

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
13 March 2025 (13.03.2025)



(10) International Publication Number
WO 2025/053884 A1

(51) International Patent Classification:

C23C 16/455 (2006.01) C23C 16/52 (2006.01)
C23C 16/04 (2006.01)

(21) International Application Number:

PCT/US2024/031642

(22) International Filing Date:

30 May 2024 (30.05.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/581,463 08 September 2023 (08.09.2023) US

(71) Applicant: **LAM RESEARCH CORPORATION**
[US/US]; 4650 Cushing Pkwy., Fremont, California 94538
(US).

(72) Inventors: **MAK, Joshua Nathaniel Eric**; 4650 Cushing
Pkwy., Fremont, California 94538 (US). **SAKIYAMA,**

Yukinori; 4650 Cushing Pkwy., Fremont, California 94538
(US). **BOATRIGHT, Daniel**; 4650 Cushing Pkwy., Fremont,
California 94538 (US). **SMITH, Shaun Tyler**; 4650
Cushing Pkwy., Fremont, California 94538 (US). **ZHANG,**
Yue; 4650 Cushing Pkwy., Fremont, California 94538 (US).

(74) Agent: **HAHN, Brian T.** et al.; WEAVER AUSTIN VIL-
LENEUVE & SAMPSON 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,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,
KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, 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,

(54) Title: SELECTIVE SUBSTRATE PROCESSING BASED ON ELECTRODE REGIONS

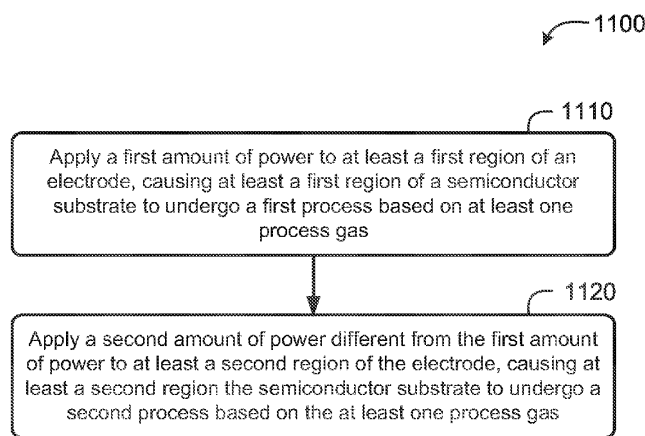


FIG. 11

(57) Abstract: Provided are apparatus and methods for selective substrate processing based on electrode regions. In some embodiments, selectively processing a semiconductor substrate may include applying a first amount of power to at least a first region of an electrode, causing at least a first corresponding region of the semiconductor substrate to undergo a first deposition process based on at least one process gas; and applying a second amount of power different from the first amount of power to at least a second region of the electrode, causing at least a second corresponding region the semiconductor substrate to undergo a second deposition process based on the at least one process gas; wherein, based on the application of the first amount of power to the first region and the second amount of power to the second region, a material comprises a spatially varying property on the backside of the semiconductor substrate.

[Continued on next page]

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, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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).

Published:

— with international search report (Art. 21(3))