REMARKS

The parent application was filed with claims 30-46. Claims 31, 33, 35-36, and 41-46 have been canceled herein, without prejudice, disclaimer or waiver. Applicants expressly reserve the right to pursue canceled subject matter in one or more divisional and/or continuation applications. Claims 30, 32, 34, 38, and 40 have been amended herein and which are believed fully supported by the original specification and claims. No new matter has been added.

Page 1 of the specification has been amended to add a priority claim. No new matter has been added by this amendment.

In light of this Preliminary Amendment, the claims are believed to be allowable, and Applicants respectfully request notification of same. The Examiner is invited and encouraged to directly contact the undersigned if such contact may enhance the efficient prosecution of the application to issuance.

Respectfully submitted

THOMAS | HORSTEMEYER, LLP

/Todd Deveau/

Todd Deveau, Reg. No. 29,526

3200 Windy Hill Rd. SE
Suite 1600E
Atlanta, Georgia 30339
(770) 933-9500

Electronic Acknowledgement Receipt

EFS ID:	32805295
Application Number:	15989655
International Application Number:	
Confirmation Number:	5897
Title of Invention:	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
First Named Inventor/Applicant Name:	Kenneth M. Ponder
Customer Number:	24504
Filer:	Todd Deveau./Sheila Gray
Filer Authorized By:	Todd Deveau.
Attorney Docket Number:	821920-1033
Receipt Date:	05-JUN-2018
Filing Date:	
Time Stamp:	13:24:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	821920-1033__Preliminary_Amendment.pdf	252302 a427be1f1d05e5eecd7ed41ef81ac9de85de2641	no	7

Warnings:

Information:	
Total Files Size (in bytes):	252302

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/989,655	05/25/2018	1761	0.00	821920-1033	7	3

CONFIRMATION NO. 5897

FILING RECEIPT

24504
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

Date Mailed: 06/18/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Kenneth M. Ponder, Cumming, GA;
Steffan Thomas, Buckhead, GA;

Applicant(s)

Kenneth M. Ponder, Cumming, GA;
Steffan Thomas, Buckhead, GA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/493,491 06/11/2012 PAT 9982179
which is a CON of 12/961,045 12/06/2010 PAT 8197706
which is a CON of 10/937,736 09/08/2004 ABN
which claims benefit of 60/501,049 09/08/2003

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 06/14/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/989,655**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

Preliminary Class

252

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/989,655	05/25/2018	Kenneth M. Ponder	821920-1033

CONFIRMATION NO. 5897

24504
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

FORMALITIES LETTER

OC000000100300607

Date Mailed: 06/18/2018

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **75** basic filing fee.
- $ **80** surcharge.
- $ **330** search fee.
- $ **380** examination fee.
- $(**0**) previous unapplied payment amount.
- $ **865** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's

oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Kenneth M. Ponder
  Steffan Thomas

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tnguyen/

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/989,655

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	7 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	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 found in the appropriate box in column 1.

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Thomas | Horstemeyer
INTELLECTUAL PROPERTY ATTORNEYS

August 20, 2018

[Matter No. 821920-1033]

TO: USPTO

FAX: 571-273-8300

TEL: 571-272-1000

FROM: Todd Deveau

FAX: 770-951-0933

TEL: 770-933-9500

EMAIL: todd.deveau@thomashorstemeyer.com

RE: U.S. Serial No. 15/989,655

Please find enclosed a Transmittal Form, Response to Notice to File Missing Parts, a copy of the Notice to File Missing Parts, Information Disclosure Statement, and Form 1449, for U.S. Serial No. 15/989,655.

Number of Pages (Including This Cover Sheet): - 10 - Page(s)

PLEASE ACKNOWLEDGE SAFE AND CLEAR RECEIPT OF ALL PAGES.

