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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	05/07/2019	10281183	PA7TP0069WOAUS	2198

49458 7590 04/17/2019
DON W. BULSON (PARK)
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 EUCLID AVENUE / 19TH FLOOR
CLEVELAND, OH 44115

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 280 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

PARKER-HANNIFIN CORPORATION, Cleveland, OH;
Christian D. Parker, Washington, MO;
Timothy A. Plassmeyer, Union, MO;
James D. Ruether, Union, MO;
Jason T. Dunn, Minneapolis, MN;
Shawn D. Ellis, Golden Valley, MN;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IR103 (Rev. 10/09)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

49458 7590 01/04/2019
DON W. BULSON (PARK)
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 EUCLID AVENUE / 19TH FLOOR
CLEVELAND, OH 44115

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7TP0069WOAUS	2198

TITLE OF INVENTION: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	04/04/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
MA, KUN KAI	3763	062-127000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Renner, Otto, Boisselle
& Sklar, LLP

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Parker-Hannifin Corporation

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Cleveland, OH

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 180988

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Lawrence S. Drasner/

Date March 19, 2019

Typed or printed name Lawrence S. Drasner

Registration No. 38127

Electronic Patent Application Fee Transmittal				
Application Number:		14913834		
Filing Date:		23-Feb-2016		
Title of Invention:		HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT		
First Named Inventor/Applicant Name:		Christian D. Parker		
Filer:		Lawrence Scott Drasner/Noreen Leciejewski		
Attorney Docket Number:		PA7TP0069WOAUS		
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1000

Electronic Acknowledgement Receipt	
EFS ID:	35465621
Application Number:	14913834
International Application Number:	
Confirmation Number:	2198
Title of Invention:	HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
First Named Inventor/Applicant Name:	Christian D. Parker
Customer Number:	49458
Filer:	Lawrence Scott Drasner
Filer Authorized By:	
Attorney Docket Number:	PA7TP0069WOAUS
Receipt Date:	19-MAR-2019
Filing Date:	23-FEB-2016
Time Stamp:	14:42:48
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1000
RAM confirmation Number	032019INTEFSW14433800
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2019-03-19_A7T-069_Issue-Fee.pdf	195509	no	1
			bb03cef036c1481efb0f9e565eb38d43745156df		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30621	no	2
			b5d70679bb305614ce48a865b61b28528954a2f6		
Warnings:					
Information:					
Total Files Size (in bytes):			226130		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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14/913,834	02/23/2016	Christian D. Parker	PA7TP0069WOAUS	2198
49458 7590 02/13/2019 DON W. BULSON (PARK) RENNER, OTTO, BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE / 19TH FLOOR CLEVELAND, OH 44115			EXAMINER MA, KUN KAI	
			ART UNIT 3763	PAPER NUMBER
			NOTIFICATION DATE 02/13/2019	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

Corrected Notice of Allowability	Application No. 14/913,834	Applicant(s) Parker et al.	
	Examiner KUN KAI MA	Art Unit 3763	AIA Status Yes

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RUSH dated on 02/07/2019.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ 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.

3. ☒ The allowed claim(s) is/are See Continuation Sheet. As a result of the allowed claim(s), 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**.

4. ☒ 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)).
 * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.	5. ☐ Examiner's Amendment/Comment 6. ☐ Examiner's Statement of Reasons for Allowance 7. ☒ Other <u>RUSH</u> .
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/KUN KAI MA/ Primary Examiner, Art Unit 3763	
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Continuation of 3. The allowed claim(s) is/are: 1,3,5-7,9-17 and 19-20

Form PTO/SB/08a (Modified) INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	Attorney Docket No.	Application No.
	P212P0069WOAUS	HEREWITH
	First Named Inventor: Christian Parker	
	Filing Date February 23, 2016	Art Unit Not Yet Assigned

U.S. PATENT DOCUMENTS

Examiner Initials	Document Number	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Comments
	2006/0090484 A1	May 2006	Bell et al.	
	~~2008/006474 A1~~ 2006/0066474	March 2008	Porter et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Country Code	Foreign Patent Document	Publication Date (MM-DD-YYYY)	Translation		Comments
				Yes	Machine	
	DE	20 2008 000 837	June 2008	X		
	EP	2 309 212 A1	April 2011			

NON PATENT LITERATURE AND OTHER DOCUMENTS

Examiner Initials	Author, Title, Date, Pertinent Pages, etc.
	International Search report and Written Opinion for corresponding International Application No. PCT/US2015/011900, dated April 24, 2015.

EXAMINER SIGNATURE	/KUN KAI MA/	DATE CONSIDERED	12/05/2017
--------------------	--------------	-----------------	------------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Information Disclosure Statement Form PTO/SB/08a (Modified)

The identification of any reference is not intended to be, and should not be understood as being, an admission that such publication, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given reference may have a later effective date than first seems apparent or the reference may have an effective date which can be antedated. The "prior art" status of any reference is a matter to be resolved during prosecution.

Form PTO/SB/08a (Modified) INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	Attorney Docket No.	Application No.
	P212P0069WOAUS	HEREWITH
	First Named Inventor: Christian Parker	
	Filing Date February 23, 2016	Art Unit Not Yet Assigned

U.S. PATENT DOCUMENTS

Examiner Initials	Document Number	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Comments
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	~~2006/006474 A1~~ 2008/0066474	March 2008	Porter et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Country Code	Foreign Patent Document	Publication Date (MM-DD-YYYY)	Translation		Comments
				Yes	Machine	
	DE	20 2008 000 837	June 2008	X		
	EP	2 309 212 A1	April 2011			

NON PATENT LITERATURE AND OTHER DOCUMENTS

Examiner Initials	Author, Title, Date, Pertinent Pages, etc.
	International Search report and Written Opinion for corresponding International Application No. PCT/US2015/011900, dated April 24, 2015.

EXAMINER SIGNATURE	/KUN KAI MA/	DATE CONSIDERED	02/08/2019
--------------------	--------------	-----------------	------------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

49458 7590 01/04/2019
DON W. BULSON (PARK)
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 EUCLID AVENUE / 19TH FLOOR
CLEVELAND, OH 44115

EXAMINER

MA, KUN KAI

ART UNIT

PAPER NUMBER

3763

DATE MAILED: 01/04/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7TP0069WOAUS	2198

TITLE OF INVENTION: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	04/04/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

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Commissioner for Patents
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(Typed or printed name)
(Signature)
(Date)

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EXAMINER	ART UNIT	CLASS-SUBCLASS
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1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

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Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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49458	7590	01/04/2019	EXAMINER	
DON W. BULSON (PARK)			MA, KUN KAI	
RENNER, OTTO, BOISSELLE & SKLAR, LLP			ART UNIT	
1621 EUCLID AVENUE / 19TH FLOOR			PAPER NUMBER	
CLEVELAND, OH 44115			3763	

DATE MAILED: 01/04/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/913,834	Applicant(s) Parker et al.	
	Examiner KUN KAI MA	Art Unit 3763	AIA Status Yes

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to after final amendment filed 11/01/2018.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2. ☐ 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.

3. ☒ The allowed claim(s) is/are See Continuation Sheet. As a result of the allowed claim(s), 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**.

4. ☒ 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)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892) 2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.	5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☒ Other <u>A. NE and PTO-2323</u> .
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/KUN KAI MA/ Primary Examiner, Art Unit 3763	
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Continuation of 3. The allowed claim(s) is/are: 1,3,5-7,9-17 and 19-20

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or teach a sensor system and a temperature sensor clamp as recited in current independent claims 1 and 15.

Applicant's arguments on the remarks filed 11/01/2018 are persuasive.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KUN KAI MA whose telephone number is (571)270-3530. The examiner can normally be reached on Monday-Friday 9am-6pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jianying Atkisson can be reached on 571-270-7740. 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.

/KUN KAI MA/
Primary Examiner, Art Unit 3763

<i>Notice of References Cited</i>	Application/Control No. 14/913,834		Applicant(s)/Patent Under Reexamination Parker et al.	
	Examiner KUN KAI MA		Art Unit 3763	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-4114448-A	09-1978	Merritt; Joseph E.	G01D3/02	374/112
*	B	US-9958190-B2	05-2018	West; Michael Kenneth	F25B49/02	1/1
*	C	US-20030182950-A1	10-2003	Mei, Viung C.	F25B49/005	62/129
*	D	US-20130297225-A1	11-2013	Jeffers; Edward	G05B19/042	702/22
*	E	US-20170100985-A1	04-2017	JOHNSON; KARL	B60H1/00978	1/1
*	F	US-20180128529-A1	05-2018	CHEN; JIE	F25B45/00	1/1
*	G	US-20020040280-A1	04-2002	Morgan, Stephen A.	B60H1/00585	702/114
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20181214

<i>Search Notes</i> 	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination Parker et al.
	Examiner KUN KAI MA	Art Unit 3763

CPC - Searched*		
Symbol	Date	Examiner
f25b 49/00, 2700/19, 2700/21	12/5/2017	KM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

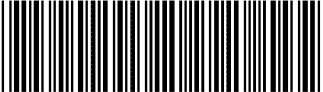
US Classification - Searched*			
Class	Subclass	Date	Examiner
62	129	12/5/2017	KM
81, 269	text search in class 81 and 269	12/5/2017	KM

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor search in PALM	11/28/2017	KM
EAST search (see attached)	12/5/2017	KM
Updated EAST search (see attached)	5/21/2018	KM
Updated EAST search (see attached)	8/31/2018	KM
Updated EAST search (see attached)	12/14/2018	KM

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
f25b	49/00, 2700/19, 2700/21	12/14/2018	KM

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Issue Classification 	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination Parker et al.
	Examiner KUN KAI MA	Art Unit 3763

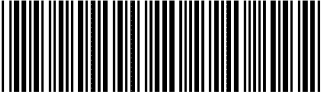
CPC						
Symbol					Type	Version
F25B		49		00	F	2013-01-01
F25B		2700		19	A	2013-01-01
F25B		2700		21	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Version

NONE (Assistant Examiner)		Total Claims Allowed: 16	
/KUN KAI MA/ Primary Examiner, Art Unit 3763 (Primary Examiner)		14 December 2018 (Date)	O.G. Print Claim(s) 1
			O.G. Print Figure 5

U.S. Patent and Trademark Office

Part of Paper No.: 20181214

Issue Classification 	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination Parker et al.
	Examiner KUN KAI MA	Art Unit 3763

INTERNATIONAL CLASSIFICATION			
CLAIMED			
F25B49/00		49	00

NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	16	
/KUN KAI MA/ Primary Examiner, Art Unit 3763 (Primary Examiner)	14 December 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

U.S. Patent and Trademark Office

Part of Paper No.: 20181214

Issue Classification 	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination Parker et al.
	Examiner KUN KAI MA	Art Unit 3763

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 16	
/KUN KAI MA/ Primary Examiner, Art Unit 3763 (Primary Examiner) _____ (Date) 14 December 2018		O.G. Print Claim(s) 1	O.G. Print Figure 5

AFCP 2.0 Decision

Application No.

14/913,834

Applicant(s)

Parker et al.

Examiner

KUN KAI MA

Art Unit

3763

AIA Status

Yes

This is in response to the After Final Consideration Pilot request filed 01 November 2018.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

- ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.
- ☐ A non-broadening amendment to at least one independent claim was not submitted.
- ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.
- ☐ Other: _____

2. **Proper Request**

- A. After final amendment submitted with the request will not be treated under AFCP 2.0.

The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

- ☐ The after final amendment will be treated under pre-pilot procedure.

- B. Updated search and/or completed additional consideration.

The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

- ☒ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.
- ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.
- ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.
- ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.
- ☐ 5. Other: _____

Examiner Note: Please attach an interview summary when necessary as described above.

