

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
20 June 2024 (20.06.2024)



(10) International Publication Number
WO 2024/128970 A1

- (51) International Patent Classification:
G02B 1/00 (2006.01) *G02B 5/20* (2006.01)
- (21) International Application Number:
PCT/SG2023/050733
- (22) International Filing Date:
06 November 2023 (06.11.2023)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10202260441W 14 December 2022 (14.12.2022) SG
- (71) Applicant: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North Tower, Singapore 138632 (SG).
- (72) Inventors: **MANSHA, Shampy**; 2 Fusionopolis Way, Innovis, Singapore 138634 (SG). **PANIAGUA-DOMINGUEZ, Ramon Jose**; 2 Fusionopolis Way, Innovis, Singapore 138634 (SG). **KUZNETSOV, Arseniy**; 2 Fusionopolis Way, Innovis, Singapore 138634 (SG).
- (74) Agent: **VIERING, JENTSCHURA & PARTNER LLP**; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (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, 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, 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).

(54) Title: AN OPTICAL ELEMENT, AN OPTICAL UNIT AND OPTICAL DEVICES

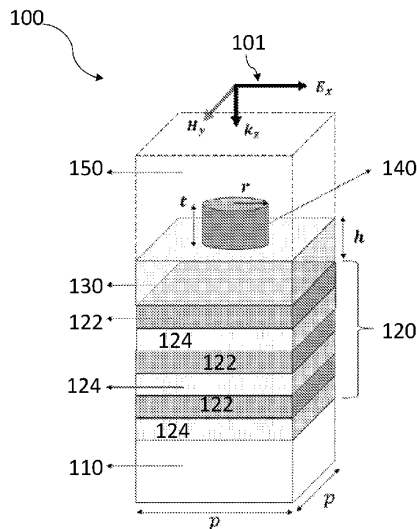


FIG. 1

(57) Abstract: In some aspects, an optical element is provided. The optical element includes a substrate; a Bragg reflector disposed on the substrate; a nanoparticle disposed over the Bragg reflector; and a spacer disposed between the Bragg reflector and the nanoparticle. The nanoparticle is surrounded by dielectric material disposed on the spacer.

WO 2024/128970 A1

[Continued on next page]

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*