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(54) Title: HYDROGEN PRODUCTION WITH INTEGRATED CO₂ CAPTURE

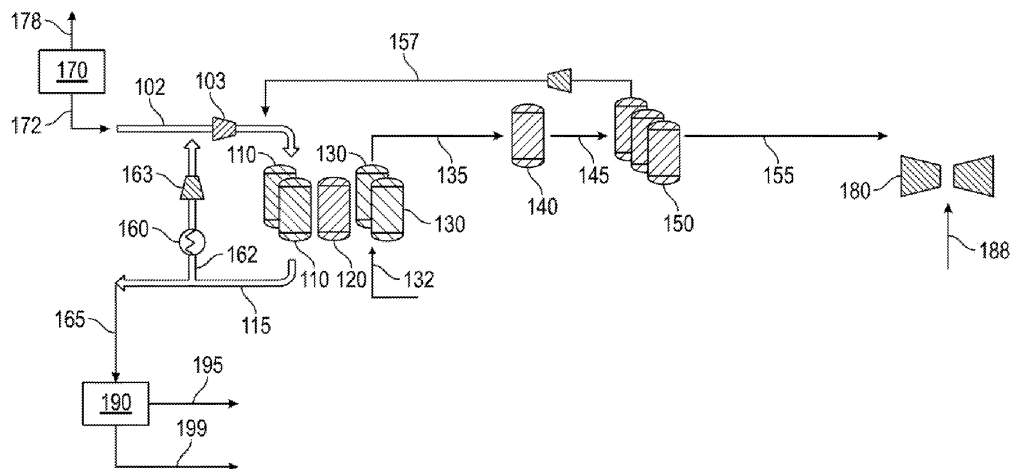


FIG. 1

(57) Abstract: Systems and methods are provided for performing hydrocarbon reforming within a reverse flow reactor environment (or another reactor environment with flows in opposing directions) while improving management of CO₂ generated during operation of the reactor. The improved management of CO₂ is achieved by making one or more changes to the operation of the reverse flow reactor. The changes can include using an air separation unit to provide an oxygen source with a reduced or minimized content of nitrogen and/or operating the reactor at elevated pressure during the regeneration stage. By operating the regeneration at elevated pressure, a regeneration flue gas can be generated that is enriched in CO₂ at elevated pressure. The CO₂-enriched stream can include primarily water as a contaminant, which can be removed by cooling while substantially maintaining the pressure of the stream. This can facilitate subsequent recovery and use of the CO₂.

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