

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
10 August 2023 (10.08.2023)



(10) International Publication Number
WO 2023/150188 A1

(51) International Patent Classification:
H01J 37/32 (2006.01)

(21) International Application Number:
PCT/US2023/012149

(22) International Filing Date:
01 February 2023 (01.02.2023)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
17/649,823 03 February 2022 (03.02.2022) US

(71) Applicants: **TOKYO ELECTRON LIMITED** [JP/JP];
3-1 Akasaka 5-chome, Minato-ku, Tokyo 1076325 (JP).
TOKYO ELECTRON U.S. HOLDINGS, INC. [US/US];
2400 Grove Boulevard, Austin, TX 78741 (US).

(72) Inventors: **LANE, Barton**; 2400 Grove Blvd., Austin,
TX 78741 (US). **YAMAZAWA, Yohei**; 1 Techno Hills,
Kurokawa-gun, Taiwa-cho, Miyagi 9813629 (JP). **FUNK,**
Merritt; 2400 Grove Blvd., Austin, TX 78741 (US).

MOYAMA, Kazuki; 1 Techno Hills, Kurokawa-gun, Tai-
wa-cho, Miyagi 9813629 (JP).

(74) Agent: **MEHIGAN, Jason, D.**; 2400 Grove Blvd., Austin,
TX 78741 (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: APPARATUS FOR PLASMA PROCESSING

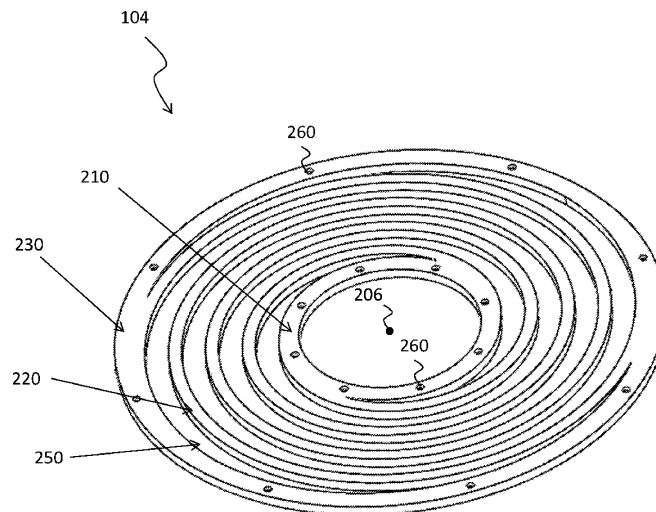


FIG. 2

(57) Abstract: An antenna includes an inner structure, an outer structure, and a plurality of interconnecting structures coupling the inner structure to the outer structure. The plurality of interconnecting structures is axisymmetric with respect to a center of the antenna. Each interconnecting structure has an azimuthal component of at least 30 degrees.

[Continued on next page]



WO 2023/150188 A1

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))*
- *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))*