

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 February 2006 (23.02.2006)

PCT

(10) International Publication Number
WO 2006/020153 A3

(51) International Patent Classification:

B24D 18/00 (2006.01) B29C 33/40 (2006.01)
B24D 13/14 (2006.01) B29C 33/56 (2006.01)
B24B 37/04 (2006.01) B29C 41/02 (2006.01)
B29C 33/42 (2006.01)

(21) International Application Number:

PCT/US2005/025330

(22) International Filing Date: 15 July 2005 (15.07.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

10/897,192 21 July 2004 (21.07.2004) US

(71) Applicant (for all designated States except US): **NEOPAD TECHNOLOGIES CORPORATION** [US/US]; 1290 Oakmead Parkway, Suite 305, Sunnyvale, CA 94085 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DEOPURA, Manish** [IN/US]; 22C2, 550 Memorial Drive, Cambridge, MA 02139 (US). **VAIDYA, Hem, M.** [IN/US]; 1271 Lakeside Drive, #3130, Sunnyvale, CA 94085 (US). **ROY, Pradip, K.** [US/US]; 7706 Hidden Ivey Court, Orlando, FL 32819 (US).

(74) Agents: **MAYER, Mika** et al.; Morrison & Foerster, LLP, 755 Page Mill Road, Palo Alto, CA 94304-1018 (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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, 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).

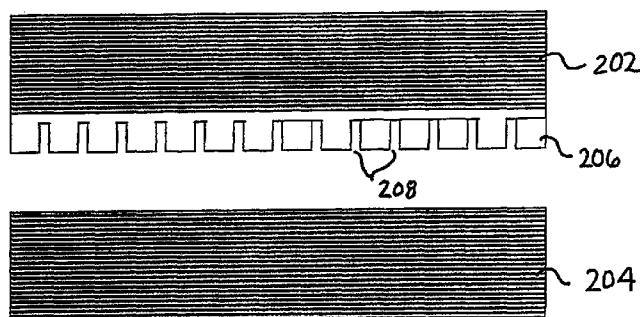
Published:

— with international search report

[Continued on next page]

(54) Title: METHODS FOR PRODUCING IN-SITU GROOVES IN CHEMICAL MECHANICAL PLANARIZATION (CMP) PADS, AND NOVEL CMP PAD DESIGNS

200



(57) Abstract: Methods for producing in-situ grooves in CMP pads are provided. In general, the methods for producing in-situ grooves comprise the steps of patterning a silicone lining (206), placing the silicone lining (206) in. or on, a mold (200), adding CMP pad material to the silicone lining (206), and allowing the CMP pad to solidify. CMP pads comprising novel groove designs are also described. For example, described here are CMP pads comprising concentric circular grooves and axially curved grooves, reverse logarithmic grooves, overlapping circular grooves, lassajous grooves, double spiral grooves, and multiply overlapping axially curved grooves. The CMP pads may be made from polyurethane, and the grooves produced therein may be made by a method from the group consisting of silicone lining, laser writing, water jet cutting, 3-D printing, thermoforming, vacuum forming, micro-contact printing, hot stamping, and mixtures thereof.

WO 2006/020153 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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.

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

27 April 2006