

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 821920-1034																														
Application Number 16/920,905	Filed July 6, 2020																															
For REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT																																
Art Unit 1761	Examiner Hardee, John R.																															
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: center;"><u>Fee</u></th> <th style="text-align: center;"><u>Small Entity Fee</u></th> <th style="text-align: center;"><u>Micro Entity Fee</u></th> <th style="text-align: center;"></th> </tr> </thead> <tbody> <tr> <td>☐ One month (37 CFR 1.17(a)(1))</td> <td style="text-align: center;">\$220</td> <td style="text-align: center;">\$110</td> <td style="text-align: center;">\$55</td> <td style="text-align: center;">\$ _____</td> </tr> <tr> <td>☐ Two months (37 CFR 1.17(a)(2))</td> <td style="text-align: center;">\$640</td> <td style="text-align: center;">\$320</td> <td style="text-align: center;">\$160</td> <td style="text-align: center;">\$ _____</td> </tr> <tr> <td>☒ Three months (37 CFR 1.17(a)(3))</td> <td style="text-align: center;">\$1,480</td> <td style="text-align: center;">\$740</td> <td style="text-align: center;">\$370</td> <td style="text-align: center;">\$ 740</td> </tr> <tr> <td>☐ Four months (37 CFR 1.17(a)(4))</td> <td style="text-align: center;">\$2,320</td> <td style="text-align: center;">\$1,160</td> <td style="text-align: center;">\$580</td> <td style="text-align: center;">\$ _____</td> </tr> <tr> <td>☐ Five months (37 CFR 1.17(a)(5))</td> <td style="text-align: center;">\$3,160</td> <td style="text-align: center;">\$1,580</td> <td style="text-align: center;">\$790</td> <td style="text-align: center;">\$ _____</td> </tr> </tbody> </table> ☒ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously. ☐ A check in the amount of the fee is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>20-0778</u>. ☒ Payment made via EFS-Web. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>29,526</u>. ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <u>/Todd Deveau/</u> <u>December 6, 2021</u> Signature Date <u>Todd Deveau</u> <u>770-933-9500</u> Typed or printed name Telephone Number NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☐ One month (37 CFR 1.17(a)(1))	\$220	\$110	\$55	\$ _____	☐ Two months (37 CFR 1.17(a)(2))	\$640	\$320	\$160	\$ _____	☒ Three months (37 CFR 1.17(a)(3))	\$1,480	\$740	\$370	\$ 740	☐ Four months (37 CFR 1.17(a)(4))	\$2,320	\$1,160	\$580	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____
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☐ * Total of _____ forms are submitted.
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This collection of information is required by 37 CFR 1.136(a). 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 and 1.14. This collection is estimated to take 6 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

B0001

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.

B0002



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 NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/920,905	05/31/2022	11345840	821920-1034	6800

24504 7590 05/11/2022
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

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 0 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 Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

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

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

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

R421A LLC, Alpharetta, GA

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.

Electronic Patent Application Fee Transmittal				
Application Number:		16920905		
Filing Date:		06-Jul-2020		
Title of Invention:		REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
First Named Inventor/Applicant Name:		Kenneth M. Ponder		
Filer:		Todd Deveau./Sheila Gray		
Attorney Docket Number:		821920-1034		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
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	2501	1	600	600

B0004

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt

EFS ID:	45581754
Application Number:	16920905
International Application Number:	
Confirmation Number:	6800
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:	821920-1034
Receipt Date:	28-APR-2022
Filing Date:	06-JUL-2020
Time Stamp:	08:07:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	E20224R908080765
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

B0006

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)	821920-1034__Issue_Fee.pdf	97387	no	1
			cd63cb9a0c886c5b622c6cd147981e9670db96b4		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38077	no	2
			0061c8583ffa0de81b58edc740e5dd5cbfaeed6f		
Warnings:					
Information:					
Total Files Size (in bytes):			135464		
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.					

B0007

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)

24504 7590 01/31/2022
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

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.
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034	6800

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	05/02/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
HARDEE, JOHN R	1761	252-067000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 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 Thomas|Horstemeyer, 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

R421A LLC

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

Alpharetta, GA

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. 20-0778

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 /Todd Deveau/

Date April 28, 2022

Typed or printed name Todd Deveau

Registration No. 29,526



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
16/920,905	07/06/2020	1761	905	821920-1034	7	3

CONFIRMATION NO. 6800

CORRECTED FILING RECEIPT



0000000131551105

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

Date Mailed: 02/03/2022

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

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

Applicant(s)

R421A LLC, Alpharetta, GA

Power of Attorney: The patent practitioners associated with Customer Number 24504

Domestic Priority data as claimed by applicant

This application is a CON of 15/989,655 05/25/2018 PAT 10703949
which 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: 07/15/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/920,905**

Projected Publication Date: Not Applicable

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

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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 Assets Control, 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).

SelectUSA

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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
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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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.R.H/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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

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

EXAMINER SIGNATURE

Examiner Signature	/JOHN R HARDEE/ (01/05/2022)	Date Considered	01/05/2022
--------------------	------------------------------	-----------------	------------

*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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.R.H/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

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)	2021-12-06
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.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

B0016



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

NOTICE OF ALLOWANCE AND FEE(S) DUE

24504 7590 01/31/2022
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

EXAMINER

HARDEE, JOHN R

ART UNIT

PAPER NUMBER

1761

DATE MAILED: 01/31/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034	6800

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	05/02/2022

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. 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.

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)

24504 7590 01/31/2022
THOMAS | HORSTEMEYER, LLP
3200 WINDY HILL ROAD, SE
SUITE 1600E
ATLANTA, GA 30339

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.
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034	6800

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	05/02/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
HARDEE, JOHN R	1761	252-067000

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/AIA/122 or PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 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, 1 _____
- (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. 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

(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 _____

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. _____

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 _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034	6800
24504 7590 01/31/2022 THOMAS HORSTEMEYER, LLP 3200 WINDY HILL ROAD, SE SUITE 1600E ATLANTA, GA 30339			EXAMINER HARDEE, JOHN R	
			ART UNIT 1761	PAPER NUMBER
DATE MAILED: 01/31/2022				

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.
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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.

B0020

Notice of Allowability	Application No. 16/920,905	Applicant(s) Ponder et al.	
	Examiner JOHN R HARDEE	Art Unit 1761	AIA (FITF) Status No

-- 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 applicant's TD and declaration.
☐ 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 1-12. 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 <u>12062021</u> . 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 _____.
---	---

/JOHN R HARDEE/
Primary Examiner, Art Unit 1761

<i>Search Notes</i> 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

CPC - Searched*		
Symbol	Date	Examiner
C09K5/045; 2205/22	06/01/2021	JRH
Above to date.	01/05/2022	JRH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* 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
EAST text and CPC searches. Reviewed prosecution of parents.	06/01/2021	JRH
IPR2020-01660 Reviewed Inter Partes Review of US Patent No. 9,982,179.	07/12/2021	JRH
PGR2020-0008 Reviewed Post Grant Review of US Patent No. 10,703,949.	07/13/2021	JRH
IPR2021-00199 Reviewed Inter Partes Review of US Patent No. 8,197,706.	07/14/2021	JRH
Above to date.	01/05/2022	JRH

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<i>Search Notes</i> 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
C09K	5/045; 2205/22	01/05/2022	JRH

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	25,673	"1" adj "1" adj "1" adj "2" adj tetrafluoroethane or "1,1,1,2-tetrafluoroethane" or (r hfc) adj 134a r134a hfc134a	US-PGPUB; USPAT	OR	OFF	2022/01/05 17:12
L2	9,835	(r hfc) adj "125" r125 hfc125 pentafluoroethane	US-PGPUB; USPAT	OR	OFF	2022/01/05 17:14
L3	2,280	L2 near 1	US-PGPUB; USPAT	OR	OFF	2022/01/05 17:14
L4	869	3 AND (C09K5/045 OR C09K2205/22).CPC.)	US-PGPUB; USPAT	OR	OFF	2022/01/05 17:14

1/5/2022 5:23:16 PM

C:\Users\jhardee\Documents\EAST\Workspaces\920905.wsp

B0024

Issue Classification 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

CPC						
Symbol					Type	Version
C09K	/	5	/	045	F	2013-01-01
C10M	/	171	/	008	I	2013-01-01
C09K	/	2205	/	22	A	2013-01-01
C09K	/	2205	/	43	A	2013-01-01
C10M	/	2203	/	1065	A	2013-01-01
C10M	/	2223	/	041	A	2013-01-01
F25B	/	2400	/	18	A	2013-01-01
C10N	/	2020	/	101	A	2020-05-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	12	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761	05 January 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20220105

Issue Classification 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

INTERNATIONAL CLASSIFICATION			
CLAIMED			
C09K		5	04
NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	12	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761 (Primary Examiner)	05 January 2022 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

☐ 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
1	1	12	10												
5	2	4	11												
9	3	8	12												
2	4														
3	5														
6	6														
7	7														
10	8														
11	9														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 12	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761 (Primary Examiner) _____ (Date) _____		05 January 2022 O.G. Print Claim(s) 1	O.G. Print Figure 1

Bibliographic Data

Application No: 16/920,905

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:

/JOHN R HARDEE/

Examiner's Signature

Initials

Title:

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT
OF R22 REFRIGERANT

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
07/06/2020	252	1761	821920-1034
RULE			

APPLICANTS

R421A LLC, Alpharetta, GA,

INVENTORS

Kenneth M. Ponder, Cumming, GA, UNITED STATES

Steffan Thomas, Buckhead, GA, UNITED STATES

CONTINUING DATA

This application is a CON of 15989655 05/25/2018 PAT 10703949

15989655 is a CON of 13493491 06/11/2012 PAT 9982179

13493491 is a CON of 12961045 12/06/2010 PAT 8197706

12961045 is a CON of 10937736 09/08/2004ABN

10937736 has PRO of 60501049 09/08/2003

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/15/2020

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

THOMAS | HORSTEMEYER, LLP

3200 WINDY HILL ROAD, SE

SUITE 1600E

ATLANTA, GA 30339

UNITED STATES

FILING FEE RECEIVED

B0028

\$75

B0029

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated hereafter wherein the changes are shown by strikethrough or double brackets for deleted matter and underlining for added matter.

1. (Currently Amended) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a ~~refrigerant~~ composition designed to achieve a phase change over a range of working temperatures and pressures of the apparatus, the ~~refrigerant~~ composition ~~comprising a combination of refrigerant gases, said refrigerant gases~~ consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein ~~in the substitute refrigerant~~ said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

2. (Currently Amended) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute ~~refrigerant~~ composition designed to be a substitute for the chlorodifluoromethane refrigerant and designed to achieve a phase change over a range of working temperatures and pressures of the apparatus, the substitute composition ~~and comprising a combination of refrigerant gases, the refrigerant gases~~ consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein ~~in the substitute refrigerant~~ said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane, and

(2) supplying the substitute ~~refrigerant~~ composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus.

3. (Currently Amended) A ~~refrigerant~~ composition designed to be used as a substitute for R-22 chlorodifluoromethane refrigerant, the composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein in the ~~refrigerant~~ composition said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane, and said tetrafluoroethane totaling 100% and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

4. (Original) In the apparatus of claim 1, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

5. (Currently Amended) In the apparatus of claim 1, wherein the ~~refrigerant~~ composition is blended with ~~includes~~ an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof, or blended with a lubricant wherein the lubricant is present up to 20% by weight of the composition on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, or both.

6. (Original) The method according to claim 2, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

7. (Currently Amended) The method according to claim 2, wherein the substitute ~~refrigerant~~ composition is blended with ~~includes~~ an additive selected from the group consisting of an acrylic polymer, a corrosion ~~inhibitor inhibit~~, a surfactant, a foaming agent, and mixtures thereof, or blended with a lubricant wherein the lubricant is present up to 20% by weight of the composition on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, or both.

8. (New) The composition according to claim 3, wherein the composition is designed for use in an apparatus selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment, the composition designed to undergo a phase change over a range of working temperatures and pressures of the apparatus.

9. (New) The composition according to claim 3, wherein the composition is blended with an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof, or blended with a lubricant wherein the lubricant is present up to 20% by weight of the composition on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, or both.

10. (New) The composition according to claim 9, wherein the composition is designed for use in an apparatus selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment, the composition designed to undergo a phase change over a range of working temperatures and pressures of the apparatus.