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S108	1528	f25b49/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/12/13 09:53
S109	647	f25b2700/21.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/12/13 10:19
S110	766	f25b2700/19.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/12/13 13:58
S111	2030	62/129.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/12/13 18:14
S115	24	("20070205296" "20080163629" "20050005759" "20050098932" "6799756" "9810250" "D350892" "20130245965" "20080006474" "20150241316" "5317903" "6056282" "6334320" "7234313" "7685882" "20090024268" "6708587" "8746971" "9448140" "20060090484" "8991254" "20080066474" "2561864" "20100162822").PN.	US-PGPUB; USPAT	OR	ON	2018/12/14 18:24

12/ 14/ 2018 6:40:36 PM

C:\Users\kma1\Documents\EAST\Workspaces\14913834.wsp

EAST Search History**EAST Search History (Interference)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S112	193	f25b49/00.cpc.	USPAT	OR	ON	2018/12/14 09:40
S113	45	f25b2700/21.cpc.	USPAT	OR	ON	2018/12/14 11:16
S114	72	f25b2700/19.cpc.	USPAT	OR	ON	2018/12/14 13:34

12/ 14/ 2018 6:40:50 PM**C:\ Users\ kma1\ Documents\ EAST\ Workspaces\ 14913834.wsp**

OK TO ENTER: /K.M/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Applicant(s): Christian D. Parker et al.
Serial No: 14/913,834
Filing Date: February 23, 2016
Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
Examiner: Kun Kai Ma
Art Unit: 3744
Docket No. PA7TP0069WOAUS

REPLY TO FINAL OFFICE ACTION DATED SEPTEMBER 6, 2018

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following part(s) of this reply:

Amendments to the Claims

Remarks

In the event any fee or additional fee is due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (under the above Docket Number). In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988 (under the above Docket Number).

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0		
Practitioner Docket No.: PA7TP0069WOAUS	Application No.: 14/913,834	Filing Date: February 23, 2016
First Named Inventor: Christian D. Parker	Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT	
APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116. 1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (<i>e.g.</i>, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c). 2. The above-identified application contains an outstanding final rejection. 3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect. 4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection. 5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response. 6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web). 7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.] 8. By filing this certification and request, applicant acknowledges the following: • Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0. • The examiner will verify that the AFCP 2.0 submission is compliant, <i>i.e.</i>, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions: ○ The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, by mailing an advisory action. ○ If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview. ▪ The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate. ▪ If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.		
Signature /Lawrence S. Drasner/	Date November 1, 2018	
Name (Print/Typed) Lawrence S. Drasner	Practitioner Registration No. 38127	
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.		
☒ * Total of <u>1</u> forms are submitted.		

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings. Minor clarifying amendments are made to independent claim 1 based on comments of the Examiner. A request is hereby submitted under AFCP 2.0 for entry and consideration of the claim amendments as not raising substantial new issues of patentability.

I. Claim Objection

The Examiner objects to independent claim 1 for a minor format issue, which is corrected.

II. Indefiniteness Rejection

The Examiner rejects claims as being indefinite as to the nature of the lack of physical connections as recited in independent claim 1. The Examiner has interpreted independent claim 1 to mean a lack of “external” physical connections among the plurality of sensors and the portable electronic device. Independent claim 1 has been amended in accordance with the Examiner’s understanding, and thus no new issues of patentability are raised. The indefiniteness rejection, therefore, should be withdrawn.

III. Prior Art Rejections

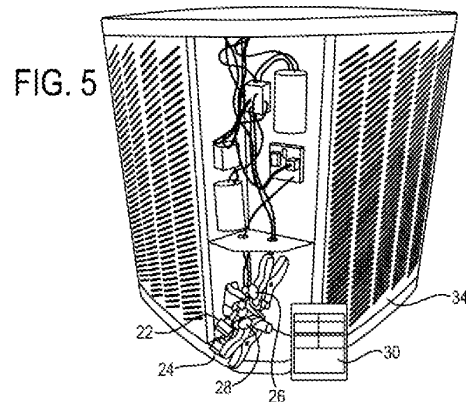
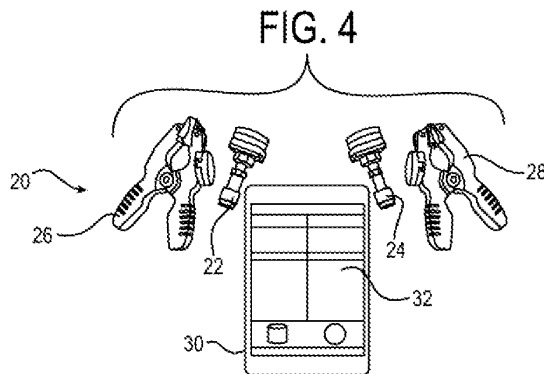
A. Lack of External Physical Connections

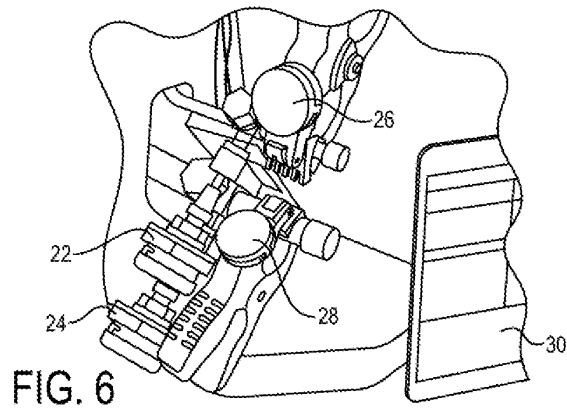
In response to previous Office Actions and based on an early telephone interview, the Examiner accepted an amendment to independent claim 1 that “there are no [external now added] physical connections among the plurality of sensors and the portable electronic device [the reading device].” Comparable features are recited in independent claim 15 as to the temperature sensor clamp. Applicant’s previous arguments over the combination of Alfano and Kane have been found persuasive (Final Office Action at page 12), and thus the previous rejections have been withdrawn. In the current Final Office Action, the Examiner cites to a new reference as teaching the lack of external physical connections: Porter et. al., US 2008/0066474 (Porter). Previously

cited Alfano and Kane remain cited, but as to more of the detailed or secondary features.

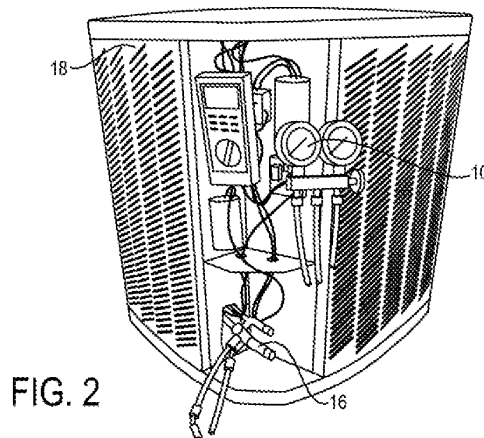
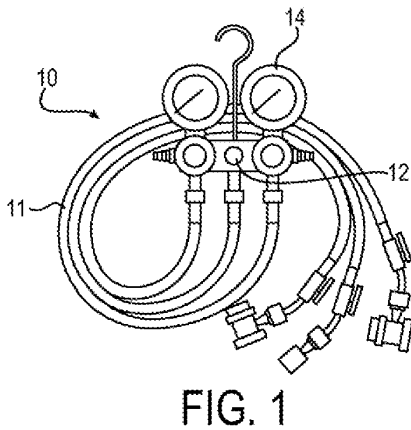
The Examiner broadly cites to Figs. 1 and 4 of Porter as allegedly teaching the claimed lack of external physical connections. Porter Fig. 1 is a system depiction in particular, with Porter Fig. 4 showing one of the sensor modules in isolation, and a wireless connection is illustrated relative to the purported measuring device 150. Applicant disputes this manner of applying Porter based on the figures, as such figures largely are generalized block diagrams and thus do not illustrate the actual nature of the connections and related structures.

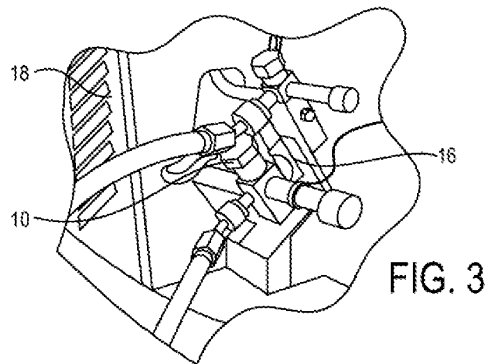
In the current application, the depiction and description of the lack of external physical connections among the plurality of sensors and the portable electronic device is clearly and explicitly set forth.



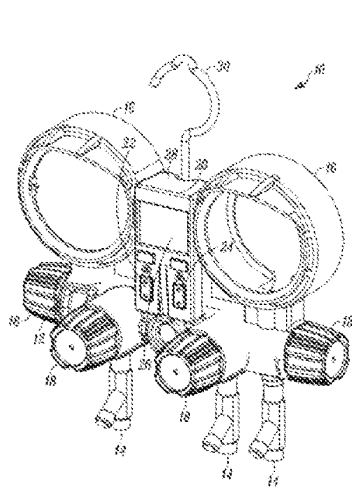


Application Figs. 4-6, reproduced above, and the related description provide physical and structural representations of the sensors and reading device that demonstrate the lack of external physical connections. Such configuration is contrasted against conventional systems as illustrated in application Figs. 1-3, reproduced below, which show the use of various external physical connections (hose, wires, gauges) that have been employed in conventional configurations.





As described in the current application and discussed during the first telephone interview, the absence of external physical electrical or fluid connections among the sensors 22, 24, 26, and 28 and the reading device 30 in Applicant's system (Figs. 4-6 above) results in a system that is more portable and otherwise permits full freedom of movement of the operator as compared to conventional configurations (Figs. 1-3 above), as there are no restrictive tethers (neither electrical nor fluidic) among the components. Previously cited Alfano and Kane essentially exemplify the conventional configuration with numerous physical connections. Alfano Figs. 1 and 3 and Kane Fig. 3 are reproduced below as representative, which bear similarity to the conventional configuration depicted in application Figs. 1-3.



ALFANO

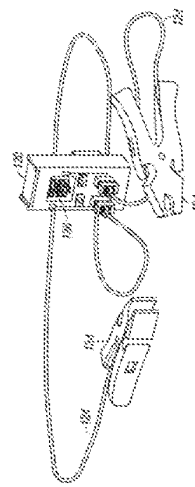


FIG. 3

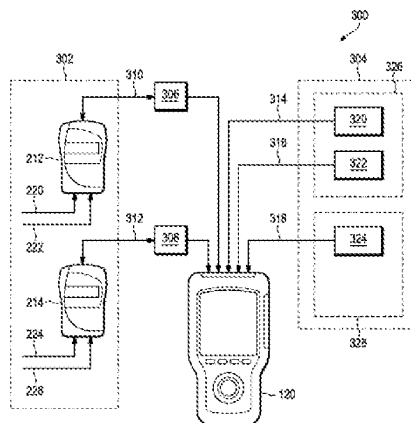


FIG. 3

KANE

By withdrawal of the previous rejections, the Examiner recognizes the deficiencies of Alfano and Kane. The issue, therefore, becomes whether the additional teaching of Porter results in the claimed configuration.

The system of Porter employs microelectromechanical system (MEMS) sensors for sensing internal aspects of a refrigerant system. As such, the MEMS based system is depicted in essentially a block diagram form, rather than as a more structural configuration, as illustrated in Porter Figs. 1 and 4 reproduced below. (See, e.g., Porter at paragraphs [0023-0032].)

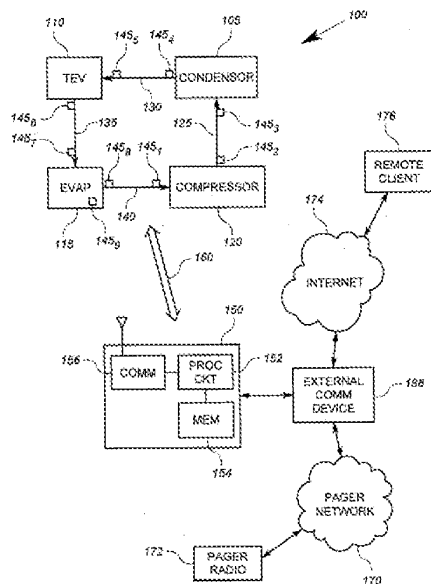


FIG. 1

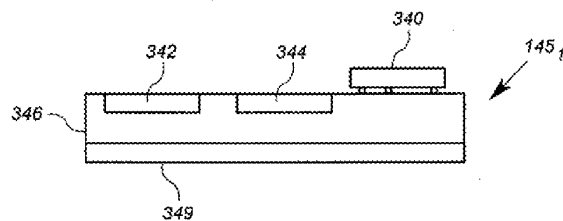


FIG. 4

PORTER

These block diagram depictions and related descriptions set forth at most high-level interaction among the various components. Because MEMS modules are employed in Porter, which essentially are permanently affixed within the system equipment, there is no basis to combine such MEMS type of sensor modules with the measuring system kits of temperature and pressure sensors used by an HVAC operator in the field, such as taught in Alfano and Kane to arrive at the claimed invention. Porter is insufficient, therefore, as teaching a system that truly lacks external physical connections because of the generalized nature of the block diagrams above, and the use of MEMS type sensor modules would not be applicable to field measuring systems of the type described in Alfano, Kane, and the claimed invention. One of ordinary skill in the art, therefore, would not modify the MEMS modules of Porter based on the pressure and temperature sensors of the other references to arrive at the claimed invention to provide a measuring system that lacks external physical connections.

