

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT7129032

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	ASSIGNMENT	
CONVEYING PARTY DATA		
Name		Execution Date
IAED TECHNOLOGIES INC		12/03/2021
RECEIVING PARTY DATA		
Name:	ROSEN TECHNOLOGIES LLC	
Street Address:	17330 PRESTON RD	
Internal Address:	ST 200D	
City:	DALLAS	
State/Country:	TEXAS	
Postal Code:	75252	
PROPERTY NUMBERS Total: 18		
Property Type	Number	
Patent Number:	7232075	
Patent Number:	7152806	
Patent Number:	7156318	
Patent Number:	7185825	
Patent Number:	7145110	
Patent Number:	7058477	
Patent Number:	7028912	
Patent Number:	7050026	
Patent Number:	6902117	
Patent Number:	6789739	
Patent Number:	6786421	
Patent Number:	6619555	
Patent Number:	6578770	
Patent Number:	6581846	
Patent Number:	7841542	
Patent Number:	7838803	
Application Number:	13953135	
Application Number:	14313507	

CORRESPONDENCE DATA**Fax Number:**

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Email: JASON@IPVAL.COM**Correspondent Name:** JASON BOURGEOIS**Address Line 1:** 4940 BROADWAY STREET**Address Line 2:** ST130**Address Line 4:** SAN ANTONIO, TEXAS 78209

NAME OF SUBMITTER:	JASON BOURGEOIS
SIGNATURE:	/JASON BOURGEOIS/
DATE SIGNED:	01/19/2022
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 3

source=IAED and Rosen Tech Patent Assignment#page1.tif

source=IAED and Rosen Tech Patent Assignment#page2.tif

source=IAED and Rosen Tech Patent Assignment#page3.tif

PATENT ASSIGNMENT AGREEMENT

THIS PATENT ASSIGNMENT AGREEMENT (the "Agreement"), is made and entered into this 3rd day of December, 2021 (the "Effective Date"), is by and between IAED Technologies, Inc., a Canadian Company with a principal place of business at 695 Chenin Avila Unit 7 Suite 259, Piedmont, Quebec, J0R1T0 Canada ("Assignor") and Rosen Technologies, LLC, a Texas company organized under the laws of Texas, ("Assignee"). Assignor and Assignee are also referred to in this Agreement each as a "Party" and collectively as the "Parties."

WHEREAS, Assignor is the sole owner of all rights, title and interest in and to the inventions (the "Inventions") as described and claimed in the United States and foreign patents and patent application as listed on Schedule A (United States patent properties) and Schedule B (foreign patent properties) hereto (collectively the "Patents");

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the Parties and pursuant to the Purchase Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, it is hereby agreed as follows:

I. ASSIGNMENT

1. Assignor hereby sells, transfers, assigns and sets over to Assignee all rights, title and interest (for all countries) in and to the Inventions and the Patents, and all the rights and privileges under any letters patent that may be granted under any continuations, divisions, reissues, reexaminations, renewals and extensions therefor and thereon and all continuations, divisions, reissues, reexaminations, renewals and extensions thereof; and all applications for industrial property protection, including without limitation, all applications for patents, utility models, copyright, and designs which may hereafter be filed for said Inventions and Patents in any country or countries, together with the right to file such applications and the right to claim for the same the priority rights derived from the Inventions and the Patents under the patent laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, copyrights and designs which may hereafter be filed for said Inventions or Patents in any country or countries, together with the right to file such applications; and all forms of industrial property protection, including, without limitation, patents, utility models, inventors' certificates, copyrights and designs which may be granted for said Invention and/or Patent in any country or countries and all extensions, renewals and reissues thereof.
2. The rights, title and interest transferred above are subject to Assignor having previously granted a non-exclusive, fully paid up, royalty-free license to the Patents to Verdant Environmental Technologies Inc. dated August 31, 2016 (Verdant License) presently held through acquisition by Emerson Electric Co. For the avoidance of doubt, Emerson Electric Co. (including its Subsidiaries) or any subsequent acquirer of this pre-existing license. Further, including the right to expand the license in the future to products branded under other trademarks owned by the holding licensee.
3. Assignor hereby authorizes and requests the Commissioner of Patents and Trademarks of the

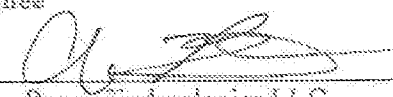
United States and any official of any country or countries foreign to the United States, whose duty is to issue patents or other evidence or forms of industrial property on applications as aforesaid, to issue the same to Assignee, its successors, assigns and legal representatives, or to such nominees as it may designate.

4. Assignor agrees that, whenever reasonably requested by Assignee, Assignor will execute all papers, take all rightful oaths, and do all acts which may be reasonably necessary for securing and maintaining patents for the Inventions in any country and for vesting title thereto in Assignee, its successors, assigns and legal representatives or nominees.
5. Assignor authorizes and empowers Assignee, its successors, assigns and legal representatives or nominees, to invoke and claim for any application for patent or other form of protection for the Inventions, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable, and to invoke and claim such right of priority without further written or oral authorization from Assignor.
6. Assignor hereby consents that a copy of this Agreement shall be deemed a full legal and formal equivalent of any assignment, consent to file or like document that may be required in any country for any purpose and more particularly in proof of the right of Assignee or nominee to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it.
7. All of the rights, title and interest in and to the Inventions and the Patents sold, transferred, assigned and set over to Assignee hereunder include all income, royalties, damages and payments now or hereafter due or payable with respect thereto, and all causes of action (whether in law or equity) and the right to sue, counterclaim, and recover for the past, present and future infringement of the rights assigned or to be assigned hereunder.

Assignor


By: IAED Technologies, Inc.
Name: Howard Rosen
Title: Managing Member

Assignee


By: Rosen Technologies LLC
Name: Adam Baumli
Title: Managing Member

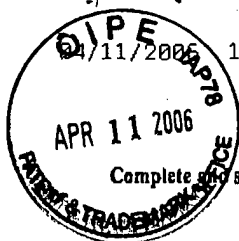
SCHEDULE A
UNITED STATES PATENTS AND PATENT APPLICATIONS

U.S. Patent Application Publications

Publication Number	Application Number	Publication Date	Application Date	Issue Date
US20150028114A1	13/953,135	1/29/2015	7/29/2013	Pending
US20150369508A1	14/313,507	12/24/2015	6/24/2014	Pending

U.S. Patent Publications

Patent Number	Application Number	Publication Date	Application Date	Issue Date
US7232075B1	11/039,180	6/19/2007	1/19/2005	6/19/2007
US7152806B1	10/654,230	12/26/2006	9/3/2003	12/26/2006
US7156318B1	10/654,235	1/2/2007	9/3/2003	1/2/2007
US7185825B1	10/875,579	3/6/2007	6/24/2004	3/6/2007
US7145110B1	11/254,078	12/5/2006	10/19/2005	12/5/2006
US7058477B1	10/995,574	6/6/2006	11/23/2004	6/6/2006
US7028912B1	10/878,825	4/18/2006	6/28/2004	4/18/2006
US7050026B1	10/440,474	5/23/2006	5/15/2003	5/23/2006
US6902117B1	10/420,560	6/7/2005	4/21/2003	6/7/2005
US6789739B2	10/287,677	9/14/2004	11/4/2002	9/14/2004
US6786421B2	10/654,236	9/7/2004	9/3/2003	9/7/2004
US6619555B2	10/075,866	9/16/2003	2/13/2002	9/16/2003
US6578770B1	10/119,180	6/17/2003	4/9/2002	6/17/2003
US6581846B1	10/091,767	6/24/2003	3/6/2002	6/24/2003
US7841542B1	11/557,492	11/30/2010	11/7/2006	11/30/2010
US7836803B1	11/852,036	11/23/2010	9/7/2007	11/23/2010



PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (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 I, 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 I for any change of address)

7590 03/06/2006

David T. Bracken
The Law Office of David T. Bracken
4839 Bond Avenue
Orange, CA 92869

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Marc E. Hankin (Depositor's name)
Marc E. Hankin (Signature)
April 11, 2006 (Date)

700.00 OP

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/995,574	11/23/2004	Howard Rosen	0410.1A4	7651

TITLE OF INVENTION: THERMOSTAT SYSTEM WITH REMOTE DATA AVERAGING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$0	\$700	06/06/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
GANDHI, JAYPRAKASH N	2125	700-277000

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

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

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 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. Hankin Patent Law, APC

2. Marc E. Hankin

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 has been filed for recordation as set forth in 37 CFR 3.11. 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. The following fee(s) are enclosed:

☒ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies

4b. Payment of Fee(s):

☐ A check in the amount of the fee(s) is enclosed.

☒ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

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

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Marc E. Hankin

Date

April 11, 2006

Typed or printed name

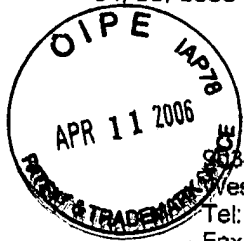
Marc E. Hankin

Registration No.

38,908

This collection of information 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 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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.