11. (New) In the apparatus of claim 5, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

12. (New) The method according to claim 7, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:	Confirmation No.: 6800
Kenneth M. Ponder	Group Art Unit: 1761
Serial No.: 16/920,905	Examiner: Hardee, John R.
Filed: July 6, 2020	Docket No. 821920-1034
For:	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

RESPONSE TO OFFICE ACTION

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

Sir:

The Non-Final Office Action from Examiner Hardee mailed on June 4, 2021 (Paper No./Mail Date 20210601), has been received and reviewed. Applicants provide the following remarks in response.

AUTHORIZATION TO DEBIT ACCOUNT

A three (3) month extension of time is submitted herewith. It is not believed that any additional extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to deposit account no. 20-0778.

B0033

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce	
Electronic Petition Request	TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT		
Application Number	16920905		
Filing Date	06-Jul-2020		
First Named Inventor	Kenneth Ponder		
Attorney Docket Number	821920-1034		
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action ☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.			
Owner		Percent Interest	
R421A LLC		100%	
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 10703949 9982179 8197706 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns. In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later: - expires for failure to pay a maintenance fee; - is held unenforceable; - is found invalid by a court of competent jurisdiction; - is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; - has all claims canceled by a reexamination certificate; - is reissued; or - is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.			

B0034

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.
- ☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

- ☒ Small Entity
- ☐ Micro Entity
- ☐ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

- ☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 29526

- ☐ A sole inventor
- ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application
- ☐ A joint inventor; all of whom are signing this request

Signature	/Todd Deveau/
Name	/Todd Deveau/

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

B0035

Electronic Acknowledgement Receipt

EFS ID:	44441552
Application Number:	16920905
International Application Number:	
Confirmation Number:	6800
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:	821920-1034
Receipt Date:	06-DEC-2021
Filing Date:	06-JUL-2020
Time Stamp:	14:23:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 870
RAM confirmation Number	E2021B6E24044651
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

B0036

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	821920-1034__3-mo_EOT__small_.pdf	188852	no	2
			231afa7d91e46dec8f65b8ce20037146d6401a5		
Warnings:					
Information:					
2	Amendment/Req. Reconsideration-After Non-Final Reject	821920-1034__Response_to_Office_Action_dated_6-4-21.pdf	242028	no	11
			9fbc667829598677445f9b1da82171b1d4ace8d		
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	IDS_Form_1449__submit_w-Response_.pdf	614812	no	4
			1b56e4bd2dcfee93585e5cbbc1e18a50c520a58e		
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Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
4	Non Patent Literature	IDS_references.pdf	5909706	no	76
			7c6a671c7df6a6e60fb485a12e2704ed2249ed10		
Warnings:					
Information:					
5	Affidavit/Dec/Exhibit after Notice of Appeal	Ponder-Affidavit.pdf	1504486	no	11
			6701d1a9d02370ad4d01c658e934810f56f031ee		
Warnings:					
Information:					

B0037

6	Fee Worksheet (SB06)	fee-info.pdf	40750	no	2
			e566daa31ad728ee4425f5f2f97dd85a8111 c4df		
Warnings:					
Information:					
Total Files Size (in bytes):				8500634	
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.					

B0038

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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

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

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	16920905
	Filing Date	2020-07-06
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1034

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

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)	2021-12-06
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.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

B0042

Electronic Acknowledgement Receipt

EFS ID:	44440994
Application Number:	16920905
International Application Number:	
Confirmation Number:	6800
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:	821920-1034
Receipt Date:	06-DEC-2021
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B0043

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	41688	no	2
			2bddd48685dee195e8c086b24a08a82ab50ae6b5		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38044	no	2
			8559421bfe78c036024a9b060283ecd5e200d7d8		
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REMARKS

The Office Action presents two issues, namely: 1) claims 1-7 stand rejected under 35 U.S.C. §103(a) as obvious in view of US 6,207,071 (Takigawa et al.); and 2) a double patenting rejection in view of claims 1-23 of U.S. Patent No. 8,197,706, claims 1-37 of U.S. Patent No. 9,982,179, and claims 1-19 of U.S. Patent No. 10,703,949.

In response, claims 1-3, 5 and 7 are amended herein, and new claims 8-12 presented. No new matter is believed to be presented by these amendments.

Applicants note the kind statement in Section 8 at page 6 of the Office Action that: “Submission of the declarations similar to those which were submitted in the parent case would further prosecution.”

Applicants respectfully submit this information herein and in response to the Office Action.

1) Claim Rejections – 35 USC § 103

First, Applicants respectfully submit that the declarations and supporting information demonstrate:

- 1) the unexpected benefits of the composition of the present claims;
- 2) that unexpectedly adjusting the present composition blend so that the composition blend more closely matches that of R-22 for which it is to serve as a substitute would negatively impact the GWP of the Applicants’ composition blend;
- 3) there is no teaching or suggestion in *Takigawa* determining a composition blend that can serve as a substitute for HCFC-22 (R-22);

- 4) that, while the Office asserts that *Takigawa* reads on refrigerant compositions consisting of 40-60% R134a and 60-40% R125 and infers that *Takigawa* provides motivation to experiment within “the relatively narrow range of 40:60 to 60:40 pentafluoroethane to tetrafluoroethane, the Office fails to identify any purpose or objective allegedly taught by *Takigawa* for such blind experimentation;
- 5) that a range of 40:60 to 60:40 is not at all a “relatively narrow range in the refrigerant field”; and
- 6) that various composition blends within the 40:60 to 60:40 range are not suitable as substitutes for various types of refrigerants including, in particular, HCFC-22.

Thus, Applicants respectfully request reconsideration based upon the amendments and remarks presented herein.

The Second Declaration of Kenneth M. Ponder (dated March 28, 2017 submitted in connection with Applicants’ application no. 13/493,491 and resubmitted herein) demonstrates the unexpected benefits provided by the above referenced composition of the present claims. They show that the composition blend recited in the present claims more closely approximates characteristics of HCFC-22 than the 60/40 composition asserted as the closest prior art, particularly within the temperature range most needed for a substitute for HCFC-22.

Additionally, the evidence shows that unexpectedly adjusting the composition blend so that the composition blend more closely approximates that of HCFC-22 negatively impacts the Global Warming Potential (GWP) of the blend. Moreover, the present composition blend while having been determined by the trade association as an acceptable substitute for HCFC-22, it is not an acceptable substitute for refrigerant R-11.

Applicants respectfully submit that when a rejection is made for obviousness, there must be some teaching or suggestion found in the prior art to modify the teachings of the prior art to meet all of the elements of a claim. The Office Action, in effect, concedes that *Takigawa* does not provide any such teaching or suggestion for finding or determining a substitute for R-22 to reach the composition of the present claims.

Further, Applicants note that *Takigawa* fails to provide any teaching for identifying or determining a substitute for R-22.

Instead, the Office Action at page 4 asserts: “It would have been obvious at the time the invention was made to make such a composition, because this reference teaches that all of the ingredients recited by appellants are suitable for inclusion in a refrigerant composition. The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.”

This amounts, in effect, to an assertion that *Takigawa* provides “motivation to experiment”. However, the Office Action fails to comment or explain where the motivation comes from. Stated another way, what purpose can the Office point to in *Takigawa* for such “motivation to experiment”? Applicants submit that experimentation for experimentation sake - without any purpose or objective - fails to meet the evidence required to support a rejection for obviousness.

Further, the Action appears to suggest that *Takigawa* provides motivation to experiment within the range of 40:60 to 60:40 mixtures of R-125 and R-132A. Applicants show, however, that the trade does not consider a range of from 40:60 to 60:40 to be a “relatively narrow range”. In fact, the trade association, ASHRAE, considers this is unacceptably large range when refrigerants are defined by percentages of, for example, $\pm 1\%$ and not an overall range of 20%. This is shown, for example, by NPL4 resubmitted herewith, namely the ANSI/ASHRAE Addenda

a, b, c, e, f, k, n, o, p, q, r, s, and u to ANSI/ASHRAE Standard 34-2004, in which it can be seen the industry standard composition deviation is typically plus or minus 1%, and for Applicants' R421A having 58% R125 and 42% R134a in particular is plus or minus 1% (page 13).

Moreover, the Office Action seems to rely on a blind "obvious to try" standard since it does not point to anywhere in *Takigawa* where there is any suggestion as what one may be trying to achieve by such "obvious to try" experimentation. Without evidence of motivation for the objective of finding a substitute for R-22, *Takigawa* cannot serve as a basis for "obvious to try" where the objective is unknown.

Stated another way, the Office Action has not stated what result-effective parameters are to be considered or involved in carrying out the blind "obvious to try" experimentation over a variation of 20% other than to find out if all compositions over the range of 20% would behave identically. This, however, would not lead one to determine an acceptable substitute for HCFC-22. Instead, such experimentation would only determine whether one composition within the 20% range behaves identically to another composition within the 20% range. However, not all refrigerant blends within the 20% range would be considered to behave identically. Then what is the purpose for the alleged "obvious to try" experimentation? Without the hindsight guidance of Applicants' specification why would one conduct such experimentation?

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as "a routine experimentation". *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Only result-effective variables can be optimized. The Office fails to address this point. It fails to describe what features are result-effective variables in finding an acceptable substitute for HCFC-22 as they are used in the claimed subject matter. Specifically,

the Office fails to state what the recognized result that is to be achieved. In addition, the Office does not provide any support for the assertion that these features are routinely optimized as is used in the claims. Rather, the Office seems to make a conclusory assertion that the amounts can be optimized without a reasonable argument to support its position. Thus, the Office has not met its prima facie case of obviousness. Accordingly, Applicants respectfully submit the claims are novel and non-obvious over *Takigawa*.

More particularly, Applicants note the Second Declaration of Kenneth Ponder re-presented herein shows just this.

In Honeywell International Inc. v. Mexichem Amanco Holding S.A.D.E.C.V. et al., Appeal No. 2016-1996, August 1, 2017) the Federal Circuit Court of Appeals reviewed and rejected arguments presented by the U.S. Patent and Trademark Office, Patent Trial and Appeal Board, in which the Board found on reexamination claims to a refrigerant namely, 1,1,1,2-tetrafluoropropene (HFO-1234YF) unpatentable on grounds that are basically the same as those presented in the present Office Action. In Honeywell, the Federal Circuit found that the Board committed legal error by improperly relying on inherency to find obviousness of the claims. Additionally, the Federal Circuit found error by the Board, while noting the overall unpredictability in the refrigerant art, the Board asserted that “routine testing” would have led to the discovery of the claimed refrigerant. The Federal Circuit rejected the Board’s assertion concerning “routine testing” and reversed the rejection of the claims. The Board noted:

“A further point regarding so-called “routine testing” is that § 103 provides that “[p]atentability shall not be negated by the manner in which the invention was made.” 35 U.S.C. § 103 (2012). That provision was enacted to ensure that routine experimentation does not necessarily preclude patentability. *See, e.g., In re Saether*, 492 F.2d 849, 854 (C.C.P.A. 1974) (“In his argument that ‘mere routine experimentation’ was involved in determining the optimized set of characteristics, the solicitor overlooks the last sentence of 35 U.S.C. §

103...Here we are concerned with the question of whether the claimed invention would have been obvious at the time it was made to a person having ordinary skill in the art-not how it was achieved.” (internal citation omitted)); *In re Fay*, 347 F.2d 597, 602 (C.C.P.A. 1965) (“[W]e do not agree that ‘routine experimentation’ negatives patentability. The last sentence of section 103 states that ‘patentability shall not be negated by the manner in which the invention was made.’”).

Thus, as shown herein, the reliance on the statement: “The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified” in *Takigawa* is not correct. As shown, Applicants’ recited composition does not have properties similar to those compositions which according to the Office would also be exemplified in *Takigawa*.

Accordingly, Applicants respectfully submit claims 1-7 are not obvious in view of *Takigawa* and are patentable there over.

2) Double Patenting Rejection

Second, responding to the double patenting rejection, Applicants submit herewith an eTerminal Disclaimer to traverse this rejection.

3) New claims 8-12

New claims 8-12 are submitted herewith. These claims are dependent upon, either directly or indirectly, upon claims 1, 5 and 7 and are believed allowable for the same reasons as those claims.

CONCLUSION

In light of the foregoing remarks and for at least the reasons set forth above, Applicants respectfully submit that the remaining rejection has been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

THOMAS | HORSTEMEYER, LLP

By: /Todd Deveau/
Todd Deveau
Registration No. 29,526

THOMAS | HORSTEMEYER, L.L.P.
Customer Number 24504

Electronic Patent Application Fee Transmittal				
Application Number:		16920905		
Filing Date:		06-Jul-2020		
Title of Invention:		REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
First Named Inventor/Applicant Name:		Kenneth M. Ponder		
Filer:		Todd Deveau./Sheila Gray		
Attorney Docket Number:		821920-1034		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				170

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Confirmation No.: 1039

Ponder et al.

