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(54) Title: METHODS FOR DEHYDROGENATING HYDROCARBONS BY THERMAL DEHYDROGENATION

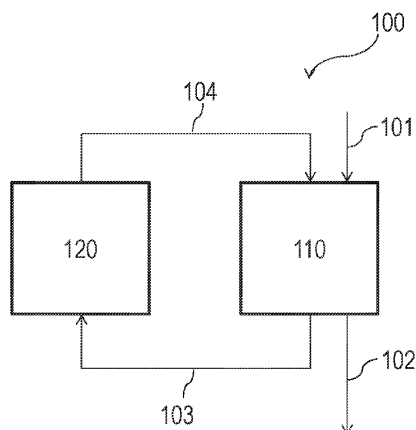


FIG. 1

(57) **Abstract:** A method for dehydrogenating hydrocarbons may include passing a hydrocarbon feed including one or more alkanes or alkyl aromatics into a fluidized bed reactor. In the fluidized bed reactor at least 95 wt.% of the hydrocarbon feed may have an atmospheric boiling point of less than or equal to 300 °C. The method may include thermally cracking the hydrocarbon feed in the fluidized bed reactor to produce a dehydrogenated product and hydrogen. The fluidized bed reactor may operate at a temperature of at least 600 °C. The fluidized bed reactor may be free of dehydrogenation catalyst. The method may include contacting the hydrogen with an oxygen-carrier material in the fluidized bed reactor to combust hydrogen and form an oxygen-diminished oxygen-carrier material. The oxygen-carrier material may be reducible.

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