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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/137,309	05/25/2010	7724521	100.1033US01	7255

34206 7590 05/05/2010
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 49 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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

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

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

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

Michael J. Nelson, Prior Lake, MN;
Michael J. Wayman, Waconia, MN;

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)

34206 7590 02/23/2010

FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

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.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01	7255

TITLE OF INVENTION: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/24/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
THOMPSON, GREGORY D	2835	361-695000

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 Fogg & Powers LLC
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)

ADC Telecommunications, Inc.

Eden Prairie, MN

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 submitted:

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

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

- ☐ A check is enclosed.
- ☒ Payment by credit card. From PTO 2008-55 attached
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 502432 (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).

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 _____ / J. Patrick Kendrick /
Typed or printed name J. Patrick Kendrick

Date April 7, 2010
Registration No. 53109

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.

Electronic Patent Application Fee Transmittal				
Application Number:		12137309		
Filing Date:		11-Jun-2008		
Title of Invention:		SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		
First Named Inventor/Applicant Name:		Michael J. Nelson		
Filer:		Joseph Patrick Kendrick./Lisa Gentry		
Attorney Docket Number:		100.1033US01		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1510	1510
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1810

Electronic Acknowledgement Receipt	
EFS ID:	7369365
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Lisa Gentry
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	07-APR-2010
Filing Date:	11-JUN-2008
Time Stamp:	16:00:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1810
RAM confirmation Number	2386
Deposit Account	502432
Authorized User	FOGG,DAVID N.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	00197960.PDF	131401	no	1
			7af5562b0dcd37919cff1d02ab0be2e459dd0210		

Warnings:**Information:**

2	Fee Worksheet (PTO-875)	fee-info.pdf	32074	no	2
			de83351e65c8b3c5a0546d1d6aa2094d435756d4		

Warnings:**Information:**

Total Files Size (in bytes):			163475
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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



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NOTICE OF ALLOWANCE AND FEE(S) DUE

34206 7590 02/23/2010

FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

EXAMINER

THOMPSON, GREGORY D

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 02/23/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01	7255

TITLE OF INVENTION: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/24/2010

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

IMPORTANT REMINDER: 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)

34206 7590 02/23/2010

FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

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.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/137,309 06/11/2008 Michael J. Nelson 100.1033US01 7255

TITLE OF INVENTION: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/24/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
THOMPSON, GREGORY D	2835	361-695000

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 submitted:

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

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, 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).

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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01	7255
34206	7590	02/23/2010	EXAMINER	
FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439			THOMPSON, GREGORY D	
			ART UNIT	PAPER NUMBER
			2835	
DATE MAILED: 02/23/2010				

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 49 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 49 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.	Applicant(s)	
	12/137,309	NELSON ET AL.	
	Examiner	Art Unit	
	Gregory D. Thompson	2835	

-- 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 amdt filed on 12/15/09 and remarks therein.

2. ☒ The allowed claim(s) is/are 1-20.

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)	5. ☐ Notice of Informal Patent Application
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____	7. ☐ Examiner's Amendment/Comment
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. ☐ Examiner's Statement of Reasons for Allowance
	9. ☐ Other _____.

/Gregory D Thompson/ Primary Examiner, Art Unit 2835	
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1. The drawings were received on 12/15/09. These drawings are acceptable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory D. Thompson whose telephone number is (571) 272-2045. The examiner can normally be reached on varying schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on (571) 272- 3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory D Thompson/
Primary Examiner, Art Unit 2835

Gregory D Thompson
Primary Examiner
Art Unit 2835



UNITED STATES PATENT AND TRADEMARK OFFICE

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

BIB DATA SHEET

CONFIRMATION NO. 7255

SERIAL NUMBER 12/137,309	FILING or 371(c) DATE 06/11/2008 RULE	CLASS 365	GROUP ART UNIT 2835	ATTORNEY DOCKET NO. 100.1033US01		
APPLICANTS Michael J. Nelson, Prior Lake, MN; Michael J. Wayman, Waconia, MN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 06/25/2008						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /GREGORY D THOMPSON/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 9	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 4
ADDRESS FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439 UNITED STATES						
TITLE SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING						
FILING FEE RECEIVED 1240	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			

Issue Classification 	Application/Control No. 12137309	Applicant(s)/Patent Under Reexamination NELSON ET AL.
	Examiner Gregory D Thompson	Art Unit 2835

ORIGINAL						INTERNATIONAL CLASSIFICATION													
CLASS		SUBCLASS				CLAIMED					NON-CLAIMED								
361		695				H	0	5	K	7 / 20 (2006.01.01)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		
361	690	694																	
454	184																		

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
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16	16														

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/Gregory D Thompson/ Primary Examiner.Art Unit 2835	2/3/10	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2D

Search Notes 	Application/Control No. 12137309	Applicant(s)/Patent Under Reexamination NELSON ET AL.
	Examiner Gregory D Thompson	Art Unit 2835

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
See Updated EAST search	2/3/10	GDT

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
See PGPUB,USP AT,UPAD text search		2/3/10	GDT

	/Gregory D Thompson/ Primary Examiner.Art Unit 2835
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2070	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 13:54
L2	409	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 13:57
L3	688	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 13:58
L4	12	(fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same ("Venturi" "venturi") adj (chamber cavity compartment)) and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:00
L5	1020	(fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:00

L6	817	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:02
L7	1865	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:04
L8	270	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective) and("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:07
L9	270	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective) and("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:10

L10	98	(cabinet enclosure housing casing box equipment) and (side wall) same fin and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective) and ("361"/\$. ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$. ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:11
L11	132	(cabinet enclosure housing casing box equipment) same (side wall) and fin and telecommunications and (chimney convection convective) and ("361"/\$. ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$. ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:12
L12	1266	(cabinet enclosure housing casing box equipment) same fins and (fan blower impeller pump "cooling unit" "cooling module" tray) and(chimney convection convective) and ("361"/\$. ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$. ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/02/03 14:13

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L13	5214	(electronics and "sealed environment" and heatsink and drawing and airflow and convective amd opening and venturi).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2010/02/03 14:20
L14	5214	(devices and enclosure and "sealed environment" and heatsink and drawing and airflow and convective amd opening and venturi).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2010/02/03 14:21

L15	1	(devices and enclosure and "sealed environment" and heatsink and drawing and "first airflow" and "second airflow" and convective and opening and venturi).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2010/02/03 14:22
L16	0	("2009/0310301").URPN.	USPAT	OR	ON	2010/02/03 14:22

2/ 3/ 2010 2:22:52 PM

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01

CONFIRMATION NO. 7255

34206
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

PUBLICATION NOTICE



Title:SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

Publication No.US-2009-0310301-A1

Publication Date:12/17/2009

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

Applicant(s)	Nelson	<u>AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111</u>
Serial No.	12/137,309	
Filing Date	6/11/2008	
Confirmation No.	7255	
Examiner Name	THOMPSON, GREGORY D	
Group Art Unit	2835	
Attorney Docket No.	100.1033US01	
Title: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		

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

The Office Action mailed on September 29, 2009 has been reviewed. Please amend the above-identified application as follows.

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims that begins on page 6 of this paper.

Amendments to the Drawings begin on page 11 of this paper and include both an attached replacement sheet and an annotated sheet showing changes.

Remarks begin on page 12 of this paper.

An **Appendix** including amended drawing figures is attached following page 16 of this paper.

Amendments to the Specification:

Starting on page 1 of the application, please amend paragraphs [0002] – [0015] of the specification by replacing those paragraphs as follows.

[0002] United States patent application serial number ~~___/___~~ 12,137,322 (attorney docket number 100.1027US01 entitled “COMMUNICATION MODULES”) and which is referred to here as the ‘1027 Application;

[0003] United States patent application serial number ~~___/___~~ 12/137,297 (attorney docket number 100.1028US01 entitled “APPARATUS FOR MOUNTING A MODULE AND ENABLING HEAT CONDUCTION FROM THE MODULE TO THE MOUNTING SURFACE”) and which is referred to here as the ‘1028 Application;

[0004] United States patent application serial number ~~___/___~~ 61/060,589 (attorney docket number 100.1029USPR entitled “SUSPENSION METHOD FOR COMPLIANT THERMAL CONTACT OF ELECTRONICS MODULES”) and which is referred to here as the ‘1029 Application;

[0005] United States patent application serial number ~~___/___~~ 12/137,307 (attorney docket number 100.1030US01 entitled “ANGLED DOORS WITH CONTINUOUS SEAL”) and which is referred to here as the ‘1030 Application;

[0006] United States patent application serial number ~~___/___~~ 61/060,523 (attorney docket number 100.1031USPR entitled “L-SHAPED DOOR WITH 3-SURFACE SEAL FOR ENDPLATES”) and which is referred to here as the ‘1031 Application;

[0007] United States patent application serial number ~~___/___~~ 61/060,576 (attorney docket number 100.1032USPR entitled “L-SHAPED DOORS WITH TRAPEZOIDAL SEAL”) and which is referred to here as the ‘1032 Application;

[0008] United States patent application serial number ~~___/___~~ 61/060,547 (attorney docket number 100.1034USPR entitled “COMBINATION EXTRUDED AND CAST

METAL OUTDOOR ELECTRONICS ENCLOSURE”) and which is referred to here as the ‘1034 Application;

[0009] United States patent application serial number ~~___/___~~ 61/060,584 (attorney docket number 100.1035USPR, entitled “SYSTEMS AND METHODS FOR CABLE MANAGEMENT”) and which is referred to here as the ‘1035 Application;

[0010] United States patent application serial number ~~___/___~~ 61/060,581 (attorney docket number 100.1037USPR entitled “CAM SHAPED HINGES”) and which is referred to here as the ‘1037 Application;

[0011] United States patent application serial number ~~___/___~~ 12/137,313 (attorney docket number 100.1038US01 entitled “SOLAR SHIELDS”) and which is referred to here as the ‘1038 Application;

[0012] United States patent application serial number ~~___/___~~ 61/060,501 (attorney docket number 100.1039USPR entitled “APPARATUS AND METHOD FOR BLIND SLOTS FOR SELF DRILLING/SELF-TAPPING SCREWS”) and which is referred to here as the ‘1039 Application;

[0013] United States patent application serial number ~~___/___~~ 61/060,593 (attorney docket number 100.1040USPR entitled “SYSTEMS AND METHODS FOR THERMAL MANAGEMENT”) and which is referred to here as the ‘1040 Application;

[0014] United States patent application serial number ~~___/___~~ 61/060,762 (attorney docket number 100.1062USPR entitled “SERF BOARD COMPONENTS”) and which is referred to here as the ‘1062 Application; and

[0015] United States patent application serial number ~~___/___~~ 61/060,740 (attorney docket number 100.1064US01 entitled “PULL-OUT SHELF FOR USE IN A CONFINED SPACE FORMED IN A STRUCTURE”) and which is referred to here as the ‘1064 Application.