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22
REFRIGERANT

SECOND DECLARATION OF KENNETH M. PONDER

I, Kenneth M. Ponder, hereby declare as follows:

1. I am the President of RMS of Georgia, LLC and am a co-inventor named on the above application.

2. RMS of Georgia, LLC sells and distributes refrigerants and reclaims most refrigerants.

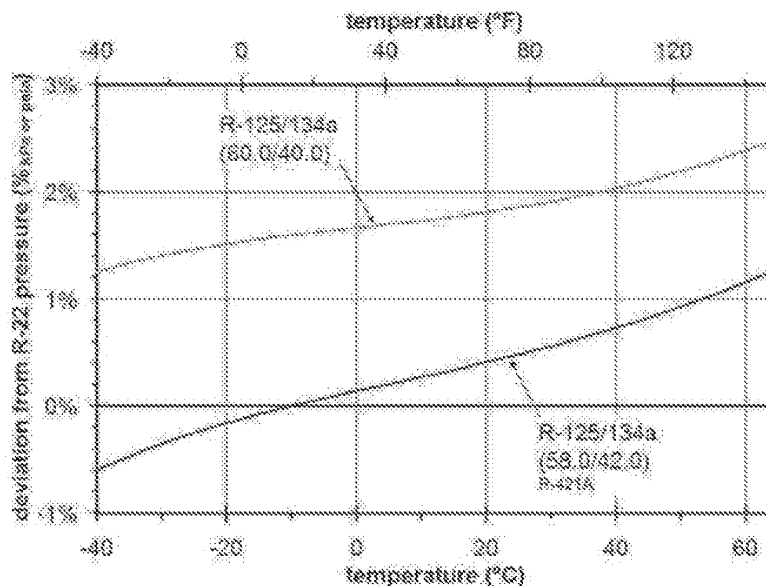
3. Among the refrigerants that RMS of Georgia, LLC sells and distributes are refrigerants known under ASHRAE designations R-421A and R-421B. Our R-421A and R-421B refrigerants are approved by ASHRAE and are SNAP approved by the U.S. Environmental Protection Agency (EPA) for use with or as a replacement or substitute for R-22 refrigerant for different uses, as described below. The refrigerant having the ASHRAE designation R-421A is a refrigerant composition of my present application that is a mixture of R-125 (pentafluoroethane) and R-134a (1,1,1,2-tetrafluoroethane) as the only refrigerant gases blended with a lubricant in which R-125 is present in an amount of 58%±1% by weight and R-134a is present in an amount of 42% ±1% by weight of the two refrigerant gases wherein the combined weight of the two gases totals 100%.

4. An accepted guide for refrigerant designations is ASHRAE Standard 34. Based on assignment in prior editions and addenda thereto, Addendum O, Table 2

to ASHRAE Standard 34-2004 identifies my R-421A-series refrigerant blend (along with adopted safety data and classifications for them) as a composition of R-125 and R-134a with formulation and tolerances of: "R-421A: R-125/134a (58.0% / 42.0%) ($\pm 1.0/\pm 1.0$)."

As such, a composition of 60% R-125 / 40% 134a (60.0/40.0) is considered by ASHRAE as distinct from R-421A [58% R-125 / 42% 134a (58.0/42.0)] and does not fall within ASHRAE's formulation tolerances ($\pm 1.0/\pm 1.0$). Stated another way, a 60.0/40.0 (or "60/40") composition cannot be identified as within ASHRAE's designation and tolerances for a refrigerant designated or labeled R-421A. Were one to seek a Standard Designation for 60% R-125 / 40% 134a (60.0/40.0), it would be given consideration for a separate ASHRAE designation, in accordance with ASHRAE Standard 34.

5. The following figure shows the difference in deviations from the HCFC refrigerant R-22 (chlorodifluoromethane), the most widely used refrigerant from the late 1950s until 2010 and that most commonly used in residential air conditioners among other applications. Many blends, including R-421A (58% R125 / 42% R134a), were developed for and are marketed as Freon – 22 (R-22) replacements with the phase-out of ozone-depleting substances, of which Freon – 22 (R-22) is one.

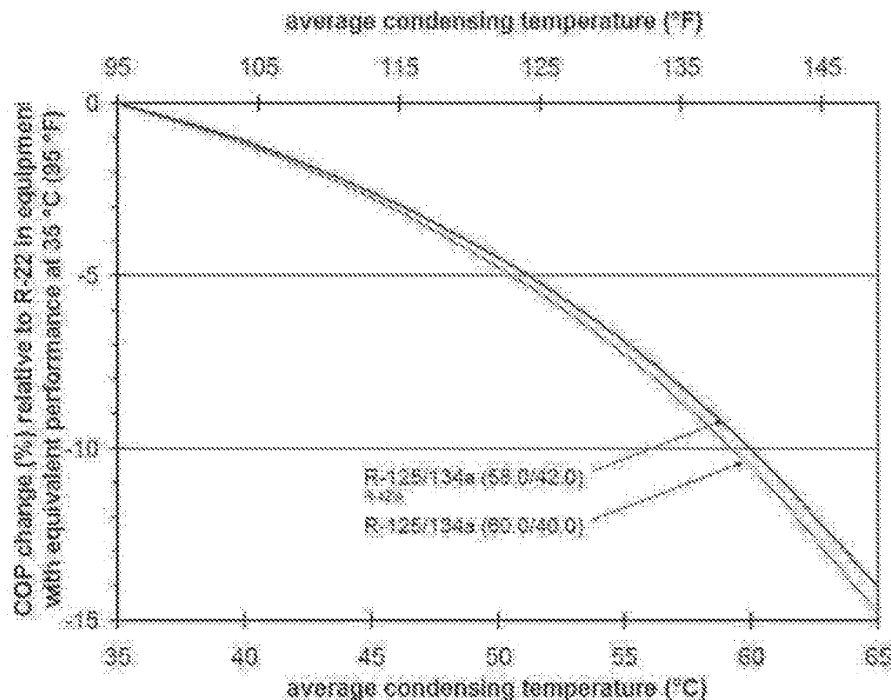


6. As shown in the above figure, R-421A [58% R-125 / 42% R134a (58.0/42.0)] offers a much closer approximation of the thermodynamic R-22 pressure-temperature (P-T) characteristics than 60% R-125 / 40% R134a (60.0/40.0), an important consideration for replacement of the HCFC refrigerant Freon – 22 (R22) and for retrofit and specifically for thermostatic expansion valve control of refrigerant flow metering in air conditioning and refrigeration machinery. Over the temperature range of -40 to +65 °C (-40 to +149 °F), the pressure deviation in (kPa or psia) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] compared to Freon -22 (R-22) deviates by -0.6 to +1.3% as contrasted to 1.3 to 2.5% for 60% R-125 / 40% R134a (60.0/40.0) with average deviations of 0.3% and 1.8%, respectively. Restated in terms of gauge pressure (psig), the corresponding ranges are -16.1 to 1.4% for and 33.9 to 2.6% with averages of -0.5 and 4.0%. In short, unexpectedly R-421A [58% R-125 / 42% R134a (58.0/42.0)] better approximates the pressure-temperature (P-T) characteristics of Freon (R-22) than 60% R-125 / 40% R134a (60.0/40.0).

7. For the evaporating temperature span of primary interest as a replacement for the HCFC refrigerant Freon – 22 (R-22) in air conditioning and refrigeration, namely -20 to +10 °C (-4 to +14), the average pressure deviation compared to Freon – 22 (R-22) on an absolute pressure basis for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is approximately 5% that of 60% R-125 / 40% R134a (60.0/40.0).

8. Predicated on a representative average evaporating temperature of 10 °C (50 °F) without superheat, R-421A [58% R-125 / 42% R134a (58.0/42.0)] outperforms 60% R-125 / 40% R134a by 0.15 to 1.04% for average condensing temperatures spanning 35-65 °C (95-149 °F) without sub-cooling. The calculations are based on theoretical-cycle calculations discounting compressor and motor efficiency, fan power and similar parasitic losses and also assuming ideal heat transfer and fluid flow; these

simplifications actually give a very slight advantage to the less-efficient refrigerant option. The following doubly-normalized figure shows the comparative performance losses with increasing condenser temperatures (when cooling is most needed) for such idealized cycles predicated on equipment modification to yield the same nominal coefficient of performance (COP) for Freon – 22 (R-22) and the two substituted blends at the common rating condition of 35 °C (95 °F) condensing:



9. As shown, R-421A [58% R-125 / 42% R134a (58.0/42.0)] unexpectedly outperforms the 60% R-125 / 40% R134a (60.0/40.0) composition for the full range, but its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (i.e., when most needed). The higher temperatures also are when utility demand rates kick in when applicable (normally for commercial and industrial but not for residential rates). Stated another way, **unexpectedly the “58/42”**

[R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed as compared to a 60% R125 / 40% R134a composition.

10. The lower fraction of R-125 (with five fluorine atoms per molecule compared to four in the R-134a component) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] implies additional advantages compared to 60% R-125 / 40% R134a (60.0/40.0). First, the lower fluorination implies a slightly lower cost under rational pricing scenarios. Second, the Global Warming Potential (GWP), an indicator of potency as a greenhouse gas relative to carbon dioxide for 100 year integration (the value most often cited and used in treaties and regulations) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is 2380 compared to 2420 for 60% R-125 / 40% R134a (60.0/40.0); the 1.7% lower (more favorable) value is again due to the lower fraction of R-125 in R-421A [58% R125 / 42% R134a] as compared to 60% R125 / 40% R134a.

11. Attached is a Summary and a Table of Substitute Refrigerants Listed in SNAP Notice 25. The Table provides a listing of refrigerants acceptable as substitute to HCFC-22 (chlorodifluoromethane). This SNAP Notice 25 and the Table are issued by the EPA. The Table includes approximately 45-50 refrigerants determined by the EPA to be acceptable as substitutes for HCFC-22. This Table includes not only my refrigerant designated as R-421A by ASHRAE but also the following refrigerants, among others:

- 1) R125/R290/R134A/R600A in a ratio of 55/1/42.5/1.5% by weight;
- 2) R32/R125/R134A in a ratio of 20/40/40% by weight (known as R407A);
- 3) R125/R134A/R600A in a ratio of 46.6/50.0/3.4% by weight (R417A);
- 4) R125/R134A/R600A in a ratio of 55.0/42.0/3.0 (R422B);
- 5) R125/R134A/R600A/R600/R601A in a ratio of 50.5/47.0/0.9/1.0/0.6% by weight (R424A); and
- 6) R125/R134A in a ratio of 50/50% by weight (R507A).

12. As seen from the SNAP Table, not all combinations of HFC-125 (pentafluoroethane) and HFC-134a (1, 1, 1, 2-tetrafluoroethane) are suitable for use with or as a substitute or a replacement for R-22 (HCFC-22, chlorodifluoromethane). For Example, R416A (134a/125/600 in the ratio 59.0 (+0.5, -1.0)/39.5 (+1.0,-0.5)/1.5 (+1.0,-0.5) is not listed as a suitable replacement for either CFC-11 or HCFC-22. In fact, the only combination of HFC-125 and HFC-134a to the exclusion of other refrigerant gases, such as R290 and R600, that are SNAP approved by the EPA to be suitable for use with or as a substitute or a replacement for the HCFC refrigerant R-22 are our R-421A and R-421B refrigerants.

13. In fact, there are HCFC refrigerants and combinations of R-125 and R-134a that are suitable for use with or as a substitute or a replacement for R-22 (HCFC-22) but not for R-12 (CFC-12) and vice versa. HCFC 125 is an acceptable substitute for CFCs but not HCFC-22. Examples are provided in Table 1 and Table 2 below:

Table 1
In Air Conditioning

	CFC	HCFC-22
HCFC 123	Yes	No
HCFC 125	Yes	No
HFC 236	Yes	No
R-290	No	Yes
R401A,B	Yes	No
R404A	No	Yes
R-406A	Yes	No
R407A	No	Yes
R409A	Yes	No
R410A,B	No	Yes
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Table 2
In Commercial Refrigeration

	CFC	HCFC-22
HCFC 22	Yes	No
HCFC 152B	No	Yes
HFC 236	Yes	No
R290	No	Yes

R401A,B	Yes	No
R402A,B	Yes	No
R406A	Yes	No
R408A	Yes	No
R409	Yes	No
R410A,B	No	Yes
R411A,B	Yes	No
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

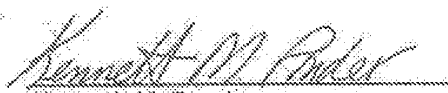
14. Attached hereto is a Table 7 including a listing of the refrigerants that are primarily offered in competition to my R-421A refrigerant along with their respective dew points and bubble points. The bubble point and dew point for HCFC-22 are -41.46 and -41.46°F, respectively. While the bubble point for my R-421A refrigerant closely approximates that of HCFC-22, the blend dew point does not; yet as shown above my R-421A refrigerant performs surprisingly well as a substitute for HCFC-22. In fact, I have found that to adjust the ratio of R125 and R134a in my refrigerant blend away from its 58% (± 1.0 %) R125 and 42% (± 1.0) so the its dew point of about -32°F (in particular, -31.65°F) more closely matches the dew point of HCFC-22 would negatively impact the aforementioned Global Warming Potential (GWP) of my refrigerant.

