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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 December 2007 (06.12.2007)

PCT

(10) International Publication Number
WO 2007/140425 A2

(51) International Patent Classification:
H05H 1/24 (2006.01)

(21) International Application Number:
PCT/US2007/070000

(22) International Filing Date: 30 May 2007 (30.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/803,499	30 May 2006 (30.05.2006)	US
11/754,924	29 May 2007 (29.05.2007)	US

(71) Applicant *(for all designated States except US)*: **APPLIED MATERIALS, INC.** [US/US]; P.O. Box 450A, Santa Clara, California 95052 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **LUBOMIRSKY, Dmitry** [IL/US]; 10540 Felton Way, Cupertino, California 95014 (US). **LIANG, Qiwei** [US/US]; 37800 Freesia Court, Fremont, California 94536 (US). **PARK, Soonam** [QA/US]; 181 Del Medio Avenue, #3139, Mountain View, California 94040 (US). **CHUC, Kien, N.** [US/US]; 1903 Mayfield Avenue, San Jose, California 95130 (US). **YIEH, Ellie** [US/US]; 5888 Pistoia Way, San Jose, California 95138 (US).

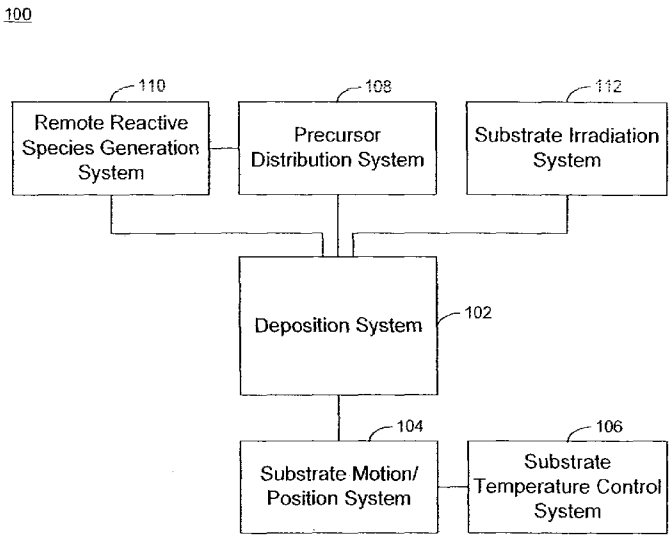
(74) Agent: **BERNARD, Eugene**; Townsend and Townsend and Crew LLP, Two Embarcadero Center, Eighth Floor, San Francisco, California 94111-3834 (US).

(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).

[Continued on next page]

(54) Title: PROCESS CHAMBER FOR DIELECTRIC GAPFILL



(57) Abstract: A system to form a dielectric layer on a substrate from a plasma of dielectric precursors is described. The system may include a deposition chamber, a substrate stage in the deposition chamber to hold the substrate, and a remote plasma generating system coupled to the deposition chamber, where the plasma generating system is used to generate a dielectric precursor having one or more reactive radicals. The system may also include a precursor distribution system that includes at least one top inlet and a plurality of side inlets. The top inlet may be positioned above the substrate stage and the side inlets may be radially distributed around the substrate stage. The reactive radical precursor may be supplied to the deposition chamber through the top inlet. An in-situ plasma generating system may also be included to generate the plasma in the deposition chamber from the dielectric precursors supplied to the deposition chamber.

WO 2007/140425 A2

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.