9084 Sunset Boulevard, Suite 200
West Hollywood, CA 90069
Tel: (310) 275-6946
Fax: (310) 274-8643
Marc@HankinPatentLaw.com

**Hankin Patent Law,
A Professional Corporation**

Fax

To:	US Patent Office	From:	Grace Pak
Fax:	(571) 273-2885	Pages:	5 (Including cover)
Phone:		Date:	April 11, 2006
Re:	Issue Fee and related documents CC: for App No 10/995,574		

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply

To Whom It May Concern:

Please see the attached Issue Fee and related documents for the patent application with application number 10/995,574, filing date 11/23/2004, and first named inventor Howard Rosen.

Thank you very much,

Grace Pak

Legal Assistant

Hankin Patent Law



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PAGE 10

MAR 16 2006

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Approved for use through 11/30/2005, OMB 0631-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

PTO/SB/82 (04-05)

Application Number	10/995,574
Filing Date	11/23/2004
First Named Inventor	Howard Rosen
Art Unit	2632
Examiner Name	
Attorney Docket Number	0410.1A4

**REVOCATION OF POWER OF
ATTORNEY WITH
NEW POWER OF ATTORNEY
AND
CHANGE OF CORRESPONDENCE ADDRESS**

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint the practitioners associated with the Customer Number:

51413

☒ Please change the correspondence address for the above-identified application to:

☒ The address associated with
Customer Number:

51413

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email	Marc@hankinpatentlaw.com	

I am the:

☒ Applicant/Inventor.

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Signature			
Name	Howard Rosen		
Date	March 15, 2006		Telephone (514) 484-7001

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.38. 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 5 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 1460, Alexandria, VA 22313-1460.

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

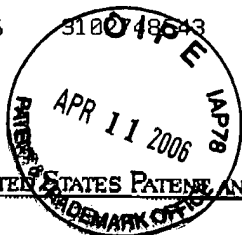
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PAGE 10/18 * RCVD AT 3/16/2006 1:28:40 PM [Eastern Standard Time] * SVR:USPTO-EFXXF-1/21 * DNIS:2738300 * CSID:3102748643 * DURATION (mm:ss):06:48

12/18

PAGE 4/5 * RCVD AT 4/11/2006 5:54:50 PM [Eastern Daylight Time] * SVR:USPTO-EFXXF-5/0 * DNIS:2732885 * CSID:3102748643 * DURATION (mm:ss):02:16

PETITIONER ECOBEE
EX. 1007



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address COMMISSION 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
10/995,574	11/23/2004	Howard Rosen	0410.1A4

51413
MARC E. HANKIN, ESQ.
11414 THURSTON CIRCLE
LOS ANGELES, CA 90049

CONFIRMATION NO. 7651



OC00000018454910

Date Mailed: 04/04/2006

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/16/2006.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.


BERHANU GIRUM
PTOSS (703) 305-0677

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/995,574	11/23/2004	Howard Rosen	0410.1A4

David T. Bracken
The Law Office of David T. Bracken
4839 Bond Avenue
Orange, CA 92869

CONFIRMATION NO. 7651



OC000000018454906

Date Mailed: 04/04/2006

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/16/2006.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

BERHANU GIRUM
PTOSS (703) 305-0677

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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/995,574	11/23/2004	Howard Rosen	0410.1A4

51413
 MARC E. HANKIN, ESQ.
 11414 THURSTON CIRCLE
 LOS ANGELES, CA 90049

CONFIRMATION NO. 7651



OC000000018454910

Date Mailed: 04/04/2006

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/16/2006.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

BERHANU GIRUM
 PTOSS (703) 305-0677

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MAR 16 2006

PTO/SB/82 (04-05)

Approved for use through 11/30/2005. OMB 0851-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REVOCATION OF POWER OF ATTORNEY WITH NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	10/995,574
	Filing Date	11/23/2004
	First Named Inventor	Howard Rosen
	Art Unit	2632
	Examiner Name	
	Attorney Docket Number	0410.1A4

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint the practitioners associated with the Customer Number:

51413

☒ Please change the correspondence address for the above-identified application to:

☒ The address associated with
Customer Number:

51413

OR

☐ Firm or Individual Name				
Address				
City	State	Zip		
Country				
Telephone	Email	Marc@hankinpatentlaw.com		

I am the:

☒ Applicant/Inventor.

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Signature			
Name	Howard Rosen		
Date	Telephone	(514) 484-7901	

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.36. 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 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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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

03/06/2006

David T. Bracken
The Law Office of David T. Bracken
4839 Bond Avenue
Orange, CA 92869

EXAMINER

GANDHI, JAYPRAKASH N

ART UNIT

PAPER NUMBER

2125

DATE MAILED: 03/06/2006

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/995,574	11/23/2004	Howard Rosen	0410.1A4	7651
TITLE OF INVENTION: THERMOSTAT SYSTEM WITH REMOTE DATA AVERAGING				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$0	\$700	06/06/2006

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 REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

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: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (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)

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.

7590

03/06/2006

David T. Bracken
The Law Office of David T. Bracken
4839 Bond Avenue
Orange, CA 92869

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/995,574

11/23/2004

Howard Rosen

0410.1A4

7651

TITLE OF INVENTION: THERMOSTAT SYSTEM WITH REMOTE DATA AVERAGING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$0	\$700	06/06/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
GANDHI, JAYPRAKASH N	2125	700-277000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 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 _____
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 has been filed for recordation as set forth in 37 CFR 3.11. 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. The following fee(s) are enclosed:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information 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 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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.

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/995,574	11/23/2004	Howard Rosen	0410.1A4	7651
7590	03/06/2006		EXAMINER	
David T. Bracken The Law Office of David T. Bracken 4839 Bond Avenue Orange, CA 92869			GANDHI, JAYPRAKASH N	
			ART UNIT	PAPER NUMBER
			2125	
DATE MAILED: 03/06/2006				

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

The Patent Term Adjustment to date is 42 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 42 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/995,574

Examiner

Jayprakash N. Gandhi

Applicant(s)

ROSEN, HOWARD

Art Unit

2125

-- 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 11/23/04.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of 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.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ 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. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 11/23/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-15 have been allowed.
2. The following is an examiner's statement of reasons for allowance:

As to claims 1-15, patentability resides, at least in part, in the combination of: an occupancy response system with a central control device, to control space conditioning equipment, wherein the control device apart from remote sensors in physical locations, the improvement includes, one or more environmental sensors and occupancy sensors, a central processor with a central processing unit, a real time clock, a memory, and an input/output unit, a remote processor for each remote sensors with central processing unit for storing a transmission control program, wherein the program detects occupancy or vacancy, read current signal from a coupled environmental and occupancy sensors, and calculate an average of the received environmental sensor values and compare with a setpoint to determine actuation of the space conditioning equipment, in further combination with the other limitations of base claims 1 and 6.

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

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Games et al., Culp, Federspiel et al., Ratz et al., Rein et al., Russ et al., Kline et al., Pesko et al., and Dudley disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayprakash N. Gandhi whose telephone number is 571-272-3740. The examiner can normally be reached on 7:00 - 4:30 (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jayprakash N Gandhi
Primary Examiner
Art Unit 2125

Jng

Please type a plus sign (+) inside this box →

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 1

Complete if Known

Application Number	10/995,574
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Filing Date	11/23/04
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First Named Inventor	Rosen
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Group Art Unit	2125
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Examiner Name	Gandhi
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Attorney Docket Number	0410.1A4
------------------------	----------

U.S. PATENT DOCUMENTS

[illegible]

FOREIGN PATENT DOCUMENTS

[illegible]

**Examiner
Signature**

Islandhi

Date Considered

3 | 2 | 06

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

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.**

PETITIONER ECOBEE
EX. 1007

Notice of References Cited	Application/Control No. 10/995,574		Applicant(s)/Patent Under Reexamination ROSEN, HOWARD	
	Examiner Jayprakash N. Gandhi		Art Unit 2125	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,205,381 A	05-1980	Games et al.	700/277
*	B	US-4,522,336 A	06-1985	Culp, Charles H.	236/46R
*	C	US-5,170,935 A	12-1992	Federspiel et al.	236/44C
*	D	US-5,197,668 A	03-1993	Ratz et al.	236/51
*	E	US-5,341,988 A	08-1994	Rein et al.	236/49.3
*	F	US-5,801,940 A	09-1998	Russ et al.	700/9
*	G	US-6,338,437 B1	01-2002	Kline et al.	236/49.3
*	H	US-6,536,675 B1	03-2003	Pesko et al.	236/47
*	I	US-2003/0216838 A1	11-2003	Dudley, Kevin F.	700/277
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	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.

Search Notes

Application/Control No.