In view of the above, the combined references do not teach the claimed invention as recited in independent claims 1 and 15 as to the lack of external physical connections, and the dependent claims are patentable for at least the same reasons. The rejections, therefore, should be withdrawn.

B. Lack of Integrated Electronics In Temperature Sensor Clamps

Further regarding the temperature sensor clamp, the independent claims recite “integrated electronics are incorporated into the handle” of the temperature sensor clamp, and dependent claims (see claims 9 and 19) further recite that the “integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.” In this manner, sensor data can be transmitted wirelessly to the processing device. By withdrawal of the previous rejections, the Examiner agrees that previously cited Alfano and Kane in combination do not teach “integrated electronics in the handle”, nor specifically the integrated electronic elements as recited in the dependent claims. Applicant further disputes that newly cited Porter teaches such deficiencies of the other references.

The Examiner again has glossed over that at least one of such components (i.e., power source, a light emitting indicator, and a wireless interface pair button) needs to be integrated into the handle of the temperature sensor clamp of the secondary references. Applicant submits that none of the cited references teaches the integration of such specific components **into the handle** of the temperature sensor clamp as claimed. Alfano and Kane already are recognized as deficient, and as referenced above, the system of Porter employs microelectromechanical system (MEMS) sensors. MEMS modules are semiconductor-based microsystems that have a small footprint so as to allow fitting onto the piping (see Porter at paragraphs [0065-0068]), and thus essentially are permanently affixed within the system equipment. The use of MEMS devices as taught generally in Porter is not sufficient to teach that electronics are integrated specifically into the **temperature sensor clamp handle itself**.

In view of the above, independent claims 1 and 15 are patentable over the cited references for the additional reason of having electronics integrated into the handle of

the temperature sensor clamp, whether generally as recited in the independent claims or as to specific components as recited in dependent claims 9 and 19, and the additional dependent claims are patentable for at least the same reasons. The rejections, therefore, should be withdrawn on this basis as well.

IV. Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

The absence in this reply of any comments on the other contentions set forth in the Office Action should not be construed to be acquiescence thereof. Rather, no comment is needed since the rejections should be withdrawn for at least the foregoing reasons.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By /Lawrence S. Drasner/
Lawrence S. Drasner, Reg. No. 38,127

1621 Euclid Avenue
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Cleveland, Ohio 44115
(216) 621-1113

Amendments to the Claims

1. (Currently Amended) A sensor system for a refrigerant unit comprising:
a plurality of sensors for sensing system parameters of the refrigerant unit; and
a portable electronic device configured to receive the system parameters from
the plurality of sensors and to calculate system conditions for the refrigerant based on
the system parameters;

wherein:

the plurality of sensors comprises a first pressure sensor and a second pressure
sensor, and a first temperature sensor and a second temperature sensor;

the first and second temperature sensors each comprises a temperature sensor
clamp having a clamping portion configured to clamp on a tube of the refrigerant unit,
the clamping portion including a sensor element to measure temperature about the
tube;

each temperature sensor clamp further comprises a handle and integrated
electronics, and the integrated electronics are incorporated into the handle and in
electrical connection with the sensor element; and

there are no external physical connections among the plurality of sensors and the
portable electronic device.

2. (Cancelled)

3. (Previously Presented) The sensor system of claim 1, wherein:
the first pressure sensor and first temperature sensor are sensors for a high side
of the refrigerant system;

the second pressure sensor and the second temperature sensor are sensors for
the low side of the refrigerant system; and

the system conditions calculated by the portable electronic device comprise
superheat and subcooling for the refrigerant system.

4. (Cancelled)
5. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.
6. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a perforated gripping portion for gripping the tube of the refrigerant unit.
7. (Original) The sensor system of claim 6, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.
8. (Cancelled)
9. (Previously Presented) The sensor system of claim 1, wherein the integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.
10. (Previously Presented) The sensor system of claim 1, wherein the integrated electronics and the plurality of sensors are sealed from environmental elements.
11. (Previously Presented) The sensor system claim 1, wherein each of the first and second pressure sensors comprises a flare quick connection for connecting the pressure sensors to the refrigerant unit.

12. (Original) The sensor system of claim 11, wherein the first and second pressure sensors further comprise an integrated charging port.

13. (Previously Presented) The sensor system of claim 1, wherein the portable electronic device is configured to receive the system parameters from the plurality of sensors over a wireless interface.

14. (Previously Presented) The sensor system of claim 1, wherein the portable electronic device comprises:

- a communications interface for wirelessly receiving the system parameters from the plurality of sensors;

- a memory storing a program application for calculating system conditions; and

- a processor device configured to receive the sensor parameters via the communications interface, and to execute the program application to calculate the system conditions based on the system parameters.

15. (Previously Presented) A temperature sensor clamp for sensing temperature in a refrigerant unit, the temperature sensor clamp comprising:

- a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube, and

- a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element;

- wherein the temperature sensor clamp has no external physical electrical or fluidic connections.

16. (Original) The temperature sensor clamp of claim 15, wherein the clamping portion includes a perforated gripping portion for gripping the tube of the refrigerant unit.

17. (Original) The temperature sensor clamp of claim 16, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

18. (Canceled)

19. (Previously Presented) The temperature sensor clamp of claim 15, wherein the integrated electronics include at least one of a battery, a light emitting indicator, and a wireless interface pair button.

20. (Previously Presented) The temperature sensor clamp of claim 15, wherein the clamping portion includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamp closes inward beyond a threshold point.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Applicant(s): Christian D. Parker et al.
Serial No: 14/913,834
Filing Date: February 23, 2016
Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
Examiner: Kun Kai Ma
Art Unit: 3744
Docket No. PA7TP0069WOAUS

REPLY TO FINAL OFFICE ACTION DATED SEPTEMBER 6, 2018

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following part(s) of this reply:

Amendments to the Claims

Remarks

In the event any fee or additional fee is due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (under the above Docket Number). In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988 (under the above Docket Number).

Electronic Acknowledgement Receipt	
EFS ID:	34185364
Application Number:	14913834
International Application Number:	
Confirmation Number:	2198
Title of Invention:	HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
First Named Inventor/Applicant Name:	Christian D. Parker
Customer Number:	49458
Filer:	Lawrence Scott Drasner
Filer Authorized By:	
Attorney Docket Number:	PA7TP0069WOAUS
Receipt Date:	01-NOV-2018
Filing Date:	23-FEB-2016
Time Stamp:	15:39:18
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	After Final Consideration Program Request	2018-11-01_A7T-069-AFCP.pdf	226569	no	2
			874fc715aefd9093c9b946c500bfca92fe81cdcc		

Warnings:

Information:					
2		2018-11-01_A7T-069-US_FOA-Response.pdf	1129737	yes	13
			d4a3a7dec57efb0e70fd61852cd7133e721810ba		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Applicant Arguments/Remarks Made in an Amendment		6	13	
	Claims		2	5	
	Response After Final Action		1	1	
Warnings:					
Information:					
Total Files Size (in bytes):			1356306		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. New Applications Under 35 U.S.C. 111 If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. National Stage of an International Application under 35 U.S.C. 371 If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. New International Application Filed with the USPTO as a Receiving Office If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number		Filing Date		☐ To be Mailed	
Substitute for Form PTO-875					14/913,834		02/23/2016			
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO										
APPLICATION AS FILED – PART I										
(Column 1)		(Column 2)								
FOR	NUMBER FILED	NUMBER EXTRA				RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A				N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A				N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A				N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =		*			X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =		*			X \$	=			
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)		(Column 2)		(Column 3)						
AMENDMENT	11/01/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X \$100 =		0		
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$460 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		0		
(Column 1)		(Column 2)		(Column 3)						
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$				
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$				
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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GLORIA NORRIS



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7IP0069WOAUS	2198

49458	7590	09/06/2018
DON W. BULSON (PARK)		
RENNER, OTTO, BOISSELLE & SKLAR, LLP		
1621 EUCLID AVENUE / 19TH FLOOR		
CLEVELAND, OH 44115		

EXAMINER	
MA, KUN KAI	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
09/06/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

Office Action Summary	Application No. 14/913,834	Applicant(s) PARKER ET AL.	
	Examiner KUN KAI MA	Art Unit 3744	AIA (First Inventor to File) Status Yes

-- 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 after final amendment filed 07/31/2018.
☐ 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) 1,3,5-7,9-17,19 and 20 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) 1,3,5-7,9-17,19 and 20 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) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

4) ☒ Other: A. NE.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. This action is responsive to the amendment filed on 04/06/2018. Claims 1, 3, 5-7, 9-17 and 19-20 are pending in this application. Claims 11 and 13-14 have been amendment. Claims 2, 4, 8, and 18 have been cancelled.
3. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Objections

4. Claim 1 is objected to because of the following informalities:

Claim 1 recites the limitation "the sensors" in line 5 which should be recited to -- the plurality of sensors-- for proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 3, 5-7 and 9-14 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

7. Claim 1 recites the limitation "there are no physical connections among the plurality of sensors and the portable electronic device" in the last two lines which is unclear and renders the claim indefinite. It is unclear whether the limitation "there are no physical connections among the plurality of sensors and the portable electronic device" means that "there are no physical connection between the plurality of sensors and the portable electronic device" or "there are no physical connection among the individual of the plurality of sensors and portable electronic device themselves". If the limitation is intended to mean that "there are no physical connection between the plurality of sensors and the portable electronic device". The limitation would be interpreted as "there are no physical connection between the plurality of sensors and the portable electronic device". However, if the limitation is intended to mean that "there are no physical connection among the individual of the plurality of sensors and portable electronic device themselves", it is unclear how it is possible that the individual sensor and the portable electronic device have no physical connection among themselves since each of these element are physically present. Also, in figures 4 and 7-17, applicant clearly illustrates these elements have physical connection among themselves. Therefore, claim 1 is unclear and indefinite. For examination purposes, the

limitation has been interpreted as "there are no **external** physical connections among the plurality of sensors and the portable electronic device".

8. Claims 3, 5-7 and 9-14 are rejected by the virtual of their dependency of claim 1.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3 and 13-14 is/are rejected under 35 U.S.C. 103 as being unpatentable over Porter et al. (2008/0066474) in view of Alfano et al. (8,746,971, previously cited and applied) and Kane et al. (2013/0245965, previously cited and applied).

Regarding claim 1, Porter discloses a sensor system (145_x) for a refrigerant unit (see figure 1) comprising:

a plurality of sensors (145_x) for sensing system parameters (pressure and temperature of refrigerant) of the refrigerant unit (Porter discloses the sensor modules 145_x measures temperature and pressure; paragraph [0024]; see figure 1); and

a electronic device (controller 150) configured to receive the system parameters (pressure and temperature of refrigerant) from the sensors (145_x) and to calculate system conditions (enthalpy; see figure 7) for the refrigerant based on the system parameters (pressure and temperature; see figure 7);

wherein:

the plurality of sensors (145_x) comprises a first pressure sensor (145₁) and a second pressure sensor (145₂), and a first temperature sensor (145₃ or 145₄) and a second temperature sensor (145₇ or 145₈ see figure 1); and

there are no physical connections among the plurality of sensors (145_x) and the electronic device (150; figure 4 shows there are no physical connections among the sensor modules 145_x and the controller 150; also, figure 1 shows the sensors and the controller are in wireless communication 160).

Also, Porter discloses the plurality sensor modules (145_x) include a sensor element (340) and integrated electronics (342, 344 and 349) which in electrical connection with the sensor element (340; see figure 4)

However, Porter fails to explicitly disclose the electronic device (150) is a portable and fails to disclose the first and second temperature sensors (145_x) comprises a temperature sensor clamp having a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube; and each temperature sensor clamp further comprises a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element.

Kane teaches a sensor system for a refrigerant unit comprises a portable electronic device (see figures 2).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate a portable electronic device as taught by Kane in order to provide

convenient for user or workers to easily carry around the device to take measurements at different locations.

