

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
30 November 2023 (30.11.2023)



(10) International Publication Number
WO 2023/229526 A1

(51) International Patent Classification:
B64U 10/10 (2023.01) *G05D 1/10* (2006.01)

(21) International Application Number:
PCT/SG2023/050344

(22) International Filing Date:
19 May 2023 (19.05.2023)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10202250031G 27 May 2022 (27.05.2022) SG

(71) Applicant: SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN [SG/SG]; 8 Somapah Road, Singapore 487372 (SG).

(72) Inventors: CAI, Xinyu; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). FOONG, Shaohui; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). WIN, Kyi Hla; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). WIN, Luke Soe Thura; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). BIN SHAFUL, Danial Sufiyan; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG).

(74) Agent: CHINA SINDA INTELLECTUAL PROPERTY 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,

(54) Title: MULTI-MONOCOPTER SYSTEM AND METHOD OF OPERATING THEROF

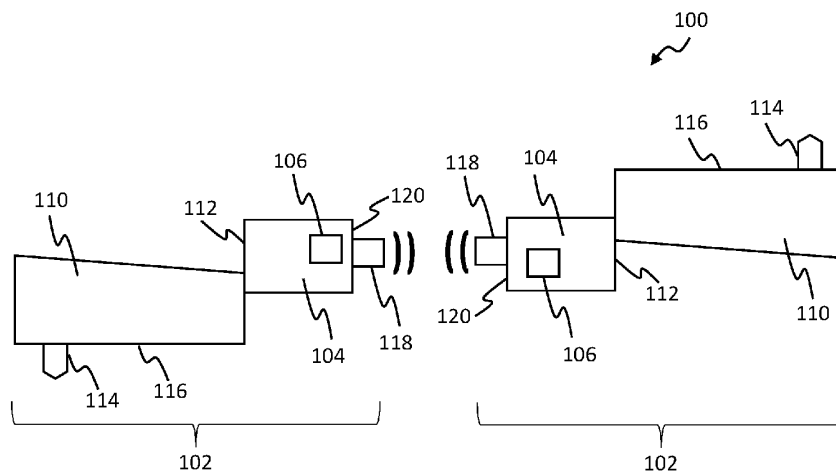


FIG. 1

(57) Abstract: A multi-monocopter system is provided, including a plurality of monocopters operable cooperatively in a cooperative flight mode and operable individually in an individual flight mode. Each monocopter includes: a housing member having disposed thereon a flight controller operable to control a flight of the monocopter in the individual flight mode and a flight of the plurality of monocopters collectively in the cooperative flight mode; a wing member coupled to the housing member so as to extend from a first side thereof; a thrust unit coupled to a leading edge of the wing member; and a magnetic connector coupled to the housing member so as to extend from a second side thereof, the second side being at least substantially opposite to the first side of the housing member. The magnetic connector is configured to be connectable to one or more corresponding magnetic connectors of other one or more monocopters of the plurality of monocopters via a magnetic force to operate cooperatively in the cooperative flight mode. In particular, when the plurality of monocopters are operating cooperatively in the cooperative flight mode during flight, the flight controller is operable to control a rotational speed of the plurality of monocopters collectively to produce a centrifugal force that exceed the magnetic force for separating the plurality of monocopters connected via the magnetic force so as to convert the cooperative flight mode to the individual

[Continued on next page]

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).

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))

flight mode.