

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 November 2021 (25.11.2021)



(10) International Publication Number
WO 2021/236470 A1

(51) International Patent Classification:

G01N 21/956 (2006.01) G01N 21/59 (2006.01)
G01N 21/88 (2006.01) G06T 7/00 (2006.01)
G01N 21/47 (2006.01)

(21) International Application Number:

PCT/US2021/032655

(22) International Filing Date:

17 May 2021 (17.05.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/028,568 22 May 2020 (22.05.2020) US
17/068,328 12 October 2020 (12.10.2020) US

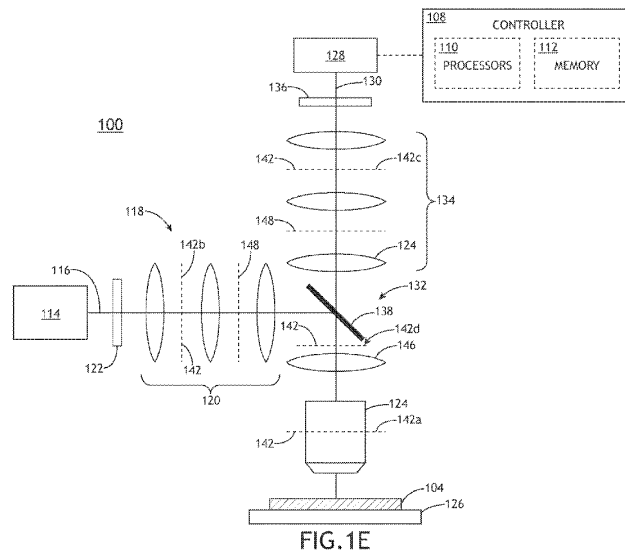
(71) Applicant: **KLA CORPORATION** [US/US]; Legal Department, One Technology Drive, Milpitas, California 95035 (US).

(72) Inventors: **MANASSEN, Amnon**; 10 Golda Meir Street, 34892 Haifa (IL). **HILL, Andrew V.**; 2112 Los Angeles Avenue, Berkeley, California 94707 (US). **LAREDO, Gilad**; Khasidei Umot Haolam 18, 3298531 Haifa (IL).

(74) Agent: **MCANDREWS, Kevin** et al.; KLA CORPORATION, Legal Department, One Technology Drive, Milpitas, California 95035 (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, 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,

(54) Title: MEASUREMENT MODES FOR OVERLAY



(57) Abstract: An overlay metrology tool may include an illumination source, illumination optics to illuminate an overlay target having periodic features with one or more illumination beams, collection optics to direct diffracted light from the periodic features of the overlay target to a detector, an adjustable pupil mask located at a pupil plane, and a controller. The adjustable pupil mask may include one or more individually-addressable control zones distributed across the one or more portions of the pupil plane to provide an adjustable pupil transmissivity distribution. The controller may direct the adjustable pupil mask to provide a selected pupil transmissivity distribution corresponding to a selected overlay metrology recipe, where the selected pupil transmissivity distribution corresponds to a selected configuration of the one or more control zones providing transmission of a selected set of diffraction orders from the target to the detector.

[Continued on next page]

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).

Published:

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