Alfano teaches a device and method for taking multiple temperature HVAC readings comprises the first and second temperature sensors (134 and 124; see figures 3 and 4B) comprises a temperature sensor clamp (see figures 3 and 4B) having a clamping portion (see figure 3) configured to clamp on a tube of the refrigerant unit (HVAC system), the clamping portion (see figure 3) including a sensor element (probe 124) to measure temperature about the tube (Col. 4, lines 64-68); and each temperature sensor clamp (see figures 3 and 4B) further comprises a handle (see figure 3).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate the claimed structure details of the first and second temperature sensors as taught by Alfano in order to conveniently measure the refrigerant temperature by easily clamping the sensors on refrigerant tubes. Upon the modification, it would also have been obvious to one having ordinary skill in the art that the clamping portion including a sensor element (340) and integrated electronics (342, 344 and 349) are incorporated into the handle (see figure 3 of Alfano and figure 1 and 4 of Porter).

Regarding claim 3, Porter as modified discloses the first pressure sensor (145₁) and first temperature sensor (145₃ or 145₄) are sensors for a high side (discharge side) of the refrigerant system (see figure 1); the second pressure sensor (145₂) and the second temperature sensor (145₇ or 145₈) are sensors for the low side (suction side) of the refrigerant system (see figure 1). Also, Porter discloses the refrigerant is sub-cooled

in regions 209 and the refrigerant is super-heated in region 205 (paragraph [0052]; see figure 2).

However, fails to disclose the system conditions calculated by the portable electronic device comprise superheat and subcooling for the refrigerant system.

Kane teaches the system conditions (superheat and sub-cool) calculated by the portable electronic device (120) comprise superheat and subcooling for the refrigerant system (paragraph [0033]).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate the system condition calculation as taught by Kane in order to improve judgment accuracy on refrigerant condition based on more calculated system condition parameters.

Regarding claim 6, Porter as modified discloses the clamping portion of each temperature sensor clamp (see figure 3) includes a perforated gripping portion (the arc portion of the claiming portion) for gripping the tube of the refrigerant unit (see figure 3).

Regarding claim 9, Porter as modified discloses the integrated electronics (342, 344 and 349) include at least one of a power source (battery 349; paragraph [0068]), a light emitting indicator, and a wireless interface pair button (342; see figures 1 and 3-4).

Regarding claim 10, Porter discloses the integrated electronics (342, 344 and 349) and the sensors (340) are sealed from environmental elements (such as, air or water).

Regarding claim 13, Porter discloses the portable electronic device (150) is configured to receive the system parameters (pressure and temperature readings) from the plurality of sensors over a wireless interface (160; see figure 1).

Regarding claim 14, Porter discloses the portable electronic device (150) comprises: a communications interface (156) for wirelessly receiving the system parameters from the sensors (160; see figure 1);

a memory (154) storing a program application for calculating system conditions (memory; see figure 7); and

a processor device (152) configured to receive the sensor parameters (pressure and temperature readings) via the communications interface (160), and to execute the program application to calculate the system conditions based on the system parameters (see figure 7).

Regarding claim 15, Porter as modified in detail above discloses a temperature sensor clamp (see figure 3 of Alfano and figures 1 and 3-4 of Porter) for sensing temperature in a refrigerant unit (see figure 1), the temperature sensor clamp comprising:

a clamping portion (the front portion of the clamp) configured to clamp on a tube of the refrigerant unit (see figure 3 of Alfano), the clamping portion including a sensor element (340, Porter) to measure temperature about the tube (upon the modification of Porter in view of Alfano; see figure 3 of Alfano and figures 1 and 3-4 of Porter), and

a handle (the back portion of the clamp) and integrated electronics (342, 344 and 349, Porter), and the integrated electronics are incorporated into the handle and in

electrical connection with the sensor element (340, Porter; upon the modification of Porter in view of Alfano; see figure 3 of Alfano and figures 1 and 3-4 of Porter);

wherein the temperature sensor clamp has no external physical electrical or fluidic connections (Porter discloses wireless communication between the sensors and the portable electronic device 150; see figure 1).

Regarding claim 16, Porter as modified discloses the clamping portion (the front portion) includes a perforated gripping portion (the curve portion which accommodates the tube when the clamp is in close position) for gripping the tube of the refrigerant unit (see figure 3, Alfano).

Regarding claim 19, Porter discloses the integrated electronics 342, 344 and 349, Porter) include at least one of a battery (battery 349; paragraph [0068]), a light emitting indicator, and a wireless interface pair button (342; see figures 1 and 3-4 of Porter).

10. Claim 11-12 is/are rejected under 35 U.S.C. 103 as being unpatentable over Porter in view of Alfano and Kane as applied to claim 1 above and further in view of Brown et al. (6,334,320, previously cited and applied).

Regarding claim 11, Porter discloses each of the first and second pressure sensors (145₁ and 145₂) connecting to the refrigerant unit (see figure 1).

However, Porter fails to explicitly disclose each of the first and second pressure sensors comprises a flare quick connection.

Brown teaches an electronic manifold for a refrigerant servicing unit comprises a pressure transducer which comprises a flare quick connection for connecting the pressure sensor to the refrigerant unit (Col. 3, lines 1-10; see figures 1-5).

It would have been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate the flare-type connection as taught by Brown in order to secure the coupling of the pressure sensor.

Regarding claim, 12 Porter as modified discloses the first and second pressure sensors further comprise an integrated charging port (electrical conductor 34; see figure 4 of Brown).

11. Claims 5 and 20 is/are rejected under 35 U.S.C. 103 as being unpatentable over Porter in view of Alfano and Kane as applied to claim 1 and 15 above and further in view of Panosian (2005/0098932, previously cited and applied).

Regarding claims 5 and 20, Porter as modified fails to disclose the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.

Panosian teaches a spring clamp system comprises a clamping portion of each clamp (see figure 2) includes a plurality of clamping teeth (paragraph [0023]), and adjacent clamping teeth interlock in an overlapping configuration (see figure 3) when the clamps closes inward beyond a threshold point (see figure 3; paragraph [0023]).

It would been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate teeth and the interlock in an overlapping configuration as taught by Panosian in order to securely clamping the sensor on refrigerant tubes.

12. Claims 7 and 17 is/are rejected under 35 U.S.C. 103 as being unpatentable over Porter in view of Alfano and Kane as applied to claim 6 and 15 above and further in view of Desmarais (6,056,282, previously cited and applied).

Regarding claim 7, Porter as modified fails to disclose the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

Desmarais teaches a clamping device comprises a gripping portion (20 and 22) comprises a grating (28; Col. 4, lines 44-50; see figure 2).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Porter to incorporate the grating as taught by Desmarais in order to remove corrosion or dust on the tube such that the sensor can contact the tube properly.

Regarding claim 17, Porter as modified discloses the gripping portion comprises a grating (28, Desmarais), wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube (the grating 28 of Desmarais is capable of cleaning and gripping the tube).

Response to Arguments

13. Applicant's arguments, see Remarks, filed 07/31/2018, with respect to the rejection(s) of claim(s) 1 and 15 under Kane in view of Alfano have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Porter in view of Alfano and Kane.

14. Applicant's arguments on the Remarks with respect to claims 1 and 15 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

15. **THIS ACTION IS MADE FINAL.** 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 mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KUN KAI MA whose telephone number is (571)270-3530. The examiner can normally be reached on Monday - Friday 9 am - 5:30 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jianying Atkisson can be reached on (571) 270-7740. 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.

/KUN KAI MA/
Primary Examiner, Art Unit 3744

Application/Control Number: 14/913,834
Art Unit: 3744

Page 14

Notice of References Cited	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination PARKER ET AL.	
	Examiner KUN KAI MA	Art Unit 3744	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2008/0066474 A1	03-2008	Porter; Michael Ramey	F25B49/005	62/127
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20180831

Search Notes 	Application/Control No. 14913834	Applicant(s)/Patent Under Reexamination PARKER ET AL.
	Examiner KUN KAI MA	Art Unit 3744

CPC- SEARCHED		
Symbol	Date	Examiner
f25b 49/00, 2700/19, 2700/21	12/5/2017	KM

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
62	129	12/5/2017	KM
81, 269	text search in class 81 and 269	12/5/2017	KM

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search in PALM	11/28/2017	KM
EAST search (see attached)	12/5/2017	KM
Updated EAST search (see attached)	5/21/2018	KM
Updated EAST search (see attached)	8/31/2018	KM

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S83	1396	f25b49/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/19 19:14
S84	1	wireless same (senser or indicator or detector or probe) same (temperature or pressure) same refrigerant near5 (parameter or property or specification or measurement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:44
S85	7	wireless same (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant same (parameter or property or specification or measurement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:48
S86	7	wireless same (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant same (parameter or property or specification or measurement or character\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:49
S87	0	wireless same (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant near5 service	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:51
S88	0	wireless same (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant same servicing	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:51
S89	2	wireless same (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant same servic\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 10:51
S90	10	wireless same (senser or indicator or	US-PGPUB;	OR	ON	2018/05/21

		detector or probe) near3 (temperature or pressure) and refrigerant same servic\$4	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			10:53
S91	563	f25b2700/21.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 14:35
S92	692	f25b2700/19.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/05/21 15:04
S93	15	clamp and wireless and (senser or indicator or detector or probe) near3 (temperature or pressure) and refrigerant same servic\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/18 11:30
S94	56	wireless and (senser or indicator or detector or probe) near3 (temperature or pressure) and refrigerant same servic\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/18 12:11
S95	237	wireless and (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/18 12:38
S96	139	(clamp or clamping) and wireless and (senser or indicator or detector or probe) near3 (temperature or pressure) same refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/20 08:40
S97	144	(clamp or clamping) and wireless and (senser or indicator or detector or probe or sensing adj (unit or device or module or apparatus)) near5 (temperature or pressure) same refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/20 08:41
S98	2	(clamp or clamping or clamper) same wireless same (senser or indicator or detector or probe or sensing adj (unit or device or module or apparatus)) near5 (temperature) and refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2018/08/20 08:45

			IBM_TDB			
S99	67	(clamp or clamping or clamber) same wireless same (sensor or indicator or detector or probe or sensing adj (unit or device or module or apparatus)) near5 (temperature)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/20 09:04
S100	7880	(clamp or clamping or clamber or cliper) same (sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (temperature)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/20 09:12
S101	70	(clamp or clamping or clamber or cliper) same (sensor or indicator or detector or probe or sensing near (unit or device or module or apparatus)) same (temperature) same refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/20 09:16
S102	144	(clamp or clamping or clamber) same (sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (temperature) and refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/25 15:21
S103	32	wireless same (thermistor or thermocouple or sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (temperature) and (superheat or subcool) same refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/25 15:56
S104	33	wireless same (thermistor or thermocouple or sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (temperature) same emitter same (embedded or integra\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/25 16:11
S105	579	wireless same (thermistor or thermocouple or sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (temperature) same (emitter or transmitter) same (embedded or integra\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/25 16:12
S106	13	wireless same (thermistor or thermocouple or sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus)) same (emitter or transmitter) same (embedded or integra\$4) same (temperature) and refrigerant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/08/25 16:14
S107	190	wireless same (thermistor or thermocouple or sensor or indicator or detector or probe or sensing near2 (unit or device or module or apparatus))	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2018/08/25 16:17

	same (emitter or transmitter) same	JPO;		
	(embedded or integra\$4) same	DERWENT;		
	(temperature) same (power or battery)	IBM_TDB		

8/ 31/ 2018 4:32:27 PM
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OK TO ENTER: /K.M/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Applicant(s): Christian D. Parker et al.
Serial No: 14/913,834
Filing Date: February 23, 2016
Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
Examiner: Kun Kai Ma
Art Unit: 3744
Docket No. PA7TP0069WOAUS

REPLY TO FINAL OFFICE ACTION DATED MAY 25, 2018

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following part(s) of this reply:

Amendments to the Claims

Remarks

In the event any fee or additional fee is due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (under the above Docket Number). In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988 (under the above Docket Number).



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7IP0069WOAUS	2198

49458	7590	08/02/2018
DON W. BULSON (PARK)		
RENNER, OTTO, BOISSELLE & SKLAR, LLP		
1621 EUCLID AVENUE / 19TH FLOOR		
CLEVELAND, OH 44115		

EXAMINER	
MA, KUN KAI	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
08/02/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

<i>Applicant-Initiated Interview Summary</i>	Application No.	Applicant(s)	
	14/913,834	PARKER ET AL.	
	Examiner	Art Unit	
	KUN KAI MA	3744	

All participants (applicant, applicant's representative, PTO personnel):

(1) KUN KAI MA. (3) _____.