Please amend paragraph [0020] of the specification by replacing that paragraph as follows.

[0020] Figures 2A, 2B, 2C, ~~and 2D~~ and 2E illustrate a Venturi assisted cooling unit for the enclosure of one embodiment of the present invention.

Please amend paragraph [0028] of the specification by replacing that paragraph as follows.

[0028] As shown in Figures 1A-1D, backplane 105 further includes a plurality of convective openings 140 which comprise open voids that run the length of backplane 105 which promotes a natural convective heat transfer between backplane 105 and the air of the environment surrounding enclosure 100, some of which will naturally flow through convective openings 140 (illustrated in Figure 2C). The base of the backplane heatsink can also be thermally enhanced by the use of advanced materials such as integral vapor chambers 145, which serve to evenly distribute the absorbed heat load through the backplane 105. Another embodiment would be use of the vapor chambers 145 as fins 143 of the heatsink. This would maximize the equivalent thermal conductivity of the fins 143, spreading the heat more evenly between the base and the integral shield of the backplane heatsink (high power heatsink). In one such embodiment, the vapor chambers 145 are installed and encapsulated into the base of the high-power heatsink, backplane 105. These vapor chambers 145 would be large, rectangular, copper stampings that would interface directly with the high power electronics in order to spread any focused load out, evenly, to all vertical fins 143 of the heatsink. In alternate embodiments, backplane 105 may also include a plurality of fins 143 running the length of backplane 105, either instead of, or in addition to, vapor chambers 145 for the purpose of further promoting heat exchange between backplane 105 and the air of the environment

surrounding enclosure 100. In that case the open spaced between the fins at either end of backplane 105 would form similar convective openings.

Please amend paragraph [0029] of the specification by replacing that paragraph as follows.

[0029] Figures 2A, 2B, 2C, ~~and~~ 2D and 2E are diagrams illustrating an enclosure 100 (with doors 110 closed), the enclosure 100 further comprising a fan assisted cooling unit 210 of one embodiment of the present invention, placed at the top of enclosure 100. Figure 2B illustrates a cut-away view of Figure 2A. Fan assisted cooling unit 210 comprises a fan shroud 215 having at lest one electrical fan 220. As shown in Figure 2E, ~~[[I]]~~in one embodiment, an assisted cooling unit 210 could include two fans with one fan being a primary fan 260 and the second fan 265 acting as a backup fan in case of the failure of the primary fan 260. One of ordinary skill in the art would appreciate that there are a number a methods to detect when the primary fan 260 has failed. For example, in one embodiment, a backup fan is provided a setpoint to activate at a temperature threshold that would not be reached under normal design expectations if the primary fan 260 was working properly.

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1. (Original) A cooling unit for an enclosure housing electronics, the cooling unit comprising:
 - a fan shroud having at least one electrical fan; and
 - a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.
2. (Original) The cooling unit of claim 1, wherein the fan shroud is offset from the Venturi chamber such that when the fan is not on, the fan shroud does not obstruct a natural circulation airflow entering the first inlet and exiting the second inlet of the Venturi chamber.
3. (Currently Amended) The cooling unit of claim 1, wherein the at least one electrical fan ~~fan shroud~~ includes a primary fan and a backup fan that becomes operational upon a failure of the primary fan.

4. (Original) The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.
5. (Original) The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow
6. (Original) An electronics enclosure, the enclosure comprising:
a sealed environment housing electronics, the sealed environment having a heatsink for dissipating heat generated by the electronics to an external environment; and
a cooling unit mounted above the sealed environment;
wherein the cooling unit comprises:
a fan shroud having at least one electrical fan; and
a Venturi chamber having a first inlet for receiving a heated airflow from the heatsink and a second inlet for receiving an airflow from the external environment and an outlet coupled to the fan shroud, the fan shroud drawing air from the Venturi chamber via the outlet when the fan is on;
wherein the Venturi chamber comprises a wall for directing the airflow from the external environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on;
wherein the fan shroud is offset with respect to the Venturi chamber so as to not obstruct a natural circulation of air through the heatsink when the fan is not on.
7. (Currently Amended) The enclosure of claim 6, the heatsink forming a backplane;
the sealed environment further comprising;
~~a backplane; and~~

at least one door pivotally attached to the backplane, wherein at least one electrical component is mounted to the backplane to conductively transfers heat to the backplane.

8. (Currently Amended) The enclosure of claim 6, ~~wherein the heatsink forming a backplane;~~

the enclosure further comprising:

~~a backplane;~~

at least two doors pivotally attached to the backplane; and

two endplates attached to the backplane;

wherein where the at least two doors are closed, the sealed environment is formed.

9. (Original) The enclosure of claim 6, the heatsink including a plurality of vapor chambers spreading the heat generated by the electronics to fins of the heatsink.

10. (Original) The enclosure of claim 6, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.

11. (Original) The enclosure of claim 6, wherein the fan shroud includes a primary fan and a backup fan that becomes operational upon a failure of the primary fan.

12. (Original) The enclosure of claim 6, wherein the fan shroud is offset from the Venturi chamber such that when the fan is not on, the fan shroud does not obstruct a natural circulation airflow entering the first inlet and exiting the second inlet of the Venturi chamber.

13. (Original) The enclosure of claim 6, wherein when the fan is on, air entering the Venturi chamber from the second inlet is cooler than air entering the Venturi chamber from the first inlet.

14. (Currently Amended) A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:

directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;

drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;

drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.

15. (Original) The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;

wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;

the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.

16. (Original) The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.

17. (Original) The method of claim 15, wherein the fan is located offset with respect to the Venturi chamber to not impede a natural circulation of airflow through the Venturi chamber when the fan is not in operation.

18. (Original) The method of claim 15, further comprising operating the fan when a temperature exceeds a predetermined threshold.

19. (Currently Amended) A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:

directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;

when a temperature exceeds a first predetermined threshold, operating a fan to draw a first airflow across one or more convective openings of the heatsink and a second airflow of heated air from the one or more convective openings of the heatsink using a Venturi effect created by drawing the first airflow, wherein the first airflow does not flow into the one or more convective openings of heatsink;

when the temperature does not exceed a second predetermined threshold, allowing a natural circulation airflow to flow from the one or more convective openings of the heatsink by not operating the fan.

20. (Original) The method of claim 19, wherein the fan is located such as to not impede the natural circulation airflow when the fan is not in operation.

Amendment to the Drawings

The attached sheets of drawings include Amendments to Fig. 1B to illustrate and add reference number for vapor channels (145) and fins (143) as described in paragraph [0028]. The amendments to Fig. 1B do not add new matter. New drawing 2E illustrates primary and secondary fans as described in paragraph [0029] and does not add new matter.

Attachments: Replacement sheet(s) 1-9

New sheet 10

REMARKS

The Office Action mailed on September 29, 2009 has been reviewed. Claims 3, 7, 8, 14 and 19 are amended by this response. No new matter was added by these amendments. Claims 1-20 are pending in this application.

Examiner Interview Summary

Applicant's representative Joseph P. Kendrick (Registration Number 53,109) thanks Examiner Thompson for the opportunity to discuss aspects of the subject application in a telephone interview on December 15, 2009.

During the above referenced interview, the 103 rejection was discussed with respect to claims 14 and 19. The Examiner agreed that the Applicant's proposed amendments would appear to overcome the cited references. Claim amendments to address the 112 rejections were also discussed.

Applicants believe that the substance and scope of the telephone interview on December 15, 2009 with respect to this application is accurately captured in the summary above and arguments below.

Allowable Subject Matter

Claims 1, 3 and 6-8 were indicated to be allowable if rewritten to overcome the rejection(s) under 35 USC § 112, second paragraph, set forth in the Office Action. The Applicant thanks the Examiner for this indication of allowable subject matter.

Drawing Objections

The drawings were objected to because "the vapors chambers and fins in claim 9 and primary, secondary fans in claims 3 and 11 must be shown or the feature(s) canceled from the claim(s)."

The Applicant has amended Fig. 1B to illustrate and add reference number for vapor channels and fins as described in paragraph [0028] and does not add new matter.

The Applicant has added new drawing 2E that illustrates primary and secondary fans as described in paragraph [0029] and does not add new matter.

Withdrawal of this objection is respectfully requested.

Specification Objections

The disclosure was objected to because of missing serial numbers. The Applicant has amended paragraphs [0002]-[0015] to provide the requested serial numbers. Paragraphs [0026] and [0027] on page 5 of the specification were not amended because the Applications references in those paragraphs are now unambiguously cross-referenced to application serial numbers by the cross-reference provided by amended paragraphs [0002]-[0015].

Paragraphs [0020], [0028] and [0029] were also amended to be consistent with the drawing amendments discussed above.

Withdrawal of this objection is respectfully requested.

Rejections Under 35 U.S.C. § 112

Claims 1, 3, 6-8, 14 and 19 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Applicant respectfully traverses this rejection.

Claims 1 and 3

Claim 3 has been amended to clarify that “the at least one electrical fan includes a primary fan and a backup fan that becomes operational upon a failure of the primary fan.” Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 6-8

Claims 7 and 8 have both been amended to clarify “the heatsink forming a backplane;”
Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 14 and 19

Claims 14 and 19 have both been amended to clarify that the sealed environment is part of the enclosure. Reconsideration and withdrawal of this rejection are respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 14-20 were rejected under 35 USC § 103(a) as being unpatentable over Aakalu et al. (U.S. Patent No. 5,894,407) in view of Dellapi et al. (U.S. Patent No. 6,142,595). The Applicant respectfully traverses this rejection.

Independent claims 14 and 19 have been amended to clarify that the first airflow does not flow into openings of the heatsink. More particularly, claim 14 has been amended to provide:

A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:
 directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;
 drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;
 drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.

Claim 19 has been amended to provide:

A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:
 directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;

when a temperature exceeds a first predetermined threshold, operating a fan to draw a first airflow across one or more convective openings of the heatsink and a second airflow of heated air from the one or more convective openings of the heatsink using a Venturi effect created by drawing the first airflow, wherein the first airflow does not flow into the one or more convective openings of heatsink;

when the temperature does not exceed a second predetermined threshold, allowing a natural circulation airflow to flow from the one or more convective openings of the heatsink by not operating the fan.