10/995,574

Examiner

Jayprakash N. Gandhi

Applicant(s)/Patent under
Reexamination

ROSEN, HOWARD

Art Unit

2125

SEARCHED

Class	Subclass	Date	Examiner
700	276-278	3/2/2006	JNG
236	1C,51,91F	3/3/2006	JNG
236	91R	3/3/2006	JNG

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner
700	276-277	3/3/2006	JNG
236	1C, 51	3/3/2006	JNG

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
EAST	3/3/2006	JNG



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Bib Data Sheet

CONFIRMATION NO. 7651

SERIAL NUMBER 10/995,574	FILING DATE 11/23/2004 RULE	CLASS 700	GROUP ART UNIT 2125	ATTORNEY DOCKET NO. 0410.1A4
-----------------------------	---------------------------------------	--------------	------------------------	---------------------------------

APPLICANTS

Howard Rosen, Hampstead, CANADA;

** CONTINUING DATA ***** *JNR*** FOREIGN APPLICATIONS ***** *JNR*

IF REQUIRED, FOREIGN FILING LICENSE GRANTED

** SMALL ENTITY **

** 12/28/2004

Foreign Priority claimed

☐ yes ☒ no

35 USC 119 (a-d) conditions met

☒ yes ☒ no ☐ Met after Allowance

Verified and Acknowledged

JNR
Examiner's Signature

Initials

STATE OR

COUNTRY
CANADA

SHEETS

DRAWING
4

TOTAL

CLAIMS
15

INDEPENDENT

CLAIMS
2

ADDRESS

David T. Bracken
 The Law Office of David T. Bracken
 4839 Bond Avenue
 Orange, CA
 92869

TITLE

Thermostat system with remote data averaging

FILING FEE RECEIVED 395	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ All Fees
		☐ 1.16 Fees (Filing)
		☐ 1.17 Fees (Processing Ext. of time)
		☐ 1.18 Fees (Issue)
		☐ Other _____
		☐ Credit

PETITIONER ECOBEE

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4474	occup\$4 sensor (environment or temperature) real memory average	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:40
L2	1460	(700/90,276,277,278 236/191).ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:49
L3	19	L1 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:40
L4	36	("4860950" "5407002" "5644302"). PN"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/03/03 07:40
L5	0	("4860950" "5407002" "5644302"). PN"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:40
L6	32	("4860950" "5407002" "5644302"). PN"	USPAT	OR	ON	2006/03/03 07:40
L7	36	("4860950" "5407002" "5644302"). PN"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/03/03 07:40
L8	4474	occup\$4 sensor (environment or temperature) real memory average	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:40
L9	63	occup\$4 sensor (environment or temperature) real	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2006/03/03 07:40

EAST Search History

L10	5	L9 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2006/03/03 07:40
L11	63	occup\$4 sensor (environment or temperature) real	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2006/03/03 07:40
L12	3010	(236/91r,91f,1c).ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/03/03 07:52
L13	3	1 and 12	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/03/03 07:53
L14	2	9 and 12	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/03/03 07:53

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2001

Application or Docket Number

100 99574

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	34	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	43 minus 20 =	23
INDEPENDENT CLAIMS	1 minus 3 =	0
MULTIPLE DEPENDENT CLAIM PRESENT ☒		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

8-16-04

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	43	43	=
Independent	1	1	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

4-12-05

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	34	43	=
Independent	2	1	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			=
Independent			=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

- * 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."
- Th "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	207
X42=	
+140=	140.00
TOTAL	717.00

RATE	FEE
BASIC FEE	740.00
X\$18=	
X84=	
+280=	
TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDITIONAL FEE	

Best Available Copy

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

22764 U.S. PTO
112304

Title: THERMOSTAT SYSTEM WITH
REMOTE DATA AVERAGING
Inventor(s): Howard Rosen
Serial No.:
Filing Date:
Group No.:
Examiner:
Attorney Docket No.: 0410.1A4

TRANSMITTAL LETTER:
REGULAR PATENT APPLICATION

19270 U.S. PTO
10/995574
112304

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted hereunder for filing is
the above patent application and/or
related documents as listed below.

Papers Which Are Required for Filing Date:

- i) Pages of Specification: 14
- ii) Pages of Claims: 7
- iii) Pages of Drawings: 4
- iv) Pages of Abstract: 1

CERTIFICATE OF MAILING (37 CFR 1.10)
I, the person below signing this Certificate of Mailing,
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D. Bracken
Signature: David T. Bracken
Date of Mailing: November 23, 2004

Additional Papers Enclosed:

- ☒ Declaration/Power of Attorney
- ☒ Information Disclosure Statement / Remarks
- ☒ A Credit Card Auth. for \$395
- ☒ Copies of Cited Prior Art

Inventor(s)	Address
Howard Rosen	Lyncroft Road, Hampstead, Quebec, H3X 3E3 Canada

Address all correspondence to: David T. Bracken, The Law Office of David T.
Bracken, 4839 Bond Avenue, Orange, CA 92869
Phone: 714-744-4798

- ☒ Applicant(s) claim small entity status for this application as per 37 CFR 1.9 and 27.
- ☒ Pursuant to 37 CFR 1.211, Applicant hereby requests nonpublication with this application. The application is not to be published under 35 U.S.C. 122(b). Applicant certifies that the invention disclosed in the application has not been 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.

David T. Bracken

Attorney for Applicant(s)
David T. Bracken, Reg. No. 37522

1 TITLE: THERMOSTAT SYSTEM WITH REMOTE DATA AVERAGING

2 INVENTOR: HOWARD ROSEN

3
4
5 Field of the Invention

6 This invention relates to the art of thermostats and, more particularly, to a
7 thermostat system incorporating a central control device receiving remote
8 environmental sensing data from remote sensors.

9 Background of the Invention

10 Thermostats have been used for many years as a temperature sensitive
11 switch which controls heating and/or cooling equipment for conditioning a space in
12 which the thermostat, or a temperature sensor connected to the thermostat, is
13 placed. In the well known manner, a simple thermostat can be adjusted to establish
14 a temperature set point such that, when the temperature in the conditioned space
15 reaches the set point, the thermostat interacts with the heating and/or/cooling
16 equipment to take suitable action to heat or cool the conditioned space as may be
17 appropriate for the season.

18 Modern thermostat systems, which take advantage of the ongoing rapid
19 advances in electronic technology and circuit integration, have many features
20 which provide more precise supervision of the heating and/or cooling equipment to
21 achieve more economical and more comfortable management of the temperature of
22 a conditioned space. Many modern thermostat systems include a real time clock, a
23 memory and a data processor to run a process control program stored in the
24 memory to accurately measure the temperature of a temperature sensor disposed in
25 the conditioned space and to send control signals to the heating and/or cooling
26 equipment to closely control the temperature of the conditioned space. Modern
27 thermostat systems permit anticipating and minimizing hysteresis or overshoot of

1 the temperature in the conditioned space. In addition, the program can specify
2 different set points at different times of the day and week and may also include a
3 “vacation” mode which employs different set points when the conditioned space is
4 not occupied for an extended period.

5 Many modern thermostat systems have a central control device or unit that
6 receives environmental sensor data from sensors remote from the central control
7 device. These sensors can detect temperature, humidity, or other parameters that
8 may be used in a control program by the central control device to control
9 environmental control equipment. The environmental control equipment
10 (comprising HVAC equipment, among others) responds to signals from the central
11 control device to affect the ambient comfort in rooms of a conditioned space.
12 Typically, a remote sensor signal is received by the central control device and its
13 value compared with that of a pre-set setpoint. If the sensor value is sufficiently
14 different from the setpoint, environmental control equipment is activated or de-
15 activated in response thereto. Remote sensors can be connected by wire directly to
16 the central control device or by wireless connection so that the control program can
17 store the output of each sensor and associate it with an identifier for the remote
18 sensor where the output originated.

19 Modern programmable thermostat systems also may act to control
20 temperature in some rooms of out of all those in a conditioned space as a “zone”.
21 Unfortunately, zone control requires dedicated equipment for the zone or duct
22 dampers or deflectors to direct conditioned air to the zone rooms. This requires
23 complexity and additional cost to the system. One form of zone control uses
24 storage in a central control device storing all the signals from multiple remote
25 environmental sensors in the zone. The control program calculates an average
26 value from the stored values of the remote sensors and uses that average value as a
27 control value. The control value is compared with a setpoint, whereafter

1 environmental control equipment is activated or de-activated. The control value
2 established by prior art thermostat systems can easily over- or under-condition a
3 room where a user most desires environmental control.

4 There is a need for zone control in a thermostat system where remote sensor
5 values are averaged for occupied rooms at a central control device. The averaged
6 sensor data establish a zone control value. This zone control value more accurately
7 reflects environmental conditions of rooms where the user most desires control of
8 those environmental conditions.

9 10 Summary of the Invention

11 A thermostat system according to the invention includes: a central control
12 device (typically a programmable thermostat with a processor having: a CPU, real
13 time clock and a memory for storing a control program and data information),
14 multiple rooms comprising a conditioned space, environmental control equipment,
15 and multiple environmental sensors capable of sensing an environmental condition
16 (such as temperature, humidity, or other condition). With exception of those
17 provided within or close to a housing of the central control device, environmental
18 sensors are located remote from the central control device. "Remote" as used
19 herein means effectively remote from the central control device as to a sensed
20 environmental condition. A remote sensor may be located in another room as
21 compared with the central control device. Alternately, a remote sensor may be
22 located some distance away from the central control device in a large room. A
23 communications interface is adapted to establish reception of signals (via wired or
24 wireless connections) between the processor and the environmental sensors.

