

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 June 2022 (23.06.2022)



(10) International Publication Number
WO 2022/132524 A1

(51) International Patent Classification:

H01L 21/3205 (2006.01) C23C 16/40 (2006.01)
H01L 21/02 (2006.01) C23C 16/509 (2006.01)
C23C 16/24 (2006.01)

(21) International Application Number:

PCT/US2021/062339

(22) International Filing Date:

08 December 2021 (08.12.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/125,349 17 December 2020 (17.12.2020) US

(71) Applicant: **APPLIED MATERIALS, INC.** [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors: **AYDIN, Aykut**; 3050 Bowers Avenue, Santa Clara, California 95054 (US). **CHENG, Rui**; 3050 Bowers Avenue, Santa Clara, California 95054 (US). **JANAKIRAMAN, Karthik**; 3050 Bowers Avenue, Santa Clara, California 95054 (US).

(74) Agent: **MCCORMICK, Daniel K.** et al.; 1100 Peachtree Street NE, Suite 2800, Mailstop: IP Docketing - 22, Atlanta, Georgia 30309 (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: PLASMA ENHANCED DEPOSITION OF SILICON-CONTAINING FILMS AT LOW TEMPERATURE

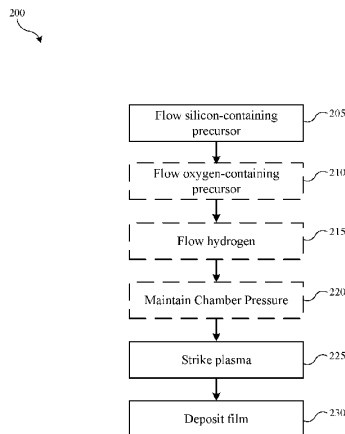


FIG. 2

(57) Abstract: Exemplary deposition methods may include flowing a silicon-containing precursor into a processing region of a semiconductor processing chamber. The method may include striking a plasma in the processing region between a faceplate and a pedestal of the semiconductor processing chamber. The pedestal may support a substrate including a patterned photoresist. The method may include maintaining a temperature of the substrate less than or about 200 °C. The method may also include depositing a silicon-containing film along the patterned photoresist.

WO 2022/132524 A1

[Continued on next page]

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*