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(54) Title: ENHANCED LIGHT OLEFIN YIELD VIA STEAM CATALYTIC DOWNER PYROLYSIS OF HYDROCARBON
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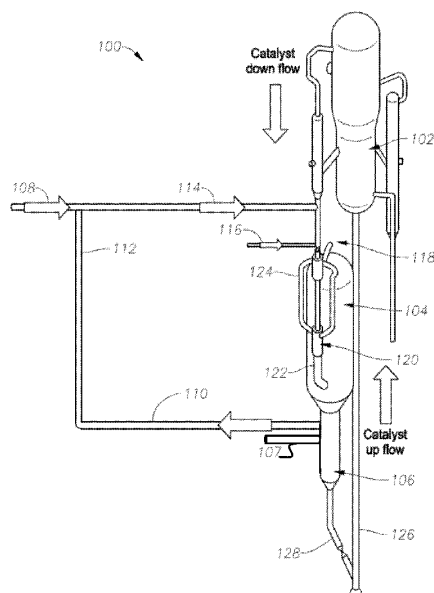


FIG. 1

(57) Abstract: Systems and methods for steam and catalytic cracking of a hydrocarbon inlet stream comprising hydrocarbons. Systems and methods can include a catalyst feed stream, where the catalyst feed stream comprises a fluid and a heterogeneous catalyst, the heterogeneous catalyst operable to catalyze cracking of the hydrocarbons on surfaces of the heterogeneous catalyst a steam feed stream, where the steam feed stream is operable to effect steam cracking of the hydrocarbons, and where the steam feed stream decreases coking of the heterogeneous catalyst; and a downflow reactor, where the downflow reactor is operable to accept and mix the hydrocarbon inlet stream, the catalyst feed stream, and the steam feed stream, where the downflow reactor is operable to produce light olefins by steam cracking and catalytic cracking, and where the downflow reactor is operable to allow the heterogeneous catalyst to flow downwardly by gravity.

WO 2018/200650 A1

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