25 In one embodiment, the sensors are associated with transmission means,
26 which control transmission of sensor signals, and occupancy sensors. Each sensor
27 measures a local environmental condition. Occupancy sensors comprise infrared or

1 other motion sensors, light detection sensors, door opening sensors, and other such
2 sensors that detect the presence of humans in a room of the conditioned space
3 where its associated sensor is located.

4 In one form of the invention, transmission means enables transmission of
5 environmental sensor signals to the central control device only upon input of
6 signals from the occupancy detector. In another form of the invention, transmission
7 means provide continuous transmissions from environmental sensor signals to a
8 central control device, albeit where such signals are associated with indications of
9 occupancy or non-occupancy of a room where the sensor is located. sensing
10 occupancy of a room or an area of a large room. Such remote sensor signals are
11 transmitted to the central control device and stored in its memory as a table of data
12 indicating environmental conditions only in occupied rooms. The values of this
13 table are averaged in one of several selected modes to yield a control value. This
14 control value more accurately reflects the desired environmental conditions of the
15 rooms where user's are present. Alternately, all sensor data may be stored at the
16 central control device and associated with indications of occupancy or non-
17 occupancy of a room where the sensor is located and a time of the sensing of the
18 environmental condition and occupancy status of the room.

19 In a second embodiment, remote sensors and occupancy detectors are
20 associated as in the first embodiment. However, this second embodiment
21 comprises transmission means that causes transmission of environmental sensor
22 signals to the central control device with additional signals indicating whether the
23 sensor signal originates from an occupied or non-occupied room. Transmission
24 means may transmit continuously, periodically or upon the occurrence of a sensed
25 event. The occupancy status of the room is determined by the input to the
26 transmission means of the occupancy sensor. These remote sensor signals are
27 transmitted to the central control device and stored in its memory as a table of data

1 indicating environmental conditions of both occupied and un-occupied rooms. The
2 values of this table are averaged in one of several selected modes to yield a control
3 value. This control value more accurately reflects the overall desired
4 environmental conditions of the rooms where user's are present.

5 A user may optionally select from one of several forms of averaging of
6 sensor data to derive a control value. The control program may cause a display
7 screen connected with the CPU to provide a user with a list of averaging options,
8 where by the user can select one of the options through a user interface with touch
9 sensitive buttons or other well known means.

10 Averaging of sensor data may be accomplished by one of several methods.
11 The sensor data table may contain sensor data from sensors located at the central
12 control devices as well as from remote sensors. Simple averaging of sensor data
13 associated with room occupancy occurs when all environmental sensor data are
14 added together and divided by the number of data items in the table.

15 A second form of averaging uses weighting depending on square footage of
16 the room where the sensor is located. Greater weighting is assigned to sensor data
17 associated with occupancy in rooms with greater relative square footage.

18 A third form of averaging uses sensor data from occupied and unoccupied
19 rooms and assigns greater weight to sensor data from occupied rooms.

20 A fourth form of averaging uses historical data to determine rooms most
21 heavily occupied over a pre-determined period (such as a week or month) and
22 averages current sensor data only from those heavily occupied rooms to arrive at a
23 control value regardless of current occupancy status.

24 Current thermostat systems can include mobile remote temperature sensors
25 with wireless transmitters. These mobile temperature sensors send sensed, local
26 temperature signals to a central control device and are usually battery powered and
27 enclosed in a handheld housing, The mobile sensors can include a display of

1 locally sensed temperature. In one form of the invention, mobile sensors detect
2 room occupancy and also have means to detect motion of the device itself relative
3 to its surroundings. Without such means, movement of the mobile sensor by a user
4 would result in a false indication of occupancy to the occupancy sensor. For
5 example, an infra-red motion detector in the mobile sensor would falsely interpret
6 carrying the mobile sensor from one room to another as the presence of a person
7 moving in a room. Instead, transmission means are connected to a device motion
8 sensor. The device motion sensor in one form comprises a circuit that opens, closes
9 or alternates between those states when the mobile sensor is picked up and moved.
10 A set of fixed contacts for the circuit can be arranged so that rolling or sliding
11 metallic pieces in an enclosed cavity break or complete the circuit when the device
12 itself is picked up and carried to another room. The transmission means delays
13 receipt of inputs from the occupancy sensor until the mobile sensor has come to
14 rest and/or after a predetermined period of time. These adaptations allow the
15 mobile sensor to come to rest before sensing room occupancy and thereafter
16 transmitting local environmental conditions.

17 It is a feature of some modern thermostat systems to control duct dampers or
18 diverters so that conditioned air from air handlers and fans is directed only to
19 certain rooms of a conditioned space. In the present invention, occupancy sensed in
20 a room creates a signal via the occupancy sensor which is transmitted from a
21 remote device to the central control device. The central control device can act to
22 average temperatures to calculate a control value and at the same time divert
23 substantially all conditioned air only to the occupied rooms.

24 In some situations, environmental conditions in separated but occupied
25 rooms may be quite different. A side of a building with its wall receiving full sun
26 can dramatically heat a room on that side. A room on the opposite side of the
27 building may be quite cool and have a temperature close to a desired setpoint.

1 Simple averaging of local temperatures in those rooms may result in a control
2 value near a desired setpoint for the central control device. A fifth form of
3 averaging would cause the data table values of sensed environmental conditions to
4 be subtracted from the setpoint to calculate a table of differences, some positive
5 and some negative depending on the relationship of a sensor value to the setpoint.
6 Differences beyond the setpoint value at which environmental control equipment is
7 activated (such as the setpoint temperature at which air conditioning equipment is
8 turned on) would be averaged and given greater weight than an average of
9 differences outside of that activation range. For example, temperature sensors
10 might indicate degree Fahrenheit temperatures of 80, 79, 77 and 75. If the setpoint
11 is 78 for air conditioning to be turned on, the differences would be 2, 1, -1 and -3.
12 Simply averaging the sensor values would not result in the overheated rooms being
13 cooled. In one scenario, the positive differences are weighted 70% and the negative
14 differences at 30%. The resulting control value will be sufficient to activate the air
15 conditioning at the cost of overcooling some occupied rooms.

16 It is an object of the invention to average sensed environment conditions
17 only in occupied rooms in order to calculate a control value.

18 19 Description of the Drawing

20 FIG. 1 is a plan view of a conditioned space with several rooms, a central
21 control device and remote environmental sensors arranged in the rooms.

22 FIG. 2 is a block diagram of a central control device and its relationship to
23 environmental control equipment, the conditioned space, and remote sensors.

24 FIG. 3 is a block diagram of a remote sensor.

25 FIG. 4 is a high level process flow chart describing the operation of the
26 remote sensor in a first embodiment.

1 FIG. 5 is a high level process flow chart describing the operation of the
2 remote sensor in a second embodiment.

3 FIG. 6 is a high level process flow chart describing the operation of the
4 central control device in the invention thermostat system.

5 Description of the Preferred Embodiment(s)

6 Referring first to FIG. 1, a structure 10 defines within its walls conditioned
7 space for a thermostat system. Structure 10 comprises sides 11 and 12, rooms 13
8 through 18, lighting fixture 19, fireplace 20, and exemplary doors 21 and 22. The
9 thermostat system includes central control device 23 and remote sensors 23A
10 through 23F. Remote sensors 23A through 23F are located respectively in rooms
11 13 through 18. Alternately, any of the remote sensors 23A through 23F may be
12 mobile sensors capable of being moved to any room in structure 10.

13 Referring now to FIG. 2, central control device 23 is shown in a block
14 diagram form with a processor 30 connected to an environmental temperature
15 sensor S1 and an occupancy sensor S2 which are disposed with access to
16 conditioned space 38. The processor 30 and the sensors S1 and S2 may be situated
17 in a common housing (not shown) or separated, all as very well known in the art,
18 so that said sensors have effective access to the room in which the housing for
19 processor 30 is located.

20 The processor 30 includes a central processing unit (CPU) 31 in
21 communication with a memory 32 which stores data and program information and
22 also, via an input/output unit (I/O unit) 34, an optional user interface 35 and a
23 liquid crystal or other type display (LCD) 36. The memory 32 may include a read-
24 only part which is factory-programmed and a random-access part which stores data
25 subject to change during operation. A settable real time clock 33 is used to keep
26 time in the central control device to facilitate diverse operations, such as different
27 temperature set points (desired temperatures), during different periods of the day

1 cycle. The thermostat system may be suitably powered by a battery (not shown)
2 and/or from equipment to which is connected. The I/O unit 34 includes a wired or
3 wireless communications interface 41 for coordinating communications between
4 the CPU 31 and one or more remote sensors.

5 Referring now to FIG. 3, remote sensors 23A through 23F are shown in a
6 block diagram form with a processor 50 connected to an environmental
7 temperature sensor S3, an occupancy sensor S4, and device motion sensor S5
8 which are disposed with access to conditioned space 56. The processor 50 and the
9 sensors S3, S4 and S5 may be situated in a common housing (not shown) or
10 separated, all as very well known in the art, so that said sensors have effective
11 access to the room in which the housing for processor 50 is located.

