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

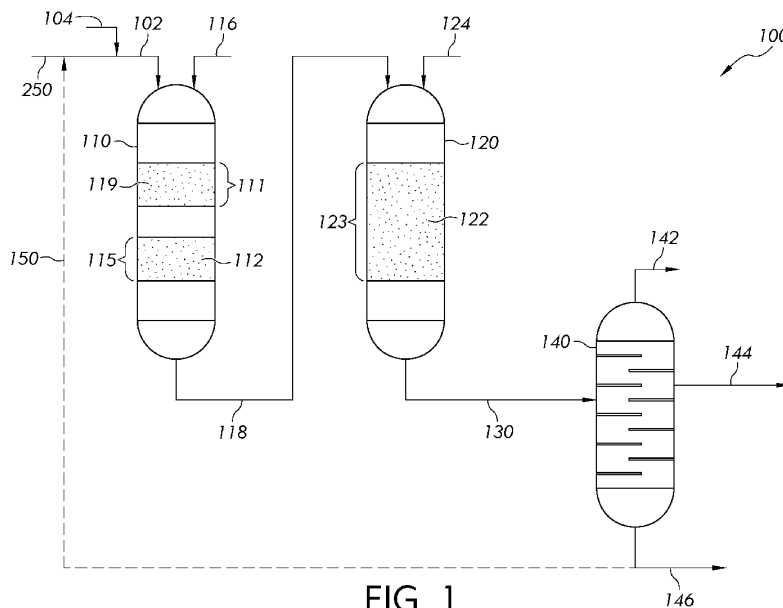


FIG. 1

(57) Abstract: Systems for upgrading pyrolysis oil include a first fixed-bed reactor having a first catalyst bed and a second catalyst bed. The first catalyst bed includes: a first treating catalyst containing alumina, binder, Mo, Ni, and P; a second treating catalyst made of Al_2O_3 , SiO_2 , ZrO_2 , NiO, and WO_3 ; or both. The second catalyst bed includes mixed metal oxide catalyst. The first fixed-bed reactor contacts the pyrolysis oil with hydrogen in the presence of the treating catalyst and the mixed metal oxide catalyst to produce an intermediate stream comprising light aromatic compounds. The system includes a second fixed-bed reactor downstream that includes a mesoporous supported metal catalyst having nickel and tungsten on a mesoporous support. The second fixed-bed reactor contacts the intermediate stream with hydrogen in the presence of the mesoporous supported metal catalyst to produce a second reactor effluent comprising aromatic compounds having six to eight carbon atoms.

[Continued on next page]

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