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(54) Title: TWO STAGE FIXED-BED CATALYTIC PROCESS FOR UPGRADING PYROLYSIS OIL TO BTX

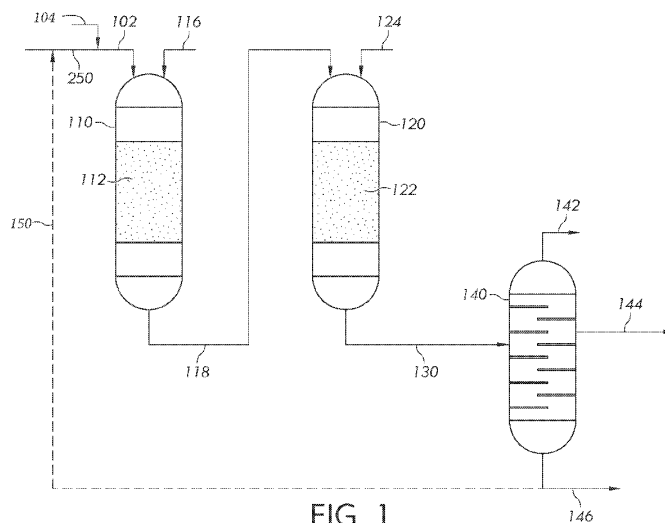


FIG. 1

(57) Abstract: A method for upgrading pyrolysis oil includes contacting a pyrolysis oil feed with hydrogen in the presence of a mixed metal oxide catalyst in a first fixed-bed reactor, where: the pyrolysis oil feed comprises multi-ring aromatic compounds comprising greater than or equal to sixteen carbon atoms, and contacting the pyrolysis oil feed with hydrogen in the presence of the mixed metal oxide catalyst in the first fixed-bed reactor to convert at least a portion of the multi-ring aromatic compounds in the pyrolysis oil feed to di-aromatic compounds, tri-aromatic compounds, or both, passing an intermediate stream comprising the di-aromatic compounds, tri-aromatic compounds, or both to a second fixed-bed reactor downstream of the first fixed-bed reactor; and contacting the intermediate stream with hydrogen in the presence of a mesoporous supported metal catalyst in a second fixed-bed reactor.

[Continued on next page]

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