12 The processor 50 includes a central processing unit (CPU) 51 in
13 communication with a memory 52 which stores data and program information and
14 also, via an input/output unit (I/O unit) 54, and a liquid crystal or other type display
15 (LCD) 55. The memory 52 may include a read-only part which is factory-
16 programmed and a random-access part which stores data subject to change during
17 operation. A settable real time clock 53 is used to keep time in the remote sensor
18 to facilitate diverse operations, such as receiving and transmitting sensor signals.
19 The remote sensor may be suitably powered by a battery (not shown) and/or from
20 power supply integral with structure 10. The I/O unit 54 includes a wired or
21 wireless communications interface 59 for coordinating communications between
22 the CPU 50 and the central control device.

23 Thus, in the usual manner during normal operation, one or more
24 environmental sensors send an electrical signal (e.g., if the sensor S1 is a simple
25 thermistor, a resistance value; several types of temperature sensors are widely
26 used) representative of the temperature within its local conditioned space (i.e., the
27 room) which the processor can average to calculate a control value to compare

1 against a previously entered set point to determine if control signals need to be sent
2 to the space conditioning equipment 37. For example, if the control value
3 temperature in the conditioned space is found to be too low when operation is in
4 the heating mode, the processor 31 signals the space conditioning equipment 38
5 circulate, through ducts 39 / 40, air from/to the conditioned space 38 which is
6 heated by the space conditioning equipment before return to the conditioned space.
7 This heating phase continues until the calculated control value indicates that the
8 space is now too hot (or approaching too hot) with reference to the set point such
9 that the processor 31 sends signal(s) to the space conditioning equipment 38 to
10 cease the heating function, all as very well known in the art. In a cooling mode, a
11 counterpart procedure is followed. Those skilled in the art will understand that the
12 control process typically includes such refinements as anticipation, hysteresis
13 accommodation, fan control, etc. which are acknowledged, but are not directly
14 relevant to the invention.

15 Consider now a first embodiment of the invention referring to FIG. 4 as well
16 as FIGS. 1, 2 and 3. Continuously or at one or more predetermined times of day
17 (and/or on-demand if provided for in a sensor control program), occupancy sensor
18 S4 determines whether or not its local conditioned space (i.e., a room) is occupied.
19 An occupancy sensor S4 may detect motion in the room, the opening of doors 21
20 or 22, or the turning on of a light fixture 19, all of which indicate presence of a
21 human occupant. Processor 50 comprises a sensor control program that determines
22 whether occupancy sensor S4 has detected occupancy in conditioned space 56. If
23 occupancy is not detected, the control program optionally waits a predetermined
24 period of time before evaluating input from occupancy sensor S4 again or monitors
25 such inputs continuously. If occupancy is detected, the sensor control program
26 inquires to determine if an optional device motion sensor S5 has detected
27 movement of the remote sensor from a resting or installation location. If remote

1 sensor movement is detected, the control program optionally waits a predetermined
2 period of time before evaluating input from occupancy sensor S4 again. If remote
3 sensor movement is not detected, the control program receives input from
4 environmental sensor S3 and transmits its signal (or value) to the central control
5 device 23 for storage in memory of processor 30. Each remote sensor has a known
6 data communications "address" so that a control program of the central control
7 device can determine which remote sensor has transmitted sensor signals or values.

8 Consider now a second embodiment of the invention referring to FIG. 5 as
9 well as FIGS. 1, 2 and 3. Continuously or at one or more predetermined times of
10 day (and/or on-demand if provided for in a sensor control program), occupancy
11 sensor S4 determines whether or not its local conditioned space (i.e., a room) is
12 occupied. An occupancy sensor S4 may detect motion in the room, the opening of
13 doors 21 or 22, or the turning on of a light fixture 19, all of which indicate
14 presence of a human occupant. Processor 50 comprises a sensor control program
15 that determines whether occupancy sensor S4 has detected occupancy in
16 conditioned space 56. If occupancy is not detected, the sensor control program
17 receives and transmits to the central control device 23 the signals (or values) from
18 environmental sensor S3 with signals indicating that the sensor value is associated
19 with a vacant room. The remote sensor optionally waits a predetermined period of
20 time before evaluating input from occupancy sensor S4 again. If occupancy is
21 detected, the sensor control program inquires to determine if an optional device
22 motion sensor S5 has detected movement of the remote sensor from a resting or
23 installation location. If remote sensor movement is detected, the control program
24 optionally waits a predetermined period of time before evaluating input from
25 occupancy sensor S4 again. If remote sensor movement is not detected, the control
26 program receives input from environmental sensor S3 and transmits its signal (or
27 value) to the central control device 23 for storage in memory of processor 30 with

1 signals indicating that the sensor value is associated with occupied room.. Each
2 remote sensor has a known data communications “address” so that a control
3 program of the central control device can determine which remote sensor has
4 transmitted sensor signals or values.

5 Consider now the first and second embodiments of the invention referring to
6 FIG. 6 as well as FIGS. 1 through 5. At the start of a portion of a control program
7 for the central control device 23, a user may select one of a set of averaging
8 methods for environmental sensor values stored in memory 32 to generate a
9 control value to compare with a setpoint for control of equipment 38. The control
10 program determines whether or not a user has selected an averaging method. If no
11 averaging method is selected, a default method is used for averaging said
12 environmental sensor values. In one form, the default averaging method adds
13 together all stored sensor values in a data table and divides them by the number of
14 sensor values to arrive at a control value. This form of averaging is referred to
15 herein as the simple form. After an averaging method is selected, previously stored
16 sensor values in the data table are erased and new sensor values are received and
17 stored in the data table. Alternately, previously stored values from the data table
18 are stored with an associated current time and date so that historical occupancy and
19 vacancy may be determined for a particular room of structure 10. New values of
20 sensors S1 and/or S3 are received into a data table in memory 32 of the central
21 control device to be used for averaging environmental condition values detected in
22 certain rooms of structure 10. The averaging calculation results in a control value
23 used in comparison with a previously input setpoint to control operation of
24 equipment 38 for changing an environmental condition in the conditioned space of
25 structure 10.

26 If the central control device is programmable, the control program installed
27 during manufacture will provide for user entry of above user input following

1 conventional instructions similar to those used in user-programming the climate
2 control operation of the thermostat system.

3 As used herein, a second form of averaging uses weighting of values of
4 environmental conditions detected by environmental sensors S1 and S3 in
5 occupied rooms depending on square footage of the room where the sensor is
6 located. Greater weighting is assigned to sensor data in rooms with greater relative
7 square footage. For an example using the environmental condition of temperature,
8 assume that room 13 is four times the size of room 15 in structure 10. If rooms 13
9 and 15 are the only ones occupied, the second form of averaging would divide the
10 sensed temperature at central control device 23 by 0.80 and the sensed temperature
11 at remote sensor 23C by 0.20 to arrive at the control value. The denominator in the
12 divisions is arrived at by the pro rata amount of space or square footage of the
13 rooms relative to each other.

14 For the second embodiment of the invention, a third form of averaging uses
15 weighting of values of environmental conditions detected by environmental
16 sensors S1 and S3 in occupied and unoccupied rooms and assigns greater weight to
17 sensor data from occupied rooms. For an example using the environmental
18 condition of temperature, assume that rooms 13 through 15 are occupied and the
19 rest vacant. The third form of averaging would divide the sensed temperatures at
20 central control device 23 and remote sensors 23B and 23C by 0.90 and the sensed
21 temperatures at the remained of the remote sensors by 0.10 to arrive at the control
22 value. The denominator in the divisions is arrived at determining the value of
23 conditioning the air in the unoccupied rooms.

24 A fourth form of averaging uses historical data to determine rooms most
25 heavily occupied over a pre-determined period (such as a week or month) and
26 averages current sensor data only from those heavily occupied rooms to arrive at a
27 control value that may or may not depend on current occupancy. Historical data

1 would indicate that, for example, rooms 13, 15 and 17 are occupied above a
2 predetermined threshold level, i.e., three times per week or fifteen times per week.
3 For those rooms where historical data indicated frequent occupancy and in the
4 second embodiment of the invention, the environmental sensor data used to
5 determine a control value would be those environmental conditions from occupied
6 rooms and those environmental conditions from rooms where there is frequent
7 occupancy regardless of current occupancy status. This form of averaging
8 anticipates actual occupancy of a room. However, if a mobile environmental sensor
9 it moved from one room to another and such motion is detected as above, historical
10 environmental data for the moved sensor will be erased for the purposes of
11 averaging in this embodiment of the invention. Environmental sensor data must
12 begin anew with respect to room occupancy for a moved environmental sensor.

13 While the principles of the invention have now been made clear in an
14 illustrative embodiment, there will be immediately obvious to those skilled in the
15 art many modifications of structure, arrangements, proportions, the elements,
16 materials, and components, used in the practice of the invention which are
17 particularly adapted for specific environments and operating requirements without
18 departing from those principles.

