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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/839,566

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EXAMINER

SCULLY, STEVEN M

ART UNIT

PAPER NUMBER

1727

MAIL DATE

DELIVERY MODE

06/05/2014

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. 11/839,566	Applicant(s) BUTT ET AL.	
	Examiner STEVEN SCULLY	Art Unit 1727	AIA (First Inventor to File) Status No

-- 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 MONTHS 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 2/4/2014.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ 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*

- 5) ☒ Claim(s) 1,22,27 and 31-47 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1,22,27 and 31-47 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ 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).

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).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
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) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 3) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____. | 4) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. The Amendment filed February 4, 2014 has been entered. Claims 1 and 27 have been amended. Claims 2-21, 23-26 and 28-30 are previously canceled. Accordingly, claims 1, 22, 27 and 31-47 are pending examination 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.
3. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 103

4. Claim rejections of claims 1, 22, 27, 31-35, 38-44 and 47 under 35 U.S.C. 103(a) as being unpatentable over Hatoh et al. (US2006/0251943) in view of Valensa et al. (US2008/0020247) are withdrawn because Applicant's arguments were found persuasive.
5. Claim rejections of claims 36, 37, 45 and 46 under 35 U.S.C. 103(a) as being unpatentable over Hatoh et al. (US2006/0251943) in view of Valensa et al. (US2008/0020247) and Nelson et al. (US2002/0177017) are withdrawn because Applicant's arguments were found persuasive.

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6. Claims 1, 22, 27, 31-35, 38-44 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatoh et al. (US2006/0251943) in view of Valensa et al. (US2008/0020247) and Insalaco et al. (US6,082,447).

With respect to claims 1, 22, 27, 31, 40 and 47, Hatoh et al. disclose a system for conditioning the temperature of at least one fluid stream that is passed through a fuel cell stack, the system comprising an anode stream, cathode stream and coolant stream, as claimed. The system further comprises a conditioning devices 117, 118 operable to receive the anode inlet stream and coolant outlet stream, and the cathode inlet stream and coolant outlet stream.

Hatoh et al. do not explicitly disclose the conditioning device as claimed. Valensa et al. disclose a compact oxidant preheater for a fuel cell system comprising inlet ports 14, 25 and outlet ports 24, 26, where a first pipe extends through the cavity of an outer shell, as claimed. See Figure 3. This design achieves highly effective heat exchange. See [0008]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a pipe design as taught by Valensa et al. in the system of Hatoh et al. for highly effective heat exchange.

Hatoh et al. in view of Valensa et al. do not disclose the heat exchangers formed having an outer shell surrounding two pipes as claimed. Insalaco et al. disclose a heat exchanger member for having baffles to create two or more isolated fluid circuits within a single heat exchanger unit. The ability to provide multiple fluid circuits with a single heat exchanger is particularly desirable where efficient use of space is important, such as in a car. See column 1, lines 48-53. It would have been obvious to one of ordinary

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skill in the art at the time of the invention to use a compact design having multiple fluid circuits within a single heat exchanger, i.e. multiple fluids passing through an outer shell having a common heat exchange fluid therein, as taught by Insalaco et al. because it allows for efficient use of space such as in electric cars, as Hatoh et al. disclose their fuel cell to be designed for ([0001]).

With respect to claims 32, 34, 41 and 43, Hatoh et al. discloses temperature sensors at the inlets and outlets of the cooling water system in the fuel cell for controlling the fuel gas supply apparatus 102, the oxidizing gas supply apparatus 103, and the cooling water circulating pump 109. See [0125-0126]. Hatoh et al. do not explicitly disclose monitoring the fuel gas and oxidant temperatures. However, it would have been obvious to one of ordinary skill in the art to include temperatures sensors such as those taught by Hatoh et al. in the various stages of each stream in the system in order to monitor the entire system for more accurate controllability. Moreover, it is the position of the Examiner that the location of the temperature sensor would be an obvious design choice, as long as the sensor was capable of monitoring the intended fluids accurately.

With respect to claims 33, 35, 42 and 44, Hatoh et al. discloses outputting detected values of the temperature sensors to the control unit 108 to control the cooling water circulating pump 109. See [0125-0126].

With respect to claims 38 and 39, Hatoh et al. in view of Valenca et al. disclose the conditioning device is positioned exterior to the fuel cell stack. See Figure 3 of Valenca. However, regarding the conditioning device “interior” to the fuel cell stack of

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claim 39, the court has held it would have been obvious to one of ordinary skill in the art at the time of the invention to use a one piece construction because it would be merely a matter of obvious engineering choice. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

7. Claims 36, 37, 45 and 46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hatoh et al. (US2006/0251943) in view of Valensa et al. (US2008/0020247) and Insalaco et al. (US6,082,447) as applied to claims 1, 22, 27, 31-35, 38-44 and 47 above, and further in view of Nelson et al. (US2002/0177017).

With respect to claims 36, 37, 45 and 46, Hatoh et al. disclose that the humidity is a critical component that should be controlled. See [0004]. However, Hatoh et al. do not explicitly disclose a humidity sensor. Nelson et al. disclose a fuel cell comprising a sensor system for sensing the relative humidity level of gas streams in a fuel cell. See abstract. This allows that the humidity level be accurately determined and controlled. See [0006]. It would have been obvious to one of ordinary skill in the art at the time of the invention to include humidity sensors in the anode and cathode fuel inlet stream of Hatoh et al. in view of Valensa et al. as taught by Nelson et al. in order to accurately determine and control the humidity level. Moreover, it is the position of the Examiner that the location of the temperature sensor would be an obvious design choice, as long as the sensor was capable of monitoring the intended fluids accurately.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 22, 27 and 31-47 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection. In particular, Applicant's arguments were regarding the rejection over *In re Larson*, obviousness to make integral, which has been withdrawn because Applicant's arguments were found persuasive. However, Insalaco et al. specifically teach to combine multiple isolated fluid circuits in a single heat exchanger unit in order to make efficient use of space. Thus, the integration of multiple fluid paths into a single heat exchanger is an obvious design choice dependent on the intended characteristics of the system (limited space versus maximized operating efficiency, etc.).

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.

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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 1727

/BARBARA GILLIAM/

Supervisory Patent Examiner, Art Unit 1727