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PAGE 1/10 * RCVD AT 8/20/2018 10:07:48 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/46 * DNIS:2738300 * CSID:7709510933 * DURATION (mm-ss):03-02

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AUG 20 2018

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Kenneth M. Ponder	Group Art: 1761
Serial No.: 15/989,655	Docket No.: 821920-1033
Filed: May 25, 2018	Confirmation No.: 5897

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT**

RESPONSE TO NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In response to the Notice to File Missing Parts of Non-Provisional Application – Filing Date Granted, dated June 18, 2018, please find enclosed:

1. Transmittal Form;
2. A copy of the Notice to File Missing Parts of Nonprovisional Application;
3. Information Disclosure Statement;
4. Information Disclosure Statement Form 1449; and
5. Government fee in the amount of $865.00 to cover the additional surcharge fee for filing this Response to the Missing Parts Notice.

The Commissioner is authorized to charge Deposit Account 20-0778 for the required fees and for any deficiencies or credit any over payments.

Respectfully Submitted,

THOMAS | HORSTEMEYER, LLP

/Todd Deveau/

By: _____
Todd Deveau; Reg. No. 29,526

3200 Windy Hill Road, SE
Suite 1600E
Atlanta, GA 30339
(770) 933-9500

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/989,655	05/25/2018	Kenneth M. Ponder	821920-1033

CONFIRMATION NO. 5897

24504
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

FORMALITIES LETTER

OC000000100300607

Date Mailed: 06/18/2018

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ 75 basic filing fee.
- $ 80 surcharge.
- $ 330 search fee.
- $ 380 examination fee.
- $(0) previous unapplied payment amount.
- $ 865 TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's

oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Kenneth M. Ponder
  Stelfan Thomas

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

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/tnguyen/

PAGE 5/10 * RCVD AT 8/20/2018 10:07:48 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/46 * DNIS:2738300 * CSID:7709510933 * DURATION (mm-ss):03-02

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PTO/SB/21 (07-09)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 10

Application Number	15/989,655
Filing Date	May 25, 2018
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	TBD
Attorney Docket Number	821920-1033

ENCLOSURES (Check all that apply)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☑ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☑ Reply to Missing Parts/ Incomplete Application
  - ☑ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

The Commissioner is authorized to charge the required fee of $865.00 by this paper, and to credit any overpayment to Deposit Account No. 20-0778 in the name of Thomas | Horstemeyer, LLP.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Thomas | Horstemeyer, LLP		
Signature	/Todd Deveau/		
Printed name	Todd Deveau		
Date	August 20, 2018	Reg. No.	29,526

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Sheila Gray	Date	August 20, 2018

This collection of information is required by 37 CFR 1.5. 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 1.11 and1.14. This collection is estimated to 2 hours 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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AUG 2 0 2018

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Kenneth M. Ponder

Serial No.: **15/989,655**

Filed: **May 25, 2018**

Confirmation No.: **5897**

Group Art Unit: **1761**

Examiner: **TBD**

Docket No. **821920-1033**

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT**

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98. Listed on the accompanying form SB-08(a) are documents which may or may not be considered material to the examination of this application. At least some of these documents were made of record in a prior application filed June 11, 2012 and having Serial No. 13/493,491, now U.S. Patent No. 9,982,179, issued May 29, 2018 to which priority is claimed relative to the present application pursuant to 35 U.S.C. §120. Copies of these documents are not being provided pursuant to 37 C.F.R. § 1.98(d)(1) and (2), which provides:

> (d) A copy of any patent, publication, pending U.S. application or other information, as specified in paragraph (a) of this section, listed in an information disclosure statement is required to be provided, even if the patent, publication, pending U.S. application or other information was previously submitted to, or cited by, the Office in an earlier application, unless:
>
> (1) The application is properly identified in the information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. §120; and
>
> (2) The information disclosure statement submitted in the earlier application complies with a paragraphs (a) through (c) of this section.

The following rights are reserved by the Applicant: the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449 to indicate the documents have been considered.

