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(54) Title: METHODS, PROCESSES AND SYSTEMS FOR THE PRODUCTION OF HYDROGEN FROM WASTE, BIOGENIC WASTE AND BIOMASS

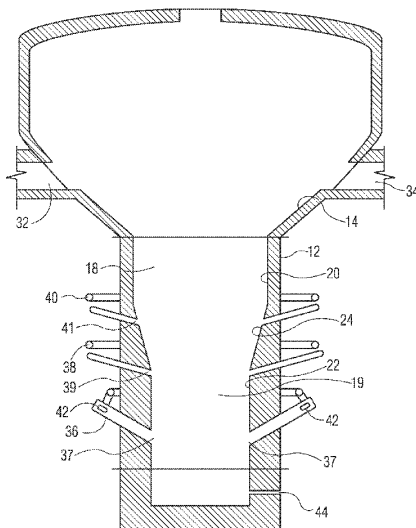


FIG. 1

(57) Abstract: Provided herein are novel devices, systems, and methods of using the same, that enable plasma-enhanced gasification of biogenic hydrocarbon waste material comprising: a geometrically designed reactor having a biochar carbon catalyst bed, together with a gas inlet system disposed around a lower section of the apparatus to supply oxidant gas generated by an integrated oxygen absorber system; to enhance the partial oxidation of biogenic hydrocarbon waste materials using exothermic heat generated by an oxidation reaction created in part by the integrated oxygen absorber system into the apparatus, in order to optimize the quantity and quality of hydrogen production in the synthetic gas produced therein.

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