United States Patent [19]

Powers

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[54] METHOD FOR INCREASING RADIANT HEAT TRANSFER FROM HOT GASES

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[51] **Int. Cl.**[2] **C21B 5/02**; C22B 15/00

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[58] **Field of Search** 75/20, 21, 40, 41, 42, 75/43, 72, 74, 76, 91, 92, 93; 432/19, 20, 266

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[57] **ABSTRACT**

Radiant heat transfer is increased by introducing to hot gases, such as those normally present in furnaces, a material which provides finely sized particles therein of the type which increase the emissivity and luminosity of the gases. The material is introduced separately from the furnace fuel and preferably downstream of the flame produced by the burning of the fuel. In one embodiment, an unsaturated gaseous hydrocarbon such as acetylene is introduced into the furnace at a plurality of locations downstream of the flame. The unsaturated hydrocarbon exothermically cracks in the furnace to produce hydrogen and carbon particles in the furnace hot gases. The carbon particles increase the emissivity and luminosity of the hot gases and thus their radiant heat transfer to the furnace charge. The exothermic cracking reaction and the combustion of the hydrogen produced during cracking add heat to the hot gases which maintains their temperature at desired levels despite the increased radiant heat transfer from the gases. By varying the locations where the hydrocarbon is introduced, as little or as much of the furnace hot gases as desired can be made luminous. Under preferred conditions, radiant heat transfer to the furnace charge can be increased 20% or more by the method of the invention.

4 Claims, 7 Drawing Figures