

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
15 February 2024 (15.02.2024)



(10) International Publication Number
WO 2024/035332 A1

(51) International Patent Classification:
G02F 1/29 (2006.01) *G02B 27/42* (2006.01)
G01S 7/481 (2006.01)

(21) International Application Number:
PCT/SG2022/050568

(22) International Filing Date:
08 August 2022 (08.08.2022)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant: **ADVANCED MICRO FOUNDRY PTE. LTD.** [SG/SG]; P.O. Box 1861, Robinson Road Post Office, 903711 Singapore (SG).

(72) Inventors: **TAN, You Sian James**; 11 Science Park Road, Singapore 117685 (SG). **LUO, Xianshu**; 11 Science Park Road, Singapore 117685 (SG).

(74) Agent: **AMICA LAW LLC**; 77 Robinson Road, #22-01 Robinson 77, Singapore 068896 (SG).

(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, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,

(54) Title: OPTICAL BEAM SCULPTING ASSEMBLY

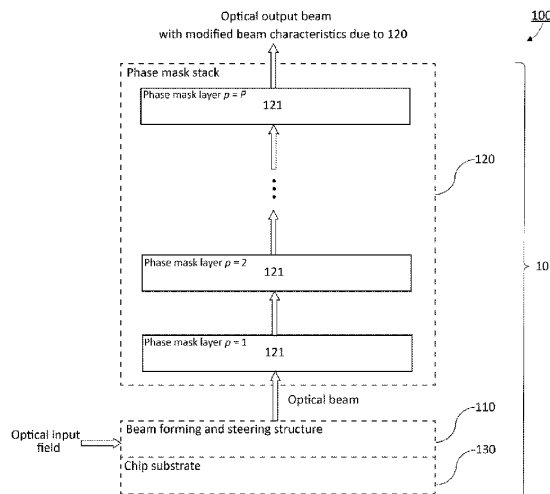


Fig. 1

(57) Abstract: An optical beam sculpting assembly defines optical beam characteristics of an optical beam, and comprises a chip substrate, a beam forming and steering structure positioned on the chip substrate, adapted to emit, to receive, and/or to steer the optical beams, and at least one phase mask, with each phase mask having at least one corresponding core having a thickness, and a height. The beam forming and steering structure is positioned between the at least one phase mask and the chip substrate, and the at least one phase mask is configured to modify the optical beam characteristics of the optical beam. The optical beam characteristic comprises at least one of a spatial distribution of optical amplitude, a temporal distribution of optical amplitude, an optical phase, a polarization, and an optical orbital angular momentum.

[Continued on next page]

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).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

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