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(54) Title: DUAL-RAIL ENTANGLING GATES VIA BEAMSPLITTER-ACTIVATED CROSS KERR INTERACTIONS

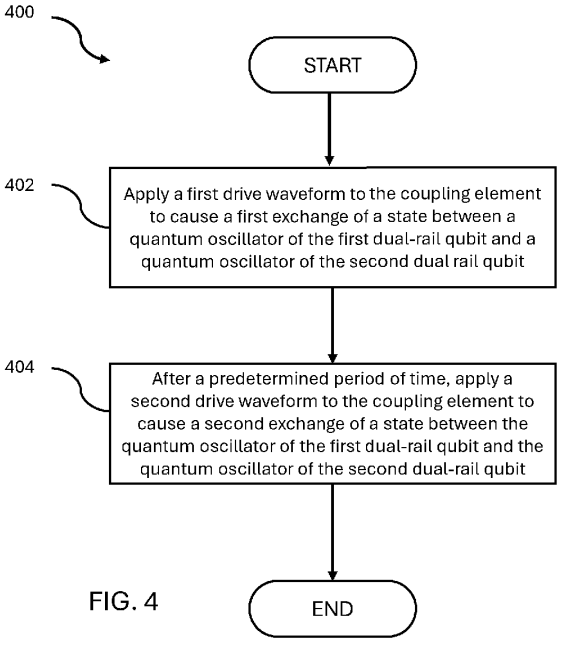

FIG. 4

(57) Abstract: Systems and methods for performing an entangling gate between a first dual-rail qubit and a second dual-rail qubit are described herein. The techniques described herein may leverage static non-linear interactions (e.g., static cross Kerr interactions) to perform entangling gates using coupled dual-rail qubits. The entangling gates may be performed by applying one or more drive waveforms to exchange encoded states of quantum oscillators in the dual-rail qubits to turn the non-linear interactions "on" and "off."

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