15. I have read US Patent No. 6,207,071 that I understand is cited against my above application. I do not find any teaching therein on how to select or design a refrigerant composition to serve as a substitute specifically for HCFC-22. There is a general statement in column 1, lines 21-27, to the use of "CFC (chlorofluorocarbon) and HCFC (hydrochlorofluorocarbon)" is now restricted. This statement, however, does not specifically identify HCFC-22 (chlorodifluoromethane). Moreover, there is no mention, let alone any suggestion, in Takigawa of considering the bubble point and/or dew point of a refrigerant blend of refrigerants in designing a blend of refrigerant gases to serve as a substitute for HCFC-22.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this patent.

Respectfully submitted,

Date: September 28 2017


Kenneth M. Ponder

B0062

ATTACHMENT OF TABLE 7

Comparative Properties and Efficiency of R-421A for Retrofit Use to Replace R-22
James M. Cahn, Engineering Consultant, USA

JMS/FRMS-13(5a)
2013.12.28

Table 7: Data for Selected Refrigerants (IP units)

properties	R-22	R-407C	R-410A	R-421A	R-422B	R-422D	R-427A	R-438A
molar mass (lb/mol)	0.190538	0.190048	0.190323	0.240358	0.239242	0.242385	0.199935	0.218478
normal boiling point (NBP)	-41.46	-45.53	-55.00	-41.22	-42.35	-45.78	-48.33	-65.19
bubble point for blends ("F)	-41.46	-45.53	-55.00	-41.22	-42.35	-45.78	-48.33	-65.19
dew point for blends ("F)	-41.46	-45.53	-55.00	-41.22	-42.35	-45.78	-48.33	-65.19
maximum temperature glide at NBP ("F)	0.000	12.907	0.142	0.568	0.768	0.747	12.164	11.540
at 68 "F ("F)	0.000	13.005	0.209	0.582	0.754	0.753	9.323	9.505
density at NBP								
saturated liquid (lb/ft ³)	47.57	55.19	64.28	81.18	87.20	87.81	85.46	86.64
saturated vapor (lb/ft ³)	0.2295	0.2801	0.3038	0.2721	0.3032	0.3119	0.3030	0.3316
latent heat of vaporization at NBP (Btu/lb)	100.8	107.2	117.4	82.5	84.2	81.8	101.8	89.8
at NBP (Btu/lb) vapor	28.89	25.58	30.80	35.76	36.86	36.49	50.83	38.83
at 140 "C (Btu/lb)	85.23	58.20	45.23	41.48	41.78	37.84	53.00	47.28
saturated vapor pressure at 68 "F (psia)	132.0	127.7	209.5	119.8	130.7	131.9	124.2	122.8
at 140 "F (psia)	332.1	388.8	526.1	338.3	348.3	368.3	355.0	349.7
critical point								
temperature ("F)	368.1	186.8	169.4	161.9	197.8	192.2	198.8	188.5
pressure (psia)	723.7	871.4	710.8	888.4	874.2	888.3	837.0	828.3
specific volume (ft ³ /lb)	0.0908	0.0931	0.0848	0.0891	0.0864	0.0863	0.0927	0.0914
ozone depletion potential (ODP) relative to R-11								
scientific	0.04	0	0	0	0	0	0	0
regulatory (RMP)	0.068	0	0	0	0	0	0	0
global warming potential (GWP) for 100 yr (TH)								
scientific relative to CO ₂	1750	1750	2100	2600	2600	2700	2100	2200
Addendum 34 / ISO 817 safety								
classification	A1	A1	A1	A1	A1	A1	A1	A1
ASHRAE 34 Refrigerant								
Concentration Limit (RCL)								
Sulfur	18	18	25	17	18	18	18	4.9

The gray regions of Table 6 and Table 7 indicate inapplicable data, namely the absence of composition-based glide based for the single-compound R-22. They also signify inapplicable data for blends not directly regulated by ozone depletion potential (ODP) in international treaties (notably the Montreal Protocol) and most regulations, though regulatory consequences result indirectly based on mass-weighted formulations of the blends.

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16920905

Filing Date: 06-Jul-2020

Applicant/Patent under Reexamination: Ponder

Electronic Terminal Disclaimer filed on December 6, 2021

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

B0065

Electronic Patent Application Fee Transmittal				
Application Number:		16920905		
Filing Date:		06-Jul-2020		
Title of Invention:		REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
First Named Inventor/Applicant Name:		Kenneth M. Ponder		
Filer:		Todd Deveau./Sheila Gray		
Attorney Docket Number:		821920-1034		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
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:				

B0066

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	740	740
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	130	130
Total in USD (\$)				870

<i>Search Notes</i> 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

CPC - Searched*		
Symbol	Date	Examiner
C09K5/045; 2205/22	06/01/2021	JRH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* 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
EAST text and CPC searches. Reviewed prosecution of parents.	06/01/2021	JRH
IPR2020-01660 Reviewed Inter Partes Review of US Patent No. 9,982,179.	07/12/2021	JRH
PGR2020-0008 Reviewed Post Grant Review of US Patent No. 10,703,949.	07/13/2021	JRH
IPR2021-00199 Reviewed Inter Partes Review of US Patent No. 8,197,706.	07/14/2021	JRH

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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<i>Search Notes</i> 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

CPC - Searched*		
Symbol	Date	Examiner
C09K5/045; 2205/22	06/01/2021	JRH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* 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
EAST text and CPC searches. Reviewed prosecution of parents.	06/01/2021	JRH
IPR2020-01660 Reviewed Post-Grant Review of US Patent No. 9,982,179.	07/12/2021	JRH

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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<i>Search Notes</i> 	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.
	Examiner JOHN R HARDEE	Art Unit 1761

CPC - Searched*		
Symbol	Date	Examiner
C09K5/045; 2205/22	06/01/2021	JRH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* 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
EAST text and CPC searches. Reviewed prosecution of parents.	06/01/2021	JRH

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.
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034	6800
24504 7590 06/04/2021 THOMAS HORSTEMEYER, LLP 3200 WINDY HILL ROAD, SE SUITE 1600E ATLANTA, GA 30339			EXAMINER HARDEE, JOHN R	
			ART UNIT 1761	PAPER NUMBER
			NOTIFICATION DATE 06/04/2021	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):

docketing@thomashorstemeyer.com
ozzie.liggins@tkhr.com
uspatents@tkhr.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Objections

2. Claim 7 is objected to because of the following informalities: “inhibit” should be “inhibitor”. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071. The reference discloses lubricating oil compositions and their use in compositions comprising R134a and R125 (col. 1, lines 13+). The reference further discloses the use of hydrofluorocarbons as replacements for hydrochlorofluorocarbons (col. 1, lines 20+). Suitable lubricants include the alkylbenzene oils described at col. 2, lines 30+. Refrigerants include alkane fluorides containing 40% or more of R134a in admixture with alkyl fluorides containing, most preferably, 40% or more of R125 (col. 8, lines 20+). The reference further discloses that there is "no restriction as to the kind of HFC to be mixed with" the disclosed refrigerants. The examiner takes the position that this can reasonably be construed to mean that no additional HFC need be added, and that the disclosure reads on refrigerant compositions *consisting of* 40-60% R134a and 60-40% of R125. Conventional additives may be added, including those disclosed at the top of col. 8. The examiner takes the position that anticorrosion additives are conventional, and that their use would be obvious over this disclosure. Lubricant compositions comprising naphthenic mineral oil and polyol polyesters are disclosed in Table 1. Note the disclosure in Evaluation Tests 2 and 3 of refrigerant being premixed with lubricant prior to charging a compressor. The disclosed lubricating refrigerant compositions are useful in a variety of refrigeration apparatus, as disclosed at the top of col. 9. Determining which known hydrofluorocarbon refrigerant mixtures can serve as a substitute for notoriously undesirable refrigerants such as chlorodifluoromethane amounts to routine experimentation, in the absence of evidence of unexpected or superior properties. Determination of the lubrication-effective amount of a disclosed lubricant amounts to

B0074

routine optimization. This reference differs from the claimed subject matter in that it does not disclose a composition which reads on appellant's claims with sufficient specificity to constitute anticipation.

It would have been obvious at the time the invention was made to make such a composition, because this reference teaches that all of the ingredients recited by appellants are suitable for inclusion in a refrigerant composition. The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.

In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*,

B0075

686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

7. Claims 1-7 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 8,197,706; claims 1-37 of U.S. Patent 9,982,179; and claims 1-19 of U.S. Patent 10,703,949. Although the claims at issue are

not identical, they are not patentably distinct from each other because the '179, '706 and '949 patents recite compositions which overlap closely with those presently recited in admixture with a lubricant, which is a conventional additive. Determining which known refrigerant mixtures can serve as a substitute for notoriously undesirable refrigerants such as chlorodifluoromethane amounts to routine experimentation, in the absence of evidence of unexpected or superior properties.

8. Submission of declarations similar to those which were submitted in the parent case would further prosecution.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose email address is john.hardee@uspto.gov. *Correspondence by email is strongly encouraged*, including for scheduling telephone interviews. Should this be impracticable, the examiner's telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. James Seidleck, may be reached at (571) 272-1078.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100. Please note that examiners may not accept or enter faxed amendments.

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.

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Application/Control Number: 16/920,905
Art Unit: 1761

Page 7

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).

/JOHN R HARDEE/
Primary Examiner
Art Unit 1761

B0078

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	9,563	(r hfc) adj "125" r125 hfc125 pentafluoroethane	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L2	2,597	"1,1,2,2-tetrafluoroethane"	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L3	5,563	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L4	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L5	6,557	L3 L4 L2	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L6	804	L1 near L5	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
L7	366	L6 AND ((C09K5/045 OR C09K2205/22).CPC.)	US-PGPUB; USPAT	OR	OFF	2021/06/01 11:02
S2	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:11
S4	4,678	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S5	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S6	4,685	S4 S5	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S7	2,057	"1,1,2,2-tetrafluoroethane"	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S8	4,733	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22

B0079

S9	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S10	5,584	S8 S9 S7	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S11	7,912	(r hfc) adj "125" r125 hfc125 pentafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S12	2,057	"1,1,2,2-tetrafluoroethane"	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S13	4,733	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S14	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S15	5,584	S13 S14 S12	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S16	1,132	S11 near4 S15	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
S17	914	S11 near2 S15	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
S18	617	S11 near S15	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
S19	276	S18 AND ((C09K5/045 OR C09K2205/22).CPC.)	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
S20	2	((("9982179") or ("8197706"))).PN.	US-PGPUB; USPAT	OR	OFF	2019/09/18 16:04
S23	3	(US-20030062508-\$ US-5145594-\$ US-5942149-\$).DID.	US-PGPUB; USPAT	OR	ON	2020/05/12 09:35
S28	8	(US-4971712-\$ US-4983312-\$ US-5254280-\$ US-6271184-\$ US-5384057-\$ US-6606868-\$ US-5688432-\$ US-6863840-\$).DID.	US-PGPUB; USPAT	OR	ON	2020/05/12 09:40
S29	11	S23 S28	US-PGPUB; USPAT	OR	ON	2020/05/12 09:41

B0080

S30	1	(US-6606868-\$).did.	USPAT	OR	ON	2020/05/12 09:47
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6/1/2021 11:07:50 AM

C:\Users\jhardee\Documents\EAST\Workspaces\920905.wsp

B0081

Notice of References Cited	Application/Control No. 16/920,905	Applicant(s)/Patent Under Reexamination Ponder et al.	
	Examiner JOHN R HARDEE	Art Unit 1761	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-10703949-B2	07-2020	Ponder; Kenneth M.	C10M171/008	1/1
*	B	US-9982179-B2	05-2018	Ponder; Kenneth M.	C10M171/008	1/1
*	C	US-8197706-B2	06-2012	Ponder; Kenneth M.	C09K5/045	252/68
*	D	US-6207071-B1	03-2001	Takigawa; Katsuya	C10M169/04	252/68
	E					
	F					
	G					
	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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/920,905	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	80		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	350		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		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 240 =	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			
			TOTAL	830		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		OTHER THAN SMALL ENTITY
	Total (37 CFR 1.16(i))	*	Minus **	***	=		RATE(\$)
	Independent (37 CFR 1.16(h))	*	Minus ***	=		ADDITIONAL FEE(\$)	
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		OTHER THAN SMALL ENTITY
	Total (37 CFR 1.16(i))	*	Minus **	***	=		RATE(\$)
	Independent (37 CFR 1.16(h))	*	Minus ***	=		ADDITIONAL FEE(\$)	
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		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.							

