

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
20 March 2025 (20.03.2025)



(10) International Publication Number
WO 2025/059416 A1

(51) International Patent Classification:

G02B 27/00 (2006.01) G02B 6/00 (2006.01)
G02B 27/01 (2006.01) G02B 6/26 (2006.01)
G02B 5/18 (2006.01)

(21) International Application Number:

PCT/US2024/046547

(22) International Filing Date:

13 September 2024 (13.09.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/538,636 15 September 2023 (15.09.2023) US

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(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, MG, MK, MN, MU, 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,

(54) Title: EFFICIENCY-LADDERED CROPPED EXIT PUPIL EXPANDER FOR COMPACT DIFFRACTIVE WAVEGUIDES

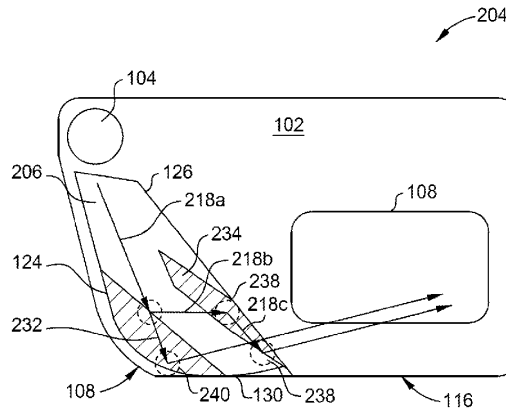


FIG. 2B

(57) Abstract: Embodiments of the present disclosure relate to devices and methods related to augmented reality waveguide combiners. The device includes a waveguide combiner, the waveguide combiner includes an input coupler operable to receive a light and in-couple the light into the waveguide combiner, an exit pupil expander (ERE) adjacent to a grating of the input coupler, the ERE having a ladder structure, the ladder structure comprising at least one band, the at least one band comprising a plurality of grating structures, at least one grating structure of the plurality of grating structures has a varying depth, a varying duty cycle, or a varying pitch that is different than a depth, a duty cycle, or pitch than an adjacent grating structure of the plurality of grating structures, and an output coupler operable to receive the light from the ERE and transmit the light onto a user field of view (FOV).

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WO 2025/059416 A1

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, CV, 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, 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, ME, 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))