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(54) **Title:** ONE-STEP FIXED-BED CATALYTIC PROCESS FOR UPGRADING PYROLYSIS OIL TO LIGHTER AROMATIC COMPOUNDS

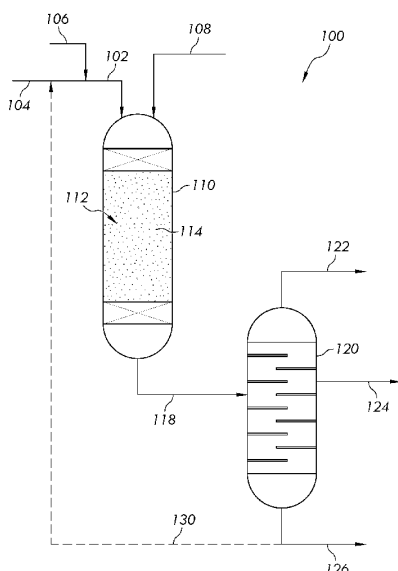


FIG. 1

(57) **Abstract:** Systems and method for upgrading pyrolysis oil to produce greater value aromatic compounds includes combining heavy pyrolysis oil and a diluent to produce the pyrolysis oil feed with at least 30 wt.% multi-ring aromatic compounds boiling at greater than 360 °C. The systems and methods include passing the pyrolysis oil feed to a fixed-bed reactor having a hydrocracking catalyst that includes pellets having a particle size greater than or equal to 0.1 millimeter. The hydrocracking catalyst is a mixed metal oxide catalyst that includes a binder and mixed metal oxide particles or a supported metal oxide catalyst that includes molybdenum oxide and nickel oxide supported on a catalyst support material comprising a large-pore alumina. The methods may further include contacting the pyrolysis oil feed with the hydrogen in the presence of the hydrocracking catalyst at reaction conditions in the fixed-bed reactor to produce a reaction effluent.

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Declarations under Rule 4.17:

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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