B0083



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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
16/920,905	07/06/2020	1761	905	821920-1034	7	3

CONFIRMATION NO. 6800

UPDATED FILING RECEIPT



0000000121400913

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

Date Mailed: 11/18/2020

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

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

Applicant(s)

R421A LLC, Alpharetta, GA

Power of Attorney: The patent practitioners associated with Customer Number 24504

Domestic Priority data as claimed by applicant

This application is a CON of 15/989,655 05/25/2018 PAT 10703949
which 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: 07/15/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/920,905**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

Preliminary Class

062

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

page 2 of 4

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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 Assets Control, 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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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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 821920-1034																														
Application Number 16/920,905	Filed July 6, 2020																															
For REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT																																
Art Unit 1761	Examiner TBD																															
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 15%; text-align: center;"><u>Fee</u></th> <th style="width: 15%; text-align: center;"><u>Small Entity Fee</u></th> <th style="width: 15%; text-align: center;"><u>Micro Entity Fee</u></th> <th style="width: 25%;"></th> </tr> </thead> <tbody> <tr> <td>☐ One month (37 CFR 1.17(a)(1))</td> <td style="text-align: center;">\$220</td> <td style="text-align: center;">\$110</td> <td style="text-align: center;">\$55</td> <td>\$ _____</td> </tr> <tr> <td>☒ Two months (37 CFR 1.17(a)(2))</td> <td style="text-align: center;">\$640</td> <td style="text-align: center;">\$320</td> <td style="text-align: center;">\$160</td> <td>\$ <u>320</u></td> </tr> <tr> <td>☐ Three months (37 CFR 1.17(a)(3))</td> <td style="text-align: center;">\$1,480</td> <td style="text-align: center;">\$740</td> <td style="text-align: center;">\$370</td> <td>\$ _____</td> </tr> <tr> <td>☐ Four months (37 CFR 1.17(a)(4))</td> <td style="text-align: center;">\$2,320</td> <td style="text-align: center;">\$1,160</td> <td style="text-align: center;">\$580</td> <td>\$ _____</td> </tr> <tr> <td>☐ Five months (37 CFR 1.17(a)(5))</td> <td style="text-align: center;">\$3,160</td> <td style="text-align: center;">\$1,580</td> <td style="text-align: center;">\$790</td> <td>\$ _____</td> </tr> </tbody> </table> ☒ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously. ☐ A check in the amount of the fee is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>20-0778</u>. ☒ Payment made via EFS-Web. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>29,526</u> ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <u>/Todd Deveau/</u> <u>November 16, 2020</u> Signature Date <u>Todd Deveau</u> <u>770-933-9500</u> Typed or printed name Telephone Number NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☐ One month (37 CFR 1.17(a)(1))	\$220	\$110	\$55	\$ _____	☒ Two months (37 CFR 1.17(a)(2))	\$640	\$320	\$160	\$ <u>320</u>	☐ Three months (37 CFR 1.17(a)(3))	\$1,480	\$740	\$370	\$ _____	☐ Four months (37 CFR 1.17(a)(4))	\$2,320	\$1,160	\$580	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____
	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>																													
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☐ Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____																												

☐ * Total of _____ forms are submitted.
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This collection of information is required by 37 CFR 1.136(a). 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 and 1.14. This collection is estimated to take 6 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

B0088

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.

B0089

Electronic Patent Application Fee Transmittal

Application Number:	16920905			
Filing Date:	06-Jul-2020			
Title of Invention:	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
First Named Inventor/Applicant Name:	Kenneth M. Ponder			
Filer:	Todd Deveau./Sheila Gray			
Attorney Docket Number:	821920-1034			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY SEARCH FEE	2111	1	350	350
UTILITY EXAMINATION FEE	2311	1	400	400
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80
Petition:				
Patent-Appeals-and-Interference:				
B0090				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	2252	1	320	320
Miscellaneous:				
Total in USD (\$)				1150

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Kenneth M. Ponder

Group Art: 1761

Serial No.: 16/920,905

Docket No.: 821920-1034

Filed: July 6, 2020

Confirmation No.: 6800

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 July 16, 2020, please find enclosed:

1. Government fee in the amount of \$830.00 to cover (\$350) search fee, (\$400) examination fee, and (\$80) for the surcharge fee for filing this Response to the Missing Parts Notice; and
2. Petition for Extension of Time (\$320).

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

B0092

Electronic Acknowledgement Receipt

EFS ID:	41132328
Application Number:	16920905
International Application Number:	
Confirmation Number:	6800
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:	821920-1034
Receipt Date:	16-NOV-2020
Filing Date:	06-JUL-2020
Time Stamp:	14:44:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1150
RAM confirmation Number	E2020AFE44575822
Deposit Account	200778
Authorized User	Sheila Gray

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:
37 CFR 1.21 (Miscellaneous fees and charges)

B0093

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	821920-1034__2- mo_EOT__small_.pdf	182342	no	2
			1e1875cd45144db804f625624c8b6aaf29d80a10		
Warnings:					
Information:					
2	Applicant Response to Pre-Exam Formalities Notice	821920-1034__Response_to_N otice_to_File_Missing_Parts. pdf	130267	no	1
			ddb7907a2b383a1c0f8a35cf6e1e3dbd65ffa839		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	37393	no	2
			643bb0b272734ebbbb371ebe013d314dc5f0571a		
Warnings:					
Information:					
Total Files Size (in bytes):			350002		
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.					

B0094



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	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034

CONFIRMATION NO. 6800

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

PUBLICATION NOTICE



OC000000120832501

Title:REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

Publication No.US-2020-0332165-A1

Publication Date:10/22/2020

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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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
16/920,905	07/06/2020	1761	75	821920-1034	7	3

CONFIRMATION NO. 6800

FILING RECEIPT



0000000118481971

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

Date Mailed: 07/16/2020

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

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

Applicant(s)

R421A LLC, Alpharetta, GA

Power of Attorney: The patent practitioners associated with Customer Number 24504

Domestic Priority data as claimed by applicant

This application is a CON of 15/989,655 05/25/2018 PAT 10703949
which 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: 07/15/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/920,905**

Projected Publication Date: 10/22/2020

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

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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

page 2 of 4

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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

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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 Assets Control, 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 DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/920,905	07/06/2020	Kenneth M. Ponder	821920-1034

CONFIRMATION NO. 6800

FORMALITIES LETTER



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

Date Mailed: 07/16/2020

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 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.)

- \$ **80** surcharge.
- \$ **330** search fee.
- \$ **380** examination fee.
- \$ **(0)** previous unapplied payment amount.
- \$ **790** TOTAL FEE BALANCE DUE.

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**.

/mgabre/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/920,905	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	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			
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			
			TOTAL	785		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		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.							

B0102

Electronic Acknowledgement Receipt

EFS ID:	39913968
Application Number:	16920905
International Application Number:	
Confirmation Number:	6800
Title of Invention:	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
First Named Inventor/Applicant Name:	Kenneth M. PONDER et al.
Customer Number:	24504
Filer:	Todd Deveau./Sheila Gray
Filer Authorized By:	Todd Deveau.
Attorney Docket Number:	821920-1034
Receipt Date:	06-JUL-2020
Filing Date:	
Time Stamp:	12:08:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$75
RAM confirmation Number	E202076C08448894
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

B0103

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	821920-1034__ADS.pdf	1256458	no	9
			b421e37d7828f31556b8ff45f4952b16d9767c69		
Warnings:					
Information:					
2		821920-1034__Continuation_Application.pdf	293940	yes	20
			f166cb116ce3fe5c9aa6a2799baa3a45e267a5a2		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	17	
	Claims		18	19	
	Abstract		20	20	
Warnings:					
Information:					
3	Oath or Declaration filed	821920-1034__Declaration_-_signed.pdf	468520	no	1
			314e7c2398a9697f4b270dd6ba44fee91c71d9c		
Warnings:					
Information:					
4	Oath or Declaration filed	821920-1034__Substitute_Oath_or_Declaration_-_Thomas_-_signed.pdf	652930	no	2
			55a6ad72239b595e18a71f46e023d77818ad0b80		
Warnings:					
Information:					
5	Power of Attorney	POA_R421A-signed.pdf	564059	no	1
			4300917ec67304f12c8104efcbcd056d2e74195c		
					B0104

Warnings:					
Information:					
6	Drawings-only black and white line drawings	1034-drawings.pdf	757702	no	1
			7de726216eaf92c70404cd311ae7119e2e43940c		
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	30175	no	2
			a05c728886de99c9f29596b41b21a4768bcd54b5		
Warnings:					
Information:					
Total Files Size (in bytes):			4023784		
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.					

B0105

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
As the below named inventor, I hereby declare that: This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number <u>15/989,655</u> filed on <u>May 25, 2018</u> The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR	
Inventor: <u>Kenneth M. Ponder</u> Date (Optional): _____	
Signature: <u>Kenneth M. Ponder</u>	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 and 1.14. This collection is estimated to take 1 minute 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.

B0106

FIG. 1

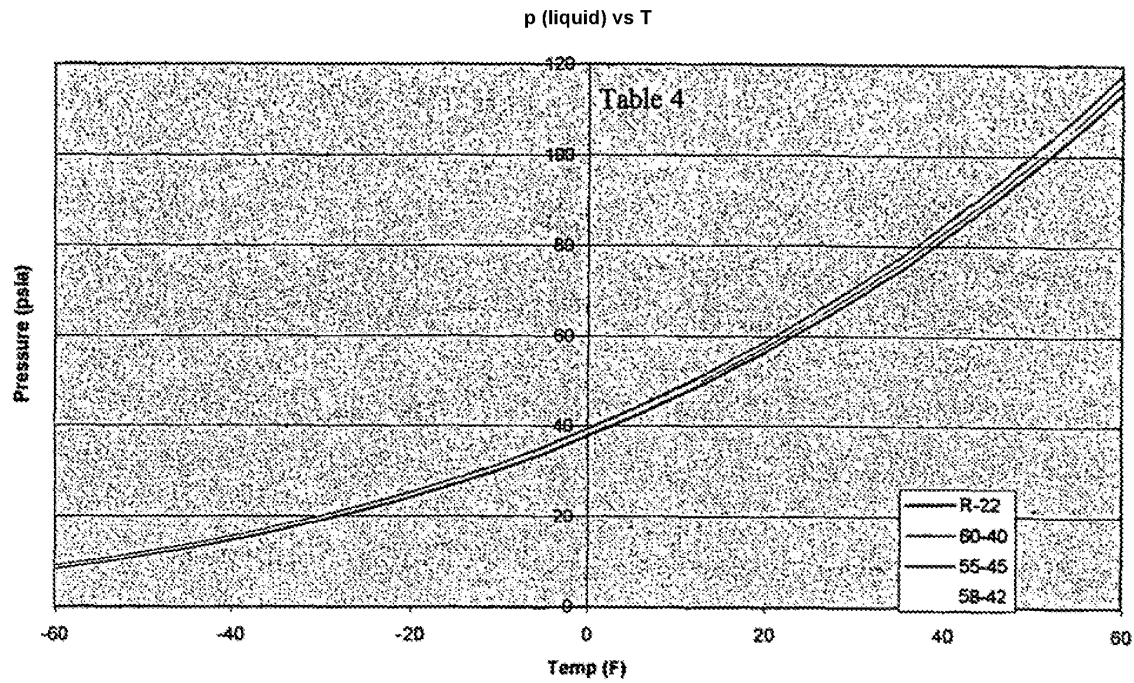
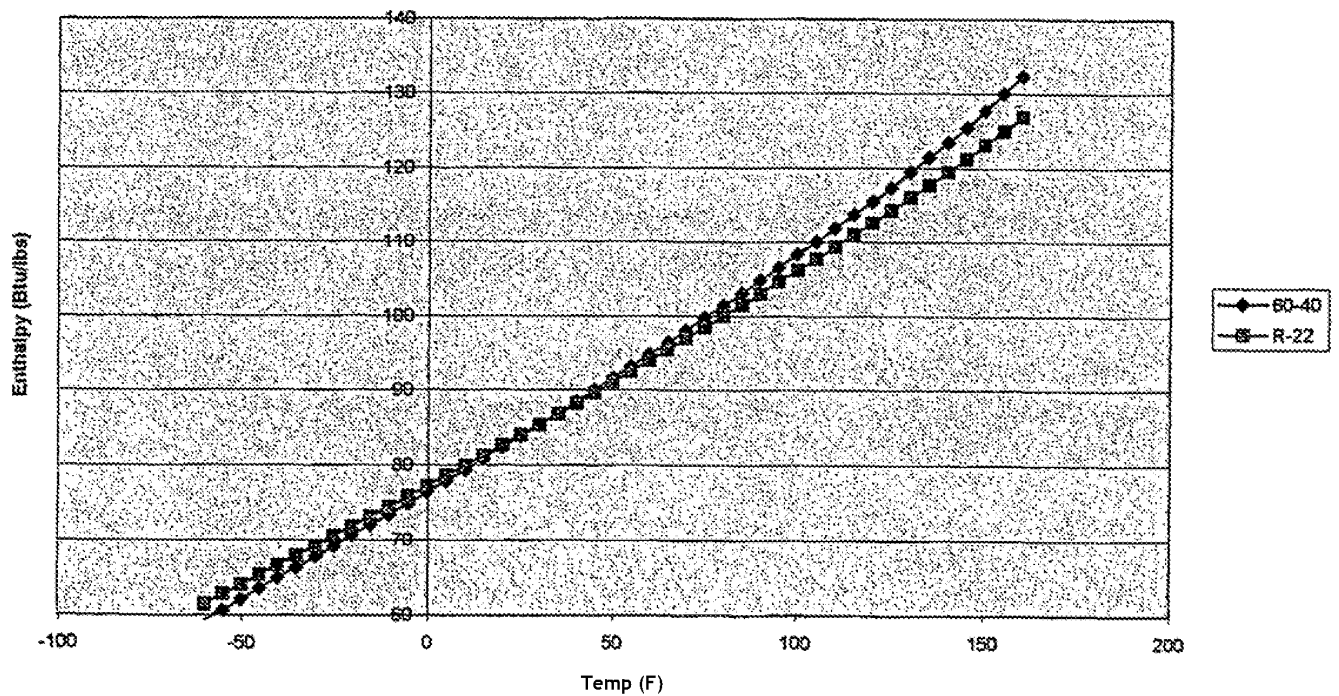


