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(54) Title: PRODUCTION OF SYNTHETIC TRANSPORTATION FUELS FROM CARBONACEOUS MATERIALS USING SELF-SUSTAINED HYDRO-GASIFICATION

(57) Abstract: A process and apparatus for producing a synthesis gas for use as a gaseous fuel or as feed into a Fischer-Tropsch reactor to produce a liquid fuel in a substantially self-sustaining process. A slurry of particles of carbonaceous material in water, and hydrogen from an internal source, are fed into a hydro-gasification reactor under conditions whereby methane rich producer gases are generated and fed into a steam pyrolytic reformer under conditions whereby synthesis gas comprising hydrogen and carbon monoxide are generated. A portion of the hydrogen generated by the steam pyrolytic reformer is fed through a hydrogen purification filter into the hydro-gasification reactor, the hydrogen therefrom constituting the hydrogen from an internal source. The remaining synthesis gas generated by the steam pyrolytic reformer is either used as fuel for a gaseous fueled engine to produce electricity and/or process heat or is fed into a Fischer-Tropsch reactor under conditions whereby a liquid fuel is produced. Molten salt loops are used to transfer heat from the hydro-gasification reactor, and Fischer-Tropsch reactor if liquid fuel is produced, to the steam generator and the steam pyrolytic reformer.



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