



# United States Patent [19]

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Ennis et al.

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- [54] **METHOD AND APPARATUS FOR TOTAL ENERGY FUEL CONVERSION SYSTEMS**
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- [52] **U.S. Cl.** ..... **252/373**; 48/116; 60/39.02; 60/39.12; 60/200.1; 60/209; 60/227; 75/452; 75/508; 252/374; 423/439; 585/648; 585/682; 585/752
- [58] **Field of Search** ..... 252/373, 374, 252/188.1; 48/116; 585/752, 648, 682; 60/227, 209, 200.1, 39.02, 39.12; 423/439; 75/508, 452

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[57] **ABSTRACT**

Process of producing power comprising:

- providing a turbine adapted to generate shaft work, said turbine having a combustor; and a rocket engine having a nozzle and a compressor means;
- feeding fuel and oxidant to the rocket engine and the rocket engine compressor means;
- feeding carbonaceous matter and steam into the rocket engine nozzle;
- processing the output of the rocket engine nozzle into fuel for the turbine;
- introducing said fuel and oxidant for the turbine to the turbine combustor; and
- recycling a substantial portion of the hot exhaust from the turbine to the rocket engine compressor means; and
- controlling the inlet temperature to the turbine.

Apparatus for producing power comprising a rocket engine and a turbine adapted to generate shaft work is also disclosed.

An alternative process comprises

- providing a steam turbine adapted to generate shaft work; and a rocket engine having a nozzle and a rocket engine compressor means;
- feeding fuel and oxidant to the rocket engine;
- feeding carbonaceous matter and water, steam or water-steam mixture to the rocket engine nozzle;
- processing the output of the rocket engine nozzle into fuel for a boiler and a heat source for a second rocket engine;
- boiling water in said boiler to produce water vapor;
- using the resultant water vapor to power said steam turbine;
- transforming the output of the second rocket engine into a fuel product is also disclosed.