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[Continued on next page]

(54) Title: MILD HYDRODESULFURIZATION INTEGRATING GAS PHASE CATALYTIC OXIDATION TO PRODUCE FUELS HAVING AN ULTRA-LOW LEVEL OF ORGANOSULFUR COMPOUNDS

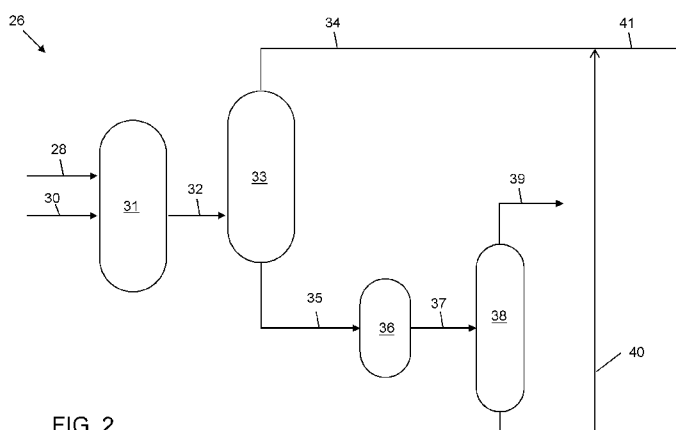


FIG. 2

(57) Abstract: Desulfurization of hydrocarbon feeds is achieved by first contacting the entire feed with a hydrodesulfurization catalyst in a hydrodesulfurization reaction zone operating under mild conditions to remove the labile organosulfur compounds. A flashing column downstream of the hydrodesulfurization reaction zone fractionates the effluent at a target cut point temperature to obtain two hydrocarbon fuel fractions. A first fraction boiling at or above the target cut point temperature contains the remaining refractory organosulfur compounds. A second fraction boiling below the target cut point temperature is substantially free of organosulfur compounds, since the organosulfur compounds boiling in the range of this fraction were the labile organosulfur compounds which were initially removed by mild hydrodesulfurization. The first fraction is contacted with a gaseous oxidizing agent over an oxidation catalyst having a formula $\text{Cu}_x\text{Zn}_{1-x}\text{Al}_2\text{O}_4$ in a gas phase catalytic oxidation reaction zone to convert the refractory organosulfur compounds to SO_x and low sulfur hydrocarbons. The by-product SO_x is subsequently removed, producing a stream containing a reduced level of organosulfur compounds.



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