



(22) Date de dépôt/Filing Date: 2004/10/28

(41) Mise à la disp. pub./Open to Public Insp.: 2005/05/06

(45) Date de délivrance/Issue Date: 2012/07/10

(62) Demande originale/Original Application: 2 486 216

(30) Priorité/Priority: 2003/11/06 (JP2003-376409)

(51) Cl.Int./Int.Cl. *H01M 8/24* (2006.01)

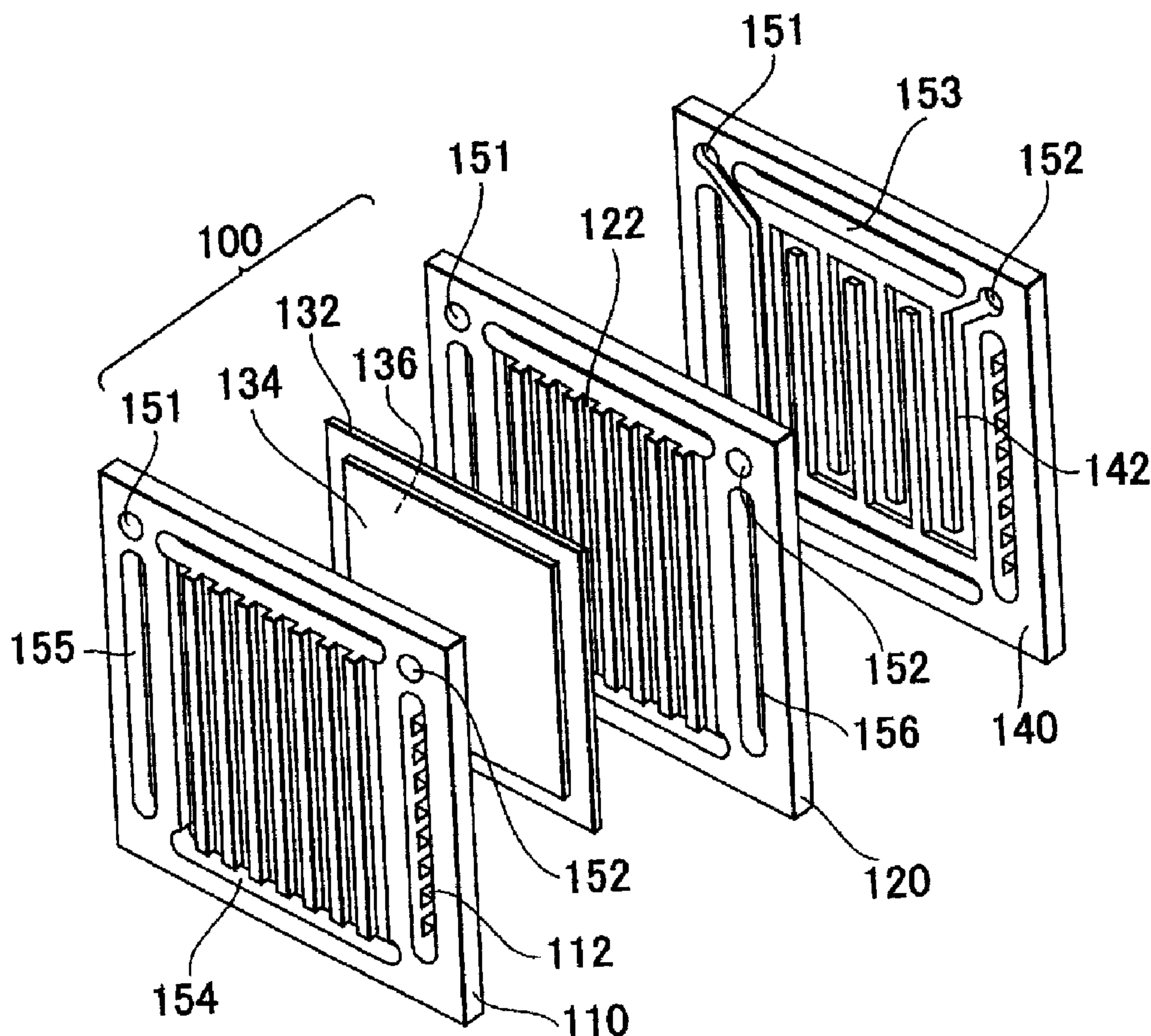
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(54) Titre : PILE A COMBUSTIBLE AVEC CATALYSEUR NON UNIFORME