Thus claims 14 and 19 both clarify that the first airflow that creates the Venturi effect does not enter the openings of the heatsink. In contrast in the Aakalu reference “the cross channels 42 are normal to the longitudinal channels 40, and allow for the passage of cross winds through the heat sink while permitting fresh air to be drawn into the longitudinal channels 40 (through the cross channels 42) during the convection process.” See, Aakalu, col. 3, lines 39-44. The Applicant respectfully asserts that Aakalu reference is deficient in teaching the limitations of claim 14 and 19 “wherein the first airflow does not flow into the one or more convective openings of heatsink.”

The Dellapi reference is drawn to

A sealable container having a container body, a cover forming a right angle movably connected to the container body, at least one alignment piece and corresponding alignment bracket, and at least one tension lock connected to the container body.

See, Dellapi, Abstract. The “sealable container” discussed in the Dellapi reference, does not teach or suggest anything that would cure the deficiency discussed above in Aakalu. For this reason, claims 14 and 19 are allowable over these references.

Claims 15-18 either directly or indirectly depend from and further define claim 14 and are therefore also allowable. Claim 20 either directly or indirectly depends from and further defines claim 19 and is therefore also allowable.

Reconsideration and withdrawal of these rejections is respectfully requested.

Serial No.: 12/137,309

Filing Date: 6/11/2008

Attorney Docket No. 100.1033US01

Title: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

CONCLUSION

Applicant respectfully submits that claims **1-20** are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: December 15, 2009

/ J. Patrick Kendrick /
J. Patrick Kendrick
Reg. No. 53109

Attorneys for Applicant
Fogg & Powers LLC
5810 W. 78th Street, Ste. 100
Minneapolis, MN 55439
T – (952) 465-0770
F – (952) 465-0771

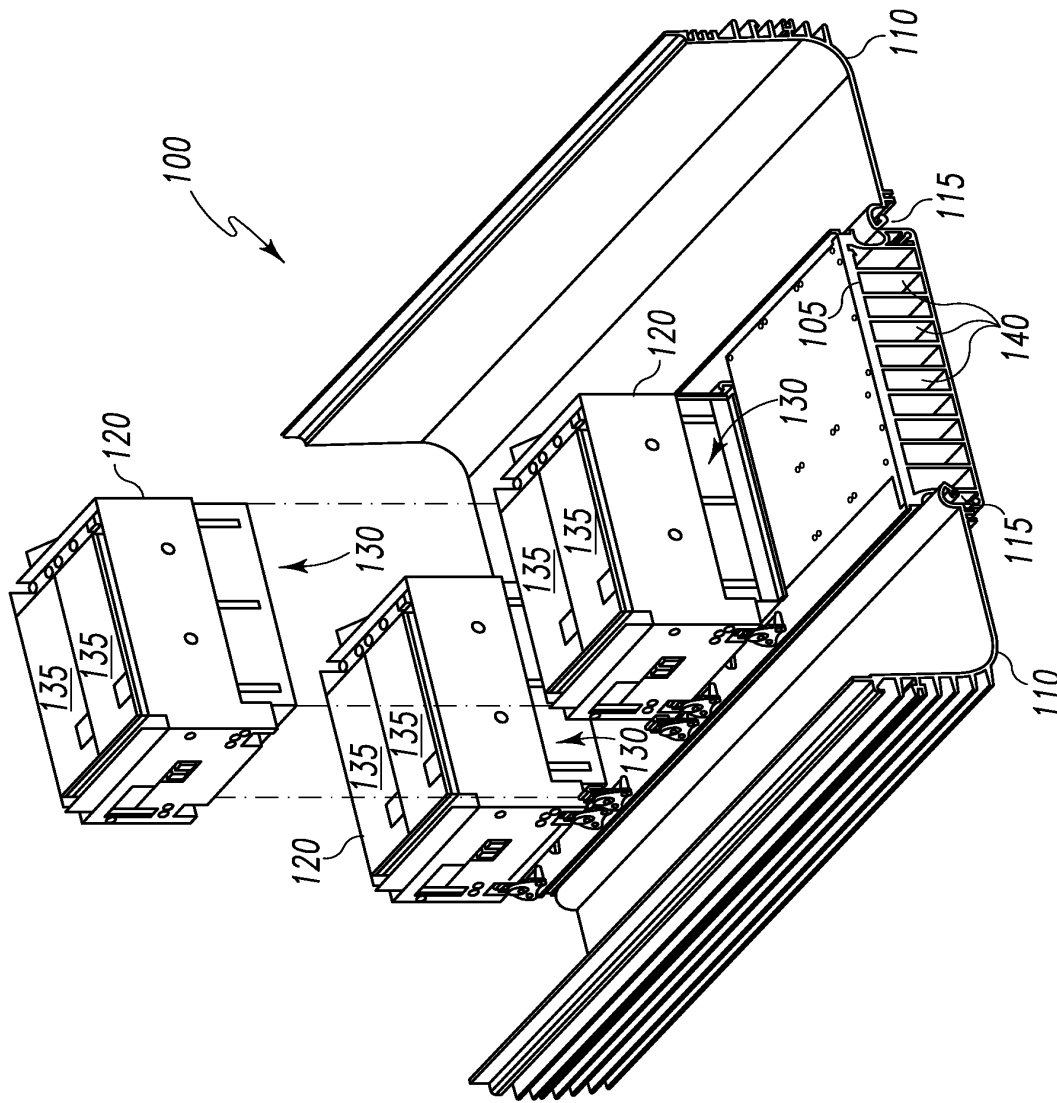
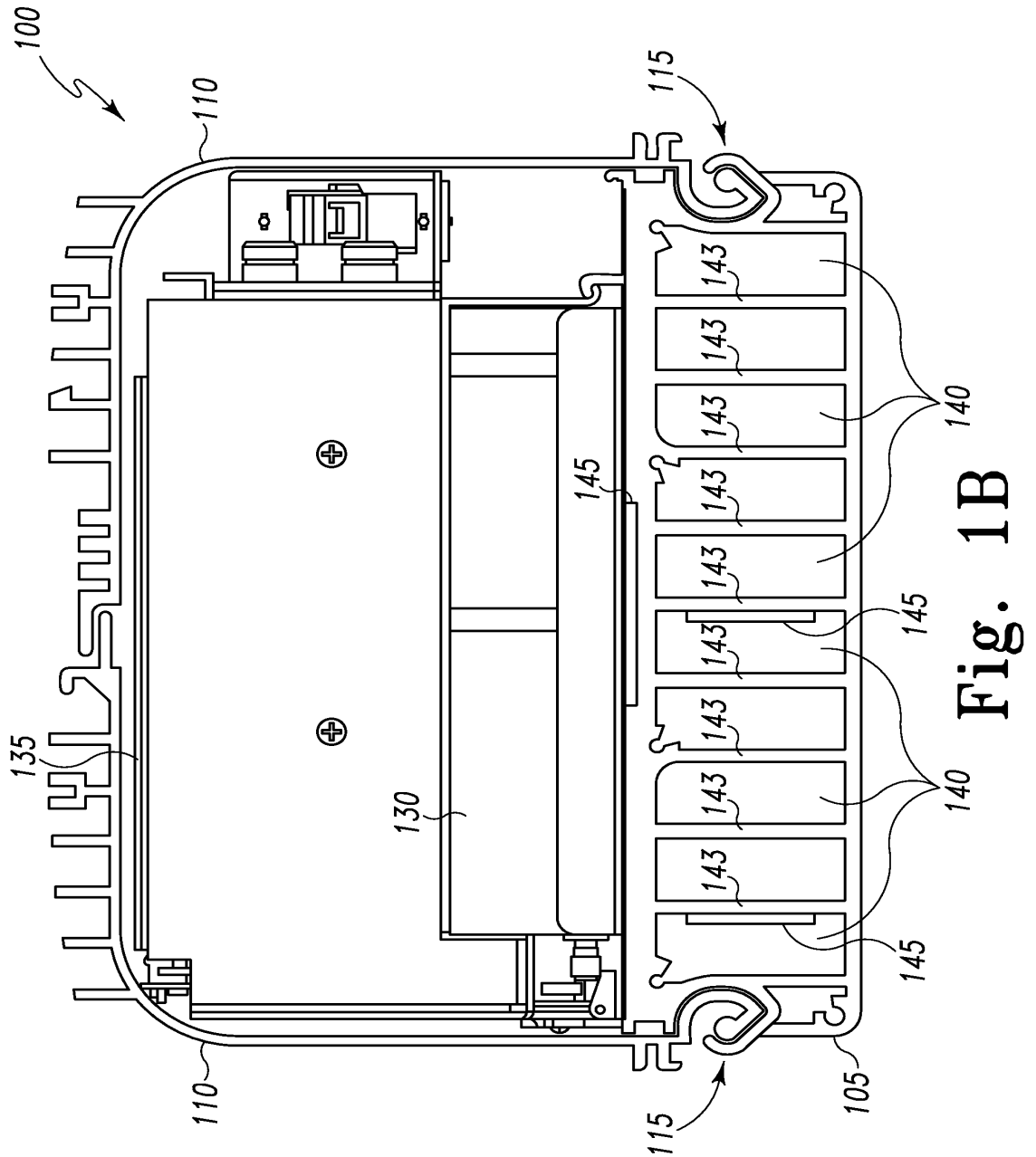
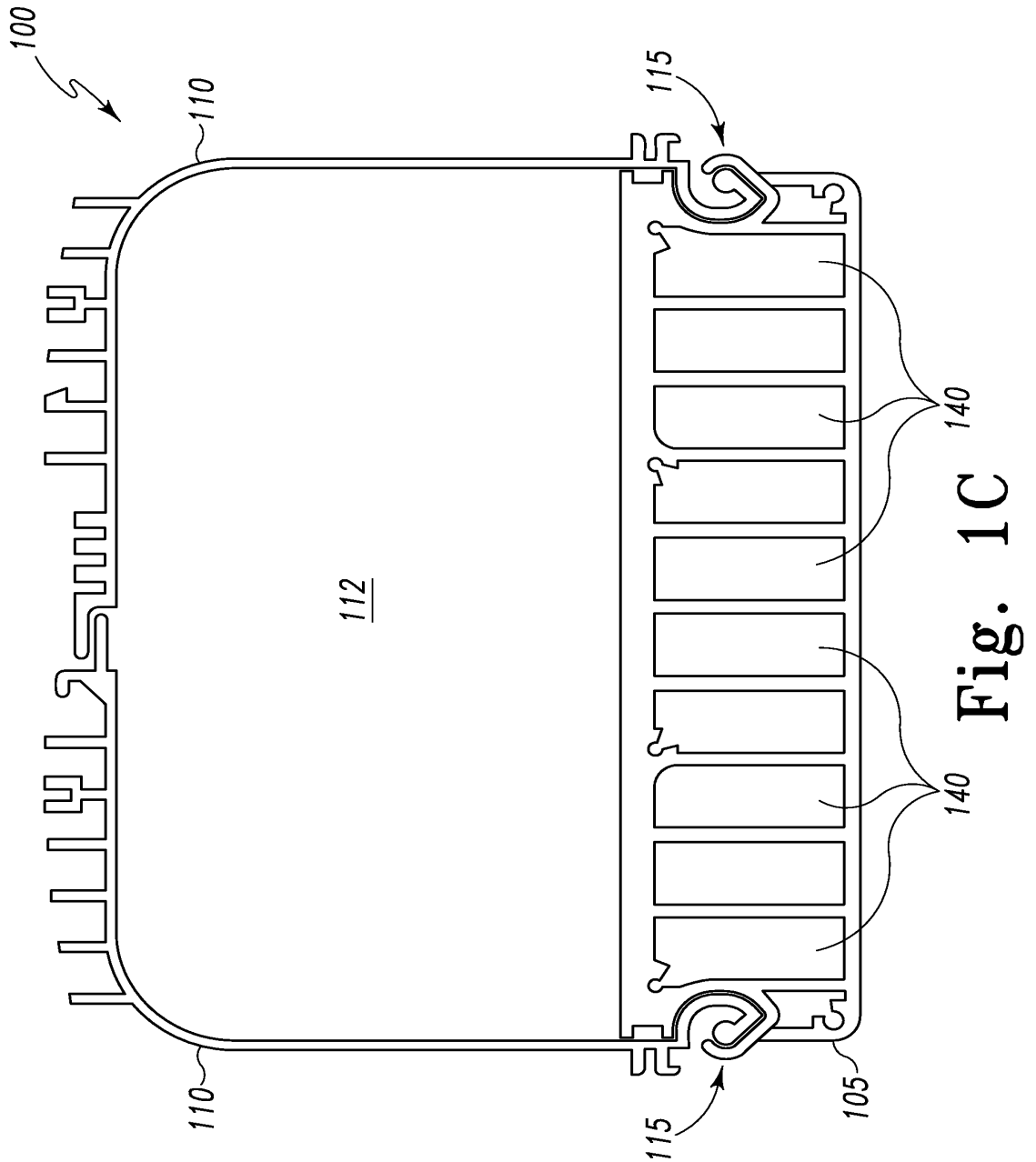


