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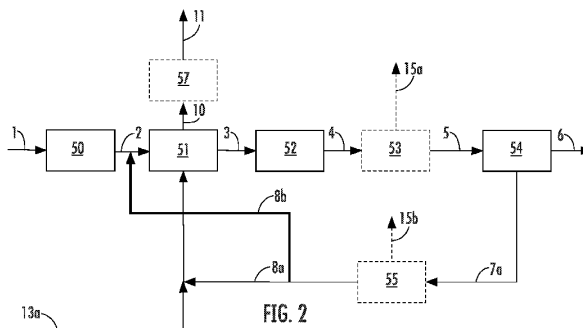
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(54) Title: STEAM METHANE REFORMING WITH PROCESS CARBON DIOXIDE CAPTURE AND AMMONIA FIRING



(57) Abstract: A method and apparatus for producing hydrogen in a steam methane reformer with reduced carbon emissions that can include the steps of: heating a feed stream comprising methane in a first heat exchanger to produce a heated feed stream, wherein the heated feed stream is at a temperature above 500°C; introducing the heated feed stream into a reaction zone under conditions effective for catalytic conversion of the heated feed stream to produce a reformed stream, wherein the reformed stream comprises hydrogen, carbon monoxide, and unreacted methane; introducing the reformed stream in the presence of steam to a shift conversion unit that is configured to produce a shifted gas stream comprising hydrogen and carbon dioxide; and purifying the shifted gas stream to produce a hydrogen product stream and a tail gas; wherein the conditions effective for catalytic conversion of the heated feed stream comprise providing heat to the reaction zone via combustion of a fuel and a hydrogen fuel stream in presence of an oxidizer, wherein the fuel

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comprises ammonia, wherein a flue gas is produced by the combustion of the fuel and the hydrogen fuel stream.