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(54) **QUANTUM COMPUTING-ENHANCED SYSTEMS AND METHODS FOR LARGE-SCALE CONSTRAINED OPTIMIZATION**

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(52) **U.S. Cl.**
CPC **G06N 10/60** (2022.01); **G06Q 10/04** (2013.01)

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(57) **ABSTRACT**

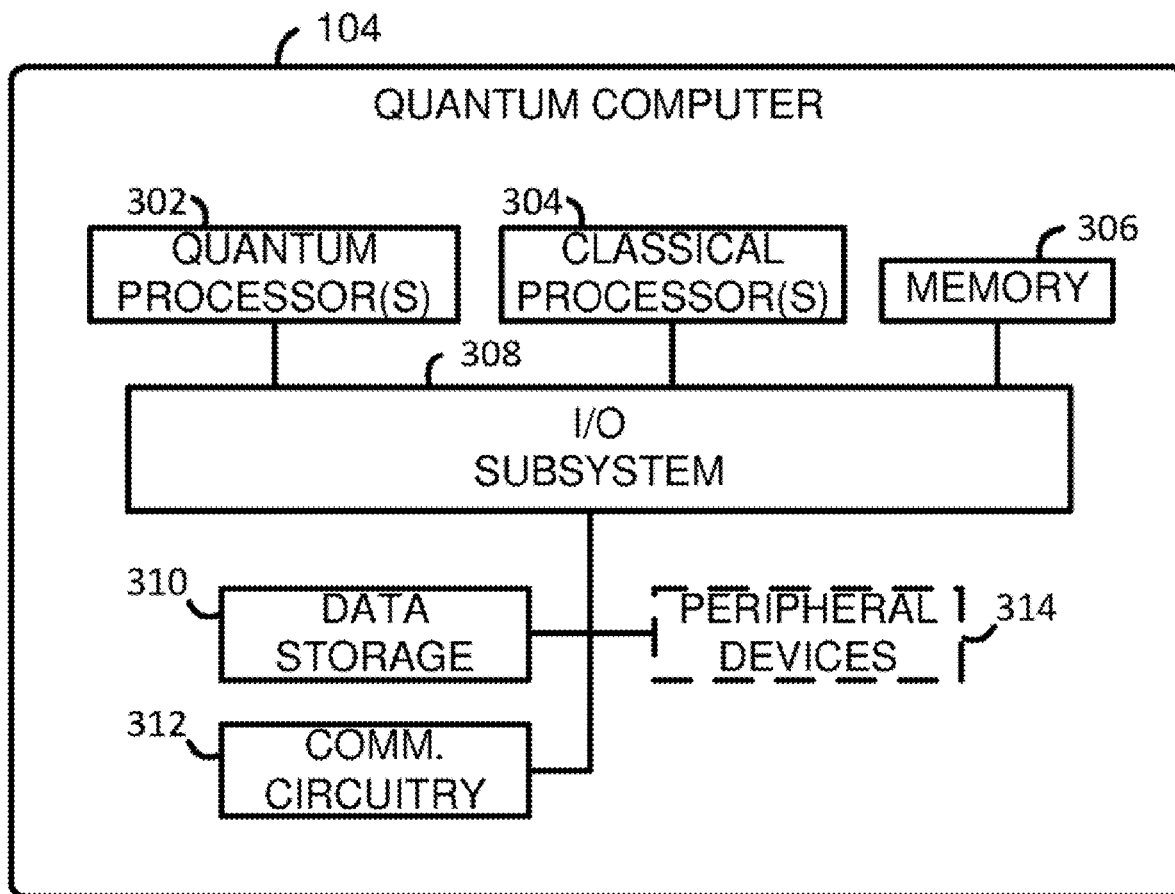
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Technologies for a quantum/classical hybrid approach to solving optimization problems are disclosed. In the illustrative embodiment, an optimization problem is decomposed into two sub-problems. The first sub-problem is solved on a classical computer, and a result from the first sub-problem is provided to a quantum computer. The quantum computer then solves the second sub-problem based on the result of the first sub-problem from the classical computer. The quantum computer can then provide a result to the classical computer to re-solve the first problem. The iterative calculation is continued until an end condition is met.

