

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
15 December 2022 (15.12.2022)



(10) International Publication Number
WO 2022/260601 A3

(51) International Patent Classification:

B29C 64/112 (2017.01) *B33Y 10/00* (2015.01)
B41J 2/04 (2006.01) *B33Y 70/00* (2020.01)
H01F 1/00 (2006.01) *H10N 30/00* (2023.01)
B22F 1/068 (2022.01) *B33Y 80/00* (2015.01)
B22F 1/14 (2022.01) *H01G 4/00* (2006.01)
B22F 10/10 (2021.01)

(21) International Application Number:

PCT/SG2022/050399

(22) International Filing Date:

10 June 2022 (10.06.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202106292P 11 June 2021 (11.06.2021) SG

(71) Applicant: **NANYANG TECHNOLOGICAL UNIVERSITY** [SG/SG]; 50 Nanyang Avenue, Singapore 639798 (SG).

(72) Inventors: **LE FERRAND, Hortense Reine Marie-Marceline**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **LIU, Wing Chung**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).

(74) Agent: **CHINA SINDA INTELLECTUAL PROPERTY**; 133 Cecil Street, #12-01A, Keck Seng Tower, Singapore 069535 (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, 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, 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, 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))
- 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))

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

23 February 2023 (23.02.2023)

(54) Title: MAGNETICALLY ASSISTED DROP-ON-DEMAND 3D PRINTING OF MICROSTRUCTURES

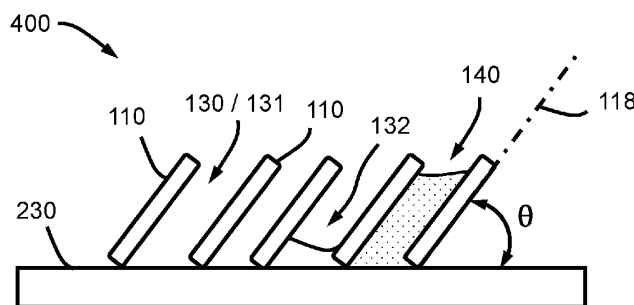


FIG. 4B

(57) Abstract: A method of 3D printing includes printing a droplet of ink with a plurality of magnetically responsive microplatelets in a liquid, subjecting the printed droplet of ink to a rotating magnetic field; and providing a period of drying in which at least a portion of the liquid is evaporated from the printed droplet of ink to form an at least partially dried droplet. The at least partially dried droplet is characterized by the plurality of microplatelets being in alignment with one another, in which the plurality of microplatelets in alignment define a corresponding plurality of at least partially un-filled gaps between the plurality of microplatelets.

WO 2022/260601 A3