(54) Title: FUEL CELL WITH NON-UNIFORM CATALYST



(57) Abrégé/Abstract:

A fuel cell having a stack structure is provided. The fuel cell includes plural unit cells each of which includes an anode and a cathode which are provided on both sides of a predetermined electrolyte membrane, and a catalytic layer which is provided in at

(57) **Abrégé(suite)/Abstract(continued):**

least one of the anode and the cathode, and which supports a catalyst for promoting an anode reaction or a cathode reaction, the plural unit cells being stacked to form a stack structure. In the fuel cell, the plural unit cells include a unit cell including a catalyst layer supporting a catalyst which is different from catalysts supported by catalyst layers of other unit cells in at least one of type, weight, and specific surface area.

ABSTRACT

A fuel cell having a stack structure is provided. The fuel cell includes plural unit cells each of which includes an anode and a cathode which are provided on both sides of a predetermined electrolyte membrane, and a catalytic layer which is provided in at least one of the anode and the cathode, and which supports a catalyst for promoting an anode reaction or a cathode reaction, the plural unit cells being stacked to form a stack structure. In the fuel cell, the plural unit cells include a unit cell including a catalyst layer supporting a catalyst which is different from catalysts supported by catalyst layers of other unit cells in at least one of type, weight, and specific surface area.

FUEL CELL WITH NON-UNIFORM CATALYST

This application is a divisional application of co-pending application 2,486,216, filed October 28, 2004.

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 [0001] The invention relates to a fuel cell having a stack structure.

2. Description of the Related Art

[0002] A fuel cell is proposed, which includes a hydrogen electrode and an oxygen electrode provided on both sides of an electrolyte membrane which a hydrogen ion
10 permeates, and a reaction represented by an equation described below is caused at each of the hydrogen electrode and the oxygen electrode, whereby electromotive force is generated.

[0003] Hydrogen electrode (anode): $\text{H}_2 \rightarrow 2\text{H}^+ + 2\text{e}^-$ (anode reaction)

[0004] Oxygen electrode (cathode): $(1/2) \text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2\text{O}$ (cathode reaction)

15 [0005] Various types of fuel cells are proposed according to the type of electrolyte membrane. For example, a solid oxide fuel cell, a molten carbonate fuel cell, a phosphoric acid fuel cell, and a polymer electrolyte fuel cell are proposed. Recently, attention has been given to the polymer electrolyte fuel cell, for the reasons that electric power density is high so that the size can be made small, and the operating temperature is
20 relatively low, and other reasons. Various improvements of the polymer electrolyte fuel cell are examined.

[0006] There is a fuel cell having a stack structure, which is formed by stacking plural unit cells through separators. Each of the unit cells has a gas diffusible anode and a gas diffusible cathode which are provided on both sides of an electrolyte membrane. In the
25 fuel cell having the stack structure (hereinafter, referred to as "fuel cell stack"), the temperature of unit cells positioned at both end portions in a direction in which the unit cells are stacked (hereinafter, referred to as "cell-stacked direction") tends to be lower than that of unit cells positioned at a center portion due to heat radiation. Therefore, in the unit cells at both end portions of the fuel cell stack, vapor pressure is reduced, and water
30 generated by the aforementioned reaction is likely to be accumulated.

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[0007] In the polymer electrolyte fuel cell, it is important to control water in each of the unit cells in order to ensure conductivity of the hydrogen ion in the electrolyte membrane, and to ensure gas diffusibility at a gas diffusion electrode formed by stacking a catalyst layer and a gas diffusion layer. For example, if the amount of water contained in

