End effector and robot workcell for automated assembly of fuel cells stacks using robotic technology

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Abstract:

Automated fuel cell assembly allows high quality, high performance production of fuel cells that serve as an alternative and a promising source of electrical energy in the modern world. End-effector and the fuel cell components are designed with features for accurate component alignment during the assembly process. Insufficient integration of the fuel cell design process is a major drawback in the procedure. The new invention overcomes this drawback and also provides an innovative, inexpensive end-effector capable of handling a variety of fuel cell components. These components include MEA’s, bipolar plates and gaskets, which perfectly align the fuel cells in the stack as a way to avoid overboard reactant gas leaks, thus possessing passive compliance. Other aspects of the invention include providing a method to align fuel cell components in the stack during the automated assembly process, providing passive compliance to the end-effector and providing the workcell for automated fuel cell assembly.

Applications:

* Fuel cell industry- automated assembly of fuel cells
* Automotive applications
* Battery applications



FIG illustrates the workcell for automated fuel assembly according to the present invention. 401-Fuel cell endplate, 402- bipolar plate, 403-gaskets, 404- MEA’s and 405-robot

Advantages:

Capable of handling a variety of fuel cell components and perfectly aligning them in fuel cell stacks with:

* Increased accuracy and repeatability
* Inexpensive and efficient automated assembly of fuel cells
* Avoiding overboard reactant leaks during fuel cell operation
* Integrated processes for manufacturing
* Increased stack quality

Patent Status:

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