

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 December 2021 (23.12.2021)



(10) International Publication Number
WO 2021/255242 A1

(51) International Patent Classification:

H01J 37/32 (2006.01) *H05H* 1/48 (2006.01)
H01J 37/34 (2006.01) *C23C* 14/32 (2006.01)

(21) International Application Number:

PCT/EP2021/066617

(22) International Filing Date:

18 June 2021 (18.06.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20181191.6 19 June 2020 (19.06.2020) EP

(71) Applicant (for all designated States except BB, CN):

NANOFILM TECHNOLOGIES INTERNATIONAL LIMITED [SG/SG]; 28 Ayer Rajah Crescent, #02-02/03, 139959 Singapore (SG).

(71) Applicant (for CN only):

NANOFILM VACUUM COATING (SHANGHAI) CO., LTD. [CN/CN]; 399 Songhui Road, Quingpu District, Shanghai 201703 (CN).

(71) Applicant (for BB only):

SCHLICH LTD [GB/GB]; 9 St Catherine's Road, Littlehampton West Sussex BN17 5HS (GB).

(72) Inventors: **SHI, Xu**; c/o Nanofilm Technologies International Limited, 28 Ayer Rajah Crescent, #02-02/03, Singapore 139959 (SG). **YANG, Ming Chu**; c/o Nanofilm Technologies International Limited, 28 Ayer Rajah Crescent, #02-02/03, Singapore 139959 (SG). **TAN, Kok How**; c/o Nanofilm Technologies International Limited, 28 Ayer Rajah Crescent, #02-02/03, 139959 Singapore (SG).

(74) Agent: **SCHLICH**; 9 St Catherine's Road, Littlehampton West Sussex BN17 5HS (GB).

(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, IR, IS, IT, 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,

(54) Title: IMPROVED CATHODE ARC SOURCE, FILTERS THEREOF AND METHOD OF FILTERING MACROPARTICLES

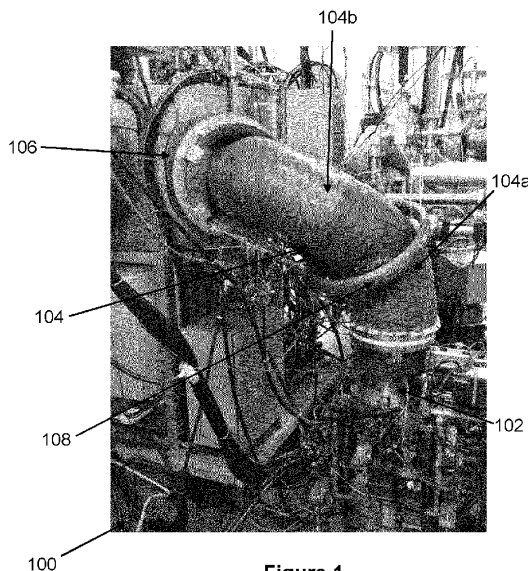


Figure 1

(57) Abstract: A filter (104a, 104b, 108) for a cathode arc source comprises: a filter duct having at least one bend (104a, 104b), and a first magnetic field source for steering plasma through the filter duct for removal of macroparticles from the plasma; wherein the apparatus comprises a second magnetic field source (108) which is rotatably mounted surrounding a portion of the filter duct. Cathode arc sources (102) and cathode arc deposition apparatuses (100) comprise the filters described herein, and methods of filtering macroparticles from a beam of plasma emitted from a cathode arc source use the filters.

WO 2021/255242 A1

[Continued on next page]

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).

Published:

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