



(51) International Patent Classification:
H05K 7/20 (2006.01) *G06F 1/20* (2006.01)

(21) International Application Number:
PCT/SG2019/050366

(22) International Filing Date:
26 July 2019 (26.07.2019)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10201806492U 30 July 2018 (30.07.2018) SG

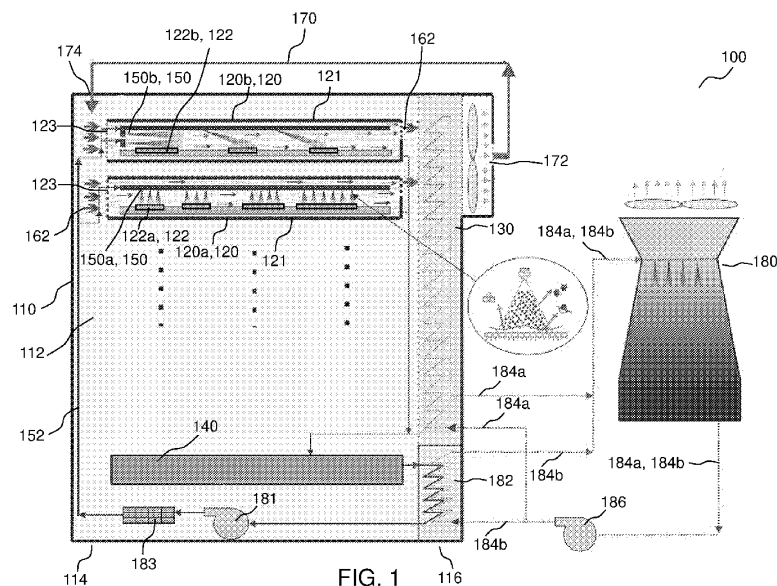
(71) Applicant: **NANYANG TECHNOLOGICAL
UNIVERSITY** [SG/SG]; 50 Nanyang Avenue, Singapore
639798 (SG).

(72) Inventors: **WONG, Teck Neng**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **KANDASAMY, Ranjith**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **TOH, Kok Chuan**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **HO, Jin Yao**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).

(74) Agent: **VIERING, JENTSCHURA & PARTNER LLP**; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (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, IR, IS, JO, JP, KE, KG, KH, KN, KP,

(54) Title: SERVER RACK COOLING ARRANGEMENT



(57) Abstract: A server rack cooling arrangement may include a server rack enclosure defining a single undivided interior volume of space and configured to be sealable; two or more open-frame-server-units disposed within the interior volume of space and arranged in a multi-level arrangement, wherein heat-producing-electronic-components may be exposed to environmental conditions of the interior volume of space; a central condenser disposed towards a rear; a coolant reservoir for collecting condensate from the central condenser; at least one nozzle in fluid communication with the coolant reservoir and configured to deliver fine coolant droplets into the interior volume of space for impingement on the heat-producing-electronic-components; and a fan configured to generate an airflow through the two or more open-frame-server-units from a front to the rear in a manner so as to carry coolant vapour generated from impingement of the fine coolant droplets on the heat-producing-electronic-components to the central condenser.

[Continued on next page]

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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*