UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD J. ASSARABOWSKI, SEAN P. BREEN, STEVEN A. LOZYNIAK, WILLIAM T. UNKERT, JOSEPH B. WYSOCKI, and MASAKI M. YOKOSE

Appeal No. 2005-1209
Application No. 10/078,086

ON BRIEF

Before CAROFF, WARREN and DELMENDO, Administrative Patent Judges.

CAROFF, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 4 and 7.

All of the other claims pending in appellants' application, i.e., claims 2-3 and 5-6, have been allowed by the examiner.

The appealed claims relate to a polymer electrolyte membrane (PEM) fuel cell power plant burner assembly, and a method for producing steam which is fed to a fuel reformer in the power plant.

The two independent claims 1 and 4 are reproduced below as illustrative of appellants' apparatus and method, respectively.

1. A polymer electrolyte membrane (PEM) fuel cell power plant burner assembly which burner assembly is operable to combust an anode exhaust gas emanating from a cell stack in the PEM fuel cell assemblage, said burner assembly comprising:

a) a catalytic burner;

b) an air/anode exhaust gas mixing station adjacent to and opening into said catalytic burner; and

c) at least one heat exchanger disposed in heat exchange relationship with said catalytic burner, said heat exchanger being operable to convert water contained in said heat exchanger to a two phase mixture of water and steam by using heat generated by said catalytic burner from a mixture of anode exhaust gas and air which is combusted in said catalytic burner.

4. A method for producing steam for use in a steam reformer in a polymer electrolyte membrane (PEM) fuel cell power plant, said method comprising:

a) the step of providing a catalytic burner which operates at temperatures as high as about 1,700°F (927°C);

b) the step of combusting a fuel cell anode exhaust gas stream in said catalytic burner;

c) the step of converting a stream of water to a mixture of water and steam with heat produced by combustion of said fuel cell anode exhaust gas stream; and

d) the step of feeding steam from said mixture to a catalytic fuel reformer in the fuel cell power plant.

The sole prior art reference relied upon by the examiner is:

Kaufmann US 2002/0012893 A1 Jan. 31, 2002

Claims 1, 4 and 7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kaufmann.

Based on the record before us, we agree with the appellants that the examiner has failed to make out a prima facie case for anticipation. Accordingly, we reverse the sole rejection at issue.

Regarding each of the claims on appeal, lack of anticipation is palpable.

Claim 1 calls for an "air/anode exhaust gas mixing station." We find nothing in Kaufmann capable of supplying air to be mixed with anode exhaust gas. Mixer 9 in Kaufmann serves to mix cathode exhaust gas with anode exhaust gas. As appellants correctly point out, cathode exhaust gas cannot be characterized as "air" by any stretch of the imagination. Air is a well known gaseous mixture consisting essentially of nitrogen and oxygen in particular proportions. As the examiner readily concedes, most of the oxygen in the air stream that enters the cathode is consumed in the fuel cell reaction and replaced with water vapor. Air from which most of the oxygen has been removed can no longer be characterized as "air."

Both claim 1 and claim 4 mandate that the recited burner assembly (claim 1) and associated method for producing steam

(claim 4) be designed to convert a stream of water to a two phase mixture of water and steam by using heat generated by the combustion of fuel cell anode exhaust gas in a catalytic burner.

We find no reference in Kaufmann regarding the conversion of a stream of water to a two phase mixture of water and steam. At most, Kaufmann (page 3, para. 46) suggests that heat generated by the combustion of anode exhaust gas in a catalytic burner can be used in a heat exchanger "for evaporating operating medium and/or water, and/or for reforming the operating medium." In no sense can this be taken as synonymous with the generation of a two phase mixture of water and steam in the heat exchanger. Evaporation of water does not necessarily imply that the water is converted to steam.

Further, as explained by appellants, neither the turbine 7 nor the fan 5 disclosed in Kaufmann contains water and, therefore, can not be said to have anything to do with converting water into a two phase mixture of water and steam.

Moreover, with regard to claim 4, we find nothing in Kaufmann to suggest feeding steam which has been so generated to a catalytic fuel reformer.

With regard to dependent claim 7, we also note that Kaufmann makes no reference to providing "a swirled mixture of air and

anode exhaust." Besides the fact that Kaufmann does not mix air with anode exhaust gas, as discussed above, Kaufmann makes no reference to a "swirled mixture." As noted in appellants' specification (p. 5, first full paragraph), swirling connotes a particular type of flow/mixing pattern. Kaufmann discloses nothing about the type of mixing conducted in the mixer 9. Accordingly, there is absolutely no support for the examiner's assertion that the admixing operation that takes place in mixer 9 inherently involves a swirling action.

For all of the foregoing reasons, the decision of the examiner is reversed.

REVERSED

MARC L. CAROFF Administrative Patent Judge	)	
CHARLES F. WARREN Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ROMULO H. DELMENDO Administrative Patent Judge	)	

MLC/hh

WILLIAM W. JONES
6 JUNIPER LANE
MADISON, CT 06443