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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 January 2008 (10.01.2008)

PCT

(10) International Publication Number
WO 2008/005756 A3

(51) International Patent Classification:
H01L 21/306 (2006.01) *H01L 21/00* (2006.01)

(21) International Application Number:
PCT/US2007/072157

(22) International Filing Date: 26 June 2007 (26.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/428,155 30 June 2006 (30.06.2006) US

(71) Applicant *(for all designated States except US)*: **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, (p1499pct), Fremont, California 94538 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **DHINDSA, Rajinder** [US/US]; c/o Lam Research Corporation, 4650 Cushing Parkway, Fremont, California 94538 (US).

(74) Agent: **NGUYEN, Joseph, A**; PO Box 700640, -, San Jose, California 95170 (US).

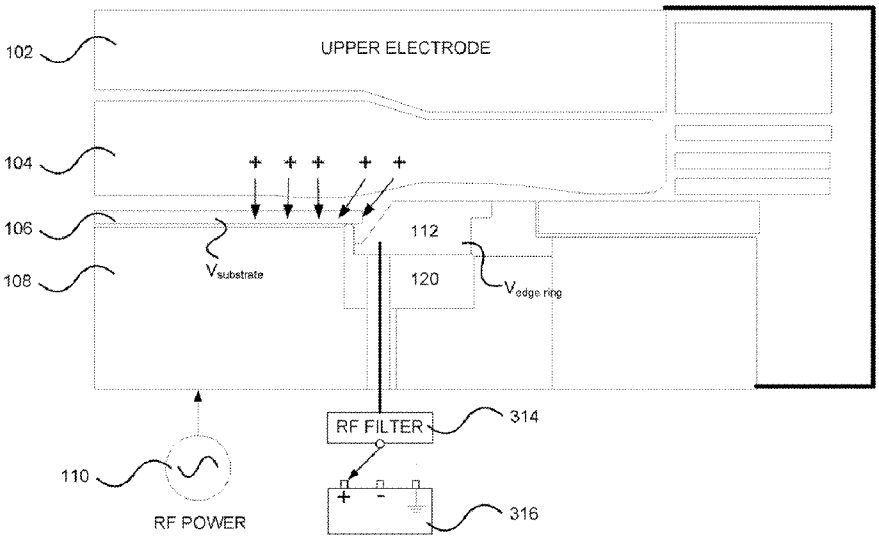
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, 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, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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:
8 May 2008

(54) Title: APPARATUS FOR SUBSTRATE PROCESSING AND METHODS THEREFOR



(57) Abstract: A method for processing a substrate in a plasma processing chamber. The substrate is disposed above a chuck and surrounded by an edge ring while the edge ring being electrically isolated from the chuck. The method includes providing RF power to the chuck and providing an edge ring DC voltage control arrangement. The edge ring DC voltage control arrangement is coupled to the edge ring to provide first voltage to the edge ring, with the edge ring potential being one of a positive potential, a negative potential and a ground. The method further includes generating a plasma within the plasma processing chamber to process the substrate. The substrate is processed while the edge ring DC voltage control arrangement is configured to cause the edge ring potential to be less than a DC potential of the substrate in an embodiment and to be substantially equal to the DC potential of the substrate in another embodiment.

WO 2008/005756 A3