WHAT IS CLAIMED IS:

1 1. An occupancy response system with a central control device adapted to
2 control space conditioning equipment affecting a conditioned space, the
3 central control device located at a single physical location in one of multiple
4 rooms comprising the conditioned space, where remote sensors are located
5 in physical locations substantially apart from the central control device, the
6 improvement comprising:

7 A) two or more environmental sensors adapted to measure a local
8 environmental condition and generate signals indicating its value;

9 B) two or more occupancy sensors adapted to detect occupancy of
10 space around an environmental sensor and generate signals
11 indicating occupancy;

12 C) either the central control device and one or more of the remote
13 sensors or two or more of the remote sensors each comprise an
14 environmental sensor and an occupancy sensor;

15 D) a central processor for the central control device including:

16 1) a central processing unit;

17 2) a real time clock;

18 3) a memory coupled to said central processing unit for storing
19 a central control program and data, said data including at
20 least one of the values of the environmental conditions
21 sensed by the environmental sensors; and

22 4) an input/output unit coupled to the central processing unit, to
23 the space conditioning equipment for issuing control signals
24 thereto, and to a reception interface adapted to receive
25 signals representing environmental conditions at a remote
26 sensor;

27 E) a remote processor for each of the remote sensors including a
28 central processing unit, a real time clock, a memory coupled to
29 said central processing unit for storing a transmission control
30 program, and an input/output unit coupled to the central processing
31 unit and to a transmissions interface adapted to send to the central
32 control device signals representing environmental conditions from
33 a coupled environmental sensor; and
34 F) for the central control device or remote sensors having
35 environmental sensors and occupancy sensors, their input/output
36 units further including a sensor input coupled to an environmental
37 sensor and an occupancy input coupled to an occupancy sensor;
38 G) the control programs causing a coupled central processing unit to
39 selectively:
40 1) detect occupancy or vacancy of a nearby space from signals
41 from a coupled occupancy sensor;
42 2) read current signals from a coupled environmental sensor
43 and transmit them for storage in the memory of the central
44 control device only if occupancy is detected;
45 3) for the central control program, calculate an average of the
46 received environmental sensor values and use the average result
47 as a control value which is compared with a setpoint stored in
48 the memory of the central control program to determine
49 actuation of the space conditioning equipment.

1 2. The system of Claim 1 wherein averaging of received environmental sensor
2 values is calculated by simple averaging or a weighted averaging depending on
3 relative spaces of occupied rooms.

1 3. The system of Claim 2 wherein a display and a user interface are coupled with
2 the input/output unit of the central processing device so the central control program
3 causes a display of averaging methods for averaging received environmental
4 sensor values.

1 4. The system of Claim 3 wherein the central control program further causes a
2 display indicating that a user may select an averaging method through the user
3 interface and thereafter accepting user input selecting one of the averaging
4 methods.

1 5. The system of Claim 1 wherein the space conditioning equipment comprises
2 zone control means so that only occupied rooms have their space affected by the
3 space conditioning equipment.

1 6. An occupancy response system with a central control device adapted to control
2 space conditioning equipment affecting a conditioned space, the central control
3 device located at a single physical location in one of multiple rooms comprising
4 the conditioned space, where remote sensors are located in physical locations
5 substantially apart from the central control device, the improvement comprising:

6 A) one or more environmental sensors adapted to measure a local
7 environmental condition and generate signals indicating its value;

8 B) one or more occupancy sensors adapted to detect occupancy of space
9 around an environmental sensor and generate signals indicating
10 occupancy;

- 11 C) either the central control device and one or more of the remote sensors or
12 two or more of the remote sensors each comprise an environmental
13 sensor and an occupancy sensor;
- 14 D) a central processor for the central control device including:
- 15 1) a central processing unit;
 - 16 2) a real time clock;
 - 17 3) a memory coupled to said central processing unit for storing a
18 central control program and data, said data including at least one of
19 the values of the environmental conditions sensed by the
20 environmental sensors; and
 - 21 4) an input/output unit coupled to the central processing unit, to the
22 space conditioning equipment for issuing control signals thereto,
23 and to a reception interface adapted to receive signals representing
24 environmental conditions at a remote sensor;
- 25 E) a remote processor for each of the remote sensors including a central
26 processing unit, a real time clock, a memory coupled to said central
27 processing unit for storing a transmission control program, and an
28 input/output unit coupled to the central processing unit and to a
29 transmissions interface adapted to send to the central control device
30 signals representing environmental conditions from a coupled
31 environmental sensor; and
- 32 F) for the central control device or remote sensors having environmental
33 sensors and occupancy sensors, their input/output units further including
34 a sensor input coupled to an environmental sensor and an occupancy
35 input coupled to an occupancy sensor;
- 36 G) the control programs causing a coupled central processing unit to
37 selectively:

38 1) detect occupancy or vacancy of a nearby space from signals from a
39 coupled occupancy sensor;
40 2) read current signals from a coupled environmental sensor and a
41 coupled occupancy sensor and transmit them for storage in the
42 memory of the central control device so that values of environmental
43 conditions are associated with their source of occupied or unoccupied
44 rooms;
45 3) for the central control program, calculate an average of the received
46 environmental sensor values and use the average result as a control
47 value which is compared with a setpoint stored in the memory of the
48 central control program to determine actuation of the space
49 conditioning equipment.

1 7. The system of Claim 6 wherein averaging of received environmental sensor
2 values is calculated by simple averaging or a weighted averaging where
3 environmental condition values from occupied rooms are given substantially more
4 value than those of vacant rooms.

1 8. The system of Claim 6 wherein where occupancy sensors include infra-red
2 motion detectors.

1 9. The system of Claim 6 wherein environmental sensors include temperature
2 sensors and humidity sensors.

1 10. The system of Claim 7 wherein a display and a user interface are coupled with
2 the input/output unit of the central processing device so the central control program

3 causes a display of averaging methods for averaging received environmental
4 sensor values.

1 11. The system of Claim 10 wherein the central control program further causes a
2 display indicating that a user may select an averaging method through the user
3 interface and thereafter accepting user input selecting one of the averaging
4 methods.

12. The system of Claim 6 wherein the space conditioning equipment comprises
zone control means so that only occupied rooms have their space affected by the
space conditioning equipment.

1 13. The system of Claim 6 wherein a device motion sensor is coupled to the
2 remote sensor's input output unit so that movement of the remote sensor results in
3 transmission of a movement signal of the device motion sensor to be received by
4 the central control device from the remote sensor and said movement signal is
5 associated with previously received environmental sensor signals from said remote
6 sensor and used for said averaging.

1 14. The system of Claim 13 wherein the central control program of the central
2 control device acts to remove data associated with said movement signal from
3 calculations averaging environmental signals to arrive at a control value.

1 15. The system of Claim 13 wherein the transmission control program of the
2 remote sensor acts to stop transmission of environmental sensor signals to the
3 central control device for a predetermined period of time after receipt of a
4 movement signal.

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1 **ABSTRACT**

2 A thermostat system according to the invention includes: a central control
3 device (typically a programmable thermostat with a processor having: a CPU, real
4 time clock and a memory for storing a control program and data information),
5 multiple rooms comprising a conditioned space, environmental control equipment,
6 and multiple environmental sensors capable of sensing an environmental condition
7 (such as temperature, humidity, or other condition). The sensors are associated
8 with transmission means, which control transmission of sensor signals, and
9 occupancy sensors. Each sensor measures a local environmental condition.
10 Occupancy sensors comprise infrared or other motion sensors, light detection
11 sensors, door opening sensors, and other such sensors that detect the presence of
12 humans in a room of the conditioned space where its associated sensor is located.
13 Space conditioning equipment is activated by comparison of a setpoint to a control
14 value averaged from values of environmental conditions in occupied rooms.

