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(54) **Title:** A PROCESS AND REACTOR FOR CONVERTING CARBON DIOXIDE INTO CARBON MONOXIDE

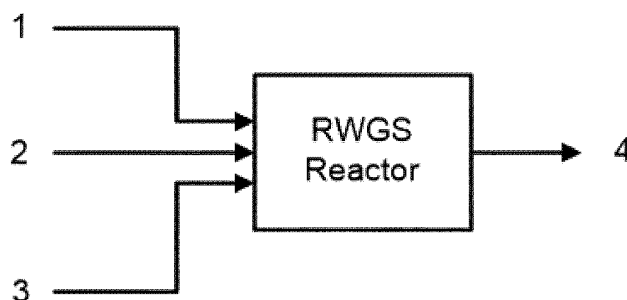


Figure 1

(57) **Abstract:** The present invention relates to a process for converting carbon dioxide and hydrogen into a product stream comprising carbon monoxide, water and hydrogen, the process comprising introducing carbon dioxide, hydrogen and oxygen into a reaction vessel, and performing a reverse water gas shift reaction at elevated temperature, wherein (a) no catalyst is present in the reaction vessel, and (b) at least a gas stream comprising carbon dioxide, a hydrogen rich gas stream and an oxygen rich gas stream are introduced into the reaction vessel in separate feed streams, wherein the hydrogen rich gas stream is introduced into the reaction vessel at a temperature between 15 and 450 °C, (c) the hydrogen rich gas stream and oxygen rich gas stream being introduced in close vicinity of each other, wherein at least the hydrogen rich gas stream and the oxygen rich gas stream are introduced into the reaction vessel via a burner comprising coaxial channels for the separate introduction of the different gas streams, the burner being located at the top of the reaction vessel, wherein the hydrogen and oxygen in the hydrogen rich gas stream and oxygen rich gas stream undergo a combustion reaction upon entering the reaction vessel, thereby providing the heating energy required for the reverse water-gas shift reaction; and (d) the temperature in the reaction vessel is maintained in the range of 1000 to 1500 °C by varying the molar ratio of hydrogen to oxygen, which are introduced into the reaction vessel in the hydrogen rich gas stream and oxygen rich gas stream, respectively.

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