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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/839,566	08/16/2007	Shazad Mahmood Butt	81156141	8756

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EXAMINER	
SCULLY, STEVEN M	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
08/31/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/839,566	BUTT ET AL.	
	Examiner	Art Unit	
	Steven Scully	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-11 and 21-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-11 and 21-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

APPARATUS FOR CONDITIONING TEMPERATURE OF A FLUID STREAM

Examiner: Scully S.N.: 11/839,566 Art Unit: 1795 August 26, 2009

DETAILED ACTION

1. The Amendment filed May 6, 2009 has been entered. Claims 1 and 8-11 have been amended, claims 7 and 12-20 canceled, and claims 21-30 are newly added. Accordingly, claims 1-6, 8-11 and 21-30 are pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The title has been amended and found to be descriptive.

Claim Rejections - 35 USC § 103

4. Claims 1-6, 9-11 and 21-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan (US 2006/0263652) in view of Matsuoka (WO 2004/055928) (see corresponding US 2006/0115699 for translation).

Regarding claims 1, 8, 22 and 27, Logan discloses a fuel cell system with a relative humidity control. The fuel cell system comprises a fuel cell stack (22) with an outlet for coolant (50). The coolant outlet temperature is higher than the coolant inlet temperature because the coolant absorbs the heat within the fuel cell stack. See

paragraphs 100 and 101 and tables 2, 3 and 4. The coolant supply subsystem is utilized in the fuel cell based upon the cathode gas inlet target temperature settings. See figure 4. Furthermore, Logan discloses coolant supply subsystem (30) (conditioning device) disposed within a fuel cell comprising a strategy or mechanizations for a fuel cell system comprising a heat exchanger that can be utilized in both the cathode and coolant inlet plumbing to allow the cathode gas and coolant to achieve a substantially same temperature prior to entering their respective flow paths in the fuel cell stack. See paragraph 108. Logan does not disclose a system module that humidifies the fluid stream to a predetermined temperature per se.

Matsuoka discloses a fuel cell system comprising a method for humidifying (conditioning) the temperature of the anode and cathode gas that is introduced into the fuel cell stack. See figure 1 and paragraphs 26 and 27. A system comprising a controller (7) that controls the state of humidification of the humidifiers (4, 5) based on the temperature (predetermined temperature) of the fuel cell (1, 50), that humidify the hydrogen and oxidant introduced to the fuel cell. See paragraphs 29 and 26. The fuel cell stack (50) comprises an inlet adapted to receive the hydrogen gas (fluid stream) that has been humidified to a temperature by the humidifier, which is different than the temperature of the fuel cell. See figure 3. Therefore, it would have been obvious to one having ordinary skill in the art to utilize the humidifying system with the fuel cell system of Logan because Matsuoka discloses the controlling of the state of humidification of the gas inlet introduced into the fuel cell. See paragraph 29 and figure 1.

Further, Logan discloses a coolant supply subsystem (30) (conditioning device) disposed within a fuel cell system (20). See figure 1. The coolant supply subsystem (30) is disposed within a housing comprising first and second ends as disclosed by the dotted line in figure 1. The dotted housing comprises a supply pipe (48) and exit pipe (50) for the coolant to be introduced to the fuel cell stack. See figure 1. Further, Logan discloses a heat exchanger can be utilized in both the cathode and coolant inlet plumbing to allow the cathode gas and coolant to achieve substantially the same temperature prior to entering their respective flow paths in the fuel cell stack. Additional sensors may be employed throughout the fuel cell system, as needed, to monitor the necessary operating parameters. See [0108]. Thus, Logan discloses a heat exchanger between the cathode inlet fuel and the coolant upstream from the fuel cell stack inlet. Heat exchangers are well known in the art, and generally have a separation (such as a conduit, coiled piping, a plate system, etc.) between a hot and a cold fluid with a housing for the heat exchanger.

Regarding claims 2 and 3, Logan discloses a schematic diagram disclosing a controller (32) and a determining of the temperature (temperature sensor) of the cathode inlet gas. The determination of the cathode gas inlet temperature generates a signal that is delivered to the controller. The coolant required to achieve the target cathode inlet gas temperature is determined (amount of coolant). See figure 4 and table 2.

Regarding claims 4, 5 and 6, Logan discloses sensors (62) communicate with the controller (32) to enable controller (32) to control and coordinate the operation of

coolant supply subsystem (30) to obtain a desired temperature for the coolant flowing into and out of the coolant flow path. Controller (32) communicates with pump (52) and bypass valve (60) to control the speed of pump (52) and the position of bypass valve (60). By adjusting the speed of pump (52) and the position of bypass valve (60), the inlet and outlet temperatures for the coolant flowing through the coolant flow path of fuel cell stack (22) can be controlled. See paragraph 27.

Regarding claims 9-11, 23-25 and 28-30, Logan discloses a fuel cell system comprising a coolant supply subsystem (conditioning system) comprising sensors (47 and 62), temperature and humidity sensors, that measure the humidity and temperature of the cathode gas before the gas is introduced to the fuel cell system and the humidity and temperature of the coolant after it has exited the fuel cell system respectively. See figure 1. Further, Logan discloses additional sensors may be employed throughout the fuel cell system, as needed, to monitor the necessary operating parameters. See [0108]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to couple the humidity sensor and temperature sensor to a pipe with exposure to the gas that is introduced and/or exited from the fuel cell, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

With respect to claims 21 and 26, Logan discloses the cathode reactant can be, for example, ambient air. See [0022].

Response to Arguments

5. Applicant's arguments filed May 6, 2009 have been fully considered but they are not persuasive. Applicant argues:

a) The proposed combination of Logan and Matsuoka fails to teach, suggest or disclose in claim 1, "the conditioning device comprising: an outer shell having first and second ends and the outer shell defining a cavity therein for receiving the coolant; and at least one pipe extending through the cavity and between the ends to enclose and to deliver the fluid stream to the fuel cell stack."

The Examiner respectfully disagrees. In particular, Logan discloses a heat exchanger can be utilized in both the cathode and coolant inlet plumbing to allow the cathode gas and coolant to achieve substantially the same temperature prior to entering their respective flow paths in the fuel cell stack. Additional sensors may be employed throughout the fuel cell system, as needed, to monitor the necessary operating parameters. See [0108]. Thus, Logan discloses a heat exchanger between the cathode inlet fuel and the coolant upstream from the fuel cell stack inlet. Heat exchangers are well known in the art, and generally have a separation (such as a conduit, coiled piping, a plate system, etc.) between a hot and a cold fluid with a housing for the heat exchanger. Therefore, it is the position of the examiner that Logan discloses a heat exchanger which would necessarily have some form of an outer shell having first and second ends with a cavity therein for the coolant and at least one flow path, i.e. some form of a piping, extending through the cavity in heat exchanging

proximity to the coolant, where the fuel fluid stream would thereby be capable of exchanging heat with the coolant stream.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795