Related U.S. Application Data

(63) Continuation of application No. 17/767,247, filed on Apr. 7, 2022, now Pat. No. 11,769,070, filed as application No. PCT/US2020/055019 on Oct. 9, 2020.

(60) Provisional application No. 62/913,146, filed on Oct. 9, 2019, provisional application No. 63/016,076, filed



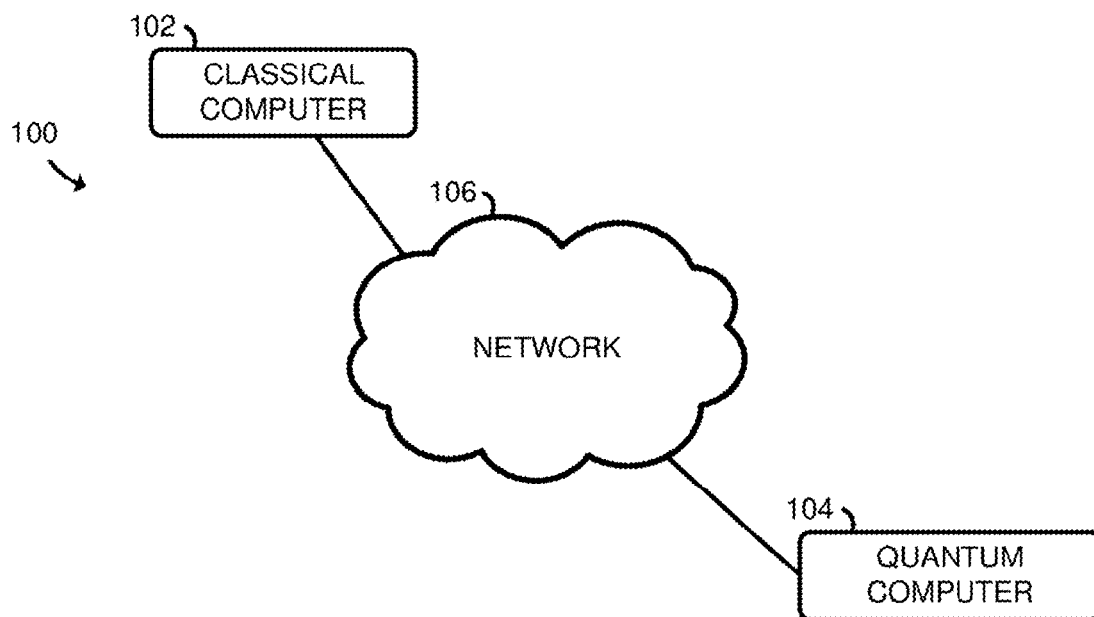


FIG. 1

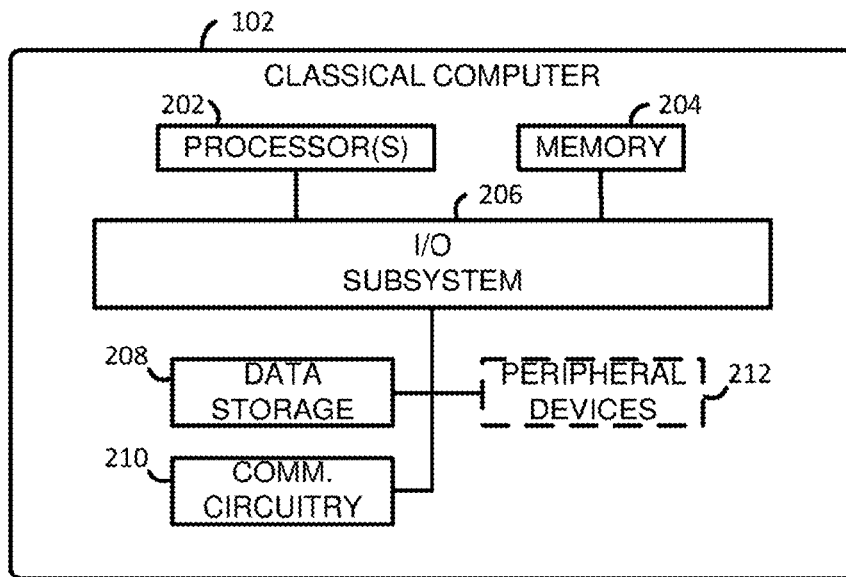


FIG. 2

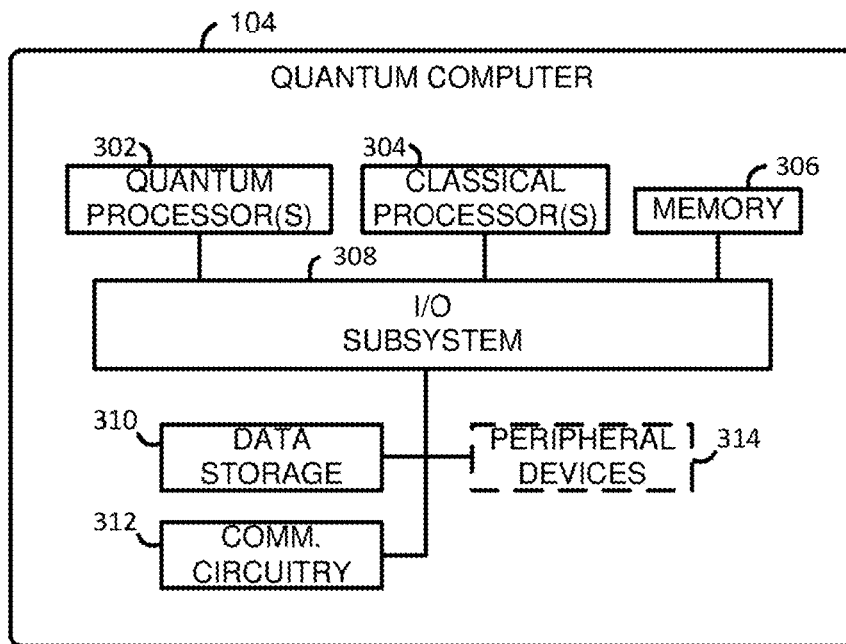


