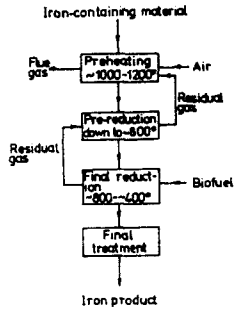


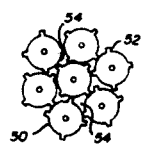
A new method is devised for the production of raw iron or so-called metallized iron ore. Biofuels i.e. preferably fuel wood and/or peat is in the final reduction brought into direct contact with the iron containing material in its solid state. Biofuels have very different properties compared to reduction agents on the basis of fossil fuels primarily coal and develop rapidly a reactive reduction gas at a comparatively low temperature. The new raw iron process is carried out with the iron containing material in its solid state of aggregation in different kinds of fluidized bed reactors in different system configurations.

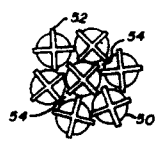
4360339

FLUIDIZED BOILER

Henry J Blaskowski assigned to Combustion Engineering Inc

A fluidized bed call having a static ignition bed (18) of inert heat storage particles



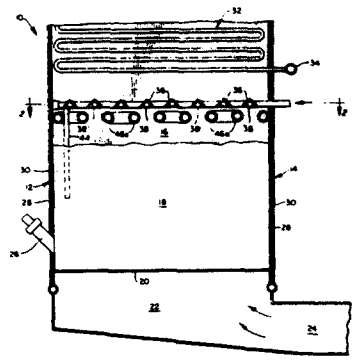


disposed immediately beneath and adjacent to a fluidizing region wherein fuel particles are combusted, characterized in that the heat storage particles are generally spherical in shape, each particle having a plurality of protuberances extending outwardly from the surface of the particle a preselected length thereby maintaining a minimum spacing, equal to the preselected length of the protuberances, between neighboring spherical particles within the static ignition bed thereby ensuring that sufficient void space exists within the static ignition bed for the fluidizing air to flow upward through the static ignition bed into the fluidizing region without an excessive pressure drop and for the fuel particles to laterally penetrate the static ignition bed.

4359968

FLUIDIZED BED HEAT EXCHANGER UTILIZING A BAFFLE SYSTEM

Robert D Stewart assigned to Foster Wheeler Energy Corporation

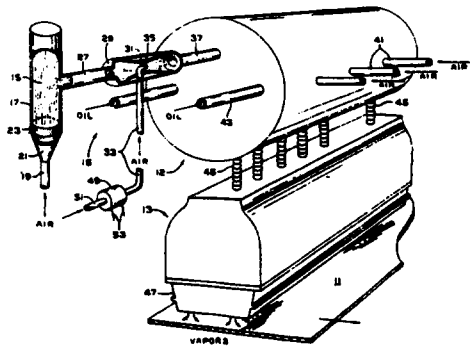


A fluidized bed heat exchanger in which a bed of particulate material is supported on a grate in a housing and air is passed through the grate and the particulate material to fluidize the bed and promote the combustion of combustible material contained therein. A baffle system is disposed in the housing for impacting with the entrained particulate material in the air and gaseous products of combustion to remove the latter material and permit it to fall by gravity back to the bed. A series of tube sections are provided in the housing for directing the air and gaseous products to the baffle means and gases are injected from the proximity of the baffle means downwardly toward the bed.

4359493

METHOD OF VAPOR DEPOSITION

Vern A Henery assigned to PPG Industries Inc



A method is disclosed for fluidizing and vaporizing particulate solid coating reactants by establishing a fluidized bed of dispersed particulate solid coating reactants, drawing a volume of fluidizing gas and suspended particulate solid coating reactant into a vaporizer while mixing an additional volume of gas therewith, and vaporizing the dispersed particulate solid coating reactant in the reactant gas mixture. The vaporized coating reactant may then be directed into contact with a substrate to be coated in order to deposit a film thereon.

4359448

FLUIDIZED BED REACTOR FOR EXOTHERMIC REACTIONS

Pieter J Schuurman; Marius Teekens assigned to Shell Oil Company

A reactor for exothermic reactions provided with bundles of narrow axial cooling pipes, mounted between distributing and collecting drums (steam headers) provided with tube sheets. The distributing drums are placed symmetrically around the outlet end of a central axial coolant inlet pipe, recovering from top to bottom of the reactor. A feed gas inlet at the bottom branches into feed pipes with a quantity of nozzles, in order to allow the gas to fluidize a mass of catalyst particles.

4359326

FLUIDIZED BED REACTOR APPARATUS AND RELATED GASIFICATION SYSTEM

Franklin D Hoffert; John D Milligan; Jose Marina; Jose Fernandez assigned to Hydrocarbon Research Inc

A process and pressurized, gasification reactor apparatus for converting combustible carbon containing materials such as coal char and other carbonaceous solids or carbonaceous solids/heavy oil combinations to an intermediate heating value fuel gas. The gasification reactor includes an insulated fluidized bed reactor chamber, an upper reactor housing for a freely suspended bayonet bundle type heat exchanger for (a) superheating incoming saturated steam and (b) cooling outgoing high temperature product gas, and a lower reactor housing structure which includes a free-floating, conically-shaped perforated plenum chamber. The superheated steam and oxygen are premixed with the plenum chamber before being pressure directed into the fluidized bed reactor chamber for mixture and combustion with the incoming combustible carbon containing materials such as coal char. After reaction of the superheated steam, oxygen and coal char in the fluidized bed reactor at temperatures ranging from 900 degrees F. to 1750 degrees F., the product fuel gases and associated particulate matter are cooled by steam flowing through the bayonet heat exchanger, the steam being superheated by this exchange. After discharge from the heat exchanger, the fuel gas product containing particulate matter is pressure directed into a conventional cyclone separator for (a) separation of the desired product gases and (b) return of the particulate matter for further recycling in the reactor chamber. Undesirable ash clinkers are gravitationally and pressure directed out of the reactor chamber through a central ash withdrawal pipe.

4359212

APPARATUS FOR REDUCING FINELY DIVIDED IRON OXIDE MATERIAL

Erik Bengtsson; Per Collin; Sune Flink; Bjorn Widell assigned to Stora Kopparbergs Bergslags AB