(2) Lawrence S. Drasner. (4) _____.

Date of Interview: 26 July 2018.

Type: ☒ Telephonic ☐ Video Conference
 ☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
 If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
 (For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: Kane.

Substance of Interview
 (For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

An interview was conducted with applicant's representative to discuss claim limitation "there are no physical connections among the plurality of sensors and the portable electronic device" and Kane reference. Applicant argues that the system of Kane requires wired connection among (between) the sensors and the sending units. The Office respective disagrees. In the Final Action, the Office interpreted the sensors and sender units 204 as the claim limitation "a plurality of sensors". Figure 3 of Kane provides support that the sensors and sender units 302 named as one package (paragraph [0039]). In figure 2, Kane discloses the sensors and sender units 204 wirelessly connected to the main unit 120 without any physical connection. Therefore, Kane's disclosure meets the argued claim limitation that "there are not physical connection among the plurality of sensors (the sensors and sender units 204 or 302) and portable electronic device (120). Applicant disagrees the Office's position. No agreement was made during the interview.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/KUN KAI MA/ Primary Examiner, Art Unit 3744	
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Applicant(s): Christian D. Parker et al.
Serial No: 14/913,834
Filing Date: February 23, 2016
Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
Examiner: Kun Kai Ma
Art Unit: 3744
Docket No. PA7TP0069WOAUS

REPLY TO FINAL OFFICE ACTION DATED MAY 25, 2018

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following part(s) of this reply:

Amendments to the Claims

Remarks

In the event any fee or additional fee is due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (under the above Docket Number). In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988 (under the above Docket Number).

Amendments to the Claims

1. (Previously Presented) A sensor system for a refrigerant unit comprising:
a plurality of sensors for sensing system parameters of the refrigerant unit; and
a portable electronic device configured to receive the system parameters from
the sensors and to calculate system conditions for the refrigerant based on the system
parameters;

wherein:

the plurality of sensors comprises a first pressure sensor and a second pressure
sensor, and a first temperature sensor and a second temperature sensor;

the first and second temperature sensors each comprises a temperature sensor
clamp having a clamping portion configured to clamp on a tube of the refrigerant unit,
the clamping portion including a sensor element to measure temperature about the
tube;

each temperature sensor clamp further comprises a handle and integrated
electronics, and the integrated electronics are incorporated into the handle and in
electrical connection with the sensor element; and

there are no physical connections among the plurality of sensors and the
portable electronic device.

2. (Cancelled)

3. (Previously Presented) The sensor system of claim 1, wherein:
the first pressure sensor and first temperature sensor are sensors for a high side
of the refrigerant system;

the second pressure sensor and the second temperature sensor are sensors for
the low side of the refrigerant system; and

the system conditions calculated by the portable electronic device comprise
superheat and subcooling for the refrigerant system.

4. (Cancelled)
5. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.
6. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a perforated gripping portion for gripping the tube of the refrigerant unit.
7. (Original) The sensor system of claim 6, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.
8. (Cancelled)
9. (Previously Presented) The sensor system of claim 1, wherein the integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.
10. (Previously Presented) The sensor system of claim 1, wherein the integrated electronics and the plurality of sensors are sealed from environmental elements.
11. (Currently Amended) The sensor system claim_1, wherein each of the first and second pressure sensors comprises a flare quick connection for connecting the pressure sensors to the refrigerant unit.

12. (Original) The sensor system of claim 11, wherein the first and second pressure sensors further comprise an integrated charging port.

13. (Currently Amended) The sensor system of claim 1, wherein the portable electronic device is configured to receive the system parameters from the plurality of sensors over a wireless interface.

14. (Currently Amended) The sensor system of claim 1, wherein the portable electronic device comprises:

a communications interface for wirelessly receiving the system parameters from the plurality of sensors;

a memory storing a program application for calculating system conditions; and
a processor device configured to receive the sensor parameters via the communications interface, and to execute the program application to calculate the system conditions based on the system parameters.

15. (Previously Presented) A temperature sensor clamp for sensing temperature in a refrigerant unit, the temperature sensor clamp comprising:

a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube, and

a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element;

wherein the temperature sensor clamp has no external physical electrical or fluidic connections.

16. (Original) The temperature sensor clamp of claim 15, wherein the clamping portion includes a perforated gripping portion for gripping the tube of the refrigerant unit.

17. (Original) The temperature sensor clamp of claim 16, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

18. (Canceled)

19. (Previously Presented) The temperature sensor clamp of claim 15, wherein the integrated electronics include at least one of a battery, a light emitting indicator, and a wireless interface pair button.

20. (Previously Presented) The temperature sensor clamp of claim 15, wherein the clamping portion includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamp closes inward beyond a threshold point.

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings. Applicant thanks the Examiner for participating in the second telephone interview on July 26, 2018. The following remarks encompass Applicant's Interview Summary. An agreement on patentability was not reached, and Applicant submits that the claims are patentable for the reasons set forth below.

I. Claim Objections

The Examiner objects to claims 11, 13, and 14 for minor format issues, which are corrected. The claim objections, therefore, should be withdrawn. No other claim amendments have been made.

II. Prior Art Rejections

A. Final Office Action Citation to Kane Fig. 2 Embodiment

In response to the previous Office Action and based on the first telephone interview, the Examiner accepted an amendment to independent claim 1 that "there are no physical connections among the plurality of sensors and the portable electronic device [the reading device]." A comparable amendment was made to independent claim 15 as to the temperature sensor clamp: "the temperature sensor clamp has no external physical electrical or fluid connections." As described in the current application and discussed during the first telephone interview, the absence of physical electrical or fluid connections among the sensors 22, 24, 26, and 28 and the reading device 3 results in a system that is more portable and otherwise permits full freedom of movement of the operator, as there are no restrictive tethers (neither electrical nor fluidic) among the components.

In the current Final Office Action, the Examiner cites to Kane et al., US 2013/0245965 (Kane) as teaching such features. Kane operates differently from Applicant's system. In the embodiment of Kane Fig. 2 relied upon by the Examiner in the Final Office Action, the sensors 202 are wired to sender units 212-218, which in turn may be wirelessly connected to a main measuring unit 120. (See, e.g., Kane at

paragraphs [0032-0033]; Fig. 2.) The Examiner equates Kane to the claimed invention because the ultimate connection to the main unit 120 may be wireless. The system, however, still requires some wired connections among the sensors, particularly between the sensors and the sending units. Accordingly, there remains limits on portability and movement as compared to the claimed invention.

Kane, therefore, does not read on the claimed invention. Because of the sensors 202 being wired to external sender units 212-218, Kane does not teach the configuration of independent claim 1 of lacking physical connection “among the plurality of sensors.” This distinction is even stronger as to independent claim 15, insofar as the wired connections in Kane are “external physical electrical connections” relative to the purported temperature sensors.

B. Telephone Interview Citation to Kane Fig. 3 Embodiment

During the telephone interview, the Examiner further relied on the embodiment of Kane Fig. 3 (see Kane paragraphs [0039-0040]). As to such embodiment, Kane refers to “sensor and sender units 302”. The Examiner asserts this means the sensors and sender units are combined into a common physical package comparably as claimed, but Kane never says the sensors and sender units are combined into a common physical package without external connections. Kane merely references the disparate elements in a common phrase.

Kane Fig. 3 is reproduced below.

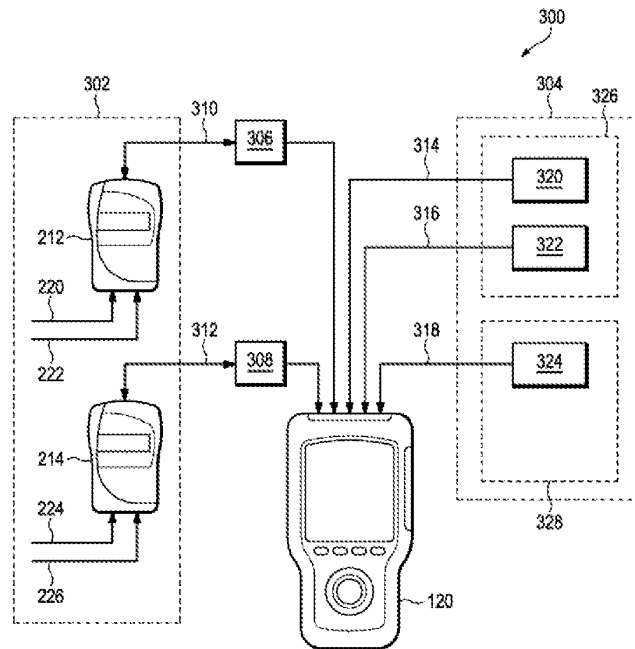


FIG. 3

Kane Fig. 3 is not described as being an accurate physical representation, but merely denotes in block diagram form the identification of elements. The Examiner is relying on the dotted line denoting the sender units 302 to indicate a lack of external physical connections among the sensors. **The sensors 202, however, are not even shown in Fig. 3, and thus cannot be deemed as integral components with the combined sender units 302, even though the connections 220-228 to the sensors are shown.** Indeed, it would not make any sense to integrate the multiple sensors into the same unit, as the sensors individually measure different parameters at different locations within and HVAC/R system.

In addition, like the embodiment of Fig. 2, the embodiment of Fig. 3 still employs physical connections among the plurality of sensors and the portable electronic device in contrast to what is claimed. Kane states "some sensor and sender units 302 may be in wireless communication with the main unit via wireless transceivers 306, 308." Later in such paragraph, Kane explains precisely what is meant by "**via wireless**

transceivers 306, 308: the sensors “communicate wirelessly to wireless transceivers 306, 308 via wireless channels 310, 312. The transceivers 306, 308 **in turn provide the main unit 120 with sensor information via wired inputs 122.**” Accordingly, in both embodiments of Figs. 2 and 3 of Kane, the system still employs physical connections among the plurality of sensors and the portable electronic device in contrast to what is claimed. In this regard, during the telephone interview, the Examiner indicated that he was interpreting the phrasing “in turn” to denote an alternative embodiment to being fully wireless. There is no basis to do so, however, as the “in turn” phrasing under the plain and any reasonable meaning denotes the sequential connection of elements to the main unit of the Fig. 3 embodiment, rather than as an alternative embodiment.

C. Additional Comments Regarding Integrated Electronics

Further regarding the temperature sensor clamp, dependent claims recite that the “integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.” In this manner, sensor data can be transmitted wirelessly to the processing device. Applicant submits that the Examiner continues to take an unreasonably broad interpretation of what constitutes “integrated electronics in the handle”. This portion of the rejections is substantively identical to the previous Office Action, as Kane does not show any comparable clamp configuration, and Applicant submits the Examiner has not adequately addressed Applicant’s previous arguments as to such features as allegedly taught in secondary reference Alfano.

The Examiner again has glossed over that at least one of such components (i.e., power source, a light emitting indicator, and a wireless interface pair button) needs to be integrated into the handle of the temperature sensor clamp the secondary references. Applicant submits that none of the cited references teaches the integration of such specific components **into the handle** of the temperature sensor clamp as claimed. Essentially, in the Final Office Action, similarly as in the previous Office Action. the Examiner apparently had considered any wiring for even an external connection of the temperature sensor to the processing device to be “integrated electronics”. A

connecting wire is an undesirable tether that the claimed invention avoids, and is not “integrated electronics” as would be understood by one of ordinary skill in the art, particularly in view of the previous clarifying amendments. In the references cited by the Examiner, the sensors, including the temperature sensor clamps of secondary reference Alfano, include a wired connection between the temperature sensor clamp and the measuring device, and no electronics are integrated into the ***sensor clamp handle itself*** in the cited references.

In view of the above, independent claims 1 and 15 are patentable over the cited references, and the dependent claims are patentable for at least the same reasons. The rejections, therefore, should be withdrawn.

III. Conclusion

In view of the foregoing, request is made for timely examination of the present application.

