



- (51) **International Patent Classification:**
G01N 21/956 (2006.01) *G01N 21/88* (2006.01)
G01N 21/95 (2006.01)
- (21) **International Application Number:**
PCT/US2022/037757
- (22) **International Filing Date:**
20 July 2022 (20.07.2022)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
17/381,743 21 July 2021 (21.07.2021) US
- (71) **Applicant:** TEL MANUFACTURING AND ENGINEERING OF AMERICA, INC. [US/US]; 3455 Lyman Blvd., Chaska, Minnesota 55318 (US).
- (72) **Inventors:** SIEFERING, Kevin; 900 Middlesex Turnpike, Building 6, Billerica, Massachusetts 01821 (US). GRUENHAGEN, Michael; 900 Middlesex Turnpike, Building 6, Billerica, Massachusetts 01821 (US). GWINN, Matthew; 900 Middlesex Turnpike, Building 6, Billerica, Massachusetts 01821 (US).
- (74) **Agent:** MEHIGAN, Jason D.; 2400 Grove Blvd., Austin, Texas 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, 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, 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).

(54) **Title:** SUBSTRATE SCANNING APPARATUS WITH PENDULUM AND ROTATABLE SUBSTRATE HOLDER

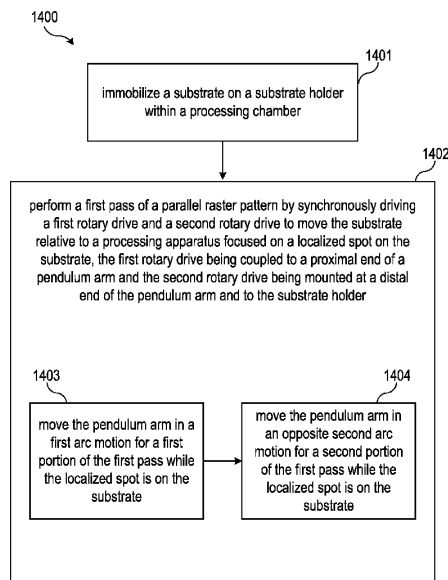


FIG. 14

(57) **Abstract:** A method of scanning a substrate includes immobilizing a substrate on a substrate holder within a processing chamber and performing a pass of a parallel raster pattern by synchronously driving a first rotary drive and a second rotary drive to move the substrate relative to a processing apparatus focused on a localized spot on the substrate, the first rotary drive being coupled to a proximal end of a pendulum arm and the second rotary drive being mounted at a distal end of the pendulum arm and to the substrate holder. Driving the first rotary drive during the pass includes moving the pendulum arm in a first arc motion for a first portion of the pass while the localized spot is on the substrate, and then moving the pendulum arm in an opposite second arc motion for a second portion of the pass while the localized spot is on the substrate.

Published:

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