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MEMBRANES IN SITU

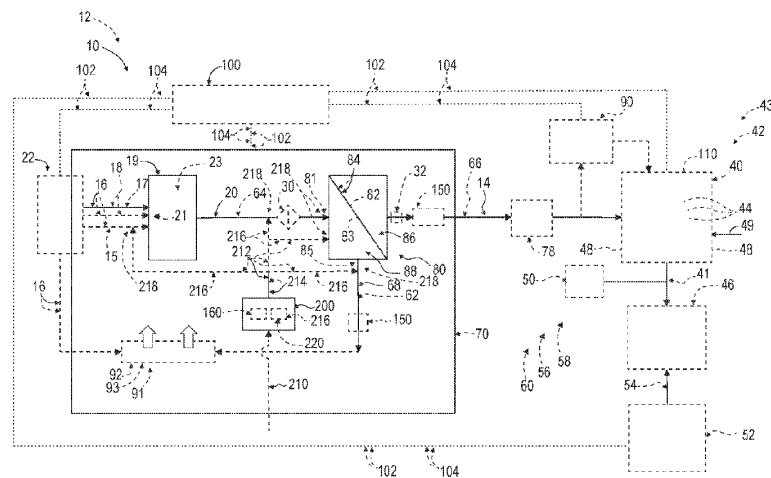


FIG. 1

(57) Abstract: Hydrogen-producing fuel processing systems and related methods. The systems include a hydrogen-producing region configured to produce a mixed gas stream from a feedstock stream, a hydrogen-separation membrane module having at least one hydrogen-selective membrane and configured to separate the mixed gas stream into a product hydrogen stream and a byproduct stream, and an oxidant delivery system configured to deliver an oxidant-containing stream to the hydrogen-separation membrane module in situ to increase hydrogen permeance of the hydrogen-selective membrane. The methods include operating a hydrogen-producing fuel processing system in a hydrogen-producing regime, and subsequently operating the hydrogen-producing fuel processing system in a restoration regime, in which an oxidant-containing stream is delivered to the hydrogen-separation membrane module in situ to expose the at least one hydrogen-selective membrane to the oxidant-containing stream to increase the hydrogen permeance of the at least one

[Continued on next page]

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hydrogen- selective membrane.