The absence in this reply of any comments on the other contentions set forth in the Office Action should not be construed to be acquiescence thereof. Rather, no comment is needed since the rejections should be withdrawn for at least the foregoing reasons.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By /Lawrence S. Drasner/
Lawrence S. Drasner, Reg. No. 38,127

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Electronic Acknowledgement Receipt	
EFS ID:	33326261
Application Number:	14913834
International Application Number:	
Confirmation Number:	2198
Title of Invention:	HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
First Named Inventor/Applicant Name:	Christian D. Parker
Customer Number:	49458
Filer:	Lawrence Scott Drasner
Filer Authorized By:	
Attorney Docket Number:	PA7TP0069WOAUS
Receipt Date:	31-JUL-2018
Filing Date:	23-FEB-2016
Time Stamp:	11:47:23
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2018-07-31_A7T-069-US_FOA-Response.pdf	446490	yes	10
			1979358b953a8af43f2e1265f92bddbe23bed3b0		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Response After Final Action	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	10
Warnings:			
Information:			
Total Files Size (in bytes):		446490	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Docket Number		Filing Date		☐ To be Mailed	
Substitute for Form PTO-875				14/913,834		02/23/2016			
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)							
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL					
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	07/31/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X \$100 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$460 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE						0			
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE									
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7IP0069WOAUS	2198
49458 7590 05/25/2018 DON W. BULSON (PARK) RENNER, OTTO, BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE / 19TH FLOOR CLEVELAND, OH 44115			EXAMINER MA, KUN KAI	
			ART UNIT 3744	PAPER NUMBER
			NOTIFICATION DATE 05/25/2018	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

Office Action Summary	Application No. 14/913,834	Applicant(s) PARKER ET AL.	
	Examiner KUN KAI MA	Art Unit 3744	AIA (First Inventor to File) Status Yes

-- 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 04/06/2018.
☐ 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) 1,3,5-7,9-17,19 and 20 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) 1,3,5-7,9-17,19 and 20 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) ☒ Notice of References Cited (PTO-892) | 3) ☐ Interview Summary (PTO-413) |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) | Paper No(s)/Mail Date. ____. |
| Paper No(s)/Mail Date ____. | 4) ☐ Other: ____. |

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. This action is responsive to the amendment filed on 04/06/2018. Claims 1, 3, 5-7, 9-17 and 19-20 are pending in this application. Claims 1, 10 and 13-15 have been amendment. Claims 2, 4, 8, and 18 have been cancelled.

Claim Objections

3. Claim 10 is objected to because of the following informalities:
The typographical error "claim1" in claim 11 which should be corrected to --claim 1--.
Claim 13 recites the limitation "the sensors" in lines 2-3 which should be recited as --the plurality of sensors-- for proper antecedent basis.
Claim 14 recites the limitation "the sensors" in line 4 which should be recited as --the plurality of sensors-- for proper antecedent basis.
Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have

been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3 and 13-14 is/are rejected under 35 U.S.C. 103 as being unpatentable over Kane et al. (2013/0245965) in view of Ulrich et al. (2015/0241316, previously cited and applied) in view of Alfano et al. (8,746,971, previously cited and applied).

Regarding claim 1, Kane discloses a sensor system (see figure 2) for a refrigerant unit (HVAC/R 100 as shown see figure 1) comprising:

a plurality of sensors (sensor sender unit 204 which includes temperature and pressure sensors 220, 222, 232 and 234 and senders 212 and 218) for sensing system parameters (pressure and temperature of refrigerant) of the refrigerant unit (HVAC system 100; paragraphs [0032]-[0033] and [0036]-[0038]; see figures 1-2); and

a portable electronic device (120) configured to receive the system parameters (pressure and temperature of refrigerant) from the sensors (220, 222, 232 and 234 and senders 212 and 218) and to calculate system conditions (superheat and sub-cool) for the refrigerant based on the system parameters (pressure and temperature; paragraph [0033]);

wherein:

the plurality of sensors (220, 222, 232 and 234 and senders 212 and 218) comprises a first pressure sensor (222 and 212) and a second pressure sensor (232 and 218), and a first temperature sensor (222 and 212) and a second temperature sensor (234 and 218; see figure 2); and

there are no physical connections (wireless communication) among the plurality of sensors (sensor sender unit 204 which includes temperature and pressure sensors

220, 222, 232 and 234 and senders 212 and 218) and the portable electronic device (120; paragraph [0033]).

However, Kane fails to disclose the first and second temperature sensors comprises a temperature sensor clamp having a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube; and each temperature sensor clamp further comprises a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element.

Alfano teaches a device and method for taking multiple temperature HVAC readings comprises the first and second temperature sensors (134 and 124; see figures 3 and 4B) comprises a temperature sensor clamp (see figures 3 and 4B) having a clamping portion (see figure 3) configured to clamp on a tube of the refrigerant unit (HVAC system), the clamping portion (see figure 3) including a sensor element (probe 124) to measure temperature about the tube (Col. 4, lines 64-68); and each temperature sensor clamp (see figures 3 and 4B) further comprises a handle and integrated electronics (the electronics of the sensor clamp 134 which connected with the electrical signal lines 122 and 124), and the integrated electronics are incorporated into the handle (see figure 3) and in electrical connection with the sensor element (the sensor element of the sensor clamp 134).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Kane to incorporate the claimed structure details of the first and second temperature sensors as

taught by Alfano in order to conveniently measure the refrigerant temperature by easily clamping the sensors on refrigerant tubes.

Regarding claim 3, Kane as modified discloses the first pressure sensor (220 and 212) and first temperature sensor (222 and 212) are sensors for a high side of the refrigerant system (paragraph [0033]; see figure 2); the second pressure sensor (232 and 218) and the second temperature sensor (234 and 218) are sensors for the low side (suction side) of the refrigerant system (paragraph [0036]; see figure 2); and

the system conditions (superheat and sub-cool) calculated by the portable electronic device (120) comprise superheat and subcooling for the refrigerant system (paragraph [0033]).

Regarding claim 6, Alfano discloses the clamping portion of each temperature sensor clamp (see figure 3) includes a perforated gripping portion (the arc portion of the claiming portion) for gripping the tube of the refrigerant unit (see figure 3).

Regarding claim 9, Kane as modified discloses the integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button (wireless communication between the sensor and the portable electronic device implies the existence of a wireless interface pair button on the sensor clamp; paragraph [0032]; see figure 2 of Kane).

Regarding claim 10, Alfano discloses the integrated electronics (the portion which connected with the electrical signal line 124) and the sensors (134) are sealed from environmental elements (such as, air or water).

Regarding claim 13, Kane discloses the portable electronic device (120) is configured to receive the system parameters (pressure and temperature readings) from the sensors over a wireless interface (paragraph [0032]; see figure 2).

Regarding claim 14, Kane discloses the portable electronic device (120) comprises: a communications interface for wirelessly receiving the system parameters from the sensors (paragraph [0032]; see figure 2);

a memory storing a program application for calculating system conditions (memory; paragraph [0053]; see figure 6); and

a processor device (620) configured to receive the sensor parameters (pressure and temperature readings) via the communications interface (the wireless communication interface; see figure 7), and to execute the program application to calculate the system conditions based on the system parameters (see figures 5-7).

Regarding claim 15, Kane as modified above discloses a temperature sensor clamp (134, Alfano) for sensing temperature in a refrigerant unit, the temperature sensor clamp comprising:

a clamping portion (the front portion) configured to clamp on a tube of the refrigerant unit (see figure 3 of Alfano), the clamping portion including a sensor element to measure temperature about the tube (see figure 3, Alfano), and

a handle (the back portion) and integrated electronics (it is understood that there is integrated electronics in the sensor clamp 134 to process and transmit the sensed data to the portable electronic device 120 of Kane through probe 124, see figure 3 of

Alfano), and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element (see figure 3, Alfano);

wherein the temperature sensor clamp has no external physical electrical or fluidic connections (Kane discloses wireless communication between the sensors and the portable electronic device 120; paragraph [0032]; see figure 2).

Regarding claim 16, Kane as modified discloses the clamping portion (the front portion) includes a perforated gripping portion (the curve portion which accommodates the tube when the clamp is in close position) for gripping the tube of the refrigerant unit (see figure 3, Alfano).

Regarding claim 19, Kane discloses the integrated electronics include at least one of a battery, a light emitting indicator, and a wireless interface pair button (wireless communication between the sensors and the portable electronic device implies the existence of a wireless interface pair button on the sensor clamp; paragraph [0032]; see figure 2 of Kane).

10. Claim 11-12 is/are rejected under 35 U.S.C. 103 as being unpatentable over Kane in view of Alfano as applied to claim 1 above and further in view of Brown et al. (6,334,320, previously cited and applied).

Regarding claim 11, Kane discloses each of the first and second pressure sensors (first pressure sensor 222 and 212 and second pressure sensor 232 and 218) connecting to the refrigerant unit (paragraphs [0033] and [0036]).

However, Kane fails to explicitly disclose each of the first and second pressure sensors comprises a hoseless flare quick connection.

Brown teaches an electronic manifold for a refrigerant servicing unit comprises a pressure transducer which comprises a flare quick connection for connecting the pressure sensor to the refrigerant unit (Col. 3, lines 1-10; see figures 1-5).

It would have been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Kane to incorporate the flare-type connection as taught by Brown in order to secure the coupling of the pressure sensor.

Regarding claim, 12 Kane as modified discloses the first and second pressure sensors further comprise an integrated charging port (electrical conductor 34; see figure 4 of Brown).

11. Claims 5 and 20 is/are rejected under 35 U.S.C. 103 as being unpatentable over Kane in view of Alfano as applied to claim 1 and 15 above and further in view of Panosian (2005/0098932, previously cited and applied).

Regarding claims 5 and 20, Kane as modified fails to disclose the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.

Panosian teaches a spring clamp system comprises a clamping portion of each clamp (see figure 2) includes a plurality of clamping teeth (paragraph [0023]), and

adjacent clamping teeth interlock in an overlapping configuration (see figure 3) when the clamps closes inward beyond a threshold point (see figure 3; paragraph [0023]).

It would been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Kane to incorporate teeth and the interlock in an overlapping configuration as taught by Panosian in order to securely clamping the sensor on refrigerant tubes.

12. Claims 7 and 17 is/are rejected under 35 U.S.C. 103 as being unpatentable over Kane in view of Alfano as applied to claim 6 and 15 above and further in view of Desmarais (6,056,282, previously cited and applied).

Regarding claim 7, Kane as modified fails to disclose the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

Desmarais teaches a clamping device comprises a gripping portion (20 and 22) comprises a grating (28; Col. 4, lines 44-50; see figure 2).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Kane to incorporate the grating as taught by Desmarais in order to remove corrosion or dust on the tube such that the sensor can contact the tube properly.

Regarding claim 17, Kane as modified discloses the gripping portion comprises a grating (28, Desmarais), wherein when the clamping portion clamps the tube, the

grating scores the tube to clean and grip the tube (the grating 28 of Desmarais is capable of cleaning and gripping the tube).

Conclusion

13. 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.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KUN KAI MA whose telephone number is (571)270-3530. The examiner can normally be reached on Monday - Friday 9 am - 5:30 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jianying Atkisson can be reached on (571) 270-7740. 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.

/KUN KAI MA/
Primary Examiner, Art Unit 3744

Notice of References Cited	Application/Control No. 14/913,834	Applicant(s)/Patent Under Reexamination PARKER ET AL.	
	Examiner KUN KAI MA	Art Unit 3744	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2013/0245965 A1	09-2013	Kane; Michael John	G01D7/00	702/33
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20180521

Search Notes 	Application/Control No. 14913834	Applicant(s)/Patent Under Reexamination PARKER ET AL.
	Examiner KUN KAI MA	Art Unit 3744

CPC- SEARCHED		
Symbol	Date	Examiner
f25b 49/00, 2700/19, 2700/21	12/5/2017	KM

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
62	129	12/5/2017	KM
81, 269	text search in class 81 and 269	12/5/2017	KM

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search in PALM	11/28/2017	KM
EAST search (see attached)	12/5/2017	KM
Updated EAST search (see attached)	5/21/2018	KM

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7IP0069WOAUS	2198

49458	7590	04/10/2018
DON W. BULSON (PARK)		
RENNER, OTTO, BOISSELLE & SKLAR, LLP		
1621 EUCLID AVENUE / 19TH FLOOR		
CLEVELAND, OH 44115		

EXAMINER	
MA, KUN KAI	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
04/10/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

<i>Applicant-Initiated Interview Summary</i>	Application No.		Applicant(s)	
	14/913,834		PARKER ET AL.	
	Examiner		Art Unit	
	KUN KAI MA		3744	

All participants (applicant, applicant's representative, PTO personnel):

(1) KUN KAI MA. (3) _____.

(2) Lawrence S. Drasner. (4) _____.

Date of Interview: 04 April 2018.

Type: ☒ Telephonic ☐ Video Conference
 ☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
 If Yes, brief description: _____.

Issues Discussed ☐ 101 ☒ 112 ☐ 102 ☐ 103 ☒ Others
 (For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: Ulrich et al. and Alfano et al.

