

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 March 2023 (23.03.2023)



(10) International Publication Number
WO 2023/043600 A1

(51) International Patent Classification:
H01J 27/18 (2006.01) *H01J 37/08* (2006.01)

(21) International Application Number:
PCT/US2022/041674

(22) International Filing Date:
26 August 2022 (26.08.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
17/476,200 15 September 2021 (15.09.2021) US

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

(72) Inventors: **LIKHANSKII, Alexandre**; 35 Dory Road,
Gloucester, Massachusetts 01930 (US). **KURUNCZI, Peter F.**; 35 Dory Road, Gloucester, Massachusetts 01930
(US). **ALLEN, Ernest E.**; 35 Dory Road, Gloucester,
Massachusetts 01930 (US).

(74) Agent: **CHAMBERLAIN, Jeffrey M.**; KDB Firm PLLC,
2601 Weston Parkway, Suite 103, Cary, North Carolina
27513 (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, 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,

(54) Title: UNIFORM PLASMA LINEAR ION SOURCE

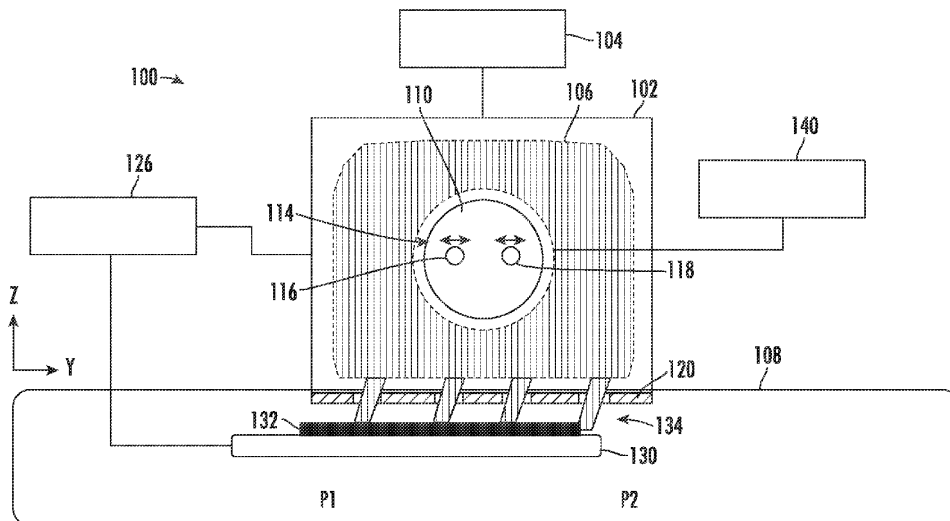


FIG. 1

(57) Abstract: An ion source. The ion source may include a plasma chamber to house a plasma, and an extraction assembly, disposed along a side of the plasma chamber, and comprising at least one extraction aperture. The ion source may further include an antenna assembly, extending through the plasma chamber, along a first axis. The antenna assembly may include a dielectric enclosure, a plurality of conductive antennae, extending along the first axis within the dielectric enclosure.

[Continued on next page]

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).

Published:

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