(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 June 2006 (22.06.2006)

PCT

(10) International Publication Number
WO 2006/066101 A3

(51) International Patent Classification:
C03C 17/36 (2006.01) *B32B 17/06* (2006.01)

(21) International Application Number:
PCT/US2005/045668

(22) International Filing Date:
19 December 2005 (19.12.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/636,656 17 December 2004 (17.12.2004) US

(71) Applicant *(for all designated States except US)*: **AFG INDUSTRIES, INC.** [US/US]; 1400 Lincoln Street, Kingsport, Tennessee 37660 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **MASCHWITZ, Peter, Alan** [US/US]; 6601 Hutchins Ave., Sebastopol, California 95472 (US).

(74) Agents: **ZOLTICK, Martin, M.** et al.; Rothwell, Figg, Ernst & Manbeck, 1425 K Street, NW, Suite 800, Washington, DC 20005 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

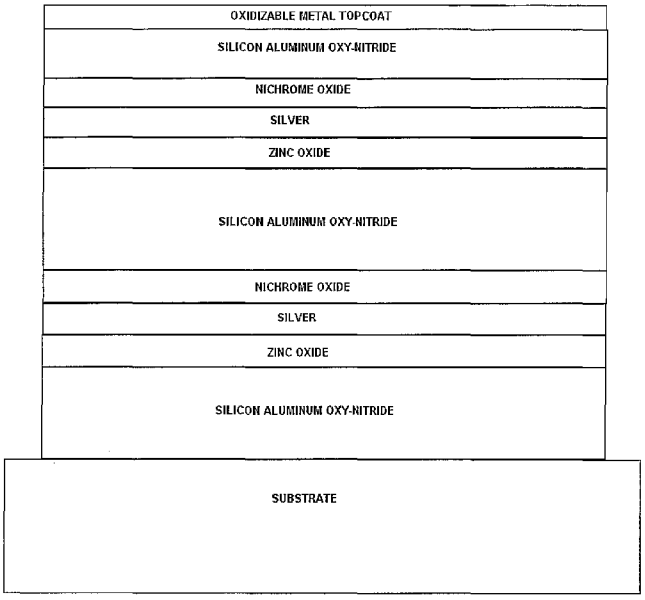
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
12 October 2006

[Continued on next page]

(54) Title: AIR OXIDIZABLE SCRATCH RESISTANT PROTECTIVE LAYER FOR OPTICAL COATINGS



(57) Abstract: The present invention provides a scratch protecting layer comprising a metal, metal alloy, metal compound or an intermetallic layer deposited on an air contacting surface. The scratch protecting layer is typically from 1 to 3 nanometers thick and not optically absorbing after oxidation occurs. This layer is initially deposited in a primarily unoxidized or un-nitrided state. Full oxidation of the metal, metal alloy, metal compound or intermetallic layer occurs within several days after exposure to air. The scratch protection layer can be 2 to 5 nanometers thick if the layer is exposed to a plasma, electrical discharge or ion beam comprising a reactive gas such as oxygen or nitrogen.

WO 2006/066101 A3

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.