



(51) International Patent Classification:

C23C 4/10 (2006.01) *C23C 28/04* (2006.01)
C23C 4/12 (2006.01) *F01D 5/28* (2006.01)

(21) International Application Number:

PCT/US2014/060104

(22) International Filing Date:

10 October 2014 (10.10.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

14/090,513 26 November 2013 (26.11.2013) US

(71) Applicant: **PRAXAIR S.T. TECHNOLOGY, INC.**
[US/US]; 441 Sackett Point Road, North Haven, CT 06473
(US).

(72) Inventor: **PETORAK, Christopher, A.**; 664 Beaverbrook
Drive, Carmel, IN 46032 (US).

(74) Agents: **DALAL, Nilay, S.** et al.; Praxair, Inc., 39 Old
Ridgebury Road, Danbury, CT 06810 (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, DK, DM,

DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
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).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*

(54) Title: MODIFIED THERMAL BARRIER COMPOSITE COATINGS

(57) Abstract: A novel coating system is provided that allows for a single coating structure to exhibit properties previously considered mutually exclusive. A unique approach for tailoring specific properties of a coating structure as a function of location within the coating is provided with a specially designed undercoat having a columnar macrostructure and a second coating layer that is selected to be compatible with and complement the undercoat. The resultant composite coating system can maintain thermomechanical compliance while improving various bulk and/or free surface properties of the composite coating system.



WO 2015/080804 A1