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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 March 2006 (16.03.2006)

PCT

(10) International Publication Number
WO 2006/028673 A1

(51) International Patent Classification:
H01L 21/311 (2006.01) *H01L 21/027* (2006.01)

(21) International Application Number:
PCT/US2005/029308

(22) International Filing Date: 17 August 2005 (17.08.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/934,324 3 September 2004 (03.09.2004) US

(71) Applicant *(for all designated States except US)*: **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, Fremont, California 94438-6470 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **KAWAGUCHI, Seiji** [JP/US]; 1429 Cedarmeadow Court, San Jose, California 95131 (US). **TAKESHITA, Kenji** [JP/US]; 4237 Garland Drive, Fremont, California 94536-6830 (US).

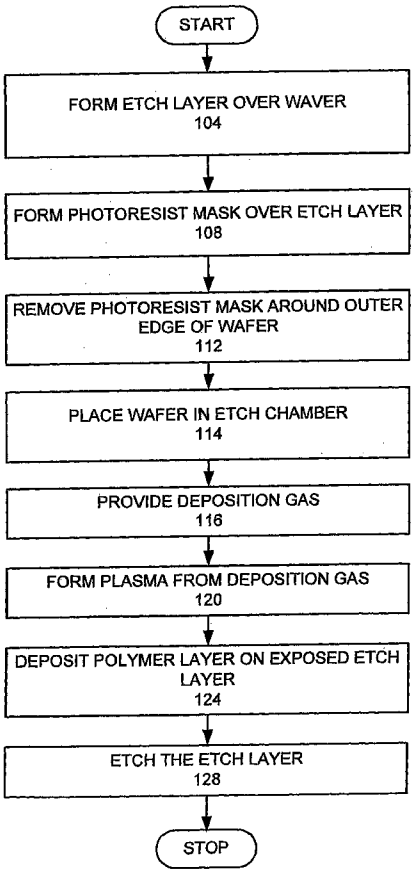
(74) Agent: **LEE, Michael, B.**; BEYER WEAVER & THOMAS, LLP, P.O. BOX 70250, Oakland, California 94612-0250 (US).

(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),

[Continued on next page]

(54) Title: ETCH WITH UNIFORMITY CONTROL



(57) Abstract: A method of forming semiconductor devices on a wafer is provided. An etch layer is formed over a wafer. A photoresist mask is formed over the etch layer. The photoresist mask is removed only around an outer edge of the wafer to expose the etch layer around the outer edge of the wafer. A deposition gas is provided comprising carbon and hydrogen containing species. A plasma is formed from the deposition gas. A polymer layer is deposited on the exposed etch layer around the outer edge of the wafer, wherein the polymer is formed from the plasma from the deposition gas. The etch layer is etched through the photoresist mask, while consuming the photoresist mask and the polymer deposited on the exposed etch layer around the outer edge of the wafer.

WO 2006/028673 A1

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*

— *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.