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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 July 2010 (15.07.2010)

PCT

(10) International Publication Number
WO 2010/080590 A3

(51) International Patent Classification:
H01L 21/683 (2006.01) *H01L 21/687* (2006.01)

(21) International Application Number:
PCT/US2009/068686

(22) International Filing Date:
18 December 2009 (18.12.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/139,297 19 December 2008 (19.12.2008) US
12/640,496 17 December 2009 (17.12.2009) US

(71) Applicant *(for all designated States except US)*: **APPLIED MATERIALS, INC.** [US/US]; 3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **SUN, Jennifer Y.** [US/US]; 1056 Oak Haven Place, Mountain View, California 94041 (US). **THACH, Senh** [US/US]; 32257 Jean Drive, Union City, California 94587 (US). **DUAN, Ren-Guan** [CN/US]; 3645 Independence Road, Fremont, California 94538 (US).

(74) Agent: **TABOADA, Alan**; Moser IP Law Group, 1030 Broad Street, Suite 203, Shrewsbury, NJ 07702 (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, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, 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))*

— *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:
30 September 2010

(54) Title: HIGH TEMPERATURE ELECTROSTATIC CHUCK BONDING ADHESIVE

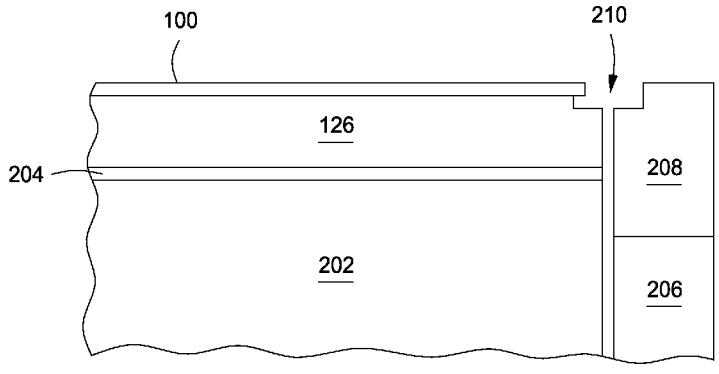


FIG. 2

(57) Abstract: Methods and apparatus for bonding an electrostatic chuck to a component of a substrate support are provided herein. In some embodiments, an adhesive for bonding components of a substrate support may include a matrix of silicon-based polymeric material having a filler dispersed therein. The silicon based polymeric material may be a polydimethylsiloxane (PDMS) structure having a molecular weight with a low molecular weight (LMW) content Σ D3 - D10 of less than about 500 ppm. In some embodiments, the filler may comprise between about 50 to about 70 percent by volume of the adhesive layer. In some embodiments, the filler may comprise particles of aluminum oxide (Al_2O_3), aluminum nitride (AlN), yttrium oxide (Y_2O_3), or combinations thereof. In some embodiments, the filler may comprise particles having a diameter of about 10 nanometers to about 10 microns.

WO 2010/080590 A3