

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
30 December 2021 (30.12.2021)



(10) International Publication Number
WO 2021/259766 A1

(51) International Patent Classification:

H01L 27/18 (2006.01) **G06N 10/00** (2019.01)
H01L 39/04 (2006.01)

(21) International Application Number:

PCT/EP2021/066475

(22) International Filing Date:

17 June 2021 (17.06.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

16/908,704 22 June 2020 (22.06.2020) US

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(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.

(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,

(54) Title: SUPERCONDUCTING QUBIT LIFETIME AND COHERENCE IMPROVEMENT VIA SUBSTRATE BACKSIDE ETCHING

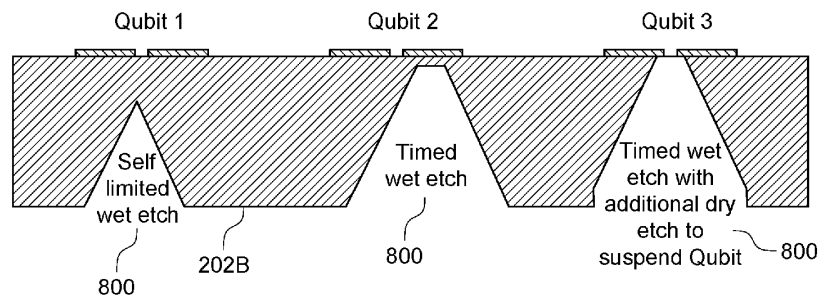


FIG. 8

(57) Abstract: A method for improving lifetime and coherence time of a qubit in a quantum mechanical device includes providing a substrate having at least one qubit formed on the frontside, the at least one qubit having capacitor pads, and removing substrate material from the backside at an area opposite the qubit and/or depositing a superconducting metal layer at the backside area opposite the qubit to reduce radiofrequency electrical current loss due to at least one of silicon-air (SA) interface, metal-air (MA) interface or silicon-metal (SM) interface.

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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))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*