

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
05 January 2023 (05.01.2023)



(10) International Publication Number
WO 2023/278100 A1

(51) International Patent Classification:

G01N 29/04 (2006.01) G01N 29/44 (2006.01)
G01N 29/12 (2006.01) G06N 20/00 (2019.01)
G01N 29/34 (2006.01) H01L 21/66 (2006.01)

(21) International Application Number:

PCT/US2022/032242

(22) International Filing Date:

03 June 2022 (03.06.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/367,250 02 July 2021 (02.07.2021) US

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

(72) Inventors: **LIN, Chuang-Chia**; 3036 Sonsilla Lane, San Ramon, CA 94582 (US). **PETERSON, David**; 1277 Singletary Avenue, San Jose, CA 95126 (US). **KRAUS, Philip, Allan**; 1006 Broadway Ave., San Jose, CA 95125 (US). **BAYATI, Amir**; 4975 Bridgeview Lane, San Jose, CA 95138 (US).

(74) Agent: **BERNADICOU, Michael, A.** et al.; Schwabe, Williamson & Wyatt, P.C., 1211 SW 5th Avenue, Suite 1900, Portland, OR 97204 (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, IQ, IR, IS, IT, JM, 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: MEMS RESONATOR SENSOR SUBSTRATE FOR PLASMA, TEMPERATURE, STRESS, OR DEPOSITION SENSING

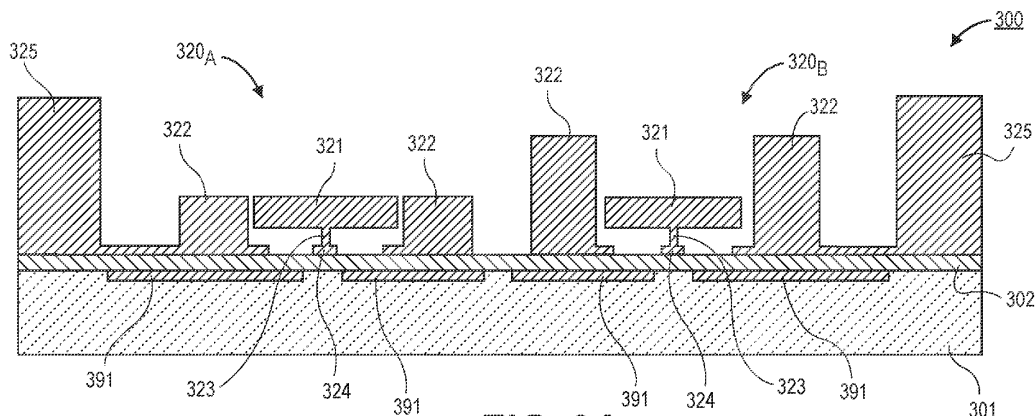


FIG. 3A

(57) Abstract: Embodiments disclosed herein include diagnostic substrates and methods of using the diagnostic substrates to extract plasma parameters. In an embodiment, a diagnostic substrate comprises a substrate and an array of resonators across the substrate. In an embodiment, the array of resonators comprises at least a first resonator with a first structure and a second resonator with a second structure. In an embodiment, the first structure is different than the second structure.

[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))*