

(19) World Intellectual Property
Organization
International Bureau



WIPO | PCT



(10) International Publication Number
WO 2022/158975 A9

(43) International Publication Date
28 July 2022 (28.07.2022)

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

2030162 16 December 2021 (16.12.2021) NL

(21) International Application Number:
PCT/NL2022/050025

(71) Applicant: **STEM TECHNOLOGIES | IXORA
HOLDING B.V.**, [NL/NL]; Ampèrestraat 5, 6716 BN EDE
(NL).

(22) International Filing Date:
20 January 2022 (20.01.2022)

(72) Inventor: **VAN HANXLEDEN HOUWERT, Vincent
Daniël**, Ampèrestraat 5, 6716 BN EDE (NL).

(25) Filing Language: English

(74) Agent: **PATENTWERK B.V.**, P.O. Box 1514, 5200 BN
's-Hertogenbosch (NL).

(26) Publication Language: English

(30) Priority Data:
2027361 21 January 2021 (21.01.2021) NL
2028314 27 May 2021 (27.05.2021) NL
2029151 08 September 2021 (08.09.2021) NL
2029988 01 December 2021 (01.12.2021) NL

(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,

(54) Title: IMMERSIVE COOLING UNIT FOR COOLING ELECTRONIC COMPONENTS AND METHOD OF USING THE
SAME

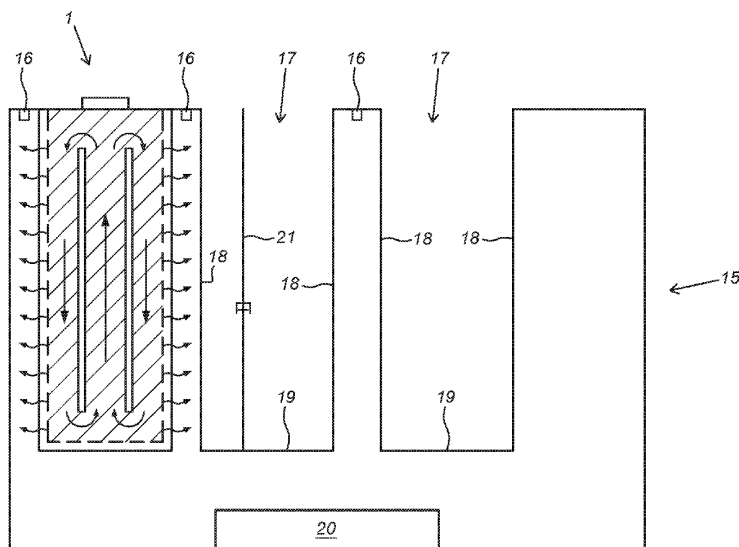


Fig. 3

(57) Abstract: The present invention is related to an immersive cooling unit (1), comprising at least one closed heating channel (2), defined by at least one circumferential heating channel wall having a start and an end, accommodating one or more printed circuit boards (10), comprising one or more heat dissipating electronic components (5), at least one closed cooling channel (3), defined by at least one circumferential cooling channel wall (6), wherein a start of the cooling channel (3) is connected to an end of the heating channel (2), and wherein an end of the cooling channel (3) is connected to the start of the heating channel (2) such that a closed circuit is formed between the channels (2,3), a liquid coolant, for cooling the electronic components (5), said coolant at least filling the channels (2, 3) and submerging the printed circuit board (10), wherein the channels (2, 3) each allow a coolant flow having at least a vertical component wherein at least a portion (7) of the cooling channel wall (6) is formed by a heat conducting material, said portion (7)

[Continued on next page]

HR, HU, ID, IL, IN, IR, IS, IT, 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))*

(48) Date of publication of this corrected version:

25 August 2022 (25.08.2022)

(15) Information about Correction:

see Notice of 25 August 2022 (25.08.2022)

allowing an exchange of heat between a part of the coolant in contact with an interior side of said cooling channel wall portion (7) and a surrounding (8) in contact with an exterior side of said cooling channel wall portion (7). The invention is further related to a cooling unit (1) and a holder (15), and a method for using the cooling unit (1).