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(54) Title: FLAMELESS COMBUSTOR PROCESS HEATER

(57) Abstract

A process heater is provided utilizing flameless combustion, the process heater having: an oxidation reaction chamber (8), the oxidation reaction chamber (4) having an inlet for oxidant, an outlet for combustion products (15), and a flow path between the inlet and the outlet; a fuel conduit (5) capable of transporting a fuel mixture to a plurality of fuel nozzles (6) within the oxidation reaction chamber (4), each nozzle providing communication from within the fuel conduit to the oxidation chamber, with each nozzle along the flowpath between the inlet and the outlet; a preheater (7) in communication with the oxidation chamber inlet, the preheater capable of increasing the temperature of the oxidant to a temperature resulting in the combined oxidant and fuel from the fuel nozzle closest to the oxidation chamber inlet being greater than the autoignition temperature of the combined oxidant and fuel from the fuel nozzle closest to the oxidation chamber inlet; and a process chamber in a heat exchange relationship to the oxidation reaction chamber wherein the heat transferred from the oxidation section does not cause the temperature of the mixture within the oxidation reaction chamber in the vicinity of each fuel nozzle to decrease below the autoignition temperature of the combined mixture in the oxidation chamber in the vicinity of that fuel nozzle.

