

Constructing the cell casing having a tubular shape rather than the typical deep drawn can shape, allows access to the lower portion of the stack. There, additional leads are welded to the cell case, which significantly adds to the stability of the stack within the case. The lower portion of the case is then within the case. The lower portion of the case is then hermetically sealed by fitting and welding a disc in place.

5478662

**METHOD AND APPARATUS FOR
DISPOSING OF WATER AND/OR INERT
GAS FROM A FUEL CELL BLOCK**

Strasser Karl Erlangen, GERMANY assigned to Siemens Aktiengesellschaft

A method for cathode-side water and inert gas disposal and/or anode-side inert gas disposal from a fuel cell block having a number of fuel cells, includes increasingly concentrating a water and an inert gas component in a cathode-side gas mixture and an inert gas component in an anode-side gas mixture, in flow direction of the gas mixtures. The water and inert gas components are at least partially discharged from the fuel cell block. In an apparatus for performing the method, the fuel cells are subdivided into cell groups through which a flow of gas mixtures can be conducted in parallel. The cell groups include a cell group disposed last as seen in gas mixture flow direction. Lines connect the cell groups for conducting at least a fraction of the gas mixtures successively through the cell groups, and for discharging another fraction of the gas mixtures, being dependent on an electric current, from the fuel cell block after flowing through the last cell group.

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**EDGE SEALS FOR MOLTEN
CARBONATE FUEL CELL STACKS**

Cipollini Ned; Bregoli Lawrence; Maricle Donald L. Enfield, CT, UNITED STATES assigned to International Fuel Cells Corporation

The reactant manifolds and corners of a molten carbonate fuel cell stack are sealed with particulate lithium aluminate members which are sufficiently

porous so as to resist significant electrolyte migration therethrough. The seal members which are disposed in vertical planes of the stack are preferentially formed from lithium aluminate grains which are bonded together by a silica-free glass binder. The seal members which are disposed in horizontal planes in the stack are preferably formed from lithium aluminate grains which are bonded together by surface hydrolysis. Alumina-clad stainless steel labyrinth seal members are associated with each of the horizontal seal members to inhibit electrolyte migration from the cell electrolyte matrices to the vertical seal members.

5480735

**HIGH CURRENT ALKALINE FUEL CELL
ELECTRODES**

Landsman Douglas A; Plasse Paul A Hartford, CT, UNITED STATES assigned to International Fuel Cells Corporation

Electrodes for an alkaline fuel cell are disclosed. The electrodes include a porous substrate and a catalyst layer supported on the substrate. The catalyst layer includes catalyst particles for catalyzing the electrochemical reaction occurring at the electrode, a hydrophobic binder for providing a network of hydrophobic gas passages communicating with the catalyst particles and hydrophilic catalytically inactive particles for providing a network of liquid transport pathways through the catalyst layer. The liquid transport pathways improve liquid transport through the catalyst layer and electrodes of the present invention provide improved resistance to electrode flooding and electrolyte pumping.

5480736

**FUEL CELL GENERATION APPARATUS
AND A METHOD FOR STARTING THE
SAME**

Ujii Takashi; Ito Makoto Kawasaki, JAPAN assigned to Fuji Electric Co Ltd

A fuel cell generation apparatus including a plurality of fuel cells to be connected in parallel. Each of the fuel cells is connected in parallel with a serial circuit of a starting load and a switch. Each of the parallel circuit

thus formed is connected in series with one of second switches, and the serial circuits thus formed are parallelly connected to form the fuel cell generation apparatus which is connected to a load. The starting loads are closed at the start of the operation of the fuel cell generation apparatus to drop the output voltages of the fuel cells to a voltage lower than a minimum voltage in no-load open-circuit voltages of the fuel cells. The fuel cell generation apparatus is started by closing the first switches, and then closing the second switches, and finally opening the first switches. This facilitates implementing a large capacity fuel cell generation apparatus whose efficiency is improved by eliminating diodes for preventing reverse currents from flowing.

5480737

SOLID OXIDE ELECTROLYTE FUEL CELL

Satake Tokuki; Miyamoto Hitoshi; Watanabe Kiyoshi; Nanjo Fusayuki; Takenobu Koichi Kobe, JAPAN assigned to Mitsubishi Jukogyo Kabushiki Kaisha

A power generation layer includes three layers of a fuel electrode, a solid oxide electrolyte and an oxygen electrode. Both faces of the power generation layer are formed with a number of dimples that are shaped and arranged so as to satisfy $(\text{half dimple height})=3.2 \times (\text{dimple diameter}) - (\text{half dimple pitch}) + (\text{dimple diameter})$.

5480738

FUEL CELL MODULE

Elangovan Singaravelu; Khandkar Ashok C; Hartvigsen Joseph J Sandy, UT, UNITED STATES assigned to Ceramtec Inc

A fuel cell module with multiple fuel cell stacks having generally planar cross-flow grooved interconnectors with fuel and air flow channels therein arranged in multi-stack columns wherein adjacent stacks are joined by manifold frames, and pairs of columns are spaced-apart across a central air plenum in fluid communication with the air flow channels, and fuel flows serially through the stacks along the length of the column. In one embodiment, a series of such modules are configured into a multi-module system.

5480739

SOLID OXIDE FUEL CELLS AND PROCESS FOR THE PRODUCTION OF THE SAME

Kawasaki Shinji; Ito Shigenori Nagoya, JAPAN assigned to NGK Insulators Ltd

A solid oxide fuel cell including at least one kind of an electrically conductive film formed by spraying and having a permeability constant of nitrogen gas being not more than $9 \times 10^{-8} \text{cm}^4/\text{g}\cdot\text{sec}$. A process for producing a solid oxide fuel cell, including the steps of: forming a sprayed film on a substrate by spraying a material for the formation of an electrically conductive film, while a thickness of a sprayed film per one pass of a spraying gun is being suppressed to not more than 10μ , and then forming the electrically conductive film by thermally treating the sprayed film.

5482615

NOBLE METAL/ZN-A1203 REFORMING CATALYSTS WITH ENHANCED REFORMING PERFORMANCE (C-2714)

Meitzner George D; Migone Ruben A; Mykytko William J Pittstown, NJ, UNITED STATES assigned to Exxon Research and Engineering Company

Catalysts for reforming typically contain platinum supported on a high surface area alumina. During reforming reactions, specifically dehydrocyclization, such catalysts produce undesirable light gases. Applicants have found a new catalyst that suppresses undesirable hydrogenolysis reactions thereby decreasing the yields of undesirable light gas make during dehydrocyclization of C_6+ hydrocarbons, especially n-heptane. The catalyst comprises a halogen, and catalytically active amounts of nonalloyed noble metal and zinc on an alumina support wherein said noble metal is selected from the group consisting essentially of Pt, Pd, Ir, Os, Ru, Rh, Re, and mixtures thereof and in the absence of cobalt and nickel. As used herein, nonalloyed means that the metallic phase consists of a single metallic element. In the present invention, noble metal. The invention is further directed to the preparation and use of the catalyst in a reforming reaction.