Fig. 1A





REPLACEMENT SHEET

4/10

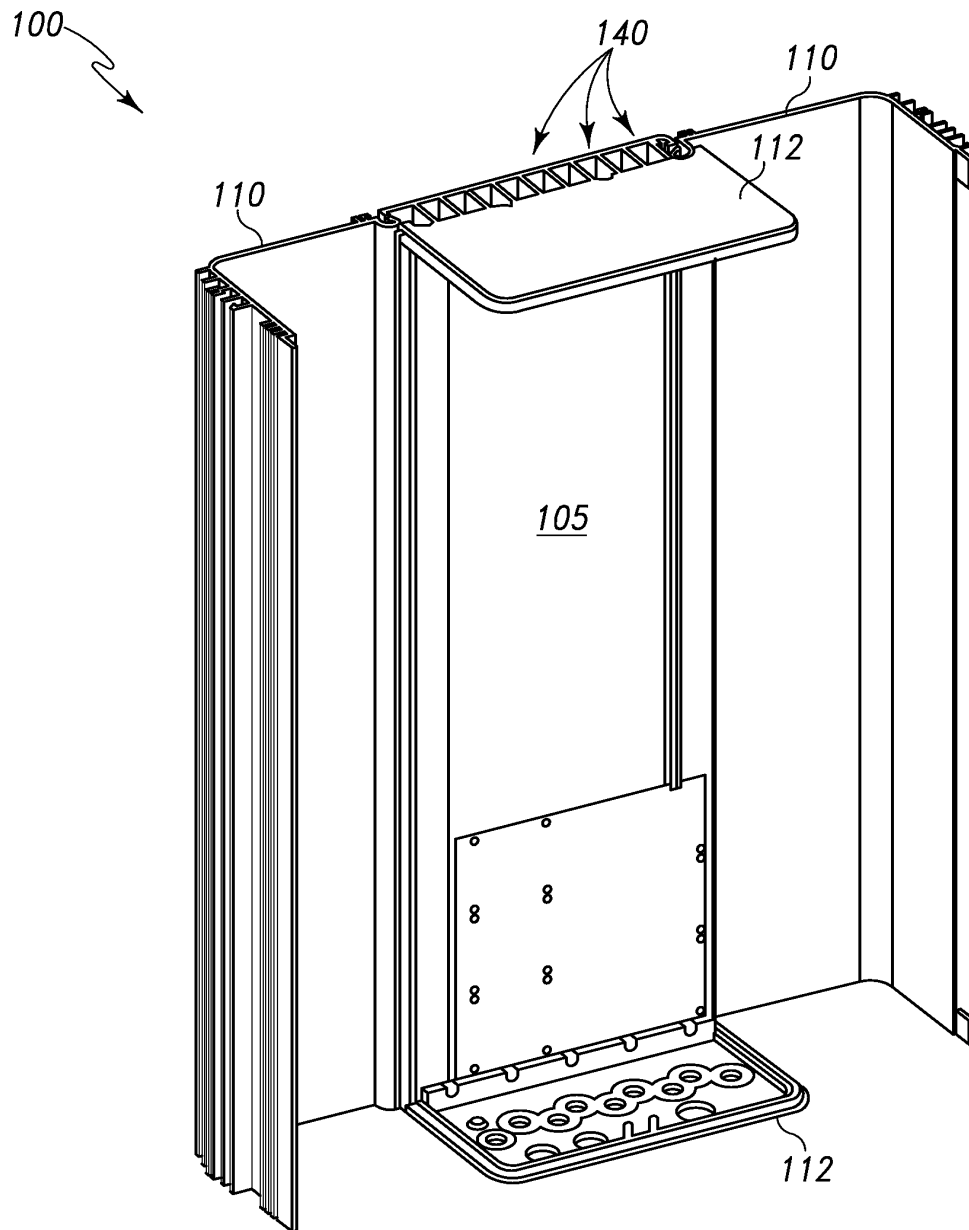


Fig. 1D

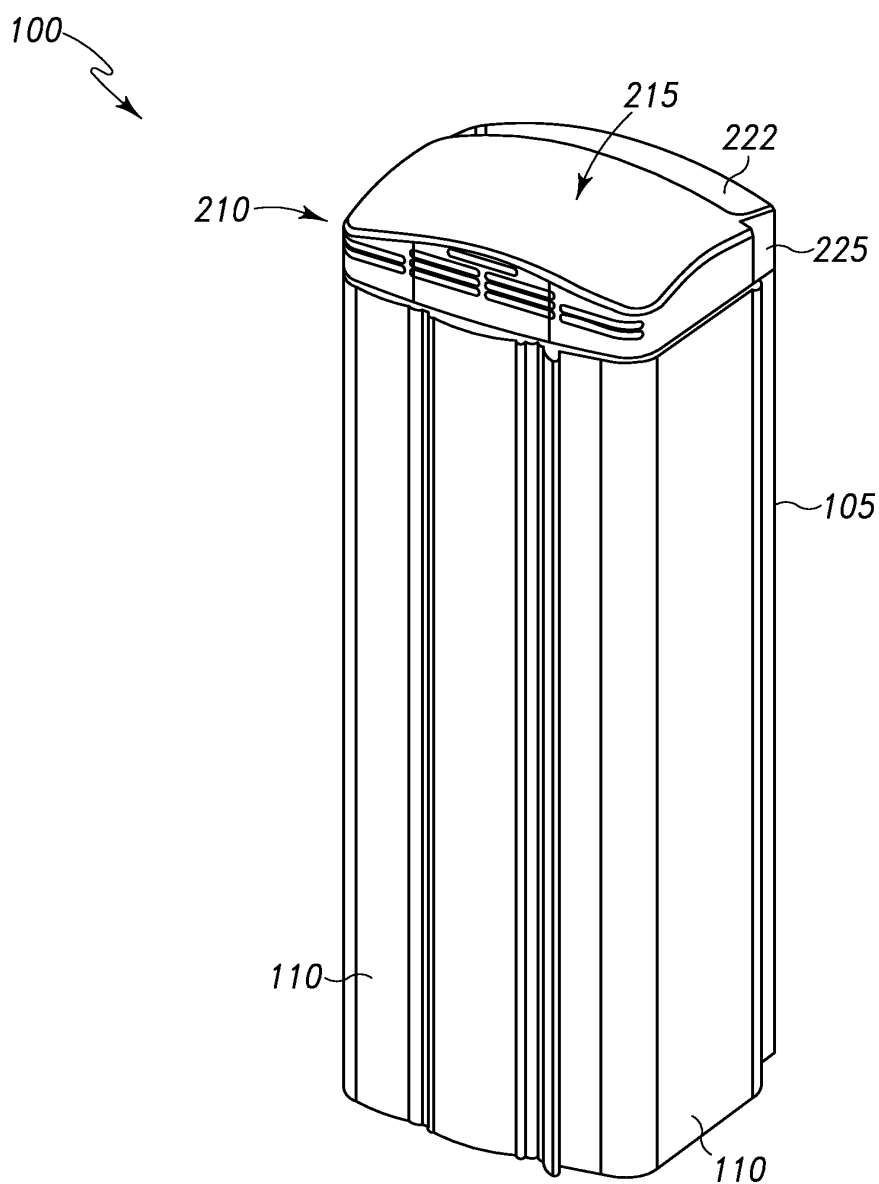


Fig. 2A

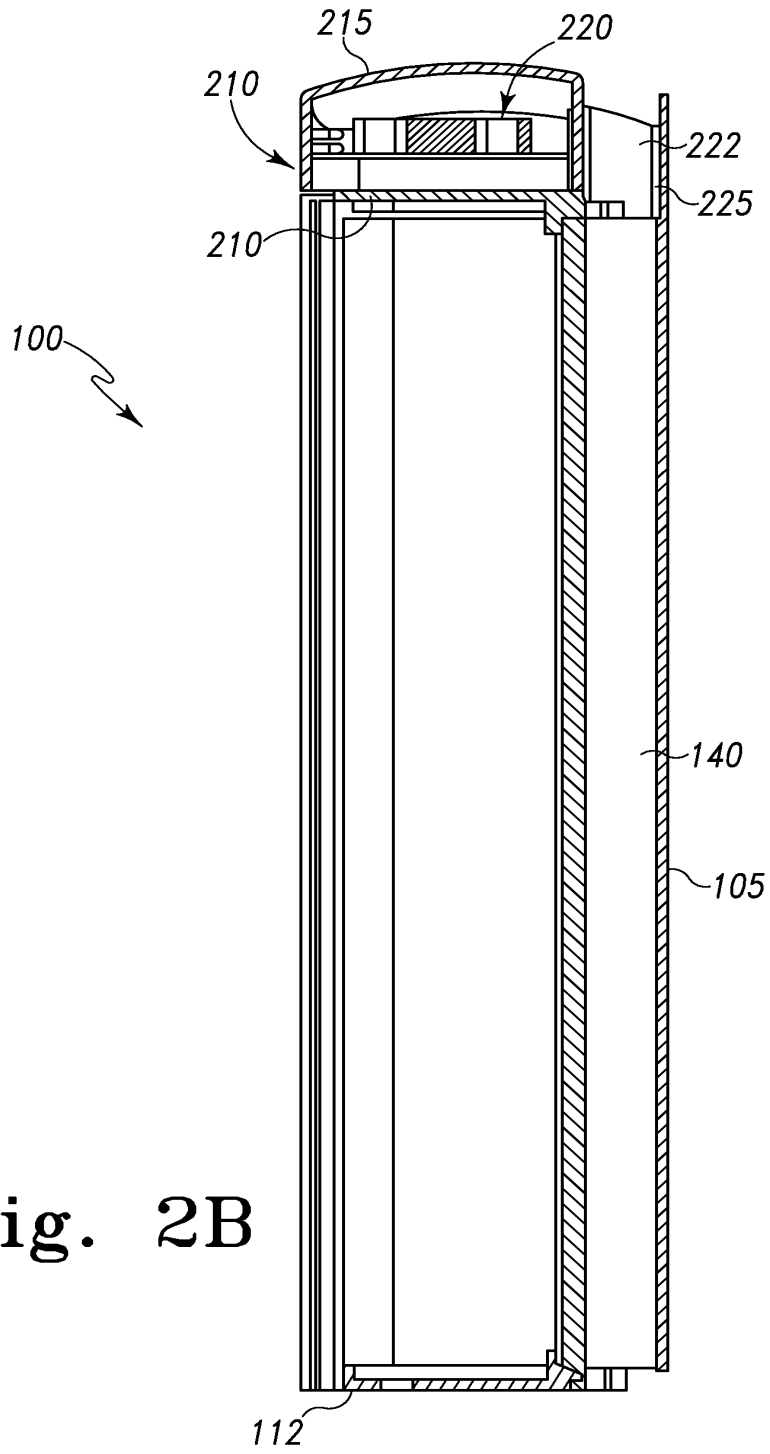


Fig. 2B

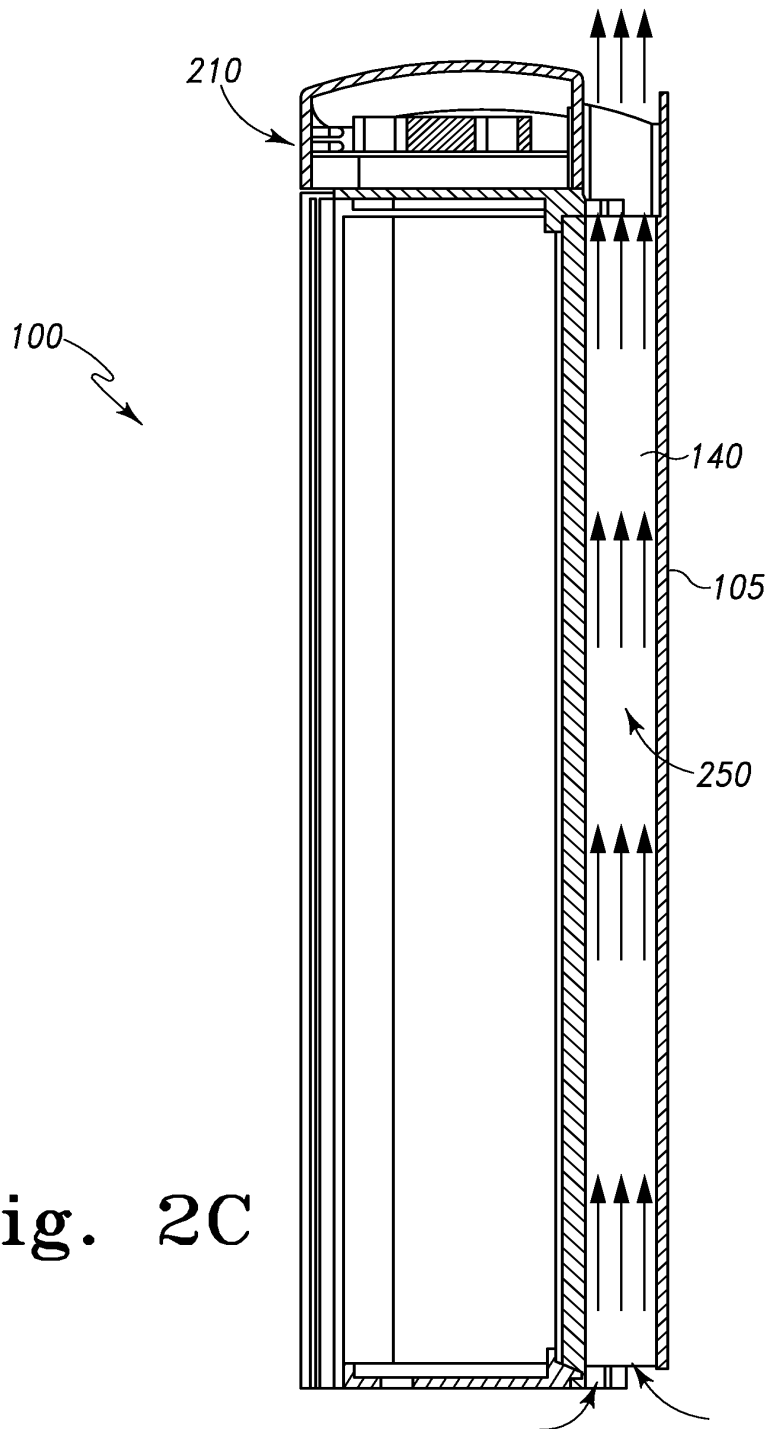


Fig. 2C

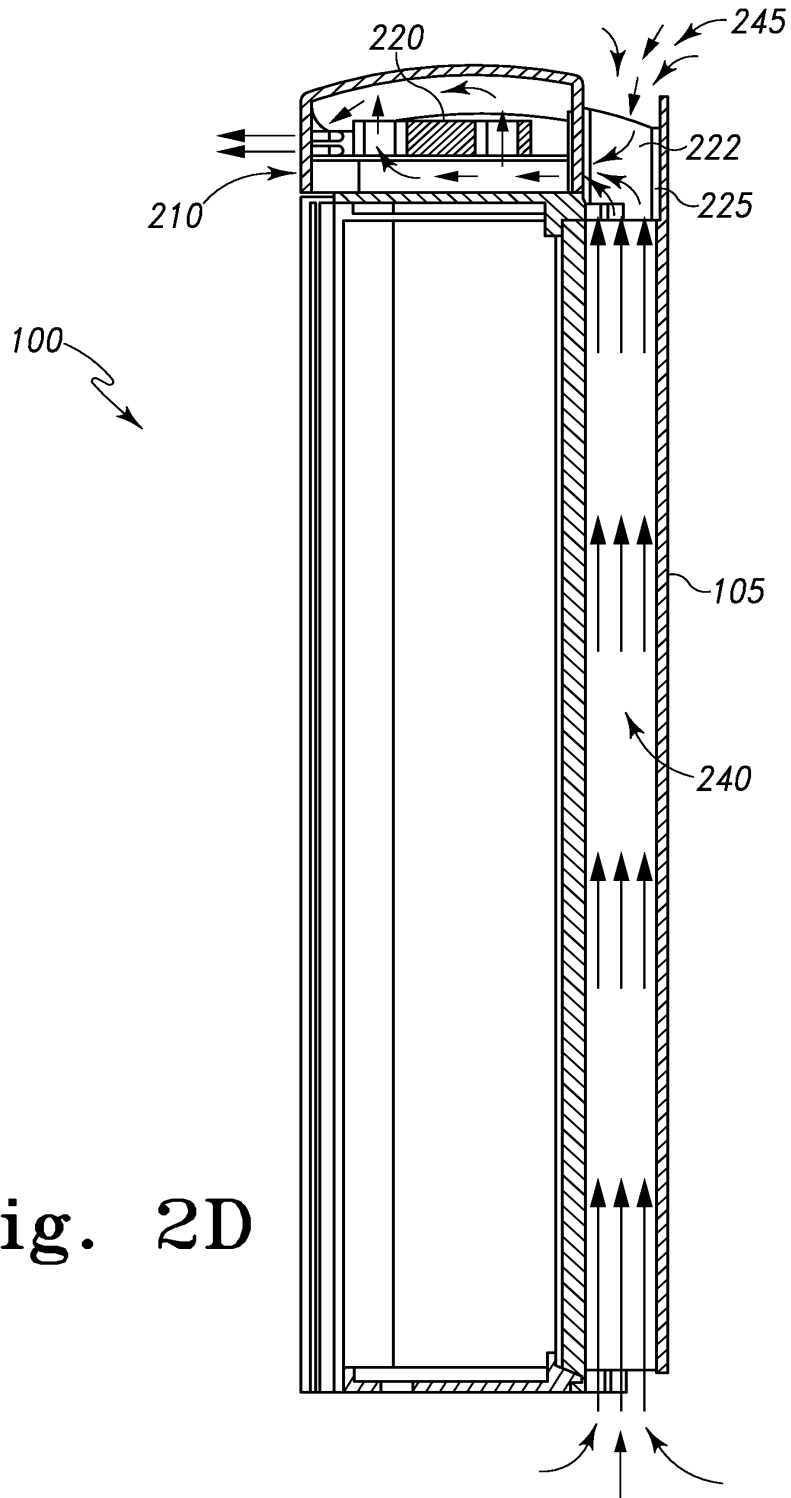


Fig. 2D

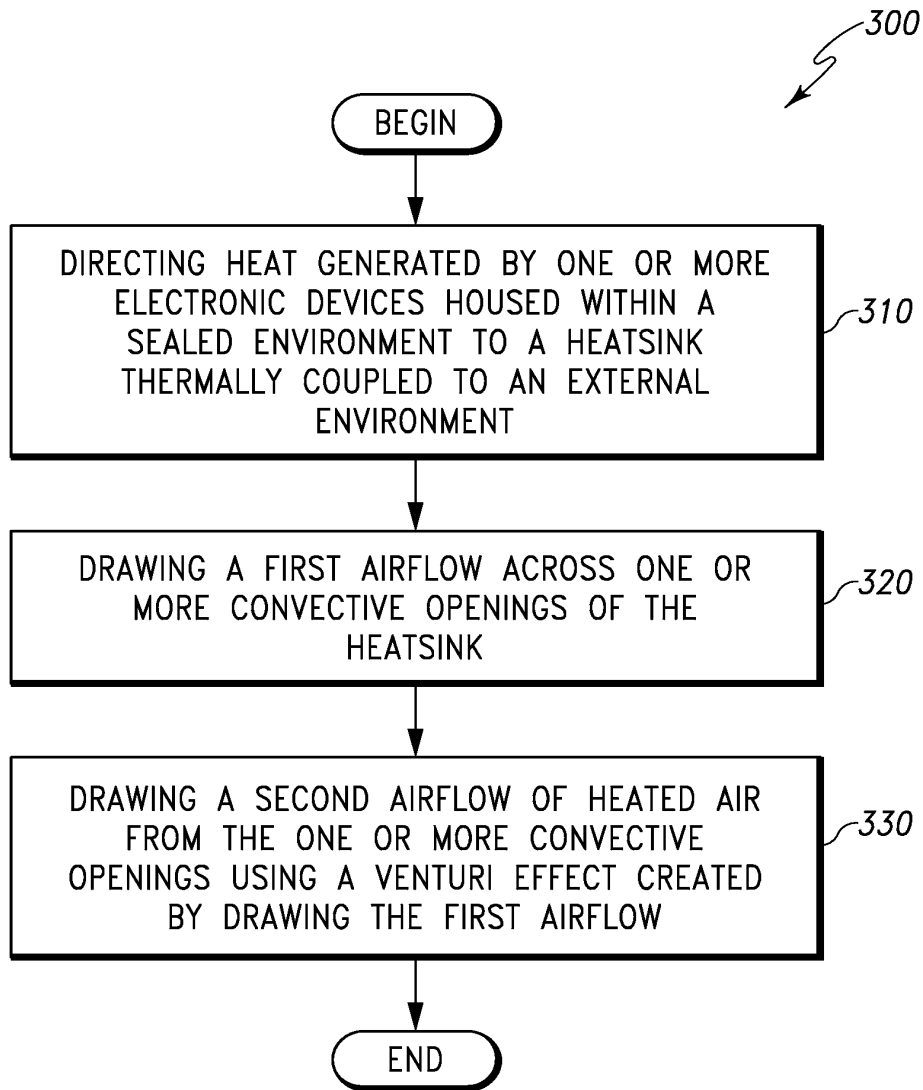


Fig. 3

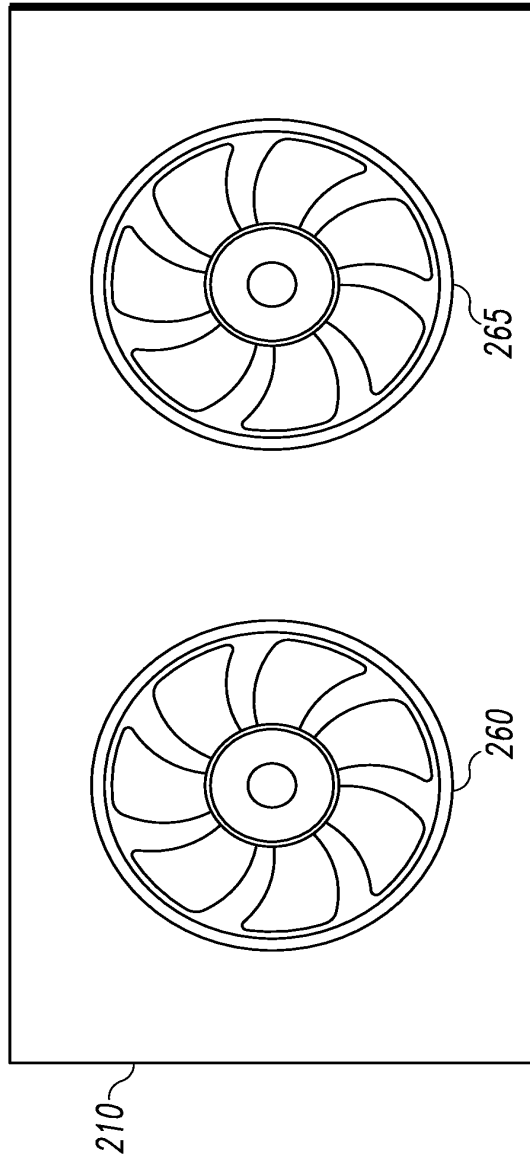


Fig. 2E

Electronic Acknowledgement Receipt	
EFS ID:	6641288
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Lisa Gentry
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	15-DEC-2009
Filing Date:	11-JUN-2008
Time Stamp:	16:50:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		00189629.PDF	443519	yes	26
			6bfd91d17233eef44711ab7fcb5a8bf68dc9765e		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Specification	2	5
	Claims	6	10
	Drawings-only black and white line drawings	11	11
	Applicant Arguments/Remarks Made in an Amendment	12	16
	Drawings-only black and white line drawings	17	26
Warnings:			
Information:			
Total Files Size (in bytes):		443519	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/137,309		Filing Date 06/11/2008		☐ To be Mailed							
APPLICATION AS FILED – PART I																
(Column 1)			(Column 2)			SMALL ENTITY ☐		OR		OTHER THAN SMALL ENTITY						
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)		RATE (\$)		FEE (\$)				
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A				N/A						
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A		N/A		N/A				N/A						
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A				N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =				X \$ =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =				X \$ =						
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).														
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))																
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL				TOTAL						
APPLICATION AS AMENDED – PART II																
(Column 1)			(Column 2)			(Column 3)			SMALL ENTITY		OR		OTHER THAN SMALL ENTITY			
AMENDMENT	12/15/2009		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 20		Minus ** 20		= 0		X \$ =				OR X \$52=		0	
	Independent (37 CFR 1.16(h))		* 4		Minus *** 4		= 0		X \$ =				OR X \$220=		0	
