



- (51) International Patent Classification:
C08K 3/34 (2006.01) *C09D 105/00* (2006.01)
C09D 101/18 (2006.01)
- (21) International Application Number:
PCT/US2018/030065
- (22) International Filing Date:
28 April 2018 (28.04.2018)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
62/492,028 28 April 2017 (28.04.2017) US
- (71) Applicant: MELIOR INNOVATIONS, INC. [US/US];
6002 Rogerdale Road, Suite 175, Houston, TX 77072 (US).
- (72) Inventors: LIAO, Wen, P.; 74 Mann Boulevard, Clifton
Park, NY 12065 (US). DUKES, Douglas, M.; 8 Orchard
Lane, Troy, NY 12180 (US). LI, Lingyu; 28 Empire Dr.,
Nishayuna, NY 12309 (US). LANDTISER, Richard; 3740
Mist Flower Ln, Naperville, IL 60564 (US). IVEY, Britte-
ny; 16 Garling Drive, Latham, NY 12110 (US).
- (74) Agent: BELVIS, Glen, P.; Belvis Law, Llc., P.o. Box
11317, Chicago, IL 60611 (US).

- (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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, SA, 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, ST, 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, KM, ML, MR, NE, SN, TD, TG).

(54) Title: HIGH TEMPERATURE BORON CERAMIC ADDITIVES, PIGMENTS, AND FORMULATIONS

(57) Abstract: High temperature boron-PDC (polymer derived ceramic) black materials for use as, or in, colorants, inks, pigments, dyes, additives and formulations utilizing these black materials. Boron-PDC materials having boron, silicon, oxygen and carbon, and methods of making these ceramics; formulations utilizing these black ceramics; and devices, structures and apparatus that have or utilize these formulations. Plastics, paints, inks, coatings, formulations, liquids and adhesives containing ceramic black materials, preferably polymer derived boron containing black ceramic materials, and in particular boron-SiOC derived ceramic materials.

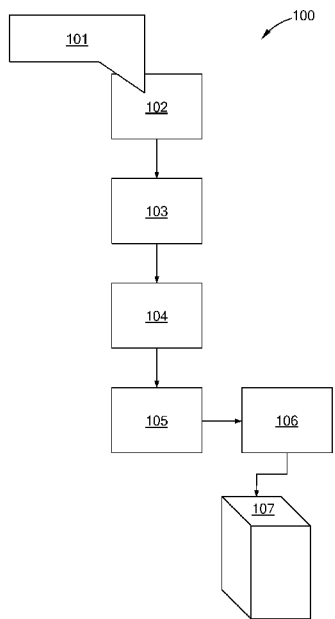


Fig. 1



Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

06 December 2018 (06.12.2018)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/30065

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - C08K 3/34, C09D 101/18, C09D 105/00 (2018.01)
CPC - C01B 33/113, C08G 77/12, C08G 77/20

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)

See Search History Document

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

See Search History Document

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

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2015/0252166 A1 (Dukes et al.) 10 September 2015 (10.09.2015) Abstract; para [0020], para [0021], para [0022], Figure 4C; para [0048], para [0073], para [00207], and full document	1-21
Y	WO 2016/007612 A1 (Kansas State University Research Foundation) 14 January 2016 (14.01.2016) Abstract, Figure 2; pg 2 para 3-5; pg 10 ln 9-15; pg 3 para 3; and full document	1-21
Y	US 2015/0252171 A1 (Molnar et al.) 10 September 2015 (10.09.2015) Abstract, para [0018]-[0029]	1-21
Y	US 5,354,602 A (Stranford et al.) 11 October 1994 (11.10.1994) Abstract, col 2 ln 60-col 4 ln 5	1-21

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

Date of the actual completion of the international search

10 October 2018

Date of mailing of the international search report

29 OCT 2018

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. 571-273-8300

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774