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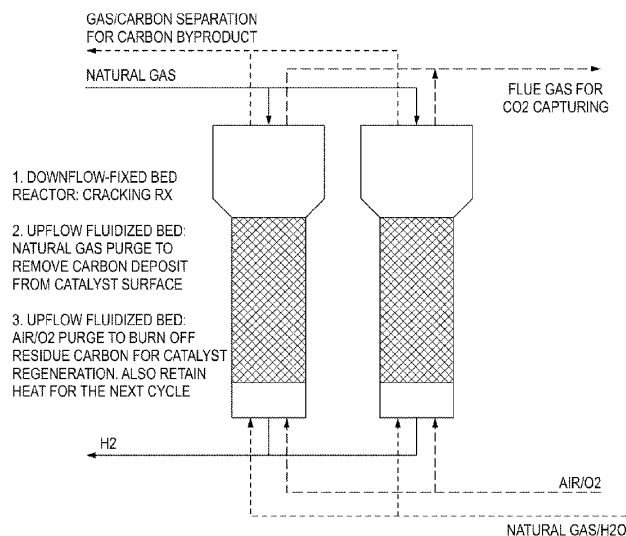


FIG. 1

(57) Abstract: The present disclosure refers to systems and methods for producing hydrogen among other products. In some embodiments the methods comprise sequentially conducting a cracking step in a fixed bed mode and conducting a flowing step in a fluidized bed mode. Such sequential processes may result in a number of advantages including, for example, regenerating the catalyst during the fluidized bed mode in a manner such that beneficial heat is generated for use in the endothermic cracking step.

[Continued on next page]

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