Respectfully submitted,

THOMAS | HORSTEMEYER, LLP

/Todd Deveau/

By: _____

Todd Deveau; Reg. No. 29,526

3200 Windy Hill Road, SE
Suite 1600E
Atlanta, GA 30339
(770) 933-9500

PAGE 7/10 * RCVD AT 8/20/2018 10:07:48 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/46 * DNIS:2738300 * CSID:7709510933 * DURATION (mm-ss):03-02

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020, OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	15989655
Filing Date	2018-05-25
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	TBD
Attorney Docket Number	821920-1033

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6207071	B1	2001-03-27	Takigawa et al.	
	2	9982179	B2	2018-05-29	Ponder et al.	
	3	8197706	B2	2012-06-12	Ponder et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15989655
	Filing Date	2018-05-25
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	TBD
	Attorney Docket Number	821920-1033

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	List of refrigerants from Wikipedia, https://en.wikipedia.org/wiki/List_of_refrigerants, last modified on 19 January 2017, 13 pages.	☐
	2	Environmental Protection Agency (EPA), Air and Radiation Stratospheric Protection Division 6205J, "Substitute Refrigerants Under SNAP as of October 4, 2011", SNAP Information: http://www.epa.gov/ozone/snap, 18 pages.	☐
	3	Summary of Substitute Refrigerants Listed in SNAP Notice 25, 10 pages.	☐
	4	ANSI/ASHRAE Addenda a, b, c, e, f, k, n, o, p, q, r, s, and u to ANSI/ASHRAE Standard 34-2004, "Designation and Safety Classification of Refrigerants", 2006 Supplement, ISSN 1041-2336, 35 pages.	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

The PTO did not receive the following listed item(s) 4 HPL

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15989655
	Filing Date	2018-05-25
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	TBD
	Attorney Docket Number	821920-1033

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Todd Deveau	Registration Number	29526

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

PAGE 10/10 * RCVD AT 8/20/2018 10:07:48 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/45 * DNIS:2738300 * CSID:7709510933 * DURATION (mm-ss):03-02

Document code: WFEE

United States Patent and Trademark Office
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		01	FC : 4011	75.00	DA		
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/989,655	05/25/2018	1761	865	821920-1033	7	3

CONFIRMATION NO. 5897

UPDATED FILING RECEIPT

24504
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

OC000000102204934

Date Mailed: 09/11/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Kenneth M. Ponder, Cumming, GA;
Steffan Thomas, Buckhead, GA;

Applicant(s)

Kenneth M. Ponder, Cumming, GA;
Steffan Thomas, Buckhead, GA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/493,491 06/11/2012 PAT 9982179
which is a CON of 12/961,045 12/06/2010 PAT 8197706
which is a CON of 10/937,736 09/08/2004 ABN
which claims benefit of 60/501,049 09/08/2003

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 06/14/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/989,655**

Projected Publication Date: 12/20/2018

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

Preliminary Class

252

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/989,655

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	7 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	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 found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/989,655	05/25/2018	Kenneth M. Ponder	821920-1033

CONFIRMATION NO. 5897

24504
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

INFORMAL NOTICE

OC000000102204935

Date Mailed: 09/11/2018

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Kenneth M. Ponder
  Steffan Thomas

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/fasrat/

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15989655
Filing Date	2018-05-25
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	TBD
Attorney Docket Number	821920-1033

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050082510	A1	2005-04-21	Ponder et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	1377397	CN	A	2002-10-30	REFRIGERANT PRODUCTS LTD	(Copy of corresponding WO0123493 (A1))	☒
	2	H08319479	JP	A	1996-12-03	DAIKIN IND LTD	(Abstract only)	☒
	3	1167133	CN	A	1997-12-10	MATSUSHITA ELECTRIC IND CO LTD	(Copy of corresponding EP0811670 (A1))	☒

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

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Filing Date	2018-05-25
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	TBD
Attorney Docket Number	821920-1033

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Translation of Notification of First Office Action for Chinese Application No. 201610187613X dated July 5, 2018 (821920-2053), 8 pages.	X

If you wish to add additional non-patent literature document citation information please click the Add button [Add]

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15989655
	Filing Date	2018-05-25
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	TBD
	Attorney Docket Number	821920-1033

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2018-11-21
Name/Print	Todd Deveau	Registration Number	29526

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(54) Title: R 22 REPLACEMENT REFRIGERANT

(57) Abstract: A refrigerant composition comprising a hydrofluorocarbon component including 1,1,1,2-tetrafluoroethane (HCFC 134a), the composition further comprising an additive selected from a saturated hydrocarbon or mixture thereof boiling in the range -5 to +70 °C.

