

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 May 2023 (25.05.2023)



(10) International Publication Number
WO 2023/091085 A8



- (51) **International Patent Classification:**
F24F 12/00 (2006.01) *F24F 5/00* (2006.01)
- (21) **International Application Number:**
PCT/SG2022/050832
- (22) **International Filing Date:**
16 November 2022 (16.11.2022)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/280,131 16 November 2021 (16.11.2021) US
- (71) **Applicant:** **ST ENGINEERING INNOSPARKS PTE LTD** [SG/SG]; 100 Jurong East St 21 ST Electronics Jurong East Bldg, Singapore 609602 (SG).
- (72) **Inventors:** **TANG, Ee Ho**; 1 Peck Hay Road, #04-05 Casa Cairnhill, Singapore 228305 (SG). **LI, Fuyun**; 5 Leedon Heights, #04-07, Singapore 267952 (SG). **WONG, Jun Kai**; 32 Lorong Mydin, #02-03 Astoria Park, Singapore 416826 (SG). **HUANG, Yujun**; Blk 137 Bedok Reservoir Road, #08-1457, Singapore 470137 (SG). **YAP, Lok Lee**

Hillary; Blk 107A Bidadari Park Drive, #05-260, 341107 Singapore (SG).

(74) **Agent:** **NG, Kim Tean**; P.O. Box 1861, Robinson Road Post Office, Singapore 903711 (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,

(54) **Title:** LIQUID COOLING UNIT, APPARATUS AND METHOD FOR COOLING INDOOR SPACES

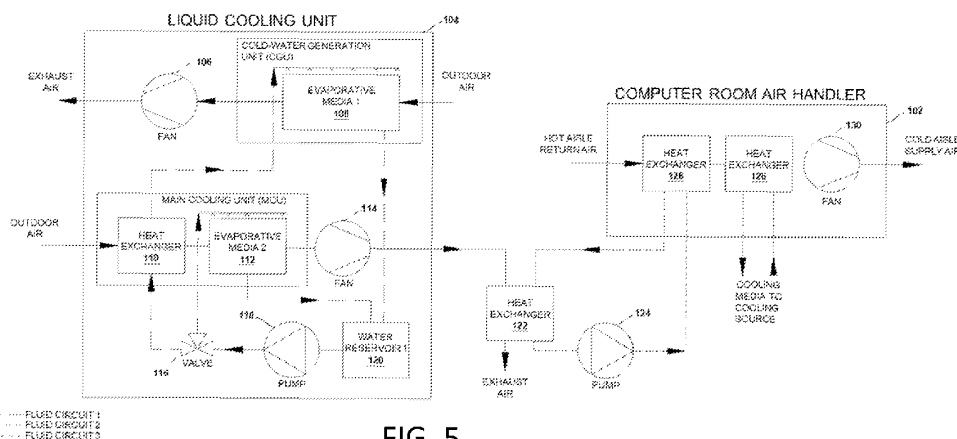


FIG. 5

(57) **Abstract:** A liquid cooling unit comprises a cold-water generation unit (CGU) adapted to receive outdoor air from a first outdoor air inlet through a first air stream and to cool water; and a main cooling unit (MCU) adapted to receive outdoor air from a second outdoor air inlet through a second air stream and to cool the outdoor air so received from the second outdoor air inlet. The cold-water generation unit comprises a first evaporative media configured to circulate evaporative cooling water therethrough, wherein airflow through first air stream is separate from airflow through the second streams such that the airflows do not mix with one another, and the main cooling unit and the cold-water generation unit are arranged in fluid communication with the water management system via a first fluid stream.

[Continued on next page]

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))*

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

20 July 2023 (20.07.2023)

(48) Date of publication of this corrected version:

21 September 2023 (21.09.2023)

(15) Information about Correction:

see Notice of 21 September 2023 (21.09.2023)