

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
19 September 2024 (19.09.2024)



(10) International Publication Number
WO 2024/191349 A1

(51) International Patent Classification:

G01N 29/24 (2006.01) G01N 29/04 (2006.01)
G01N 29/22 (2006.01) G01N 29/07 (2006.01)

(21) International Application Number:

PCT/SG2024/050131

(22) International Filing Date:

04 March 2024 (04.03.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202300670W 13 March 2023 (13.03.2023) SG

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

(72) Inventors: **LI, Xiaotian**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **YAO, Kui**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **WONG, Voon Kean**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **MOHAMED YOUSRY, Yasmin**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG). **LIM, Boon Kiang, David**; c/o Institute of Materials Research and Engineering, 2 Fusionopolis Way, #08-03, Innovis, Singapore 138634 (SG).

(74) Agent: **CSASIA IP PTE. LTD.**; 47 Scotts Road, #13-03, Goldbell Towers, Singapore 228233 (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).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

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

(54) Title: METHOD AND DEVICE FOR SURFACE DEFECT MONITORING USING ULTRASONIC BULK WAVE

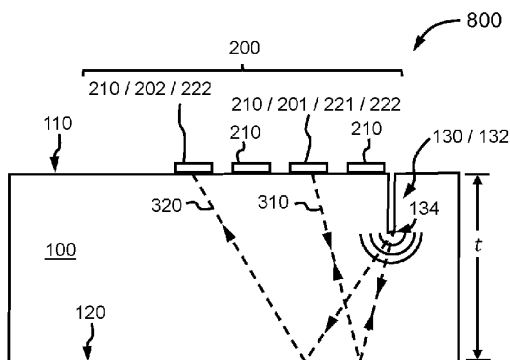


FIG. 1

(57) Abstract: A device and method of monitoring a surface defect on a proximal wall of a structure includes transmitting a generated ultrasonic bulk wave from an ultrasonic transducer array disposed on the proximal wall, the generated ultrasonic bulk wave being transmitted from the proximal wall as a spread wave having a central line angularly displaced relative to the proximal wall. The method includes determining at least one characteristic of the surface defect based on a reflected ultrasonic bulk wave sensed by the ultrasonic transducer array, the ultrasonic transducer array being disposed on the proximal wall and disposed to one side of the surface defect. The method may include determining at least one characteristic of the surface defect based on respective arrival times of the reflected ultrasonic bulk wave sensed by at least two ultrasonic transducers selected from the ultrasonic transducer array.

WO 2024/191349 A1