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(71) Applicant: **INTERNATIONAL BUSINESS MACHINES CORPORATION** [US/US]; New Orchard Road, Armonk, New York, 10504 (US).

(71) Applicant (for MG only): **IBM UNITED KINGDOM LIMITED** [GB/GB]; P.O. Box 41, North Harbour, Portsmouth Hampshire PO6 3AU (GB).

(72) Inventors: **SANDBERG, Martin**; IBM CORPORATION, P.O. BOX 218, 1101 KITCHAWAN ROAD, YORKTOWN HEIGHTS, New York 10598 (US). **ADIGA, Vivekananda**; IBM CORPORATION, P.O. BOX 218, 1101 KITCHAWAN ROAD, YORKTOWN HEIGHTS, New York 10598 (US). **TOPALOGLU, Rasit, Onur**; IBM CORPORATION, 2070 ROUTE 52, HOPEWELL JUNCTION, New York 12533-6683 (US).

(54) Title: VERTICAL SUPERINDUCTOR DEVICE

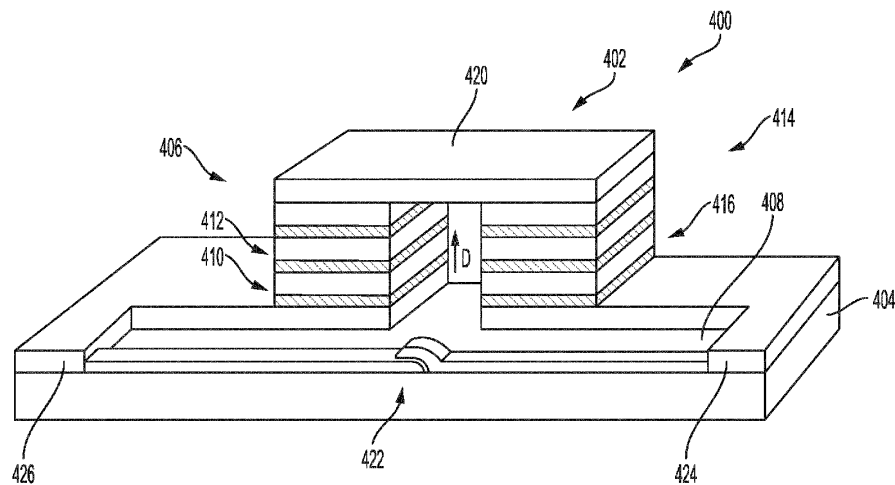


FIG. 4

(57) **Abstract:** A fluxonium qubit includes (400) a superinductor (402). The superinductor includes a substrate (404), and a first vertical stack (406) extending in a vertical direction from a surface (406) of the substrate (404). The first vertical stack includes a first Josephson junction (410) and a second Josephson junction (412) connected in series along the vertical direction. The superinductor includes a second vertical stack (414) extending in a vertical direction from a surface of the substrate. The second vertical stack includes a third Josephson junction (416). The superinductor includes a superconducting connector (420) connecting the first and second vertical stacks in series such that the first, second, and third Josephson junctions are connected in series. The fluxonium qubit further includes a shunted Josephson junction (422) connected to the superinductor with superconducting wires (424, 426) such that the first, second, and third Josephson junctions of the superinductor that are in series are connected in parallel with the shunted Josephson junction.

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(74) **Agent: LITHERLAND, David;** IBM United Kingdom Limited, Intellectual Property Law, Hursley Park, Hursley, Winchester Hampshire SO21 2JN (GB).

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