FIG. 2
Temp vs Enthalpy



B0107

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**SUBSTITUTE STATEMENT IN LIEU OF AN OATH OR DECLARATION FOR UTILITY
OR DESIGN PATENT APPLICATION (35 U.S.C. 115(d) AND 37 CFR 1.64)**

Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
This statement is directed to:			
☐ The attached application,			
OR			
☒ United States application or PCT international application number <u>15/989,655</u> filed on <u>May 25, 2018</u> .			
LEGAL NAME of inventor to whom this substitute statement applies:			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Steffan Thomas			
Residence (except for a deceased or legally incapacitated inventor):			
City		State	Country
Mailing Address (except for a deceased or legally incapacitated inventor):			
City		State	Zip
		Country	
I believe the above-named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application.			
The above-identified application was made or authorized to be made by me.			
I hereby acknowledge that any willful false statement made in this statement is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.			
Relationship to the inventor to whom this substitute statement applies:			
☐ Legal Representative (for deceased or legally incapacitated inventor only),			
☒ Assignee,			
☐ Person to whom the inventor is under an obligation to assign,			
☐ Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or			
☐ Joint Inventor.			

[Page 1 of 2]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 and 1.14. This collection is estimated to take 1 minute 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.

B0108

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SUBSTITUTE STATEMENT

Circumstances permitting execution of this substitute statement:

- ☒ Inventor is deceased,
- ☐ Inventor is under legal incapacity,
- ☐ Inventor cannot be found or reached after diligent effort, or
- ☐ Inventor has refused to execute the oath or declaration under 37 CFR 1.63.

If there are joint inventors, please check the appropriate box below:

- ☒ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) naming the entire inventive entity has been or is currently submitted.
- OR
- ☐ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) has not been submitted. Thus, a Substitute Statement Supplemental Sheet (PTO/AIA/11 or equivalent) naming the entire inventive entity and providing inventor information is attached. See 37 CFR 1.64(b).

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

Name: **Kenneth M. Ponder** Date (Optional):

Signature: *Kenneth M. Ponder*

APPLICANT NAME AND TITLE OF PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

If the applicant is a juristic entity, list the applicant name and the title of the signer:

R421A LLC

Applicant Name:

Title of Person Executing This Substitute Statement: **Manager**

The signer, whose title is supplied above, is authorized to act on behalf of the applicant.

Residence of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent):

City: State: Country:

Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)

610 McFarland 400 Dr.

City: **Alpharetta** State: **GA** Zip: **30004** Country: **US**

Note: Use an additional PTO/AIA/02 form for each inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration under 37 CFR 1.63.

[Page 2 of 2]

B0109

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1		Remove	
Legal Name			
Prefix	Given Name	Middle Name	Family Name
	Kenneth	M.	Ponder
Residence Information (Select One) • US Residency Non US Residency Active US Military Service			
City	Cumming	State/Province	GA
		Country of Residence	US
Mailing Address of Inventor:			
Address 1	105 Highland View Drive		
Address 2			
City	Cumming	State/Province	GA
Postal Code	30040	Country i	US
Inventor 2		Remove	
Legal Name			
Prefix	Given Name	Middle Name	Family Name
	Steffan		Thomas
Residence Information (Select One) • US Residency Non US Residency Active US Military Service			
City	Buckhead	State/Province	GA
		Country of Residence	US
Mailing Address of Inventor:			
Address 1	4250 Bethany Road		
Address 2			
City	Buckhead	State/Province	GA
Postal Code	30625	Country i	US
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.			
Add			

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

B0110

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

☐ An Address is being provided for the correspondence information of this application.			
Customer Number	24504		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
Attorney Docket Number	821920-1034	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	1	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.											
<table border="1"> <tr> <td>Please Select One:</td> <td>☒ Customer Number</td> <td>☐ US Patent Practitioner</td> <td>☐ Limited Recognition (37 CFR 11.9)</td> </tr> <tr> <td>Customer Number</td> <td colspan="3">24504</td> </tr> </table>				Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)	Customer Number	24504		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)								
Customer Number	24504										

B0111

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	15989655	2018-05-25	10703949	2020-07-07
Prior Application Status		Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15989655	Continuation of	13493491	2012-06-11	9982179	2018-05-29
Prior Application Status		Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13493491	Continuation of	12961045	2010-12-06	8197706	2012-06-12
Prior Application Status		Abandoned			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
12961045	Continuation of	10937736	2004-09-08		
Prior Application Status		Expired			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
10937736	Claims benefit of provisional	60501049	2003-09-08		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
			B0112

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
Additional Foreign Priority Data may be generated within this form by selecting the Add button. Add			

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐	This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.
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B0113

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

B0114

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1		Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
		Clear	
Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
☐ Person to whom the inventor is obligated to assign.		☐ Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	R421A LLC		
Mailing Address Information For Applicant:			
Address 1	610 McFarland 400 Dr.		
Address 2			
City	Alpharetta	State/Province	GA
Country	US	Postal Code	30004
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

B0115

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet must be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Todd Deveau/		Date (YYYY-MM-DD)	2020-07-06
First Name	Todd	Last Name	Deveau	Registration Number
				29526
Additional Signature may be generated within this form by selecting the Add button.				Add

B0116

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	821920-1034
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

B0117

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

B0118

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
15/989,655	May 25, 2018

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- ☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 24504
- OR
- ☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

- ☒ The address associated with the above-mentioned Customer Number

OR

- ☐ The address associated with Customer Number:

OR

- ☐ Firm or Individual Name

Address:

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

R421A LLC

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

Title

R421A LLC (Manager)

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 36 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 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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B0119

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is a continuation of U.S. Patent Application No. 15/989,655, filed
May 25, 2018, now U.S. Patent No. 10,703,949, issuing July 7, 2020, which is a
continuation of U.S. Patent Application No. 13/493,491, filed June 11, 2012, now U.S.
Patent No. 9,982,179, issued May 29, 2018, which is a continuation of U.S. Patent
Application No. 12/961,045, filed December 6, 2010, now U.S. Patent No. 8,197,706,
10 issued June 12, 2012, which is a continuation of U.S. Patent Application No. 10/937,736,
filed September 8, 2004, now abandoned, which claims priority to and the benefit of U.S.
Provisional Application No. 60/501,049, filed September 8, 2003, now expired.

BACKGROUND OF THE INVENTION

1. Field Of The Invention

15 The present invention relates to the replacement of Refrigerant R-22
(chlorodifluoromethane) refrigerant with a blend refrigerant that is less damaging to the
ozone layer in systems designed to use Refrigerant R-22 (chlorodifluoromethane). More
particularly the present invention relates to an improved refrigerant composition, method
and apparatus for refrigeration wherein two non-Refrigerant R-22 refrigerants are mixed
20 in a defined ratio such that the temperature-pressure relationship of the mix approximates
that of Refrigerant R-22 (chlorodifluoromethane). The mixture is compatible with
Refrigerant R-22 (chlorodifluoromethane) so that it can be added to supplement and
replace Refrigerant R-22 (chlorodifluoromethane). A further particularity of the instant
invention relates to an improved method and apparatus for refrigeration wherein
25 refrigerant mixture is mixed with a soluble lubricating oil to provide lubrication to the
apparatus. The lubricant is soluble in both the mixture of the invention and Refrigerant
R-22 (chlorodifluoromethane) refrigerant.

2. General Background

Until recently, R-22 refrigerant chlorodifluoromethane (hereinafter sometimes called “Refrigerant R-22 (chlorodifluoromethane)”) was the major, if not sole refrigerant, used in residential air-conditioners, refrigerators, freezers and window air-conditioning units. Refrigerant R-22 (chlorodifluoromethane) is a trademark of E. I. du Pont de Nemours & Co. Inc. for chlorodifluoromethane. Hereinafter, “Refrigerant R-22 (chlorodifluoromethane)” is used in this specification to denote chlorodifluoromethane, regardless of the source.

10 Recently, however, Refrigerant R-22 (chlorodifluoromethane) has come under attack both nationally and internationally as an ozone layer-damaging chemical. In recent years, both the national and international scientific communities have linked Refrigerant R-22 (chlorodifluoromethane) with damage to the earth’s protective ozone layer. Air-conditioners, refrigerator/freezers and window air-conditioning units
15 containing R-22 are believed to be a global source of ozone-damaging material.

In response to scientific concern and a national and global outcry over the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, the United States Congress has acted to first reduce and then ban the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units.

20 As a first step toward phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units, Congress is phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in new equipment effective 01/01/2015 and has banned the sale of Refrigerant R-22 (chlorodifluoromethane) in any size container as of 01/01/2020. One of the first areas in which the use of Refrigerant R-22
25 (chlorodifluoromethane) is to be phased out is in the Bakery industry under the Bakery Partnership Program. Another step in phasing out the use of R-22 is the import

restrictions that begin in 2003, limiting the amount of R-22 that can be imported into the United States.

At the time of this application, the vast majority of residential, window units and freezers in use in the United States contain Refrigerant R-22 (chlorodifluoromethane).

5 Prior to banning the sale of quantities of Refrigerant R-22 (chlorodifluoromethane), owners of equipment with Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units are able to purchase the level of refrigerant in their equipment with only the need of a refrigerants license as required by the Clean Air Act. Millions of units containing refrigerant R-22 (chlorodifluoromethane)
10 were sold in the United States prior to the start of mandatory phase out set forth by Congress and the international community.

Refrigerant R-22 (chlorodifluoromethane) recharging typically involves 30 lb. cans or cylinders typically used in the HVAC/R industry. The cylinders are fitted with a dispensing outlet compatible with a commercially available refrigeration manifold. In
15 order to recharge an air-conditioning system, a customer need to only fit the can or cylinder to the manifold and discharge, or “add to” the refrigerant charge directly into the air conditioning system.

