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(54) **Title:** HEATER DESIGN SOLUTIONS FOR CHEMICAL DELIVERY SYSTEMS

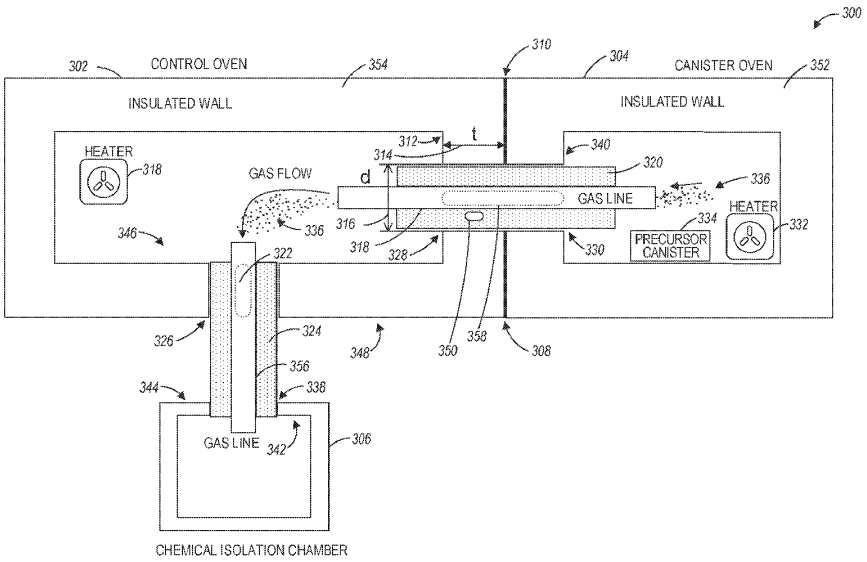

FIG. 3

(57) **Abstract:** A semiconductor substrate processing apparatus includes a chemical isolation chamber for processing a semiconductor substrate, a chemical delivery module, and a control module. The chemical delivery module is in fluid communication with the chamber and includes a canister oven, a control oven, and a heating element. The canister oven generates a process gas using a heated precursor. The control oven receives the process gas via a first gas line and supplies the process gas to the chamber via a second gas line. The first gas line extends between an inside surface of the canister oven and an inside surface of the control oven. The heating element heats a portion of the first gas line between the inside surface of the canister oven and the inside surface of the control oven. The controller module adjusts a heating temperature of the heating element based on a temperature of the portion.

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