FIG. 3

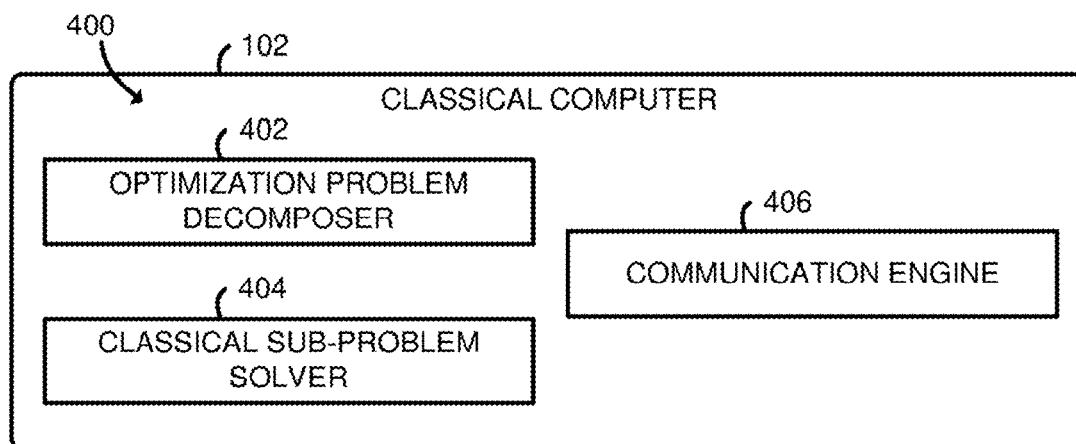


FIG. 4

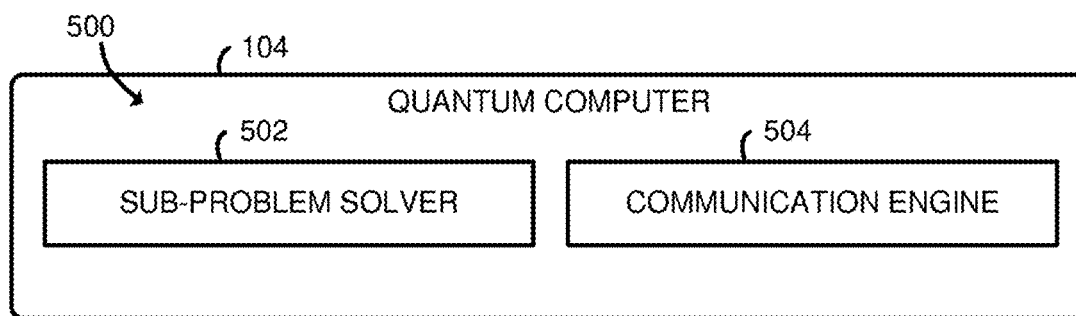


FIG. 5

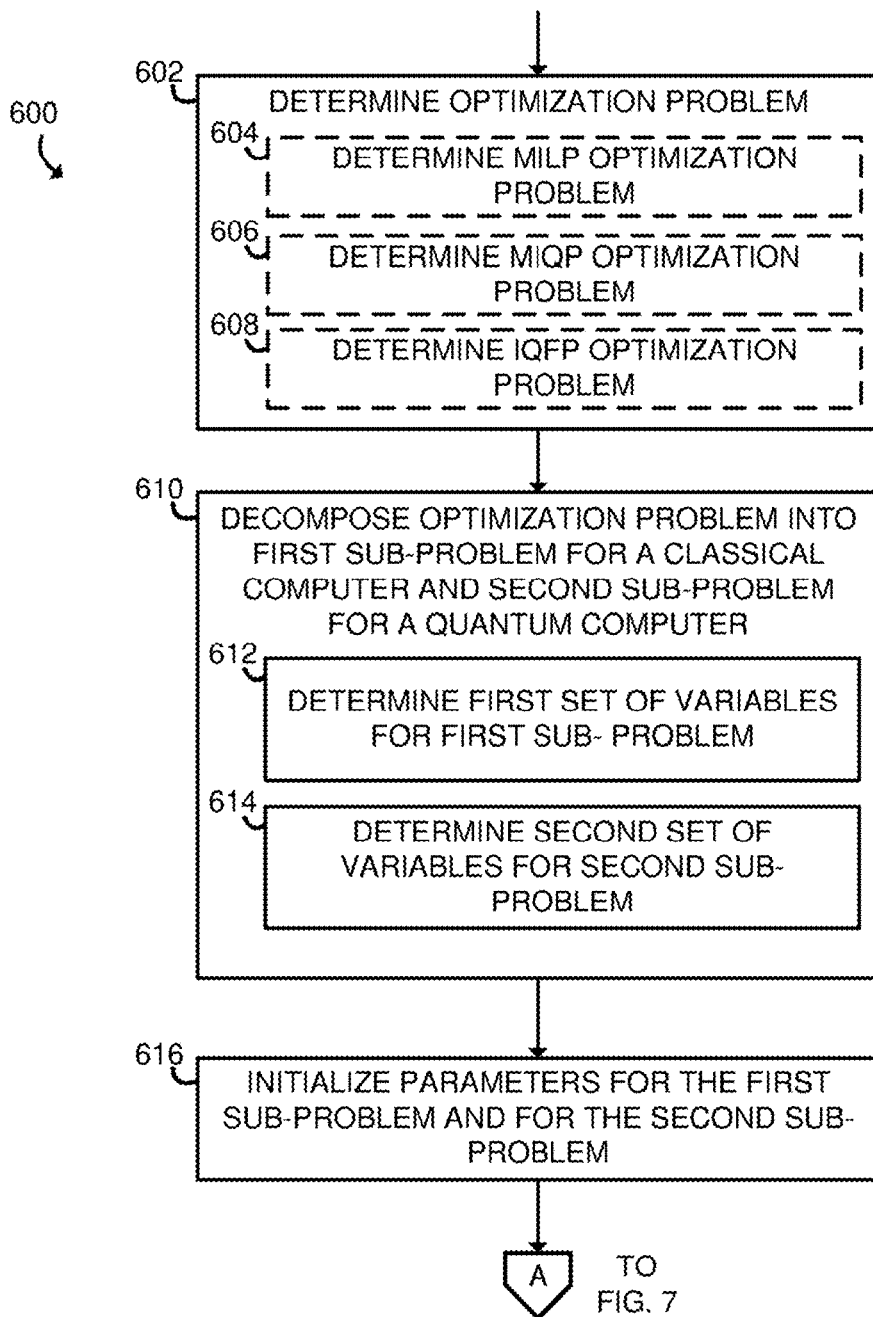


FIG. 6

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