R 22 REPLACEMENT REFRIGERANT

This invention relates to a refrigerant particularly but not exclusively for air conditioning systems. The system relates especially to refrigerant compositions which have no adverse effect on the atmospheric ozone layer and to compositions which can be added to existing refrigerants which are compatible with lubricants commonly used in refrigeration and air conditioning systems. The invention also relates to a method of modifying refrigeration and air conditioning systems.

Chlorofluorocarbons (CFCs) eg CFC 11 and CFC 12 are stable, of low toxicity and non-flammable providing low hazard working conditions used in refrigeration and air conditioning systems. When released they permeate into the stratosphere and attack the ozone layer which protects the environment from damaging effects of ultraviolet rays. The Montreal Protocol, an International environmental agreement signed by over 160 countries, mandates the phase-out of CFCs according to an agreed timetable. This now includes hydrochlorofluorocarbons (HCFCs) which also have an adverse effect on the ozone layer.

R 22 is a chemical fluid and by far the largest HCFC refrigerant used globally in refrigeration and air conditioning equipment. R 22 has an Ozone Depletion Potential (ODP) of approximately 5% of CFC 11. After CFCs have been phased out, the chlorine content of R 22 will make it the largest ozone depleting substance in volumetric terms. R 22 is also the subject of a phase-out schedule under the Montreal Protocol. R 22 is prohibited from use in new equipment in some countries.

Any replacement for HCFC 22 must have no ability to deplete ozone. The compositions of the present invention do not include chlorine atoms and consequently they will have no deleterious effect on the ozone layer while providing a similar performance as a working fluid to R 22 in refrigeration apparatus.

Various terms have been used in patent literature to describe refrigerant mixtures. These may be defined as follows:

Zeotrope: A fluid mixture whose vapour and liquid compositions are different at a specified temperature.

Temperature glide: If a zeotropic liquid is distilled at constant pressure its boiling point will increase. The change in boiling point from the beginning of the distillation until the point when a liquid phase has just disappeared is called the temperature glide. A glide is also observed when the saturated vapour of a zeotrope is condensed at constant pressure.

Azeotrope: A fluid mixture of specified composition whose vapour and liquid compositions are the same at a specified temperature. Strictly speaking a fluid mixture which is an azeotrope under for example evaporator conditions, cannot also be an azeotrope under the condenser conditions. However the refrigeration literature may describe a mixture as azeotropic provided that it meets the above definition at some temperature within its working range.

Near-azeotropes: A blend which boils over a small temperature range, that has a small temperature glide.

Retrofit refrigerant mixture: A non-chlorine-containing mixture used to replace completely the original CFC or HCFC refrigerant.

Extender refrigerant mixture: A non-chlorine-containing mixture added during servicing to the HCFC refrigerant remaining in a unit, that is a top up refrigerant to make good any leakage.

Hermetic compressor: A compressor where the electric motor is in the same totally welded casing as the compressor. The motor is cooled by the refrigerant vapour returning to the compressor. The heat generated by the motor is removed through the condenser.

Semi-hermetic compressor: Similar to a hermetic compressor, the major difference being the casing has a bolted joint which can be opened to enable the motor and compressor to be serviced.

Open compressor: A compressor which is driven by an external motor via a drive shaft passing through the compressor casing. The motor heat is dissipated directly to the environment, not via the condenser. This results in a slightly more efficient performance than a hermetic compressor, but refrigerant leaks can occur at the shaft seal.

