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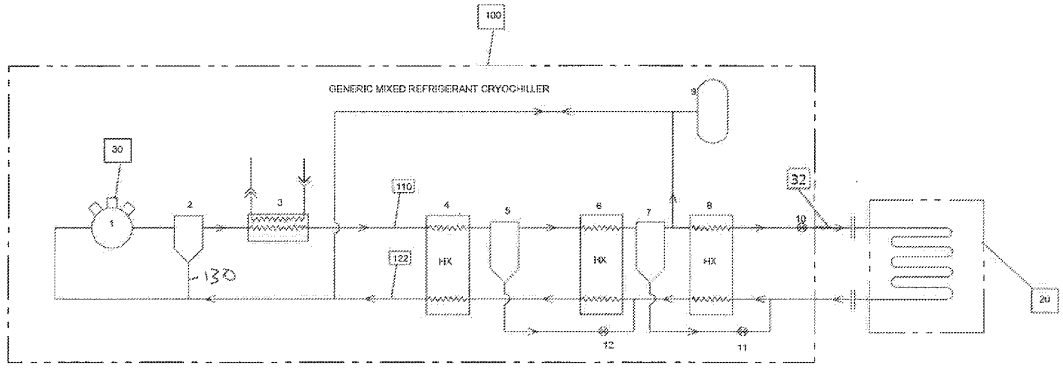


Figure 1

(57) Abstract: A temperature control apparatus for supplying fluid to control a temperature of at least one semiconductor wafer within a semiconductor processing chamber, the temperature control apparatus comprising: a mixed refrigerant refrigeration system; the temperature control apparatus being configured to supply the mixed refrigerant to at least one conditioning circuit within the semiconductor processing chamber and to receive the mixed refrigerant from the at least one conditioning circuit. The temperature control apparatus comprises a temperature control circuitry for controlling a temperature of the at least one conditioning circuit to one of a plurality of predetermined temperatures, at least one of the temperatures being below -100° C, the temperature control circuitry being configured to control the temperature of the at least one conditioning circuit by controlling at least one of a mass flow rate, composition or temperature of the mixed refrigerant supplied to the at least one conditioning circuit.

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