A Novel Interconnect Scheme for Solid Oxide Fuel Cell (SOFC) Stacks

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BACKGROUND

Solid oxide fuel cells (SOFC's) are a rapidly maturing form of alternative (clean) energy that is seeing greater media and investment coverage in recent years, see Bloom Energy as a leading example. However, one challenge in building cost effective SOFC's is the high cost of integrating each cell into a stack and effectively routing the necessary air and fuel to each anode and cathode at each cell within the stack. Creating this necessary electrical interconnection and gas manifolding for fuel cell stacks generally creates a tremendous material cost and material weight burden, as well as rendering the completed fuel cell heavier and larger, if not optimally designed.

TECHNOLOGY DESCRIPTION

To address this design shortcoming, researchers at UC San Diego's Center for Energy Research have developed a new approach to interconnects between fuel cells; permitting flexibility in gas manifolds to optimally manage the supply of fuel and air; providing a lightweight structural scaffold to the SOFC; and serving as an efficient and low contact resistance bus for electrical connection of the overall SOFC stack. This novel approach cuts raw material costs for the standard SOFC by 25 to 50 percent, reduces overall SOFC weight by 5-fold, and reduces overall stack height by 50 percent for comparable power generation and provides other performance and design improvements. The benefits of these reductions and improvements will lend to more cost effective SOFC systems, as well as new possibilities in portable SOFC systems for mobile applications, disaster response, portable power, etc.

Presently the designs described here are fully modeled with a 12-V prototype system available with cost reimbursement.

INTELLECTUAL PROPERTY INFO

Detailed design specifications are available under NDA. All commercial licensing rights are presently available.

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OTHER INFORMATION

CATEGORIZED AS

- **Energy**
  - Other
  - Storage/Battery

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