

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
06 January 2022 (06.01.2022)



(10) International Publication Number
WO 2022/003669 A1

(51) International Patent Classification:

H01S 3/10 (2006.01) H01S 5/40 (2006.01)
H01S 3/13 (2006.01)

(21) International Application Number:

PCT/IL2021/050730

(22) International Filing Date:

16 June 2021 (16.06.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

275783 01 July 2020 (01.07.2020) IL

(71) Applicant: **ELBIT SYSTEMS ELECTRO-OPTICS - ELOP LTD.** [IL/IL]; 5 Hamada St., 7670305 Rehovot (IL).

(72) Inventors: **SCHIFFER, Zeev**; c/o Elbit Systems Electro-optics - Elop Ltd., 5 Hamada St., 7670305 Rehovot (IL). **NAZAROV, Andrey**; c/o Elbit Systems Electro-optics - Elop Ltd., 5 Hamada St., 7670305 Rehovot (IL). **LEVY,**

Daniel; c/o Elbit Systems Electro-optics - Elop Ltd., 5 Hamada St., 7670305 Rehovot (IL).

(74) Agent: **SHALEM, Meirav** et al.; P.O Box 4225, 7414003 Ness Ziona (IL).

(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, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

(54) Title: SYSTEMS AND METHODS FOR COHERENT BEAM COMBINING

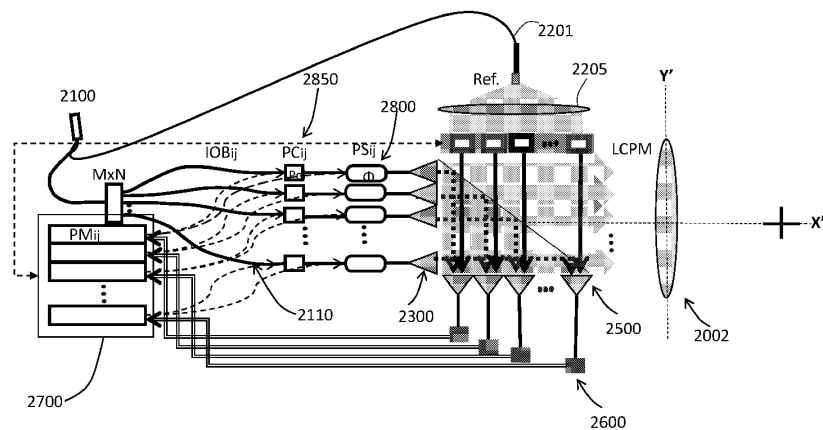


FIG. 5A

(57) Abstract: Multi-Channels coherent beam combining (CBC) using a mechanism for phase and/or polarization locking that uses a reference optical beam and an array of optical detectors each detector being configured and located to detect overall intensity of an optical interference signal caused by interfering of the reference beam and a beam of the respective channel, where the fast intensity per-channel detection allows simultaneous and quick phase/polarization locking of all channels for improving beam combining system performances.

[Continued on next page]

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))