Following Congress’s ban on the sale of Refrigerant R-22 (chlorodifluoromethane) millions of equipment owners with Refrigerant R-22
20 (chlorodifluoromethane)-based air-conditioning units will be left with no choice other than to seek replacement refrigerants to service these units. Intentionally mixing of refrigerants is currently illegal by standards set forth by the Clean Air Act. An example would be for this application is that current R-22 units could not be mixed with this invention intentionally.

25 In response to Congress’s ban on the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, service dealers have begun to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units with new,

non-R-22 refrigerants, such as R410A (a 50/50 mixture of difluoromethane and pentafluoroethane), R417 (a 46/50/4 mixture of pentafluoroethane, 1,1,1,2-tetrafluoroethane, and butane) or R407C (a 23/25/52 mixture of difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane). None of these replacements contain a
5 lubricant when produced.

The refrigerants that will be authorized by the Environmental Protection Agency (EPA) to replace Refrigerant R-22 (chlorodifluoromethane) in air conditioners is currently under review and will evolve to require an environmentally safe refrigerant, with a 0 odp factor like the one of the present invention described herein. Unfortunately, most
10 replacements for R-22 have a markedly different temperature-pressure relationship at most operating temperatures than Refrigerant R-22 (chlorodifluoromethane).

Because of this difference in the temperature-pressure relationship of Refrigerant R-22 (chlorodifluoromethane) and current replacement refrigerants, existing Refrigerant R-22 (chlorodifluoromethane)-based systems cannot typically be interchanged. Hence,
15 non-retrofitted, Refrigerant R-22 (chlorodifluoromethane)-based units have a need for a refrigerant that will fulfill the requirements of the system design while also meeting the requirements of the EPA and the international community.

Simply mixing refrigerants with existing Refrigerant R-22 (chlorodifluoromethane) in order to replenish, or "topping off" the level is against the law
20 and not feasible. When other refrigerants are mixed with Refrigerant R-22 (chlorodifluoromethane), the mixture can take on the pressure characteristics of a substance that could be harmful to either the equipment or the operator. The temperature-pressure relationship becomes markedly different from that of Refrigerant R-22 (chlorodifluoromethane) at temperatures within the normal refrigerant operating
25 temperature range and typical use of R-22.

Hence, in the absence of Refrigerant R-22 (chlorodifluoromethane) owners of equipment with Refrigerant R-22 (chlorodifluoromethane)-based air conditioners face but

one choice when the level of their air-conditioning coolant is low: professional service—at a significant cost—to remove the existing Refrigerant R-22 (chlorodifluoromethane), and retrofit the system compatible with some kind of refrigerant gas.

5 R-22 refrigerants were developed to replace the prior, now banned R-12 refrigerant, or dichlorodifluoromethane. R-12 is sometimes referred to as FREON 12®, which is a trademark of E.I. du Pont de Nemours & Co. for dichlorodifluoromethane.

Thomas et al. (U.S. Pat. No. 5,254,280) discloses a lubricant developed for use with a refrigerant known as R134a (1,1,1,2 – tetrafluoroethane) and the combination of that lubricant with a refrigerant, which is a replacement for R-12. The lubricant contains
10 polyoxyalkylene glycol, which is hydrophilic and could damage the system as discussed below.

Wilczek (U.S. Pat. No. 5,384,057), Gorski (U.S. Pat. No. 4,971,712), and Anton of DuPont (U.S. Pat. No. 5,145,594) disclose other R-12 replacements in the form of a blend of certain synthetic lubricants in various R134a and R134a/R125 refrigerant
15 systems. The DuPont patents discuss a gas known as R125 (pentafluoroethane). R125 is five fluorine atoms bonded to an ethane molecule. This is a very large molecule for a refrigerant. It is currently being produced for refrigeration only. Anton discloses the use of a lubricant comprising at least one cyanocarbon compound. Wilczek discloses a fluorosiloxane as a lubricant. Gorski discloses a polyalkylene glycol as a lubricant.

20 Systems that contain R-22, or R-12 replacements, are still being produced today. These older systems have common components: R-22, R-22 mineral oil lubricant, and water that is sequestered into the dryer. If R134a (1,1,1,2-tetrafluoroethane) were added to the system, it would damage the system as follows: (1) if no lubricant is added to the R134a (as in U.S. Pat. No. 4,953,312 to Tamura et al.), then the R-22 system would be
25 starved for lubricant, since the R134a gas is not miscible with the mineral oil lubricant; (2) if a synthetic lubricant is added to the R134a (as in Thomas et al.), then there is a different problem—that of moisture. Older systems can have water trapped in their

dryers. The synthetic lubricants (such as polyglycol- or polysiloxane-based lubricants) are hydrophilic. Thus, they are not only miscible with R-22 and R134a; they are also partially or completely miscible with water. Thus, if they are introduced into an R-22 system, they will pull this water out of the dryer into the refrigerant flow, initiating
5 corrosion and damage to pressure switches and the TX valve and possible other system components. This is why Elf Atochem and DuPont, to name a few publish elaborate flushing procedures and high efficiency dryer change-outs to prevent damage to the cooling system.

Weber (U.S. Patent No. 5,942,149) discloses yet another R-12 replacement
10 consisting of a blend of chlorodifluoroethane, tetrafluoroethane and a napthenic lubricating oil.

SUMMARY OF THE PRESENT DISCLOSURE

The present disclosure is of a method and apparatus that are environmentally sound alternatives to the use of Refrigerant R-22 (chlorodifluoromethane) as a
15 refrigerant. More particularly, the invention provides a mixture of at least two refrigerants that are miscible with each other, and compatible with Refrigerant R-22 (chlorodifluoromethane) while at the same time possessing a temperature-pressure profile that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the operating range of ambient temperatures usually encountered by air conditioning units or other
20 apparatus utilizing Refrigerant R-22 (chlorodifluoromethane) as a refrigerant. The invention also provides a lubricant, that is compatible with both the environmentally sound refrigerant of the invention and with Refrigerant R-22 (chlorodifluoromethane), so that mixtures of the refrigerant according to the invention and Refrigerant R-22 (chlorodifluoromethane) may be utilized with this lubricant in the refrigeration systems
25 without deleterious effect upon moving parts of the refrigerating apparatus that require lubrication from the refrigerant.

More particularly, the refrigerant and method disclosed herein involves a mixture of pentafluoroethane and tetrafluoroethane in specific proportions that provide a temperature-pressure relationship that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the range of ambient temperature operating conditions in which Refrigerant R-22 (chlorodifluoromethane) is a useful refrigerant. The pentafluoroethane/tetrafluoroethane refrigerant blend disclosed herein is compatible with both synthetic and mineral oils. The tetrafluoroethane can be either 1,1,1,2-tetrafluoroethane or 1,1,2,2-tetrafluoroethane. In an exemplary embodiment, the refrigerant according to the invention comprises a ratio of from about 40 to about 45 weight percent pentafluoroethane to about 55 to about 60 percent 1,1,1,2-tetrafluoroethane, based upon the total weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane. In a further exemplary embodiment, the refrigerant includes the ratio of about 42 weight percent pentafluoroethane to about 58 weight percent 1,1,1,2-tetrafluoroethane.

In addition, the refrigerant according to the invention also includes from about 0 to about 20 weight percent (based on the combined weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane) of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane. In a preferred embodiment the lubricating oil is present in the range of from about 0.5 to about 2% by weight of the refrigerant mixture.

In an exemplary embodiment, the lubricating oil is a napthenic or paraffinic based lubricating oil. In a further exemplary embodiment, the lubricant is selected from those lubricants sold by Anderol, Inc., East Hanover, N.J., an affiliate of Royal Lubricants Company, under the trademark ROYCO® 2302. ROYCO® 2302 is a napthenic oil lubricant having the following composition:

65-85% hydrotreated light napthenic distillate,

10-20% solvent refined light napthenic distillate petroleum,

<0.5% butylated triphenyl phosphate, and

<2% minor additive.

In another exemplary embodiment, the lubricating oil can be a synthetic lubricating oil, or a mixture of oils, that is soluble in the mixture of the chlorodifluoroethane and tetrafluoroethane. A suitable synthetic lubricant is a man-made, synthetic alkyl aromatic lubricant. Suitable synthetic lubricants include alkylated benzene lubricants.

The lubricant can be either a synthetic alkyl aromatic lubricant, such as alkylbenzene, alone, or a mixture of a synthetic alkyl aromatic lubricant and mineral oil or a mixture of a synthetic alkyl aromatic lubricant and polyol ester (POE). When so mixed, it is preferred, but not required, that a minor portion of the mixture be mineral oil or POE. By minor portion, we mean less than 50% by weight of the blended refrigerants. Alternatively, either mineral oil or polyol ester (POE) can be used alone.

While it is intended that the substitute refrigerant according to the invention may be utilized to replace Refrigerant R-22 (chlorodifluoromethane) that has escaped from apparatus, the substitute refrigerant of the invention may also be utilized to completely refill apparatus that have been designed for use with Refrigerant R-22 (chlorodifluoromethane), since the refrigerant has a temperature-pressure profile that closely approximates that of Refrigerant R-22 (chlorodifluoromethane). Thus, when the refrigerant is used as a complete replacement for Refrigerant R-22 (chlorodifluoromethane), it is no longer necessary that the lubricant be compatible with chlorodifluoromethane but only that it should be compatible with 1,1,1,2-tetrafluoroethane and pentafluoroethane.

Further, whereas the substitute refrigerant of the invention is less damaging to the ozone layer than Refrigerant R-22 (chlorodifluoromethane) and is useful in air conditioning units, and in particular residential type air-conditioning units, it is not so limited in its use. Indeed, the refrigerant may be utilized as a substitute or replacement

for Refrigerant R-22 (chlorodifluoromethane) in virtually any application, thereby eliminating the use of ozone layer-damaging Refrigerant R-22 (chlorodifluoromethane).

In further specifics, the invention provides a canister containing a mixture of tetrafluoroethane and pentafluoroethane with a napthenic oil that may be fitted with an outlet manifold that is compatible with a Refrigerant R-22 (chlorodifluoromethane) recharging manifold that is typically used to recharge an apparatus with the latter refrigerant. Refrigerant may then be allowed to flow from the container through the manifold and into the apparatus to replace Refrigerant R-22 (chlorodifluoromethane) refrigerant that has been lost from the refrigeration system.

10 When mixing the components of the refrigerant blend of the present invention, one should first mix the lubricant with the tetrafluoroethane, then mix that mixture with the pentafluoroethane in the proportions afore mentioned. Otherwise, the product does not mix properly.

In an exemplary form, the lubricant has a viscosity of 5 to 500 centistokes, more preferably 5 to 100 centistokes, even more preferably 5 to 50 centistokes, and most preferably 5 to 10 centistokes. The lubricant having a viscosity of 5 to 10 centistokes is preferred.

In an exemplary embodiment, the percentage by weight of lubricant in the refrigerant blend is 0-20%, preferably 0.5-2%, more preferably 1-2%, even more preferably 1.25-2%, and most preferably 1.5-1.75%. The percentage by weight of lubricant in the refrigerant blend is, for example, 1.75. $\pm 0.05\%$.

A suitable lubricant is severely hydro treated napthenic/paraffinic lubricant, such as the aforementioned ROYCO® 2302. Other suitable lubricants include Sunpar R2280 (a paraffinic based lubricant), Lubrizol 403, Sunthene 200 (a napthenic based lubricant) and L30 or L35 from Shrieve Chemical Company, The Woodlands, Texas, or Zerol 150 from Nu-Calgon Wholesale, Inc., St. Louis, Missouri, or AB150 from Virginia KMP Corporation, Dallas, Texas (alkylbenzene synthetic lubricants). Mobil One 5-weight

synthetic oil (it is hydrophobic) could also work as a lubricant, but it is relatively expensive.

In order for the parts of the refrigerant system to function best, 0.5-20% of total weight of refrigerant should be lubricant. When adding the refrigerant blend to a refrigerant system, one should leave the lubricant in the system if one for some reason takes out the Refrigerant R-22.

The lubricating of the present system is miscible with the pentafluoroethane and tetrafluoroethane blend and with R-22 refrigerant. This allows for mixing of residual R-22 refrigerant and the refrigerant of the present invention, without the release of significant amounts of residual water in the dryer and subsequent system damage (as will happen if the synthetic lubricants disclosed in Thomas et al. and the DuPont patents are used). While alkylbenzene alone is considered not miscible with tetrafluoroethane (in particular R134a), it is sufficiently soluble in the present tetrafluoroethane/chlorodifluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the system, preventing damage to the compressor and component parts of the system.

