



(51) International Patent Classification:
H01J 37/32 (2006.01) *H05H 1/46* (2006.01)

(21) International Application Number:
PCT/US2024/048592

(22) International Filing Date:
26 September 2024 (26.09.2024)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/585,853 27 September 2023 (27.09.2023) US

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

(72) Inventors: **GUO, Tongtong**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **BATZER, Rachel E.**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **YANG, Nuoya**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **WANG, Yuxi**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **GONG, Bo**; 4650 Cushing Pkwy.,

Fremont, California 94538 (US). **FROTANPOUR, Ali**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **KUDELA, Jozef**; 4650 Cushing Pkwy., Fremont, California 94538 (US).

(74) Agent: **SRINIVASAN, Arthi G.** et al.; Weaver Austin Villeneuve & 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, 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,

(54) Title: COILS FOR GENERATING RADIO FREQUENCY FIELDS

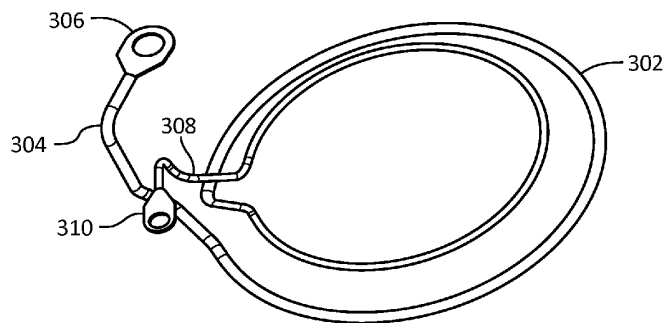


FIG. 3A

(57) Abstract: According to some embodiments, a coil for generating a radio frequency (RF) field in a semiconductor apparatus is provided. The coil may comprise a tubing section formed into two turns, the two turns configured to encircle a plasma container of the semiconductor fabrication apparatus, wherein a second end of the tubing section is bent toward a first end of the tubing section, and wherein the first end of the tubing section and the second end of the tubing section are bent at an angle from the two turns. The coil may comprise a first terminal attached to the first end of the tubing section, wherein the first terminal is configured to be operatively coupled to an RF source. The coil may comprise a second terminal attached to the second end of the tubing section, wherein the second terminal is configured to be operatively coupled to a ground.

[Continued on next page]

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))