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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 October 2006 (05.10.2006)

PCT

(10) International Publication Number
WO 2006/104841 A2

(51) International Patent Classification:
C23C 16/52 (2006.01) *B05C 11/00* (2006.01)
C23C 16/00 (2006.01)

(21) International Application Number:
PCT/US2006/010576

(22) International Filing Date: 24 March 2006 (24.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/092,737 28 March 2005 (28.03.2005) US

(71) Applicant *(for all designated States except US)*: **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, P1377pct, Fremont, California 94538 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HUDSON, Eric** [US/US]; 4400 Cushing Parkway, Ca3, Fremont, California 94538 (US). **KEIL, Douglas** [US/US]; 4400 Cushing Parkway, Ca3, Fremont, California 94538 (US). **MARAKHTANOV, Alexei** [RU/US]; 4400 Cushing Parkway, Ca3, Fremont, California 94538 (US).

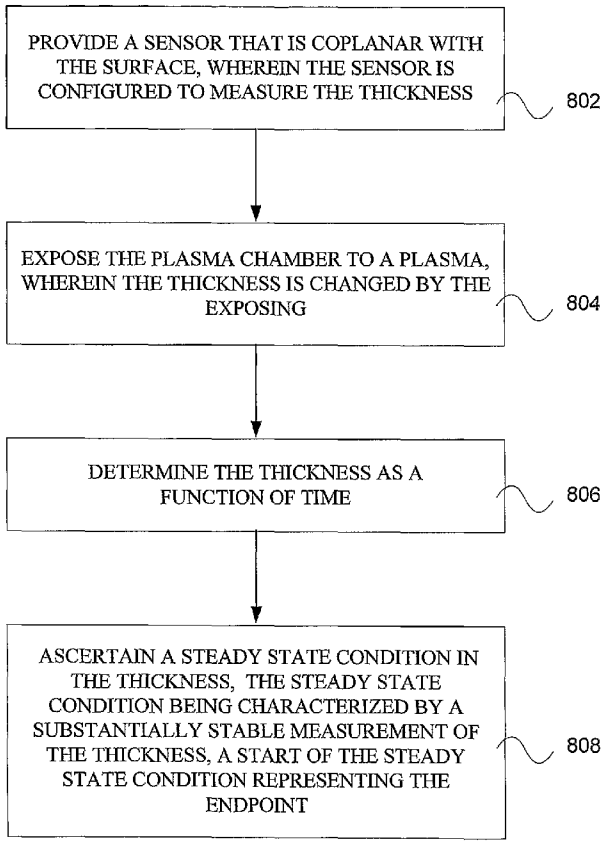
(74) Agent: **NGUYEN, Joseph, A.**; PO BOX 700640, San Jose, California 95170 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, 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,

[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR DETERMINING THE ENDPOINT OF A CLEANING OR CONDITIONING PROCESS IN A PLASMA PROCESSING SYSTEM



(57) Abstract: A method of determining an endpoint of a process by measuring a thickness of a layer, the layer being deposited on the surface by a prior process is disclosed. The method includes providing a sensor that is coplanar with the surface, wherein the sensor is configured to measure the thickness. The method also includes exposing the plasma chamber to a plasma, wherein the thickness is changed by the exposing, and determining the thickness as a function of time. The method further includes ascertaining a steady state condition in the thickness, the steady state condition being characterized by a substantially stable measurement of the thickness, a start of the steady state condition representing the endpoint.

WO 2006/104841 A2

RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

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.