Various optional additives can be included in the lubricant. A corrosion inhibitor can be included. (otherwise corrosion will probably occur within 6 months). An exemplary corrosion inhibitor is one for anhydrous systems (such corrosion inhibitors comprise calcium, or phosphate salts). The corrosion inhibitor can be bonded to the lubricant. Additionally, a surfactant and/or a foaming agent can be included.

The present refrigerant blend is designed to be utilized as a R-22 replacement in refrigeration systems. It is designed as a replacement, in which little or no modifications including parts are used to adapt the system for the refrigerant of the present invention.

The present refrigerant blend can be used as a replacement for R-22 refrigerant, typically deminimus without retrofitting the air conditioning system or flushing it out. It is recommended that a full vacuum be obtained before adding the refrigerant to the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the disclosure can be better understood with reference to the following drawings.

5 FIG. 1 illustrates pressure versus temperature profiles for various blends of the present disclosure in comparison to R-22.

FIG. 2 compares the temperature versus enthalpy profile of an exemplary embodiment of the present disclosure to R-22.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10 The present disclosure provides a mixture of non-Refrigerant 22 refrigerants that are less damaging to the Earth's ozone layer and that are approved by the U.S. Environmental Protection Agency for use in air-conditioners. The invention mixture is compatible with Refrigerant R-22 (chlorodifluoromethane) and can be used to replace existing Refrigerant R-22 (chlorodifluoromethane)-in R-22 based refrigeration systems.
15 It is expected that the present invention will gradually replace Refrigerant R-22 (chlorodifluoromethane) in Refrigerant R-22 (chlorodifluoromethane)-based air-cooling systems, without the need to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based systems for non-Refrigerant 22 replacement refrigerants.

Specifically, the present refrigerant blend includes a mixture of pentafluoroethane
20 and tetrafluoroethane packaged with a compatible lubricating oil, provided under pressure in a can or cylinder equipped with an outlet compatible with existing Refrigerant R-22 (chlorodifluoromethane) recharging kit manifolds, so that the refrigerant and lubricant mixture can be added to existing Refrigerant R-22 (chlorodifluoromethane) based coolant systems. Also, the invention provides the possibility of using new refrigerant systems,
25 originally designed for "Refrigerant R-22 (chlorodifluoromethane)," by supplying an EPA-approved refrigerant so that retrofitting to new equipment use is not required.

In an exemplary embodiment, the invention provides a cylinder can like the standard 25 or 30 lb. can formerly used for containing "Refrigerant R-22 (chlorodifluoromethane)," but containing about 58% by weight 1,1,1,2-tetrafluoroethane and about 42% by weight pentafluoroethane. The can also contains the preferred
5 lubricant, ROYCO® 2302 in solution with the coolant mixture at a percent by weight of between 0.5% and 2%.

Existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems use an amount of a vegetable or hydrocarbon mineral oil to lubricate the compressor. This oil has a very low vapor pressure, and is not soluble with pure
10 tetrafluoroethane, particularly 1,1,1,2-tetrafluoroethane. Hence, adding tetrafluoroethane to replace Refrigerant R-22 (chlorodifluoromethane) in existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems leads to compressor breakdown from lack of sufficient lubrication. The invention provides lubricants that are compatible with the invention mixture of tetrafluoroethane and pentafluoroethane, and with
15 "Refrigerant R-22 (chlorodifluoromethane)," and that are suitable for lubricating refrigerant compressors and other air-conditioner component parts. The lubricants disclosed herein, on the other hand, are soluble in a tetrafluoroethane/ pentafluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the air-conditioning system, preventing damage to the compressor and component parts of the
20 system.

EXAMPLE 1

Table 1 summarizes the results of solubility tests of a 2% by weight solution of ROYCO® 2302 oil lubricant in an 58/42% by weight mixture of 1,1,1,2-tetrafluoroethane and pentafluoroethane refrigerants. ROYCO® 2302 oil (available from
25 ANDEROL®, Inc., an affiliate of Royal Lubricants Co.), was added to a clear Fisher-Porter pressure burette and a mixture of 1,1,1,2-tetrafluoroethane/pentafluoroethane in an 58/42 ratio by weight was introduced under pressure to maintain the liquid state.

TABLE 1

	Full Burette	clear no separation
	2/3 Full Burette	clear no separation
5	1/2 Full Burette	clear no separation
	1/3 Full Burette	clear no separation
	Almost Empty Burette	clear no separation

Note: The color of the fluid remained the same as the burette was emptied. The expelled
 10 gas deposited the oil onto a test panel.

EXAMPLE 2

1,1,1,2-tetrafluoroethane and pentafluoroethane are mixed with the napthenic oil
 lubricant at set ratios such that the temperature-pressure profile of the mixture is similar
 to that of Refrigerant R-22 (chlorodifluoromethane), over the normal operating range of
 15 air-conditioners. Table 2 summarizes the results of tests of the temperature-pressure
 profiles of various mixes of 1,1,1,2-tetrafluoroethane and pentafluoroethane over the
 range of normal air-conditioner working temperatures, from -60 degree. F. to 160.
 degree. F.

For Table 2, different percentages of 1,1,1,2-tetrafluoroethane and
 20 pentafluoroethane --by weight—were mixed with the lubricant to show the pressure
 temperature relationships of the various invention combinations.

Fig. 1 shows Pressure (liquid) vs. Temperature profiles for R-22 and blends of
 40/60, 45/55 and 42/58 of tetrafluoroethane and pentafluoroethane, respectively.

Fig. 2 shows Temperature vs. Enthalpy profiles comparing a blend of 40/60
 25 tetrafluoroethane and pentafluoroethane to R-22.

The blend of refrigerants tetrafluoroethane and pentafluoroethane of the present
 disclosure shows the following properties of interest:

Dew Point @ -32F

Bubble Point @ -41.5F

Glide @ 9.5 F

5 An exemplary blend of refrigerants is about 42% by weight pentafluoroethane and about 58% by weight 1,1,1,2-tetrafluoroethane. This is the ratio of pentafluoroethane to 1,1,1,2-tetrafluoroethane with the lubricant where the mixture of the invention shows the greatest similarity to "Refrigerant R-22 (chlorodifluoromethane)", over most operating temperatures.

10 The apparatus and method of the preferred embodiment encompass the use of a mixture of 1,1,1,2-tetrafluoroethane and pentafluoroethane at the ranges, as discussed above, with a lubricating oil at ranges, as discussed above of about 0.5% to about 2% by weight in the operation of an air-conditioning system, wherein the coolant-oil mixture replaces Refrigerant R-22 (chlorodifluoromethane) in a Refrigerant R-22 (chlorodifluoromethane)-based refrigeration system.

15 The method and apparatus in the preferred embodiment further details providing the above described mix of pentafluoroethane/1,1,1,2-tetrafluoroethane and lubricating oil in 30 lb. cylinders, where the cylinders are pressure sealed and fitted with an outlet compatible for existing Refrigerant 22-type refrigeration manifolds typically 1/4 inch male flare.

20 Further, it was noted that the systems tested ran more smoothly and the compressor showed less vibration during the test period, as the mixture of the invention was added. It is theorized that the lubricating oil, being soluble in the refrigerant gasses, was better able to lubricate the compressor and reciprocating parts than the existing Refrigerant R-22 (chlorodifluoromethane) lubricant used by itself. In some applications a
25 reduction in power consumption maybe also noted.

The refrigerant of the present invention can also be used as a replacement refrigerant for the new R-22 air-conditioning systems, such as the systems used in today's HFC-free units

5 The ROYCO® 2302 naphthenic oil lubricant of the present disclosure has a flash point of more than 150 degrees F. Pure refrigerant 1,1,1,2-tetrafluoroethane is not miscible with a naphthenic lubricant like mineral oil or mineral seal oil (both of which could be used as the lubricants of the present invention). Pentafluoroethane is miscible with most naphthenic lubricants, including mineral oils. The presence of the pentafluoroethane allows the use of mineral oils in the refrigerant blend and system of the
10 present invention (a translucent, partially miscible blend is formed). The lubricant can advantageously be partially polymerized into longer chain molecules to allow it to function at very low percentage levels. The lubricant can be hydrotreated or polymerized for stability and wear resistance.

15 Phosphated additives add corrosion resistance in the presence of acids and salts and increase wear resistance. Calcium additives help the lubricant resist rust and the effects of corrosion; calcium salts reduce the corrosive effects of hydrochloric acid that is formed in the presence of water and the chlorinated gases present in the refrigerant systems of the present invention.

20 The ROYCO® lubricants mentioned above contain the corrosion inhibitors mentioned above and can also contain acrylic polymer. It is believed that the function of the acrylic polymer is to increase wear resistance under severe conditions. Acrylics can help film formation, and the ability of the lubricant to coat metal and soft parts and stay in place.

25 The lubricant of the present invention is miscible with R-22, the R-22 lubricant, and the blend of the refrigerant gases of the present invention.

It should be understood that variations and modifications may be made of the invention herein taught, and that those are within the scope and spirit of the invention as taught above and claimed here below.

Table 2

Temp (F)	P (60-40)	P (58-42)	P (55-45)	P (R-22)
-60	8.982	8.81	8.552	8.836
-55	10.36	10.16	9.87	10.19
-50	11.9	11.68	11.35	11.7
-45	13.62	13.37	12.99	13.39
-40	15.52	15.24	14.82	15.26
-35	17.63	17.32	16.84	17.34
-30	19.96	19.61	19.08	19.62
-25	22.52	22.13	21.54	22.14
-20	25.33	24.9	24.25	24.91
-15	28.41	27.93	27.21	27.93
-10	31.76	31.23	30.44	31.23
-5	35.42	34.83	33.96	34.82
0	39.39	38.74	37.79	38.73
5	43.69	42.98	41.94	42.96
10	48.34	47.57	46.43	47.54
15	53.36	52.52	51.27	52.48
20	58.76	57.85	56.5	57.79
25	64.57	63.58	62.11	63.51
30	70.8	69.73	68.14	69.65
35	77.48	76.33	74.61	76.22
40	84.62	83.38	81.52	83.26
45	92.25	90.9	88.91	90.76
50	100.4	98.93	96.79	98.76
55	109	107.5	105.2	107.3
60	118.2	116.6	114.1	116.3
65	128	126.2	123.6	125.9
70	138.4	136.5	133.6	136.1
75	149.3	147.3	144.3	146.9
80	160.9	158.8	155.6	158.3
85	173.2	170.9	167.5	170.4
90	186.1	183.7	180.1	183.1
95	199.8	197.2	193.3	196.5
100	214.2	211.4	207.3	210.6
105	229.3	226.4	222.1	225.5
110	245.3	242.2	237.6	241.1
115	262	258.7	253.9	257.5
120	279.6	276.1	271	274.7
125	298.1	294.4	289	292.7
130	317.5	313.6	307.8	311.6
135	337.8	333.7	327.6	331.4
140	359.1	354.8	348.3	352.1
145	381.4	376.8	370.1	373.7
150	404.8	400	392.8	396.4
155	429.3	424.2	416.7	420
160	454.9	449.5	441.6	444.7

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
First Named Inventor/Applicant Name:		Kenneth M. PONDER et al.		
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Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

B0137

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				75

Claims

What is claimed as the invention is:

1. In an apparatus designed for use with chlorodifluoromethane refrigerant,
5 the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said
10 tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

15 2. A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein in
20 the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2-
25 tetrafluoroethane, and

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus.

3. A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, wherein in the refrigerant composition said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43%
 5 by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane, and said tetrafluoroethane totaling 100% and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

4. In the apparatus of claim 1, wherein the apparatus is selected from the
 10 group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

5. In the apparatus of claim 1, wherein the refrigerant composition includes an additive selected from the group consisting of an acrylic polymer, a corrosion
 15 inhibitor, a surfactant, a foaming agent, and mixtures thereof.

6. The method according to claim 2, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC
 20 equipment.

7. The method according to claim 2, wherein the substitute refrigerant composition includes an additive selected from the group consisting of an acrylic
 25 polymer, a corrosion inhibit, a surfactant, a foaming agent, and mixtures thereof.

ABSTRACT

An apparatus and method wherein potential ozone layer-damaging chlorodifluoromethane (Refrigerant R-22) is substituted with a mix of less environmentally damaging refrigerants pentafluoroethane and tetrafluoroethane in chlorodifluoromethane-based air-cooling systems mainly in residential cooling. While less environmentally damaging than chlorodifluoromethane, the substitute refrigerant has a temperature-pressure relationship similar to that of chlorodifluoromethane, making the substitute refrigerant suitable for use with chlorodifluoromethane-based air-cooling systems. In this event, it is mixed with a relatively small percentage of a lubricating oil which is compatible with both the unit refrigerant and typical R-22 system design.