	☐ Application Size Fee (37 CFR 1.16(s))															
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))															
						TOTAL ADD'L FEE				OR		TOTAL ADD'L FEE		0		
AMENDMENT	Total (37 CFR 1.16(i))		*		Minus **		=		X \$ =				OR X \$ =			
	Independent (37 CFR 1.16(h))		*		Minus ***		=		X \$ =				OR X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))															
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))															
						TOTAL ADD'L FEE				OR		TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											Legal Instrument Examiner: /VENICE M. WILLIAMS/					

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

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



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01	7255
34206 7590 09/29/2009 FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439			EXAMINER THOMPSON, GREGORY D	
			ART UNIT 2835	PAPER NUMBER
			NOTIFICATION DATE 09/29/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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

DAVID@FOGGLAW.COM
docketing@fogglaw.com

Office Action Summary	Application No.	Applicant(s)	
	12/137,309	NELSON ET AL.	
	Examiner	Art Unit	
	Gregory D. Thompson	2835	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 11 June 2008.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) 2,4-5,9-13 is/are allowed.

6) ☒ Claim(s) 1,3,6-8 and 14-20 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 25 August 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892) 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>6/11/08 and 3/19/09</u> .	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
---	--

1. The drawings were received on 8/25/09. These drawings are acceptable.
2. The disclosure is objected to because of the following informalities: Provide Serial number (deleted docket number) for cases on pages 1-2 and 5.

Appropriate correction is required.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the vapors chambers and fins in claim 9 and primary, secondary fans in claims 3 and 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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