Substance of Interview
 (For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The 112 2nd paragraph rejection to the limitation "hoseless sensors" has been discussed with applicant's representative. Applicant argues that the limitation "hoseless sensor" is definite because figures 4-6 illustrate applicant's hoseless system that there is no physical electrical or fluid connection neither among the sensors 22, 24, 26 and 28. However, the Office respectfully disagrees. The limitation "hoseless sensors" is unclear and indefinite. The claim language "hoseless sensors" does not reflect what is being disclosed in applicant's invention as one having ordinary skill in the art does not understand meaning of claim language "hoseless sensors". Applicant is willing to remove the unclear language "hoseless" through out claims and change the limitation "a plurality of hoseless sensors" to "a plurality of sensors wherein there is no physical connection between the plurality of sensors and a portable electronic device". The proposed amendment overcomes the 112 2nd paragraph rejection. Also, based on the glance of the figures of the applied prior art, the amendment appears to overcome the 102 and 103 rejection in the most current Office Action. However, further review of the cited prior art is required in order to determine the applicability of the cited prior art regarding the proposed claim amendment. Also, further search and consideration are required in order to determine the allowability of the application.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/KUN KAI MA/ Primary Examiner, Art Unit 3744	
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Applicant(s): Christian D. Parker et al.
Serial No: 14/913,834
Filing Date: February 23, 2016
Title: HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
Examiner: Kun Kai Ma
Art Unit: 3744
Docket No. PA7TP0069WOAUS

REPLY TO OFFICE ACTION DATED DECEMBER 11, 2017

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following part(s) of this reply:

Amendments to the Claims

Remarks

In the event any fee or additional fee is due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (under the above Docket Number). In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988 (under the above Docket Number).

Electronic Patent Application Fee Transmittal				
Application Number:		14913834		
Filing Date:		23-Feb-2016		
Title of Invention:		HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT		
First Named Inventor/Applicant Name:		Christian D. Parker		
Filer:		Lawrence Scott Drasner		
Attorney Docket Number:		PA7TP0069WOAUS		
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
Miscellaneous:				
Total in USD (\$)				200

Electronic Acknowledgement Receipt	
EFS ID:	32268431
Application Number:	14913834
International Application Number:	
Confirmation Number:	2198
Title of Invention:	HOSE FREE SENSOR SYSTEM FOR REFRIGERANT UNIT
First Named Inventor/Applicant Name:	Christian D. Parker
Customer Number:	49458
Filer:	Lawrence Scott Drasner
Filer Authorized By:	
Attorney Docket Number:	PA7TP0069WOAUS
Receipt Date:	06-APR-2018
Filing Date:	23-FEB-2016
Time Stamp:	14:59:58
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$200
RAM confirmation Number	040918INTEFSW15005300
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2018-04-06_A7T-069-US_OA-Response.pdf	183348	yes	9
			9df4d4b96f97025fee13a25badde98dcacadd8cd		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
	Claims		2	5	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31044	no	2
			ee1154b2d3147f765761bf34580952c36bf549d4		
Warnings:					
Information:					
Total Files Size (in bytes):			214392		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings. Applicant thanks the Examiner for participating in the telephone interview on April 4, 2018. The following remarks encompass Applicant's Interview Summary. As further detailed below, the claims have been amended as discussed during the telephone interview. The Examiner agreed during the telephone interview that such amendments overcome the current rejections.

I. Claim Objection

The Examiner objects to claim 10 based on a deficiency as to antecedent basis, which is corrected. The objection, therefore, should be withdrawn.

II. Indefiniteness Rejections

Pursuant to 35 U.S.C. § 112, in the Office Action the Examiner has determined that the term "hoseless" is indefinite as not being adequately defined in the claims. During the telephone interview, Applicant presented that the term hoseless should be considered straight-forward as indicative of a lack of any kind of tethering or physical connection between or among the sensor components and the portable electronic measuring device held by the operator. This is evident by comparison of the conventional gauge system versus Applicant's system as described in the current application.

Figs. 1-3 of the current application illustrate the conventional system of hosed gauges and metering device. Such systems are bulky and tie the operator to be in close proximity to the refrigerant system, as the output or reader device is tethered to the sensors by the hosed configuration. In contrast, Figs. 4-6 illustrate Applicant's hoseless system. There are no physical electrical or fluidic connections, neither among the sensors 22, 24, 26, and 28, nor between the sensors and the reading device 30. As such, the system is more portable and otherwise permits full freedom of movement of the operator, as there are no restrictive tethers (neither electrical nor fluidic) among the components.

The cited art exemplifies the conventional configuration comparably as illustrated in Figs. 1-3 in having fluidic and electrical connections among or between the sensors and/or the reading device. During the telephone interview, the Examiner recognized this distinction, but expressed disfavor that the term "hoseless" is allegedly insufficiently technical and not well defined in the art.

Accordingly, it was discussed to submit the following clarifying amendment, which is incorporated into independent claim 1: "wherein there are no physical connections among the plurality of sensors and the portable electronic device." A comparable amendment is made to independent claim 15 reciting the temperature sensor in isolation. The term "hoseless" therefore has been removed from the claims, with the other amendments more clearly reciting this concept. With such clarifying amendments, the Examiner agreed that the indefiniteness is resolved. The indefiniteness rejections, therefore, should be withdrawn.

III. Prior Art Rejections

With the clarifying amendments, the Examiner also agreed during the telephone interview that the cited references would not teach the claimed invention, and that the current rejections would be withdrawn. As referenced above, the cited art exemplifies the conventional configuration comparably as illustrated in Figs. 1-3 in having fluidic and electrical connections among or between the sensors and/or the reading device. In the Office Action, the Examiner had dismissed this distinction in deeming the term "hoseless" as indefinite, and thus such term was eliminated for the Examiner's analysis. Accordingly, as discussed during the telephone interview, the current amendments provide patentable weight to this distinction, and thus the current prior art rejections are to be withdrawn.

As to the temperature sensor itself (see independent claim 15), the improvement is that as part of the enhanced configuration, the temperature sensor is fully without any electrical tethers or wired connections. Accordingly, the independent claims recite that the temperature sensor includes "integrated electronics incorporated into the handle" of the temperature sensor, and independent claim 15 further is clarified that "the

temperature sensor clamp has no external physical electrical or fluidic connections” comparably as the amendment to independent claim 1. Dependent claims recite that the “integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.” In this manner, sensor data can be transmitted wirelessly to the processing device without any physical connections.

Essentially, in the Office Action the Examiner apparently had considered any wiring for even an external connection of the temperature sensor to the processing device to be “integrated electronics”. A connecting wire is an undesirable tether that the claimed invention avoids, and is not “integrated electronics” as would be understood by one of ordinary skill in the art, particularly in view of the additional clarifying amendments. In the references cited by the Examiner, the sensors, including the temperature sensors as pertinent to independent claim 15, include a wired connection between the temperature sensor and the measuring device, and no electronics are integrated into the sensor handle itself in the cited references.

In view of the above, and based on the discussions during the telephone interview, independent claims 1 and 15 are patentable over the cited references, and the dependent claims are patentable for at least the same reasons. The rejections, therefore, should be withdrawn.

IV. Conclusion

In view of the foregoing, request is made for timely examination of the present application.

The absence in this reply of any comments on the other contentions set forth in the Office Action should not be construed to be acquiescence thereof. Rather, no comment is needed since the rejections should be withdrawn for at least the foregoing reasons.

Respectfully submitted,

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Amendments to the Claims

1. (Currently Amended) A sensor system for a refrigerant unit comprising:
a plurality of ~~hoseless~~ sensors for sensing system parameters of the refrigerant unit; and
a portable electronic device configured to receive the system parameters from the ~~hoseless~~ sensors and to calculate system conditions for the refrigerant based on the system parameters;
wherein:
the plurality of ~~hoseless~~ sensors comprises a ~~hoseless~~ first pressure sensor and a ~~hoseless~~ second pressure sensor, and a ~~hoseless~~ first temperature sensor and a ~~hoseless~~ second temperature sensor;
the first and second temperature sensors each comprises a temperature sensor clamp having a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube; ~~and~~
each temperature sensor clamp further comprises a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element; and
there are no physical connections among the plurality of sensors and the portable electronic device.

2. (Cancelled)

3. (Previously Presented) The sensor system of claim 1, wherein:
the first pressure sensor and first temperature sensor are sensors for a high side of the refrigerant system;
the second pressure sensor and the second temperature sensor are sensors for the low side of the refrigerant system; and

the system conditions calculated by the portable electronic device comprise superheat and subcooling for the refrigerant system.

4. (Cancelled)

5. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.

6. (Previously Presented) The sensor system of claim 1, wherein the clamping portion of each temperature sensor clamp includes a perforated gripping portion for gripping the tube of the refrigerant unit.

7. (Original) The sensor system of claim 6, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

8. (Cancelled)

9. (Previously Presented) The sensor system of claim 1, wherein the integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button.

10. (Currently Amended) The sensor system of claim 1, wherein the integrated electronics and the plurality of sensors are sealed from environmental elements.

11. (Currently Amended) The sensor system claim1, wherein each of the first and second pressure sensors comprises a ~~hoseless~~-flare quick connection for connecting the pressure sensors to the refrigerant unit.

12. (Original) The sensor system of claim 11, wherein the first and second pressure sensors further comprise an integrated charging port.

13. (Currently Amended) The sensor system of claim 1, wherein the portable electronic device is configured to receive the system parameters from the ~~hoseless~~ sensors over a wireless interface.

14. (Currently Amended) The sensor system of claim 1, wherein the portable electronic device comprises:

- a communications interface for wirelessly receiving the system parameters from the ~~hoseless~~-sensors;

- a memory storing a program application for calculating system conditions; and

- a processor device configured to receive the sensor parameters via the communications interface, and to execute the program application to calculate the system conditions based on the system parameters.

15. (Currently Amended) A temperature sensor clamp for sensing temperature in a refrigerant unit, the temperature sensor clamp comprising:

- a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube, and

- a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element;

- wherein the temperature sensor clamp has no external physical electrical or fluidic connections.

16. (Original) The temperature sensor clamp of claim 15, wherein the clamping portion includes a perforated gripping portion for gripping the tube of the refrigerant unit.

17. (Original) The temperature sensor clamp of claim 16, wherein the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

18. (Canceled)

19. (Previously Presented) The temperature sensor clamp of claim 15, wherein the integrated electronics include at least one of a battery, a light emitting indicator, and a wireless interface pair button.

20. (Previously Presented) The temperature sensor clamp of claim 15, wherein the clamping portion includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamp closes inward beyond a threshold point.

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PATENT APPLICATION FEE DETERMINATION RECORD				Application or Docket Number		Filing Date		☐ To be Mailed	
Substitute for Form PTO-875				14/913,834		02/23/2016			
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)							
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =		*	X \$		=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =		*	X \$		=			
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL					
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	04/06/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X \$100 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$460 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
	TOTAL ADD'L FEE					0			
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$		=	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$		=	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
	TOTAL ADD'L FEE								
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/913,834	02/23/2016	Christian D. Parker	PA7IP0069WOAUS	2198

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DON W. BULSON (PARK)		
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CLEVELAND, OH 44115		

EXAMINER	
MA, KUN KAI	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
12/11/2017	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@rennerotto.com

Office Action Summary	Application No. 14/913,834	Applicant(s) PARKER ET AL.	
	Examiner KUN KAI MA	Art Unit 3744	AIA (First Inventor to File) Status Yes

-- 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 02/23/2016.
☐ 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) 1,3,5-7,9-17,19 and 20 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, 3, 5-7, 9-17 and 19-20 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 02/23/2016 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) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. This action is responsive to the preliminary amendment filed on 02/23/2016. Claims 1, 3, 5-7, 9-17 and 19-20 are pending in this application. Claims 1, 3, 5-6, 9-11, 13-15 and 19 have been amendment. Claims 2, 4, 8, and 18 have been cancelled. Claim 20 has been added.

Claim Objections

3. Claim 10 is objected to because of the following informalities:

Claim 10 recites the limitation "the sensors" in line 2 which should be recited as -- the plurality of sensors-- for proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1, 3-7 and 9-14 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

6. Claim 1 recites the limitation "a plurality of hoseless sensors" (line 2), "the hoseless sensor" (line 5), "the plurality of hoseless sensors" (line 8), "a hoseless first pressure sensor" (line 8), "a hoseless second pressure sensor" (line 9), "a hoseless first temperature sensor" (line 10) and "a hoseless second temperature sensor" (line 11) which are unclear and renders the claim indefinite. It is unclear what "hoseless" means when it is used with the "sensor" limitation. For examination purposes, these limitations have been interpreted as "a plurality of sensors", "the plurality of sensors", "the plurality of sensors", "a first pressure sensor", "a second pressure sensor", "a first temperature sensor" and "a second temperature sensor", respectively.

