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- (71) Applicant: 17, INC. [US/US]; 261 Pamela Drive, Mountain View, California 94040 (US).
- (72) Inventor: EDWARDS, Garth Otway Ross; 261 Pamela Drive, Mountain View, California 94040 (US).
- (74) Agent: TYRRELL, Kathleen A.; LICATA & TYRRELL P.C., 66 E. Main Street, Marlton, New Jersey 08053 (US).
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(54) Title: REACTOR SYSTEMS FOR GAS SYNTHESIS

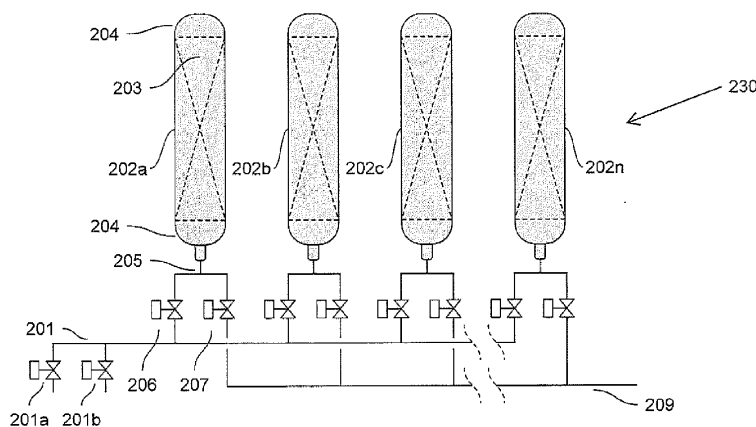


FIG. 2

(57) Abstract: Chemical reactor systems for gas synthesis with batch, pseudo-batch or dynamic reactor of one or more individual catalytic reactors for gas synthesis, one or more fluid control mechanisms of shared pipe and manifolds for delivery of reactants to and collection of reaction product from the chemical reactor system, and a control system capable of opening the one or more fluid control mechanisms to control entry of reactants to and exit of reaction products from the chemical reactor system are provided. Methods for use of these systems in gas synthesis, and in particular, ammonia synthesis, and to retrofit ammonia synthesis plants are also provided. The disclosed chemical reactor systems are particularly suitable for use in ammonia (NH₃) synthesis and enable the well established gas catalytic chemistry as used in most Haber-Bosch processes to be adapted to variable or intermittent renewable energy power sources.

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