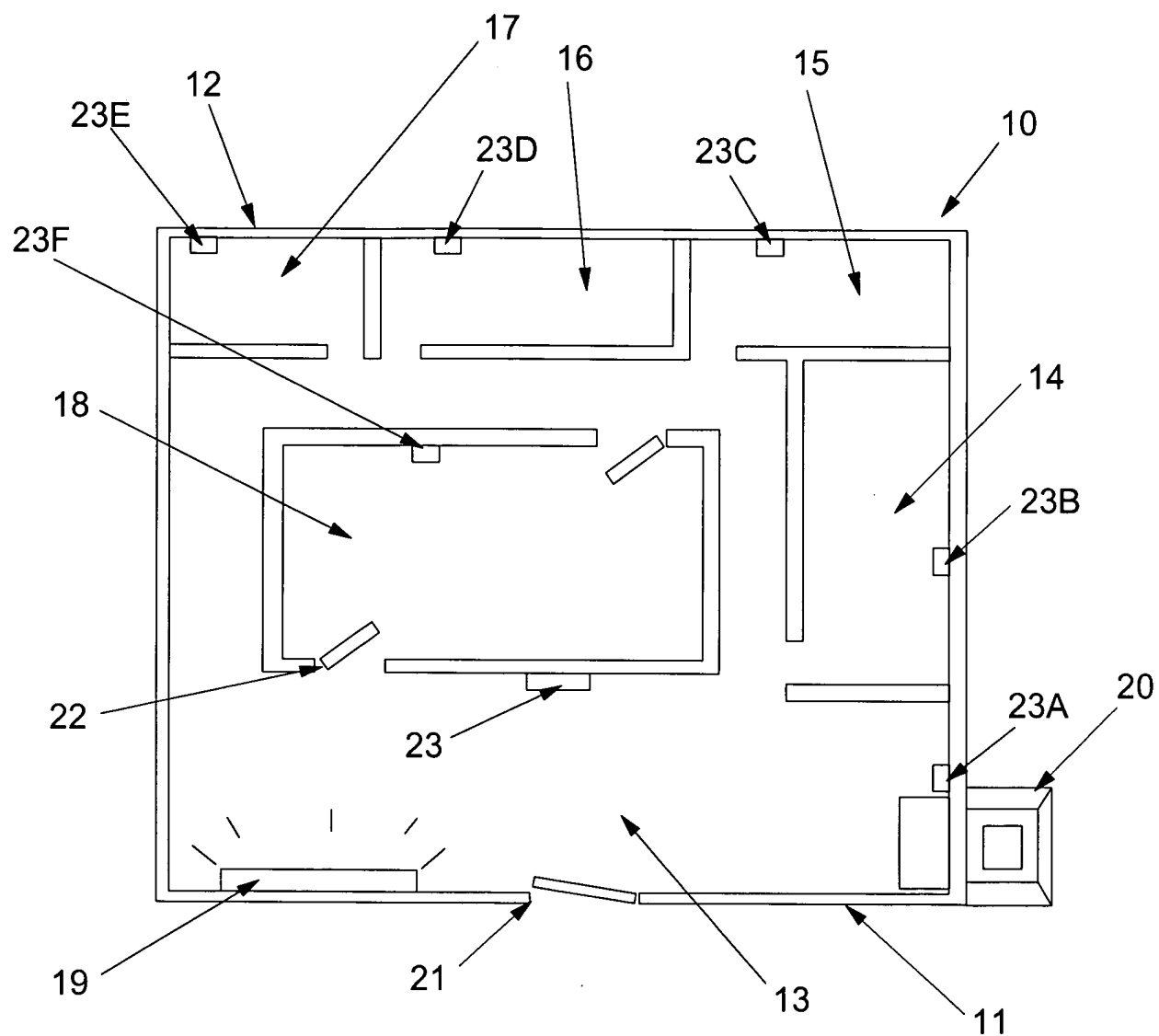


FIG. 1

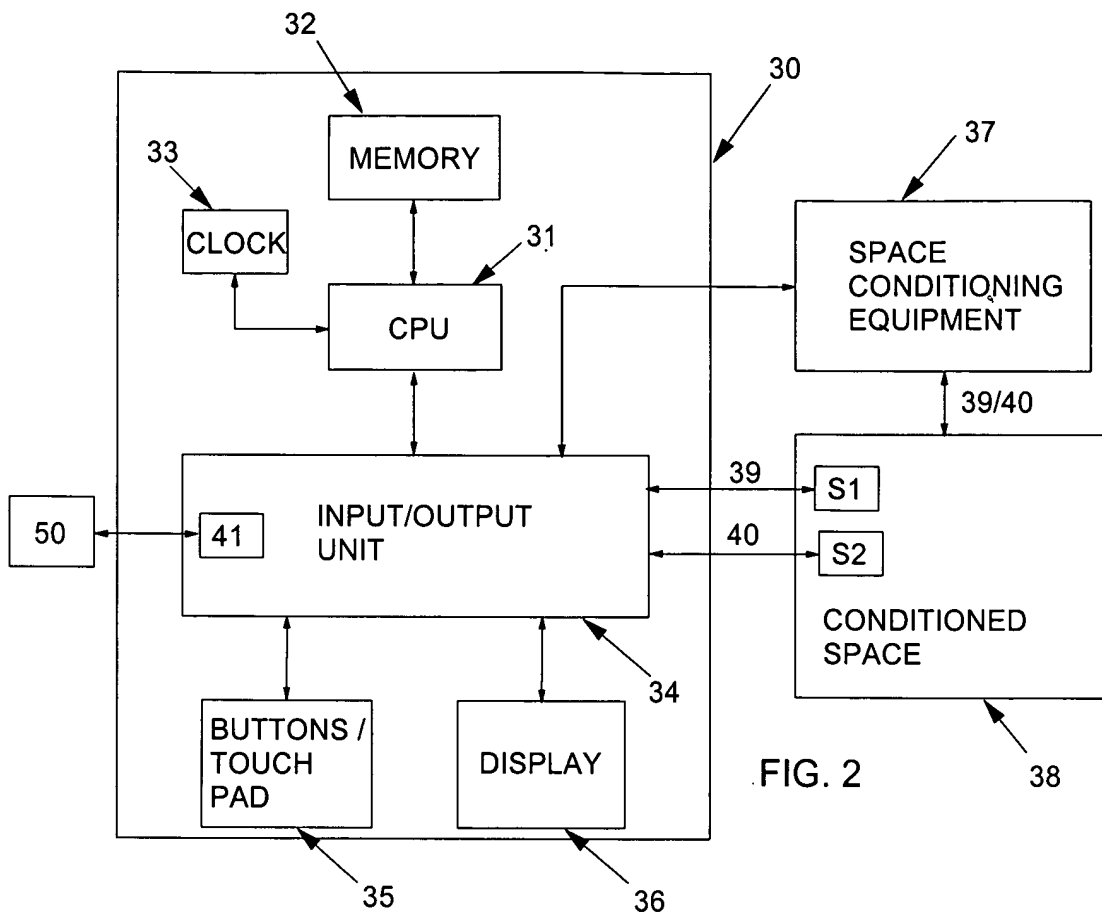


FIG. 2

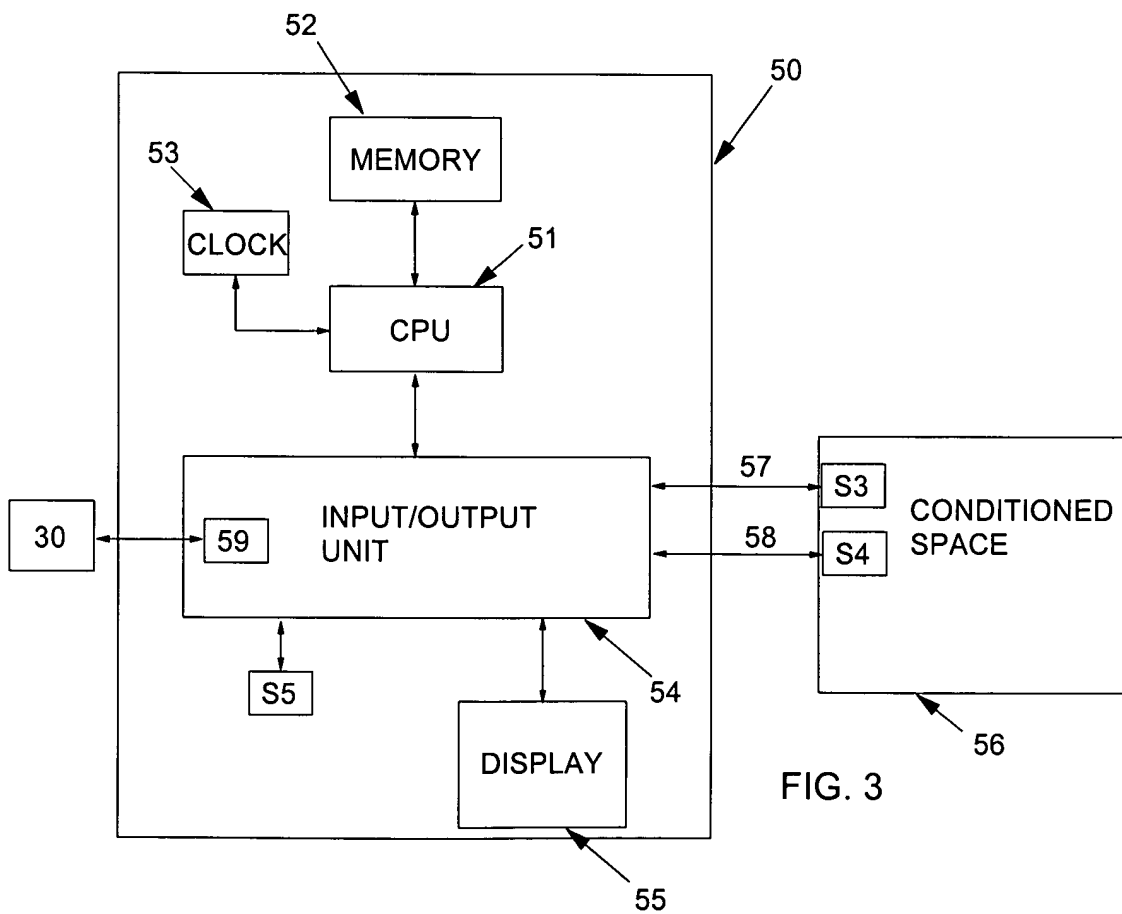


FIG. 3

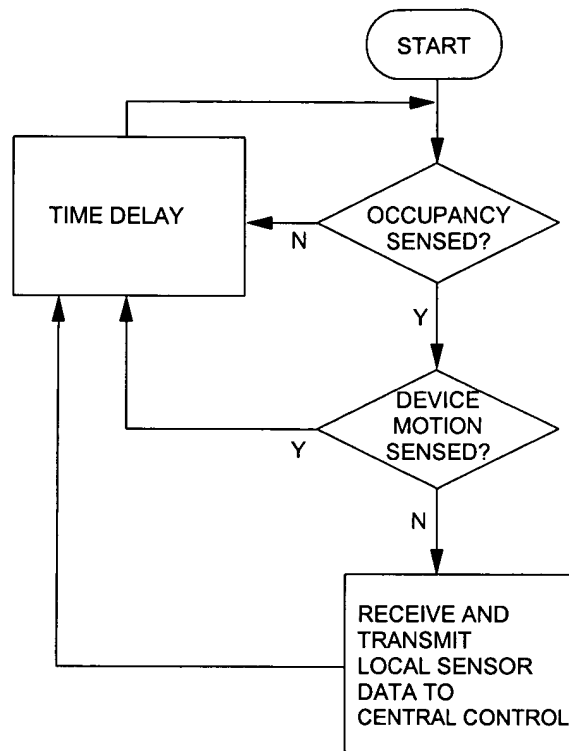


FIG. 4

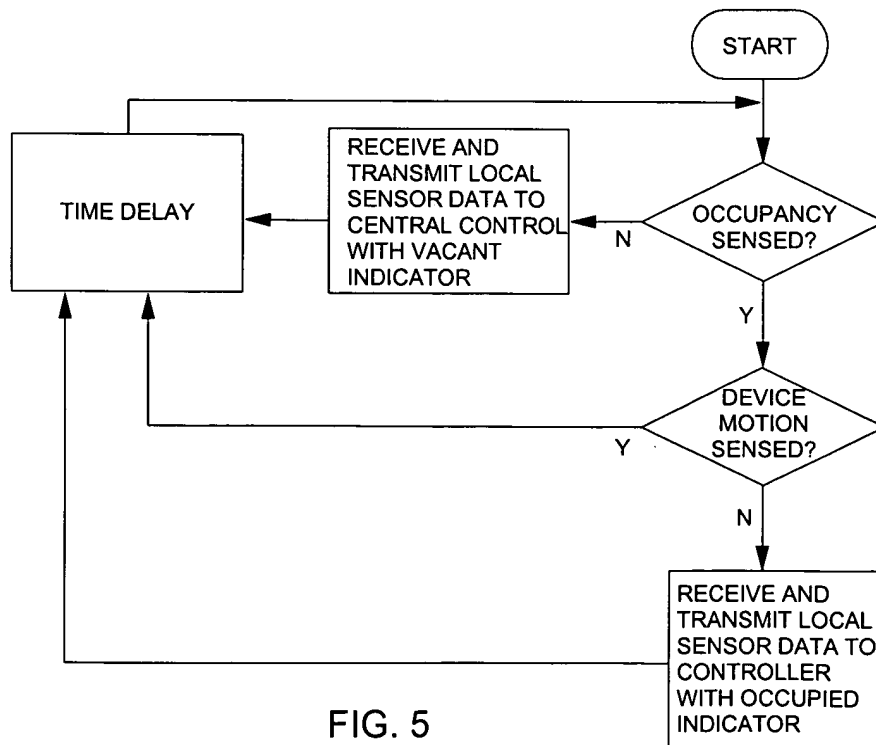


FIG. 5

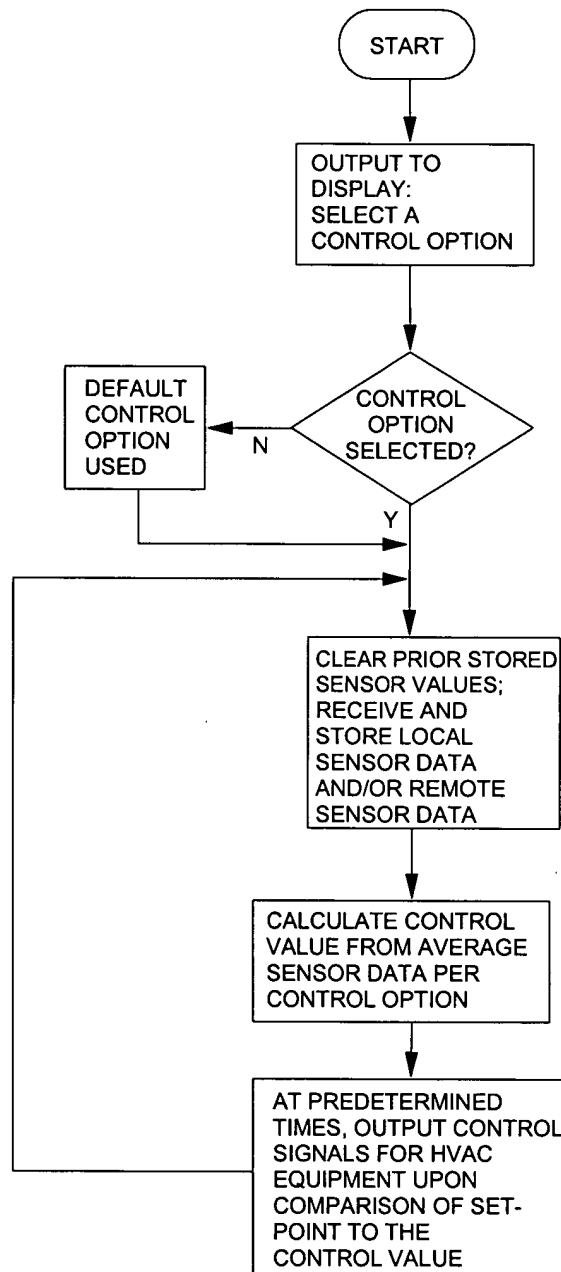


FIG. 6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Title: THERMOSTAT SYSTEM WITH REMOTE
DATA AVERAGING

Inventor(s): Howard Rosen

Serial No.:

Filing Date:

Group No.:

Examiner:

Attorney Docket No.: 0410.1A4

DECLARATION /
POWER OF ATTORNEY

As above-named inventor(s), I (we) hereby declare that:

1. My residence and citizenship are as stated by my name.

Full Name of Inventor:		Citizenship:
Howard Rosen	Lyncroft Road, Hampstead, Quebec, H3X 3E3 Canada	Canada

I (we) further declare that:

2. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention identified above and is attached hereto.
3. I have reviewed and understand the contents of the above identified specification, claims, drawings and abstract and acknowledge my duty to disclose information which is material to the examination of this application in accordance with Title 37 Code of Federal Regulations §1.56.
4. The inventor(s) named below does (do) hereby appoint as attorney of record with full power of substitution and revocation, to prosecute the above application and transact all business in the Patent and Trademark Office connected therewith.: 1. David T. Bracken, Registration No. 37,522; Send correspondence to: David T. Bracken, The Law Office of David T. Bracken, 4839 East Bond Avenue, Orange, California 92869
5. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. All the above statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 the United States Code, and such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor Name:	Signature of Inventor:	Date:
Howard Rosen		11/22/2004

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

11/29/2004 DTESSEM1 00000048 10995574

01 FC:2001

395.00 OP

PTO-1556
(5/87)

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2004

Application or Docket Number

1099557A

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	15	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	15 minus 20 = *	