Percentages and proportions referred to in this specification are by weight unless indicated otherwise. Percentages and proportions are selected to total 100%. HFC and HCFC refrigerant compounds are referred to below by the letter R.

According to a first aspect of the present invention a refrigerant composition comprises 1,1,1,2-tetrafluoroethane (R134a), pentafluoro ethane (R 125) and an additive selected from a saturated hydrocarbon or mixture thereof boiling in the range –5 to +70°C; wherein the of weights of R 125 and R 134a are in the ranges:

R 125	50 - 80%
R 134a	50 - 20%

The compositions may be used as retrofit refrigerant mixtures. The composition may also be used as extenders as discussed below. The compositions may be used in semi-hermetic and hermetic systems.

The preferred weights of R125 to R 134a are in the ranges:

R 125	60 - 80%
R 134a	40 - 20%

A more preferred range is:

R 125	60 - 78%
R 134a	40 - 22%

A most preferred range is:

R 125	64 - 76%
R 134a	34 - 24%

These ranges are preferred for hermetic and semi-hermetic systems. The composition may also be used in an open system. The preferred weights in an open system are in the ranges:

R 125	57 - 78%
R 134a	43 - 22%.

A more preferred range is:

R 125	63 - 76%
R 134a	33 - 24%

The proportion of R 125 used in an open system may be up to 10%, preferably 4 to 5 % higher than in a hermetic or semi-hermetic system.

In a first aspect of this invention no other refrigerant may be included in the mixture. In a second aspect, suitable for use as an R 22 extender, an additional refrigerant R 32 may be added.

Preferred hydrocarbons additives are selected from the group consisting of: 2-methylpropane, 2,2-dimethylpropane, butane, pentane, 2-methylbutane, cyclopentane, hexane, 2-methylpentane, 3-methylpentane, 2,2-dimethylbutane and methylcyclopentane. The hydrocarbon additive preferably has a boiling point in the range 20 to 40°C. Use of n-pentane, cyclopentane, iso-pentane and mixtures thereof is preferred. Use of n-pentane, isopentane or mixtures thereof is especially preferred. Commercially available saturated hydrocarbon mixtures are available from cyclopentane commercial grade from Phillips Petroleum International NV, Norpar ^{P}5 S n-pentane from Exxon Chemical and iso-pentane Q1111 from Shell Chemicals.

Relative proportions of the pentane and butane components may be selected to give a total of 0.2 to 5% of the compositions, preferably 2 to 4%, more preferably 3 to 4%. An amount of pentane, preferably isopentane of 0.2 to 2% may be used together with a corresponding amount of 4.8 to 3% of butane in a composition containing a total of 5% hydrocarbon. In compositions with less than 5% hydrocarbon, for example 1% or 4%, relatively larger ratios of butane : pentane may be employed to minimise hydrocarbon build-up on leakage. Flammability risks are therefore reduced.

According to a second aspect of the present invention a refrigerant extender mixture comprises a composition in accordance with the first aspect of this invention.

According to a third aspect of this invention a refrigerant composition comprises a composition in accordance with the first aspect of this invention together with R 22. This invention also provides a method of modifying a refrigerator or air conditioning system incorporating R 22 as refrigerant, the method comprising the step of adding a composition in accordance with the second aspect of this invention to the refrigerant of the system.

Positive displacement compressors, that is reciprocating or rotary compressors, used in refrigeration systems suck in small amounts of lubricant from the crank case which are ejected with the refrigerant vapour through the exhaust valves. In order to maintain compressor lubrication this oil must be forced around the circuit by the refrigerant stream and returned to the crank case. CFC and HCFC refrigerants are miscible with hydrocarbon oils and hence carry the oils around the circuit. However HFC refrigerants and hydrocarbon lubricants have low mutual solubilities so effective oil return may not occur. The problem is particularly acute in evaporators where low temperatures can increase the

viscosities of oils sufficiently to prevent them being carried along the tube walls. With CFCs and HCFCs enough refrigerant remains in the oil to reduce the viscosities to enable oil return to occur.