7. Claim 11 recites the limitation "a hoseless flare quick connection" in lines 2-3 which are unclear and renders the claim indefinite. It is unclear what "hoseless" means when it is used with the "flare quick connection" limitation. For examination purposes, this limitations has been interpreted as "a flare quick connection".

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

9. Claim(s) 15 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Alfano et al. (8,746,971).

Regarding claim 15, Alfano discloses a temperature sensor clamp (134) for sensing temperature in a refrigerant unit (see figures 1-4), the temperature sensor clamp comprising:

a clamping portion (the front portion) configured to clamp on a tube of the refrigerant unit (see figure 3), the clamping portion including a sensor element (it is understood that there is a sensor element in the clamping portion in order to sense temperature) to measure temperature about the tube (see figure 3), and

a handle (the back portion) and integrated electronics (it is understood that there is integrated electronics in the sensor clamp 134 to process and transmit the sensed data to the due temperature device 120), and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element (see figure 3).

10. Claim(s) 15 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Bell et al. (2006/0090484).

Regarding claim 15, Bell discloses a temperature sensor clamp (42 and 62) for sensing temperature in a refrigerant unit (see figures 1-3), the temperature sensor clamp comprising:

a clamping portion (62) configured to clamp on a tube of the refrigerant unit (see figures 1-3), the clamping portion (62) including a sensor element (42) to measure temperature about the tube (see figures 1-3), and

a handle (curve portion) and integrated electronics (it is understood that there are integrated electronics which connected to the signal line 48 in order to transmit sensed data), and the integrated electronics are incorporated into the handle (62) and in electrical connection with the sensor element (42; see figures 1-3).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 3 and 13-14 is/are rejected under 35 U.S.C. 103 as being unpatentable over Ulrich et al. (2015/0241316) in view of Alfano.

Regarding claim 1, Ulrich discloses a sensor system for a refrigerant unit comprising:

a plurality of hoseless sensors (pressure sensors 20 and 21 and temperature sensors 98, 22) for sensing system parameters (pressure and temperature of refrigerant) of the refrigerant unit (HVAC system; see figures 1); and

a portable electronic device (1) configured to receive the system parameters (pressure and temperature of refrigerant) from the hoseless sensors (20, 21, 98 and 22)

and to calculate system conditions (superheat and sub-cool; see figure 8) for the refrigerant based on the system parameters (pressure and temperature);

wherein:

the plurality of hoseless sensors (20, 21, 98 and 22) comprises a hoseless first pressure sensor (20) and a hoseless second pressure sensor (21), and a hoseless first temperature sensor (98) and a hoseless second temperature sensor (22; see figure 1).

However, Ulrich fails to disclose the first and second temperature sensors comprises a temperature sensor clamp having a clamping portion configured to clamp on a tube of the refrigerant unit, the clamping portion including a sensor element to measure temperature about the tube; and each temperature sensor clamp further comprises a handle and integrated electronics, and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element.

Alfano teaches a device and method for taking multiple temperature HVAC readings comprises the first and second temperature sensors (134; see figures 3 and 4B) comprises a temperature sensor clamp (see figures 3 and 4B) having a clamping portion (see figure 3) configured to clamp on a tube of the refrigerant unit (HVAC system), the clamping portion (see figure 3) including a sensor element (it is understood that the clamping portion includes a sensor element in order to sense the temperature of refrigerant) to measure temperature about the tube (Col. 4, lines 64-68); and each temperature sensor clamp (see figures 3 and 4B) further comprises a handle and integrated electronics (the electronics of the sensor claim 134 which connected with the electrical signal lines 122 and 124), and the integrated electronics are incorporated into

the handle (see figure 3) and in electrical connection with the sensor element (the sensor element of the sensor clamp 134).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Ulrich to incorporate the claimed structure details of the first and second temperature sensors as taught by Alfano in order to conveniently measure the refrigerant temperature by easily clamping the sensors on refrigerant tubes.

Regarding claim 3, Ulrich as modified discloses the first pressure sensor (20) and first temperature sensor (98) are sensors for a high side of the refrigerant system (see figure 1); the second pressure sensor (21) and the second temperature sensor (22) are sensors for the low side of the refrigerant system (see figure 1); and

the system conditions (superheat and sub-cool) calculated by the portable electronic device (1) comprise superheat and subcooling for the refrigerant system (see figure 8).

Regarding claim 9, Ulrich as modified discloses the integrated electronics include at least one of a power source, a light emitting indicator, and a wireless interface pair button (wireless communication between the sensors and the portable electronic device implies the existence of a wireless interface pair button on the sensor clamp; paragraph [0064]; Ulrich).

Regarding claim 13, Ulrich discloses the portable electronic device (1) is configured to receive the system parameters (pressure and temperature readings) from the hoseless sensors over a wireless interface (paragraph [0064]).

Regarding claim 14, Ulrich discloses the portable electronic device (1) comprises: a communications interface for wirelessly receiving the system parameters from the hoseless sensors (paragraph [0064]);

a memory storing a program application for calculating system conditions (memory; paragraph [0051]); and

a processor device (processor) configured to receive the sensor parameters (pressure and temperature readings) via the communications interface (the wireless communication interface; paragraph [0064]), and to execute the program application to calculate the system conditions based on the system parameters (paragraphs [0051]-[0056]).

Regarding claim 15, Ulrich as modified above discloses a temperature sensor clamp (134, Alfano) for sensing temperature in a refrigerant unit, the temperature sensor clamp comprising:

a clamping portion (the front portion) configured to clamp on a tube of the refrigerant unit (see figure 3), the clamping portion including a sensor element to measure temperature about the tube (see figure 3, Alfano), and

a handle (the back portion) and integrated electronics (it is understood that there is integrated electronics in the sensor clamp 134 to process and transmit the sensed data to the portable electronic device 1), and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element (see figure 3, Alfano).

Regarding claim 16, Ulrich discloses the clamping portion (the front portion) includes a perforated gripping portion (the curve portion which accommodates the tube when the clamp is in close position) for gripping the tube of the refrigerant unit (see figure 3, Alfano).

Regarding claim 19, Alfano discloses the integrated electronics include at least one of a battery, a light emitting indicator, and a wireless interface pair button (wireless communication between the sensors and the portable electronic device implies the existence of a wireless interface pair button on the sensor clamp; paragraph [0064]; Ulrich).

13. Claim 11-12 is/are rejected under 35 U.S.C. 103 as being unpatentable over Ulrich in view of Alfano as applied to claim 1 above and further in view of Brown et al. (6,334,320).

Regarding claim 11, Ulrich discloses each of the first and second pressure sensors (20 and 21) comprises a filling coupling (92 and 93) for connecting the pressure sensors to the refrigerant unit (see figure 1).

However, Ulrich fails to explicitly disclose the filling coupling of each of the first and second pressure sensors comprises a hoseless flare quick connection.

Brown teaches an electronic manifold for a refrigerant servicing unit comprises a pressure transducer which comprises a hoseless flare quick connection for connecting the pressure sensor to the refrigerant unit (Col. 3, lines 1-10; see figures 1-5).

It would have been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Ulrich to incorporate the flare-type connection as taught by Brown in order to secure the coupling of the pressure sensor.

Regarding claim, 12 Ulrich as modified discloses the first and second pressure sensors further comprise an integrated charging port (electrical conductor 34; see figure 4 of Brown).

14. Claims 1, 6 and 10 is/are rejected under 35 U.S.C. 103 as being unpatentable over Alfano in view of Ulrich.

Regarding claim 1, Alfano discloses a sensor system for a refrigerant unit comprising:

a plurality of hoseless sensors (134) for sensing system parameters (temperature of refrigerant) of the refrigerant unit (HVAC system); and

a portable electronic device (120) configured to receive the system parameters (temperature of refrigerant) from the hoseless sensors (134) and to calculate system conditions (superheat or sub-cooled) for the refrigerant based on the system parameters (temperature);

wherein:

the plurality of hoseless sensors (134) comprises a hoseless first temperature sensor (134, left) and a hoseless second temperature sensor (134, right);

the first and second temperature sensors (134) each comprises a temperature sensor clamp (see figure 3) having a clamping portion (see figure 3) configured to clamp on a tube of the refrigerant unit (HVAC system), the clamping portion (see figure 3) including a sensor element (it is understood that the clamping portion includes a sensor element in order to senses the temperature of refrigerant; Col. 4, lines 64-68) to measure temperature about the tube (see figure 3); and each temperature sensor clamp (see figure 3) further comprises a handle and integrated electronics (see figure 3), and the integrated electronics are incorporated into the handle and in electrical connection with the sensor element (see figure 3). Also, Alfano discloses a first and second analog pressure gages see figure 4B).

However, Alfano fails to explicitly disclose a hoseless first pressure sensor and a hoseless second pressure sensor.

Ulrich teaches a service device for air-conditioning system comprises a first pressure sensor (20) and a second pressure sensor (21; see figure 1).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Alfano to incorporate the claimed first and second pressure sensors as taught by Ulrich in order to measure the refrigerant pressure at different locations in the refrigeration system.

Regarding claim 6, Alfano discloses the clamping portion of each temperature sensor clamp (see figure 3) includes a perforated gripping portion (the arc portion of the claiming portion) for gripping the tube of the refrigerant unit (see figure 3).

Regarding claim 10, Alfano discloses the integrated electronics (the portion which connected with the electrical signal line 124) and the sensors (134) are sealed from environmental elements (such as, air or water).

15. Claims 5 and 20 is/are rejected under 35 U.S.C. 103 as being unpatentable over Alfano in view of Ulrich as applied to claim 1 and 15 above and further in view of Panosian (2005/0098932).

Regarding claims 5 and 20, Alfano fails to discloses the clamping portion of each temperature sensor clamp includes a plurality of clamping teeth, and adjacent clamping teeth interlock in an overlapping configuration when the clamps closes inward beyond a threshold point.

Panosian teaches a spring clamp system comprises a clamping portion of each clamp (see figure 2) includes a plurality of clamping teeth (paragraph [0023]), and adjacent clamping teeth interlock in an overlapping configuration (see figure 3) when the clamps closes inward beyond a threshold point (see figure 3; paragraph [0023]).

It would been obvious to one having ordinary skill in the art at the time before the effective filing date of the claim invention to have modified the sensor system of Ulrich to incorporate teeth and the interlock in an overlapping configuration as taught by Panosian in order to securely clamping the sensor on refrigerant tubes.

16. Claims 7 and 17 is/are rejected under 35 U.S.C. 103 as being unpatentable over Alfano in view of Ulrich as applied to claim 6 and 15 above and further in view of Desmarais (6,056,282).

Regarding claim 7, Alfano fails to disclose the gripping portion comprises a grating, wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube.

Desmarais teaches a clamping device comprises a gripping portion (20 and 22) comprises a grating (28; Col. 4, lines 44-50; see figure 2).

It would have been obvious to one having ordinary skill in the art before the effective filing date of the claim invention to have modified the sensor system of Alfano to incorporate the grating

Regarding claim 17, Alfano discloses the gripping portion comprises a grating (28, Desmarais), wherein when the clamping portion clamps the tube, the grating scores the tube to clean and grip the tube (the grating 28 of Desmarais is capable of cleaning and gripping the tube).

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KUN KAI MA whose telephone number is (571)270-3530. The examiner can normally be reached on Monday - Friday 9 am - 5:30 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jianying Atkisson can be reached on (571) 270-7740. 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.

/KUN KAI MA/
Examiner, Art Unit 3744

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Form PTO/SB/08a (Modified) INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	Attorney Docket No.	Application No.
	P212P0069WOAUS	HEREWITH
	First Named Inventor: Christian Parker	
	Filing Date February 23, 2016	Art Unit Not Yet Assigned

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EXAMINER SIGNATURE	/KUN KAI MA/	DATE CONSIDERED	12/05/2017
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The identification of any reference is not intended to be, and should not be understood as being, an admission that such publication, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given reference may have a later effective date than first seems apparent or the reference may have an effective date which can be antedated. The "prior art" status of any reference is a matter to be resolved during prosecution.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.M/