INDEPENDENT CLAIMS	2 minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	395.00
X\$ 9=	
X44=	
+150=	
TOTAL	395

RATE	FEE
BASIC FEE	790.00
X\$18=	
X88=	
+300=	
TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X44=	
+150=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X88=	
+300=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X44=	
+150=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X88=	
+300=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X44=	
+150=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X88=	
+300=	
TOTAL ADDIT. FEE	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Examiner:

Attorney Docket No.: 0410.1A4

INFORMATION DISCLOSURE
STATEMENT - REMARKS

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. 1.56 and pursuant to 37 C.F.R. 1.97-1.98, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents listed on the attached Form PTO-SB-08A. One copy of the cited document is submitted herewith.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant reserves the right to dispute any of the listed documents as prior art during examination. Further, Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application. Furthermore, the submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other material information may exist. Applicant respectfully submits that all pending claims are patentable over the foregoing references, alone or in combination.

US Patents 4,860,950 and 5,644,302 disclose remote, wireless transmitters for locally sensed temperatures. Said temperatures are transmitted to a thermostat that uses the temperatures as displayed data or as values which are compared with thermostat setpoints to control air conditioning or heating equipment. US Patent 5,407,002 discloses use of remote temperature sensors in multiple locations to control dampers which thereby control conditioned air flow to multiple zones served by a single set of air conditioning or heating equipment.

The present Information Disclosure Statement is being filed within three months of the filing date of the U.S. patent application, and therefor no certification under 37 C.F.R. 1.97(e) or fee under 37 C.F.R. 1.17(p) is required.

Respectfully submitted,

Dated: November 23, 2004

David T. Bracken

David T. Bracken, Registration No. 37,522

