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(54) Title: METHODS FOR OPERATING CONTINUOUS CATALYTIC REFORMER UNITS

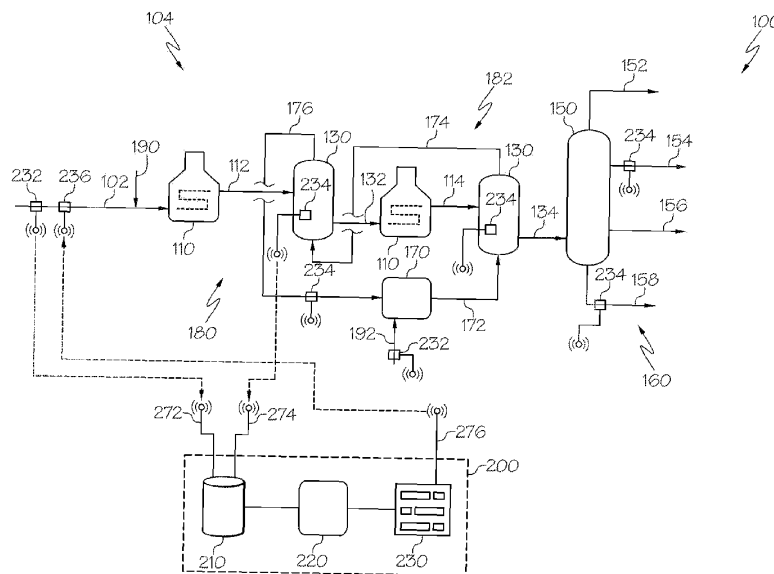


FIG. 1

(57) Abstract: A method for operating a continuous catalytic reformer unit may include passing a hydrocarbon reactant stream to a continuous catalytic reformer unit to form one or more product effluent streams, the continuous catalytic reformer unit comprising at least one stream pre-heater, at least one catalytic reactor, and at least one separation unit; implementing a hydrocarbon reformer process control system comprising a hydrocarbon reformer variable data memory comprising processor-executable instructions, a hydrocarbon reformer output translation module, and one or more predictive hydrocarbon reformer modeling processors configured to execute the processor-executable instructions and cause the process control system to: receive one or more signals indicative of one or more present state variables from one or more state variable actuator hardware, wherein the present state variables are process variables that cannot be directly set in the continuous catalytic reformer unit; and receive one or more signals indicative of one or more present control

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variables of the continuous catalytic reformer unit from one or more control variable actuator hardware, wherein the present control variables are process variables that can be directly set in the continuous catalytic reformer unit; and generate, by utilizing a machine learned model, an improved control variable that increases a selected performance variable based on the inputs of one or both of one or more present state variables or one or more present control variables, wherein the improved control variable wherein the machine learned model is trained utilizing inputs of at least historic state variable data, historic control variable data, and historic performance variable data; and adjusting one or more present control variables of the continuous catalytic reformer unit based on the improved control variable determined by the machine learned model.