When using HFCs with hydrocarbon lubricants oil return can be facilitated by introducing into the system a hydrocarbon fluid having the following properties:

(a) sufficient solubility in the lubricant at the evaporator temperature to reduce its viscosity; and

(b) sufficient volatility to allow distillation from the hot lubricant in the compressor crank case.

Hydrocarbons fulfil these requirements.

Refrigerant compositions in accordance with this invention confer several advantages. R 125 has fire suppressing characteristics. The presence of R125 suppresses the flammability of the refrigerant mixture. The higher HFC content enables more n-pentane to be added to the mixture thereby improving the solubility properties of the mixture with traditional lubricants, for example mineral and alkyl benzene oils.

The present invention may confer a number of benefits in comparison to R 22 including zero ozone depletion, lower discharge temperature, and higher capacity.

The present invention may confer a number of benefits in comparison to the HFC replacement R407C including superior hydrocarbon oil return, better motor cooling in hermetic compressors, lower discharge temperature and lower discharge pressure.

The invention is further described by means of examples but not in any limitative sense.

EXAMPLE 1

The performances of five R125/R134a/pentane compositions were evaluated using standard refrigeration cycle analysis techniques in order to assess their suitability as retrofit replacements for R22 in hermetic or semi-hermetic systems. The operating conditions, used for the analyses were chosen as being typical of those conditions that are found in air conditioning systems. Since the blends were zeotropes the midpoints of their temperature glides in the evaporator and condenser were chosen to define the temperature

limits of the cycle. The same temperatures were also used to generate performance data for R22.

The pentane was present at 4% by weight based on the total weight of the R125/R134a blend. To simplify the calculation this small amount of pentane was omitted.

The following refrigerant compositions were subjected to cycle analysis:

1. A composition comprising 44% R125: 56% R134a
2. A composition comprising 56% R125: 44% R134a
3. A composition comprising 64% R125: 36% R134a
4. A composition comprising 76% R125: 24% R134a
5. A composition comprising 80% R125: 20% R134a

The following cycle conditions were used in the analysis:

COOLING DUTY DELIVERED	10 kW
EVAPORATOR	
Midpoint fluid evaporation temperature	7.0 °C
Superheating	5.0 °C
Suction line pressure drop (in saturated temperature)	1.5 °C
CONDENSER	
Midpoint fluid condensing temperature	45.0 °C
Subcooling	5.0 °
Exhaust line pressure drop (in saturated temperature)	1.5 °C
LIQUID LINE/SUCTION LINE HEAT EXCHANGER	
Efficient	0.3

COMPRESSOR	
Electric motor efficiency	0.85
Compressor isentropic efficiency	0.7
Compressor volumetric efficiency	0.82
PARASITIC POWER	
Indoor fan	0.3 kW
Outdoor fan	0.4 kW
Controls	0.1 kW

The results of analysing the performances in an air-conditioning unit using these operating conditions are shown in Table 1. For comparison the performance of R22 is also shown.

All compositions have lower exhaust temperatures than R22 and are therefore superior on this account. However composition 5 is not preferred because the exhaust pressure is more than 2 bar above that of R22. Composition 1 is unacceptable because the refrigerant capacity is less than 90% of that of R22. The overall performances of compositions 2, 3 and 4 meet the criteria set out above and therefore satisfy the requirements of this invention.

EXAMPLE 2

The performances of five R125/R134a/pentane compositions were evaluated using standard refrigeration cycle analysis techniques in order to assess their suitability as retrofit replacements for R22 in open systems. The operating conditions, used for the analyses were chosen as being typical of those conditions that are found in air-conditioning systems. Since the blends were zeotropes the midpoints of their temperature glides in the evaporator and condenser were chosen to define the temperature limits of the cycle. The same temperatures were also used to generate performance data for R22.

