

METHOD AND APPARATUS FOR TORREFACTION OF BIOMASS MATERIALS

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ABSTRACT

Embodiments of the invention provide a heat transfer element adapted for use in a rotary furnace for torrefaction and particle size reduction of biomass material. The heat transfer
10 element is made up of a rounded object having a specific gravity substantially higher than a specific gravity of the biomass material to be torrefied, a heat capacity sufficient for the heat transfer elements in the rotary furnace to heat the biomass material to be torrefied, and a hardness sufficient for the heat transfer element to serve as grinding media to reduce the particle size of the biomass material to be torrefied. The heat transfer element
15 has one or more surface features formed in a surface of the rounded object. The surface features are configured to increase traction between the heat transfer elements and the biomass material to be torrefied. A system for torrefaction and particle size reduction of biomass material, including a rotary furnace charged with heat transfer elements as described above, and a method for using such a system for torrefaction and particle size
20 reduction of biomass material are also discussed.

(FIG. 1)