

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
01 June 2023 (01.06.2023)



(10) International Publication Number
WO 2023/096719 A1

(51) International Patent Classification:

H01L 21/683 (2006.01) H01L 21/687 (2006.01)
H01L 21/67 (2006.01) H01J 37/32 (2006.01)

(21) International Application Number:

PCT/US2022/048207

(22) International Filing Date:

28 October 2022 (28.10.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/283,113 24 November 2021 (24.11.2021) US
17/964,684 12 October 2022 (12.10.2022) US

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

(72) Inventor: **PARKHE, Vijay, D.**; 4054 Bouquet Park Lane,
San Jose, CA 95135 (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, 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, 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, CV, 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,

(54) Title: ELECTROSTATIC CHUCK WITH DETACHABLE SHAFT

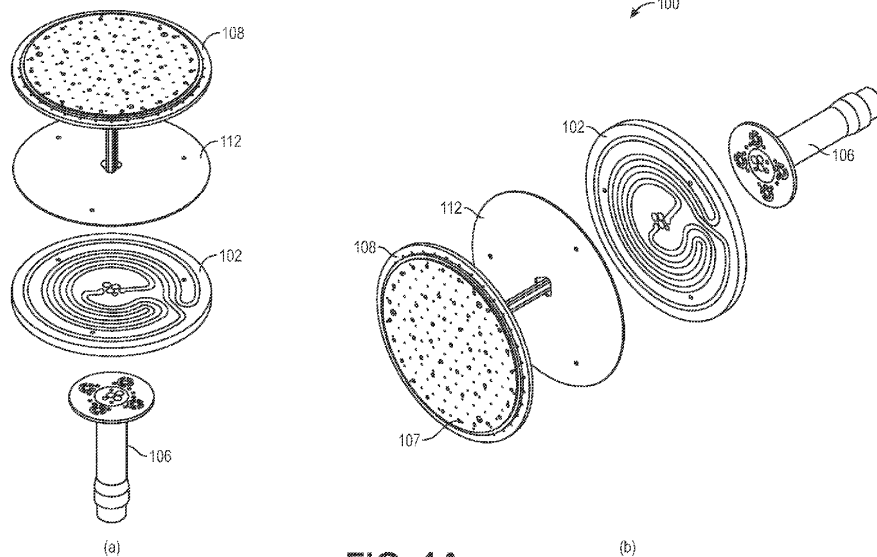


FIG. 1A

(57) Abstract: Electrostatic chucks (ESCs) for plasma processing chambers, and methods of fabricating ESCs, are described. In an example, a substrate support assembly includes a cooling bottom plate, a ceramic top plate, and a bond layer between the ceramic top plate and the cooling bottom plate, the ceramic top plate in direct contact with the bond layer, and the bond layer in direct contact with the cooling bottom plate. A detachable shaft is coupled to the cooling bottom plate by a plurality of bolts at a side of the cooling bottom plate opposite the bond layer.

[Continued on next page]

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))