

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 June 2022 (23.06.2022)



(10) International Publication Number
WO 2022/129693 A1

(51) International Patent Classification:

G06N 10/40 (2022.01) B82Y 10/00 (2011.01)
H01L 39/22 (2006.01) H01P 7/08 (2006.01)

(21) International Application Number:

PCT/FI2021/050872

(22) International Filing Date:

14 December 2021 (14.12.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20213787.3 14 December 2020 (14.12.2020) EP

(71) Applicant: IQM FINLAND OY [FI/FI]; Keilaranta 19,
02150 Espoo (FI).

(72) Inventors: HYYPPÄ, Eric; c/o IQM Finland Oy, Keilaranta
19, 02150 Espoo (FI). MÖTTÖNEN, Mikko; c/o IQM

Finland Oy, Keilaranta 19, 02150 Espoo (FI). HASSEL,
Juha; c/o IQM Finland Oy, Keilaranta 19, 02150 Espoo
(FI). TUORILA, Jani; c/o IQM Finland Oy, Keilaranta 19,
02150 Espoo (FI).

(74) Agent: PAPULA OY; P.O. Box 981, 00101 Helsinki (FI).

(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, 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.

(54) Title: QUANTUM PROCESSING UNIT COMPRISING ONE OR MORE SUPERCONDUCTING QUBITS BASED ON
PHASE-BIASED LINEAR AND NON-LINEAR INDUCTIVE-ENERGY ELEMENTS

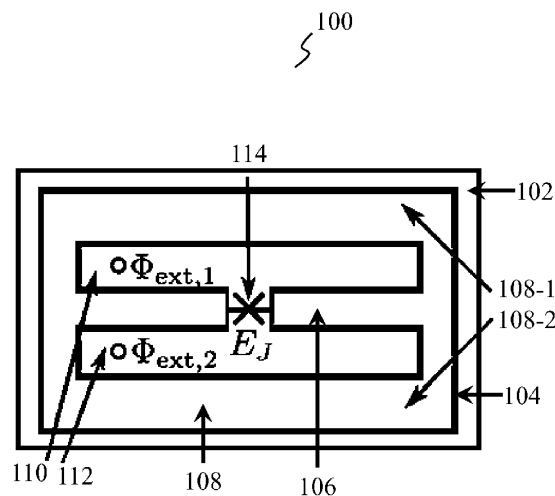


FIG. 1

(57) Abstract: The invention is generally related to the field of quantum computing and particularly to a quantum processing unit (100) comprising at least one superconducting qubit (104) based on phase-biased linear (106) and non-linear (114) inductive-energy elements. A superconducting phase difference across the linear (106) and non-linear (114) inductive-energy elements is biased, for example, by an external magnetic field, such that quadratic potential energy terms of the linear and non-linear inductive-energy elements are cancelled at least partly. In a preferred embodiment, such cancellation is at least 30%. By so doing, it is possible to implement a high-coherence high-anharmonicity superconducting qubit design.

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(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).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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))*