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19206404.6 31 October 2019 (31.10.2019) EP(71) Applicant: **EXXONMOBIL CHEMICAL PATENTS INC.** [US/US]; 5200 Bayway Drive, Baytown, TX 77520 (US).(72) Inventors: **ASLANER, William, A.**; 2936 Port Rose Lane, League City, TX 77573 (US). **HIRST, Thomas, T.**; 16326 Heatherdale Drive, Houston, TX 77059 (US). **SPICER, David**; 5319 Del Monte Drive, Houston, TX 77056 (US). **STEPHENS, George**; 3-2-2 #2302 Roppongi Minato-ku, Tokyo, 106-0032 (JP).(74) Agent: **HUGHES, Gerard, J.** et al.; Exxonmobil Chemical Company, Law Technology, P.o. Box 2149, Baytown, TX 77522-2149 (US).

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(54) Title: FURNACE SYSTEMS AND METHODS FOR CRACKING HYDROCARBONS

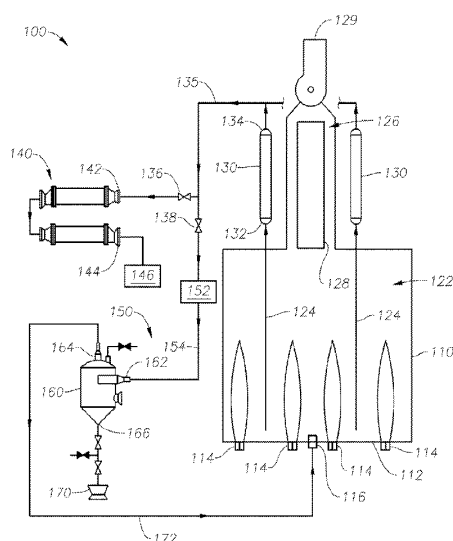


FIG. 1

(57) Abstract: Furnace systems and methods for steam cracking hydrocarbons to produce ethylene and other light olefins are provided herein. A furnace system for cracking hydrocarbons includes a radiant firebox containing a plurality of burners and an injection nozzle, a primary transfer line exchanger fluidly coupled to and downstream of the radiant firebox, and a flow restrictor fluidly coupled to and downstream of the primary transfer line exchanger. The furnace system also includes a decoke vessel containing an effluent inlet, a fluid outlet, and a coke outlet, where the effluent inlet is fluidly coupled to and downstream of the flow restrictor and the fluid outlet is fluidly coupled to and upstream of the injection nozzle of the radiant firebox, and a coke collection bin is coupled to the coke outlet of the decoke vessel.

[Continued on next page]

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