5. Claims 1,3,6-8,14 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is confusing with claim 3 for claim 1 recites "at least one fan" and now claim 3 recites "primary and secondary fans".

Claims 6-8 are confusing with each other for claim 6 recites "heat sink" and now claims 7-8 recite "backplane". These two elements appear to be the same structure.

Claims 14 and 19 are confusing for the preamble of each claim recites "for cooling an enclosure" however the body of the claims does not refer to the enclosure. They just recite a sealed environment. Is the sealed environment the enclosure?

6. Claims 14-20, insofar as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Aakalu et al (5,894,407) in view of Dellapi et al (6,142,595).

Aakalu teaches the broad method for cooling an enclosure 10 for housing electronics, the method comprising: directing heat generated by one or more electronic devices 16 housed within enclosure 10 to a heat sink/plate 32 (rear wall 20) thermally coupled to an external environment; drawing a first airflow across (as air flow crosses into the channel/opening 40 through channel 42 as seen in Fig. 3) one or more convective channels/openings 40 of the heat sink/plate 32 (rear wall 20); drawing a second airflow (the airflow coming up through the channel /opening 40 from the bottom of the plate 32/rear wall 20 in Fig. 3) of heated air from (heated air goes out the top of

the channel(s)/opening(s) 40) the one or more convective channels/openings 40 using a Venturi effect created by drawing the first airflow. The Venturi chamber is considered the channel(s)/opening(s) with the offset fan being one of the fans 72 to force the first airflow and the second airflow out of the Venturi chamber. The fan 72 does not impede the natural convection air if the fan 72 is not operating. The speed (threshold/broad term) of the fan 74 is controlled in col. 5 when the fan(s) mode is required to provide addition cooling when the natural convection mode is not efficient (see col. 3.lines 26-col.5). No sealed enclosure taught by Aakalu. Dellapi teaches a sealed outside enclosure. It is considered obvious to one of ordinary skill in the art at the time the invention was made to provide the enclosure 10 of Aakalu sealed as taught by Dellapi to keep out the environment.

