



(51) International Patent Classification:
H01L 21/3065 (2006.01) *H01L 21/00* (2006.01)
H05H 1/34 (2006.01)

(21) International Application Number:
PCT/US2009/004494

(22) International Filing Date:
6 August 2009 (06.08.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/222,789 15 August 2008 (15.08.2008) US

(71) Applicant (for all designated States except US): **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, Fremont, CA 94538-6470 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **DHINDSA, Rajinder** [US/US]; 3670 Rollingside Drive, San Jose, CA 95148 (US).

(74) Agent: **SKIFF, Peter, K.**; Buchanan Ingersoll & Rooney P.C., P. O. Box 1404, Alexandria, VA 22313-1404 (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).

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))

(88) Date of publication of the international search report:
15 April 2010

(54) Title: TEMPERATURE CONTROLLED HOT EDGE RING ASSEMBLY

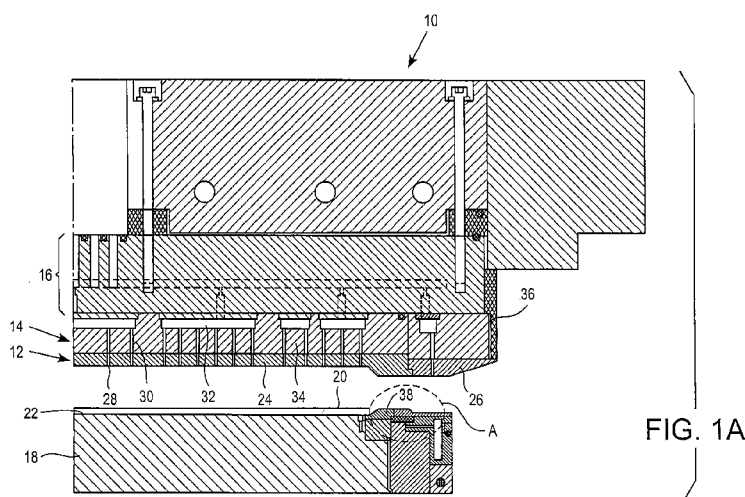


FIG. 1A

(57) Abstract: A temperature-controlled hot edge ring assembly adapted to surround a semiconductor substrate supported in a plasma reaction chamber is provided. A substrate support with an annular support surface surrounds a substrate support surface. A radio-frequency (RF) coupling ring overlies the annular support surface. A lower gasket is between the annular support surface and the RF coupling ring. The lower gasket is thermally and electrically conductive. A hot edge ring overlies the RF coupling ring. The substrate support is adapted to support a substrate such that an outer edge of the substrate overhangs the hot edge ring. An upper thermally conductive medium is between the hot edge ring and the RF coupling ring. The hot edge ring, RF coupling ring and annular support surface can be mechanically clamped. A heating element can be embedded in the RF coupling ring.