The pentane was present at 4% by weight based on the total weight of the R125/R134a blend. To simplify the calculation this small amount of pentane was omitted.

The following refrigerant compositions were subjected to cycle analysis:

1. A composition comprising 44% R125: 56% R134a
2. A composition comprising 56% R125: 44% R134a
3. A composition comprising 64% R125: 36% R134a
4. A composition comprising 76% R125: 24% R134a
5. A composition comprising 80% R125: 20% R134a

The following cycle conditions were used in the analysis:

COOLING DUTY	10 kW
EVAPORATOR	
Midpoint fluid evaporation temperature	7.0 °C
Superheating	5.0 °C
Suction line pressure drop (in saturated temperature)	1.5 °C
CONDENSER	
Midpoint fluid condensing temperature	45.0 °C
Subcooling	5.0 °C
Exhaust line pressure drop (in saturated temperature)	1.5 °C
LIQUID LINE/SUCTION LINE HEAT EXCHANGER	
Efficiency	0.3
COMPRESSOR	
Electric motor efficiency	0.85
Compressor isentropic efficiency	0.7
Compressor volumetric efficiency	0.82
PARASITIC POWER	
Indoor fan	0.3 kW
Outdoor fan	0.4 kW
Controls	0.1 kW

The results of analysing the performances in an air-conditioning unit using these operating conditions are shown in Table 2. For comparison the performance of R22 is also shown.

All compositions have lower exhaust temperatures than R22 and are therefore superior on this account. However composition 5 is unacceptable because its exhaust pressure is more than 2 bar above that of R22. Compositions 1 and 2 are unacceptable because their refrigerant capacities are less than 90% of that of R22. The overall performances of compositions 3 and 4 meet the criteria set out above and therefore satisfy the requirements of this invention.

EXAMPLE 3

The performances of five R125/R134a/pentane compositions were evaluated using standard refrigeration cycle analysis techniques the in order to assess their suitability as retrofit replacements for R22 in hermetic or semi-hermetic systems not fitted with a liquid line/suction line heat exchanger. The operating conditions, used for the analyses were chosen as being typical of those conditions that are found in air conditioning systems. Since the blends were zeotropes the midpoints of their temperature glides in the evaporator and condenser were chosen to define the temperature limits of the cycle. The same temperatures were also used to generate performance data for R22.

The pentane was present at 4% by weight based on the total weight of the R125/R134a blend. To simplify the calculation this small amount of pentane was omitted.

The following refrigerant compositions were subjected to cycle analysis:

1. A composition comprising 44% R125: 56% R134a
2. A composition comprising 56% R125: 44% R134a
3. A composition comprising 64% R125: 36% R134a
4. A composition comprising 76% R125: 24% R134a
5. A composition comprising 80% R125: 20% R134a

The following cycle conditions were used in the analysis:

COOLING DUTY	10 kW
EVAPORATOR	
Midpoint fluid evaporation temperature	7.0 °C
Superheating	5.0 °C
Suction line pressure drop (in saturated temperate	1.5 °C
CONDENSER	
Midpoint fluid condensing temperature	45.0 °C
Subcooling	5.0 °C
Exhaust line pressure drop (in saturated temperature)	1.5 °C
COMPRESSOR	
Electric motor efficiency	0.85
Compressor isentropic efficiency	0.7
Compressor volumetric efficiency	0.82
PARASITIC POWER	
Indoor fan	0.47 kW
Outdoor fan	0.26 kW
Controls	0.1 kW

The results from analysing the performances in an air-conditioning unit using these operating conditions are shown in Table 3. For comparison the performance of R22 is also shown.

All compositions have lower exhaust temperatures than R22 and are therefore superior on this account. However composition 5 is unacceptable because its exhaust pressure is more than 2 bar above that of R22. Compositions 1 and 2 are unacceptable because their refrigerant capacities are less than 90% of that of R22. The overall performances of compositions 3 and 4 meet the criteria set out above and therefore satisfy the requirements of this invention.