

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
19 May 2023 (19.05.2023)



(10) International Publication Number
WO 2023/086015 A4

(51) International Patent Classification:

F21V 3/08 (2018.01) *G01N 21/64* (2006.01)
F21V 5/10 (2018.01) *F21V 5/04* (2006.01)
G02B 6/00 (2006.01)

(21) International Application Number:

PCT/SG2022/050761

(22) International Filing Date:

25 October 2022 (25.10.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202112542P 11 November 2021 (11.11.2021) SG

(71) Applicant: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North Tower, Singapore 138632 (SG).

(72) Inventors: **TEO, Ee Jin**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **NEO, Chi Jin Darren**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **ONG, Min Xin Maxine**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (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, 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, 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).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))
— with amended claims (Art. 19(1))

(88) Date of publication of the international search report:

03 August 2023 (03.08.2023)

Date of publication of the amended claims:

12 October 2023 (12.10.2023)

(54) Title: OPTICAL DETECTION DEVICE, SYSTEM, AND METHOD FOR OMNIDIRECTIONAL PHOTODETECTION

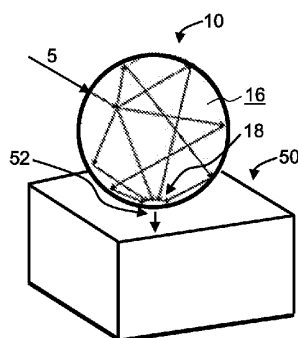


Figure 1B

(57) Abstract: Disclosed are optical detection device, system, and method which increase photodetection area and enables omnidirectional and self-aligning photodetection through the use of a fluorescent lens. An optical detection device comprises a fluorescent lens having a light collecting area being a spherical, hemispherical, or cylindrical surface of the fluorescent lens, and a light outcoupling area; and a fluorophore dispersed throughout the light collection area and the fluorescent lens, wherein the fluorophore is excitable by a light beam, which is incident at any position or angle in relation to the spherical surface, to produce a light emission, wherein the light outcoupling area is arranged to allow an extraction of the light emission from the fluorescent lens, wherein the light collecting area is larger than the light outcoupling area.

WO 2023/086015 A4