
29 January 2015

(54) Title: TRANSPARENT PHOTOCATALYST COATING

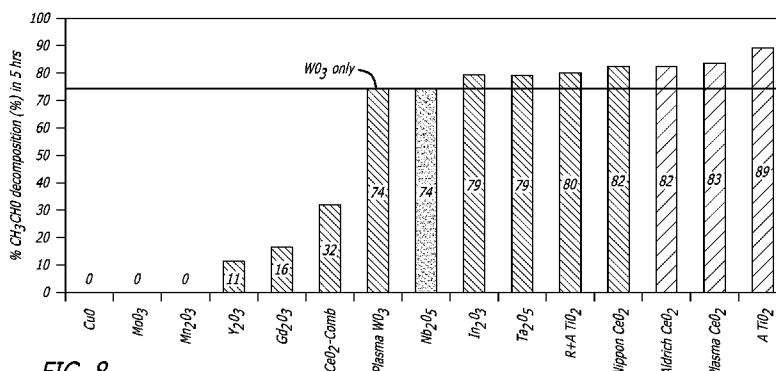


FIG. 8

(57) Abstract: A photocatalytic composition and a method for making a photocatalytic layer including a photocatalyst and co-catalyst. In some embodiments, the co-catalyst is cerium oxide. In some embodiments, the method for making a catalytic layer includes creating a dispersion comprising the photocatalyst, cerium oxide, and a dispersing media; applying the dispersion to a substrate; and heating the dispersion and the substrate at a sufficient temperature and length of time to evaporate substantially all the dispersing media from the dispersion.

WO 2013/106776 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/21318

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B01J 20/06; B01J 23/00 (2013.01) USPC - 502/184; 502/317 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) USPC 502/184; 502/317 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC B01J 20/06; B01J 23/00; USPC 502/242; 428/702 (see keywords below). Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase; Google Patents; Google Scholar Search terms used: photocatalyst; cocatalyst; co-catalyst; perform*; enhanc*; improv*; increas*; acetaldehyde; refractive inde*; cerium oxide; CeO2; layer; substrate; heat*; dispersion; evaporat*; solid; materials; content; titanium oxide; heating		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0077251 A1 (OKUSAKO et al.) 20 June 2002 (20.06.2002); Abstract; para [0001], [0004]-[0006], [0023], [0028], [0044]-[0045], [0064]-[0068], [0078], [0096]	1, 2
Y		3, 45-50
X	US 2005/0090387 A1 (NIHARA et al.) 28 April 2005 (28.04.2005); Abstract; para [0021]-[0024], [0036]-[0039], [0049]	1
Y	US 2004/0009349 A1 (BROTZMAN, JR. et al.) 15 January 2004 (15.01.2004); para [0004], [0067]	3, 45-50
Y	US 6,037,289 A (CHOPIN et al.) 14 March 2000 (14.03.2000); Abstract; col 4, ln 54-61; col 7, ln 57 to col 8, ln 10; col 10, ln 20-21; col 14, ln 58-65; col 16, ln 9-19; col 16, ln 35-45; Claim 35	45-50
Y	US 2009/0305878 A1 (SAKATANI et al.) 10 December 2009 (10.12.2009), para [0014]-[0016]	45-50
A	US 2011/0257298 A1 (ISHIHARA et al.) 20 October 2011 (20.10.2011); entire document	45-50
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* 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 08 March 2013 (08.03.2013)		Date of mailing of the international search report 26 MAR 2013
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/21318

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.: 4-44 and 51-58
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 additional fees, this Authority did not invite payment of 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.