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REFRIGERATION SYSTEM AND METHOD FOR COOLING A SUSCEPTOR
USING A REFRIGERATION SYSTEM

ABSTRACT OF THE DISCLOSURE

The refrigeration system according to the invention includes a vacuum jacketed pressure vessel which contains both a spray heat exchanger and a shell and tube heat exchanger. The spray heat exchanger includes one or more nozzles for directing a first refrigerant at a heat exchanger element conveying a second refrigerant. The first refrigerant is sprayed in a fine mist from the nozzles onto the heat exchanger element conveying the second refrigerant. The first refrigerant then evaporates and cools the second refrigerant within the heat exchanger element. The shell and tube heat exchanger is a counter current heat exchanger which includes an inner tube for conveying the second refrigerant to the spray heat exchanger, and an outer tube surrounding the inner tube for conveying the first refrigerant recovered from the interior of the vacuum jacketed pressure vessel out of the pressure vessel. The spray heat exchanger recovers the heat of vaporization of the primary refrigerant, while the shell and tube heat exchanger recovers the enthalpy remaining in the evaporated first refrigerant.

FIGURE 1

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