7. Claims 1,3,6-8 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The cited art does not each nor suggest a cooling unit composed of a fan shroud having at least one electrical fan. A Venturi chamber having a first inlet for receiving a heated airflow from a heatsink and a second inlet for receiving an airflow from a surrounding environment The chamber having a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect. Claims 3 -5 allowable since they depend on claim 1 and claims 9-13 allowable since they depend on claim 6.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches cooling the enclosures and the like.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory D. Thompson whose telephone number is (571) 272-2045. The examiner can normally be reached on varying schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on (571) 272- 3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory D Thompson/
Primary Examiner, Art Unit 2835

Gregory D Thompson
Primary Examiner
Art Unit 2835

Application/Control Number: 12/137,309
Art Unit: 2835

Page 6

Notice of References Cited	Application/Control No. 12/137,309		Applicant(s)/Patent Under Reexamination NELSON ET AL.	
	Examiner Gregory D. Thompson		Art Unit 2835	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0278912	11-2008	Zavadsky et al.	361/697
*	B	US-2008/0239632	10-2008	Wayman, Michael J.	361/600
*	C	US-2008/0238270	10-2008	Wayman et al.	312/199
*	D	US-5,946,193	08-1999	Hendrix et al.	361/704
*	E	US-7,245,485	07-2007	Morrell, Edward Albert	361/679.48
*	F	US-7,450,382	11-2008	Fischer et al.	361/695
*	G	US-7,355,848	04-2008	Hodge et al.	361/690
*	H	US-6,995,978	02-2006	Strauss, Hans-Ruediger	361/688
*	I	US-5,894,407	04-1999	Aakalu et al.	361/695
*	J	US-6,142,595	11-2000	Dellapi et al.	312/326
*	K	US-7,027,300	04-2006	Lord, Charles	361/695
*	L	US-6,788,535	09-2004	Dodgen et al.	361/695
*	M	US-6,310,772	10-2001	Hutchison et al.	361/700

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.



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BIB DATA SHEET

CONFIRMATION NO. 7255

SERIAL NUMBER 12/137,309	FILING or 371(c) DATE 06/11/2008 RULE	CLASS 365	GROUP ART UNIT 2835	ATTORNEY DOCKET NO. 100.1033US01		
APPLICANTS Michael J. Nelson, Prior Lake, MN; Michael J. Wayman, Waconia, MN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 06/25/2008						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /GREGORY D THOMPSON/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 9	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 4
ADDRESS FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439 UNITED STATES						
TITLE SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING						
FILING FEE RECEIVED 1240	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			

Search Notes 	Application/Control No. 12137309	Applicant(s)/Patent Under Reexamination NELSON ET AL.
	Examiner Gregory D Thompson	Art Unit 2835

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST search	9/23/09	GDT

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

	/Gregory D Thompson/ Primary Examiner.Art Unit 2835
--	--

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	31	("3194307" "3422888" "4233644" "4417295" "4628992" "4672509" "4674004" "4742864" "4896716" "4953634" "5029236" "5195576" "5294831" "5313362" "5370178" "5493457" "5597035" "5646822" "5676198" "5691883" "5765743" "5894987" "6397927" "6397930" "6435267" "6474409" "6914782").PN. OR ("7028753").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 13:21
L3	19	("5060112" "5373418" "5440450" "5838066" "6301115" "6333852" "6442024" "6657860" "6671177" "6912128").PN. OR ("7027300").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 13:33
L4	399	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$. ccls. or "165"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 13:41
L5	703	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$. ccls. or "165"/\$.ccls.or "454"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 13:41
L6	0	(fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same (("Venturi" "venturi") adj (chamber cavity compartment)) same ((second two) adj (inlet opening hole aperture)) and ("361"/\$.ccls or "312"/\$. ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$. ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 13:57

L7	14	(fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same (("Venturi" "venturi") adj (chamber cavity compartment)) and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 13:58
L8	1057	(fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 13:59
L9	861	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same (shroud duct conduit "air guide") same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:10
L10	1877	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:15
L11	1016	10 not 9	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:16

L12	18	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same ("Venturi" "venturi") and telecommunications and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:23
L13	5	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) same ("Venturi" "venturi") and telecommunications and (chimney convection convective) and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:31
L14	1208	(cabinet enclosure housing casing box equipment) same fins and (fan blower impeller pump "cooling unit" "cooling module" tray) and (chimney convection convective) and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 14:34
L15	12	("4051452" "4386651" "4449579" "4790373" "4908734" "5045831" "6088225" "6164369" "6330152" "6704198").PN. OR ("6995978").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 15:09
L16	12	("4051452" "4386651" "4449579" "4790373" "4908734" "5045831" "6088225" "6164369" "6330152" "6704198").PN. OR ("6995978").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 15:21

L17	2780	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 15:30
L18	626268	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective)("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 15:31
L19	232	(cabinet enclosure housing casing box equipment) and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective) and("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 15:32
L20	81	(cabinet enclosure housing casing box equipment) and (side wall) same fin and (fan blower impeller pump "cooling unit" "cooling module" tray) and telecommunications and (chimney convection convective) and("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 15:36

L21	117	(cabinet enclosure housing casing box equipment) same (side wall) and fin and telecommunications and (chimney convection convective) and("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls.or "454"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls. or "385"/\$.ccls. or "455"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 15:39
S1	352	((MICHAEL) near2 (NELSON)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:15
S2	30	((MICHAEL) near2 (WAYMAN)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:20
S3	14	("20040029617" "20070247809" "3654663" "5001602" "5292189" "5380083" "5388903" "5407263" "5540339" "6065612" "6238027" "6411515" "6968647" "7225586").PN. OR ("7518863").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:30
S4	32	("20040007348" "20050170681" "20060204397" "4656559" "4962445" "5065278" "5089935" "5150278" "5267122" "5842514" "5946193" "6028769" "6104611" "6118662" "6396691" "6510223" "6563050" "6587339" "6603660" "6611426" "6628521" "6781830" "6862180" "6865085" "6894907" "6897377" "6992249" "7075789" "7118697" "7245485" "7355848" "D462675").PN. OR ("7450382").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:32
S5	32	("20040007348" "20050170681" "20060204397" "4656559" "4962445" "5065278" "5089935" "5150278" "5267122" "5842514" "5946193" "6028769" "6104611" "6118662" "6396691" "6510223" "6563050" "6587339" "6603660" "6611426" "6628521" "6781830" "6862180" "6865085" "6894907" "6897377"	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:40

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S6	30	((MICHAEL) near2 (WAYMAN)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 10:41
S7	50	US-5566114-\$.DID. OR US- 5862381-\$.DID. OR US- 5632989-\$.DID. OR US- 5694612-\$.DID. OR US- 5986914-\$.DID. OR US- 6021087-\$.DID. OR US- 6107179-\$.DID. OR US- 5577078-\$.DID. OR US- 4933836-\$.DID. OR US- 4994798-\$.DID. OR US- 5374344-\$.DID. OR US- 5379193-\$.DID. OR US- 5384690-\$.DID. OR US- 5384737-\$.DID. OR US- 5428639-\$.DID. OR US- 5432998-\$.DID. OR US- 5440333-\$.DID. OR US- 5463353-\$.DID. OR US- 5481601-\$.DID. OR US- 5489500-\$.DID. OR US- 5515535-\$.DID. OR US- 5553842-\$.DID. OR US- 5563642-\$.DID. OR US- 5576925-\$.DID. OR US- 5589802-\$.DID. OR US- 5600099-\$.DID. OR US- 5604519-\$.DID. OR US- 5606693-\$.DID. OR US- 5612747-\$.DID. OR US- 5615161-\$.DID. OR US- 5617062-\$.DID. OR US- 5620782-\$.DID. OR US- 5625674-\$.DID. OR US- 5638029-\$.DID. OR US- 5646626-\$.DID. OR US- 5694532-\$.DID. OR US- 5697173-\$.DID. OR US- 5715207-\$.DID. OR US- 5715392-\$.DID. OR US- 5724646-\$.DID. OR US- 5740346-\$.DID. OR US- 5745109-\$.DID. OR US- 5749441-\$.DID. OR US- 5764384-\$.DID. OR US- 5768300-\$.DID. OR US- 5790615-\$.DID. OR US- 5793315-\$.DID. OR US- 5813719-\$.DID. OR US- 5825262-\$.DID. OR US- 5832533-\$.DID.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 11:14

S8	50	US-5566114-\$.DID. OR US-5862381-\$.DID. OR US-5632989-\$.DID. OR US-5694612-\$.DID. OR US-5986914-\$.DID. OR US-6021087-\$.DID. OR US-6107179-\$.DID. OR US-5577078-\$.DID. OR US-4933836-\$.DID. OR US-4994798-\$.DID. OR US-5374344-\$.DID. OR US-5379193-\$.DID. OR US-5384690-\$.DID. OR US-5384737-\$.DID. OR US-5428639-\$.DID. OR US-5432998-\$.DID. OR US-5440333-\$.DID. OR US-5463353-\$.DID. OR US-5481601-\$.DID. OR US-5489500-\$.DID. OR US-5515535-\$.DID. OR US-5553842-\$.DID. OR US-5563642-\$.DID. OR US-5576925-\$.DID. OR US-5589802-\$.DID. OR US-5600099-\$.DID. OR US-5604519-\$.DID. OR US-5606693-\$.DID. OR US-5612747-\$.DID. OR US-5615161-\$.DID. OR US-5617062-\$.DID. OR US-5620782-\$.DID. OR US-5625674-\$.DID. OR US-5638029-\$.DID. OR US-5646626-\$.DID. OR US-5694532-\$.DID. OR US-5697173-\$.DID. OR US-5715207-\$.DID. OR US-5715392-\$.DID. OR US-5724646-\$.DID. OR US-5740346-\$.DID. OR US-5745109-\$.DID. OR US-5749441-\$.DID. OR US-5764384-\$.DID. OR US-5768300-\$.DID. OR US-5790615-\$.DID. OR US-5793315-\$.DID. OR US-5813719-\$.DID. OR US-5825262-\$.DID. OR US-5832533-\$.DID.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 11:16
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S9	20	((("4742864") or ("5894407") or ("6253834") or ("6065612") or ("6082441") or ("6238027") or ("6968647") or ("7225586") or ("20060279927") or ("20070247809")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/09/23 11:18
S10	0	("2006/0279927").URPN.	USPAT	OR	ON	2009/09/23 11:31
S11	15	("4237521" "5054545" "5513071").PN. OR ("5894407").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2009/09/23 11:55
S12	2050	(fan blower impeller pump) same ("Venturi" "venturi") and ("361"/\$.ccls or "312"/\$.ccls. or "165"/\$.ccls. or "415"/\$.ccls. or "417"/\$.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/23 12:08

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	Filing Date		2008-06-11	
	First Named Inventor	Nelson		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		100.1033US01	

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	Filing Date		2008-06-11	
	First Named Inventor	Nelson		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		100.1033US01	

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	Attorney Docket Number		100.1033US01	

