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(54) Title: HEAT EXCHANGER SYSTEM WITH MACHINE-LEARNING BASED OPTIMIZATION

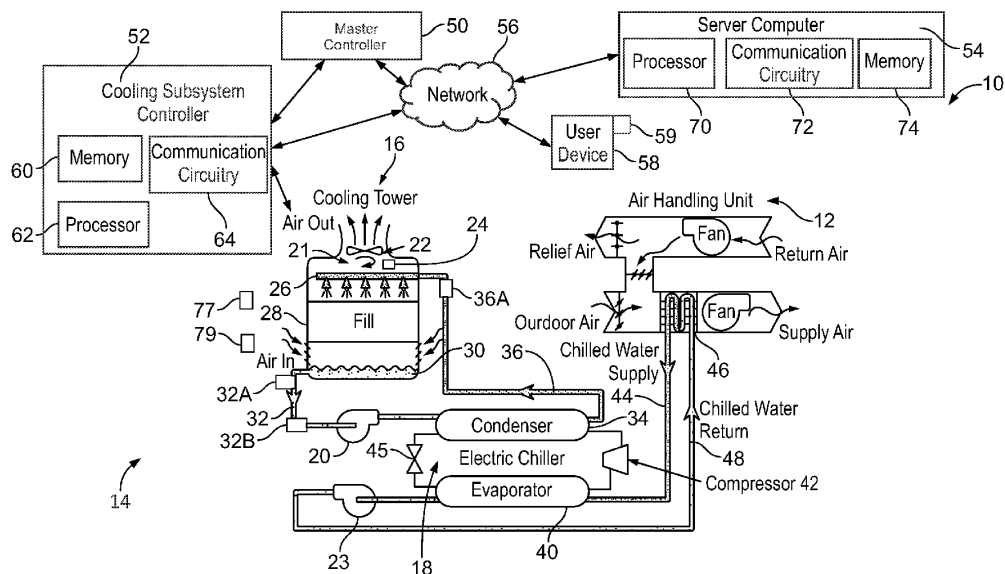


FIG. 1A

(57) Abstract: In one aspect, a heat exchanger system is provided that includes a cooling system and a sensor configured to detect a variable of the cooling system. The heat exchanger system includes processor circuitry configured to provide the variable and a plurality of potential operating parameters of the cooling system to a machine learning model representative of the cooling system to estimate at least one of energy consumption, water usage, and chemical usage for the potential operating parameters. The processor circuitry is further configured to determine, based at least in part on the estimated at least one of energy consumption, water usage, and chemical consumption, for the potential operating parameters, an optimal operating parameter of the cooling system to satisfy a target optimization criterion.

[Continued on next page]

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