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	Attorney Docket Number		100.1033US01	

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	2	6082441		2000-07-04	Boehmer et al.		
	3	6238027		2001-05-29	Kohler et al.		
	4	6968647		2005-11-29	Levesque et al.		
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	1	20060279927		2006-12-14	Strohm		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12137309
	Filing Date		2008-06-11
	First Named Inventor	Nelson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	100.1033US01	

	2	20070247809		2007-10-25	McClure	
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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12137309
	Filing Date		2008-06-11
	First Named Inventor	Nelson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		100.1033US01

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ None

SIGNATURE

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

Signature	/ J. Patrick Kendrick /	Date (YYYY-MM-DD)	2009-03-19
Name/Print	Kendrick, J. Patrick	Registration Number	53109

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	4997557
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Julia Sisterman
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	19-MAR-2009
Filing Date:	11-JUN-2008
Time Stamp:	16:13:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	00156646.PDF	798338 da1bc0a74b2c0cc8a884d747ef4afd93ce52dcb7	no	4
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/137,309	06/11/2008	2827	1240	100.1033US01	20	4

CONFIRMATION NO. 7255

UPDATED FILING RECEIPT



34206
FOGG & POWERS LLC
10 SOUTH FIFTH STREET
SUITE 1000
MINNEAPOLIS, MN 55402

Date Mailed: 09/08/2008

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

Applicant(s)

Michael J. Nelson, Prior Lake, MN;
Michael J. Wayman, Waconia, MN;

Assignment For Published Patent Application

ADC TELECOMMUNICATIONS, INC., Eden Prairie, MN

Power of Attorney: The patent practitioners associated with Customer Number 34206

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 06/25/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/137,309**

Projected Publication Date: 12/17/2009

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

Preliminary Class

365

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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page 2 of 3

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Applicant(s)	Nelson	<u>COMMUNICATION RE:</u> <u>NOTICE TO FILE</u> <u>CORRECTED APPLICATION</u> <u>PAPERS</u> <u>UNDER 37 C.F.R. §1.84</u>
Serial No.	12/137,309	
Filing Date	06/11/2008	
Group Art Unit	Unknown	
Examiner Name	Unknown	
Confirmation No.	7255	
Attorney Docket No.	100.1033US01	
Title: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		

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

Dear Sir or Madam:

In response to the Notice to File Corrected Application Papers mailed July 1, 2008, attached are nine (9) sheets of corrected formalized drawings for the above-identified patent application.

Based on the above, it is respectfully submitted that Applicants have complied with the 37 C.F.R. §1.84 as set forth on the Notice to File Corrected Application Papers.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-455-1680.

Respectfully submitted,

Date: August 25, 2008

/ J. Patrick Kendrick /
J. Patrick Kendrick
Reg. No. 53109

Attorneys for Applicant
Fogg & Powers LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T – (612) 332-4720
F – (612) 332-4731

REPLACEMENT SHEET

1/9

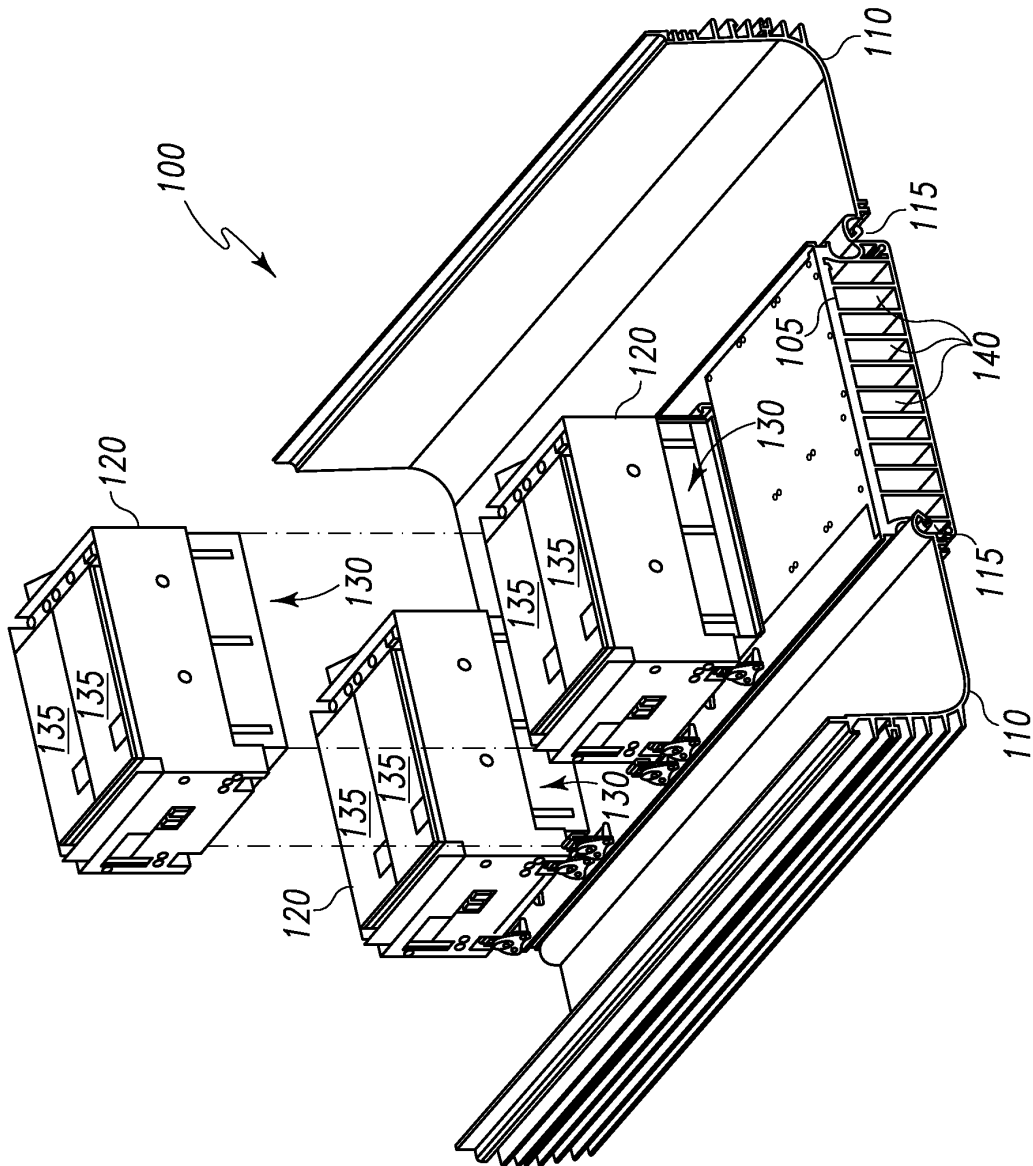


Fig. 1A

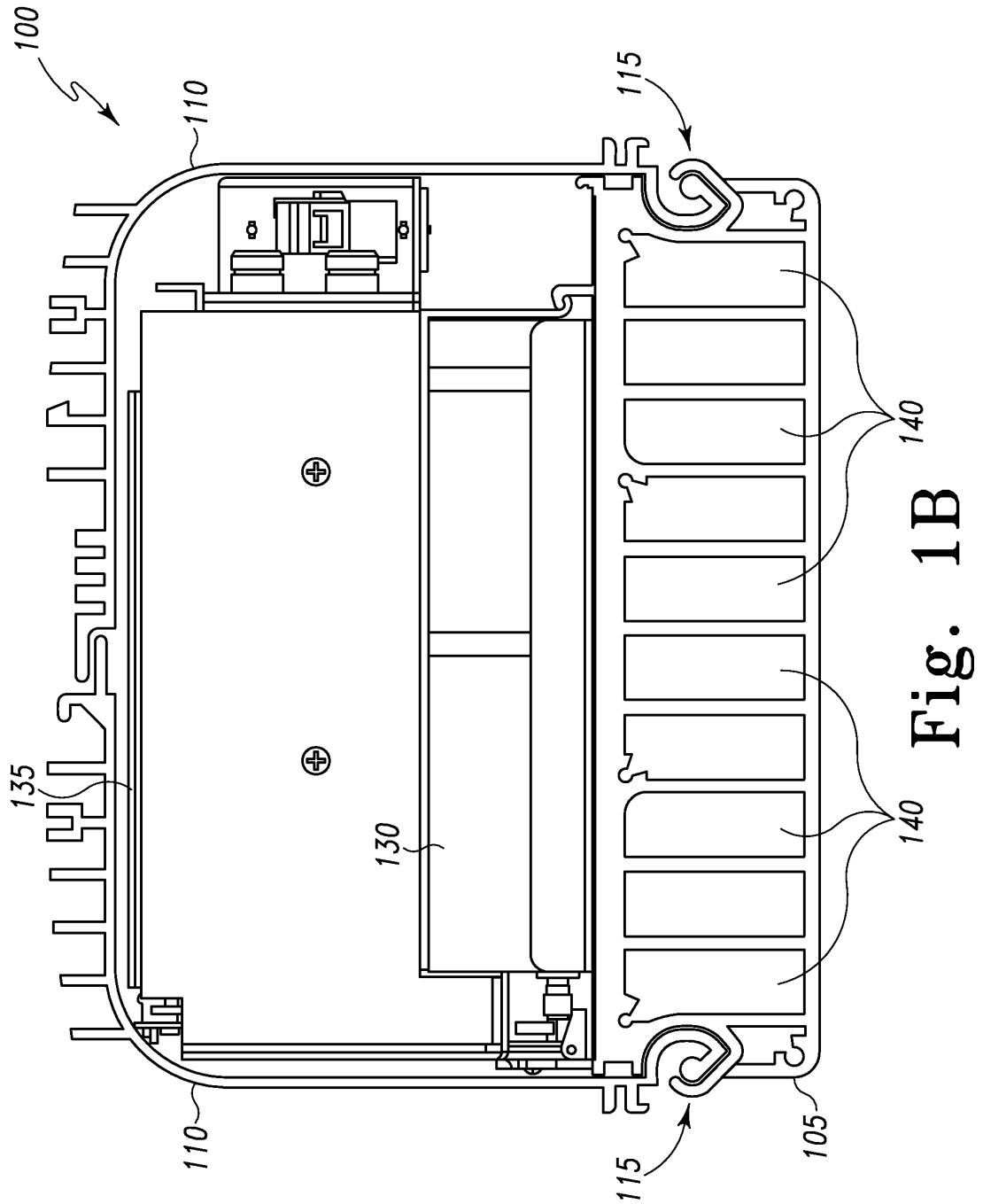
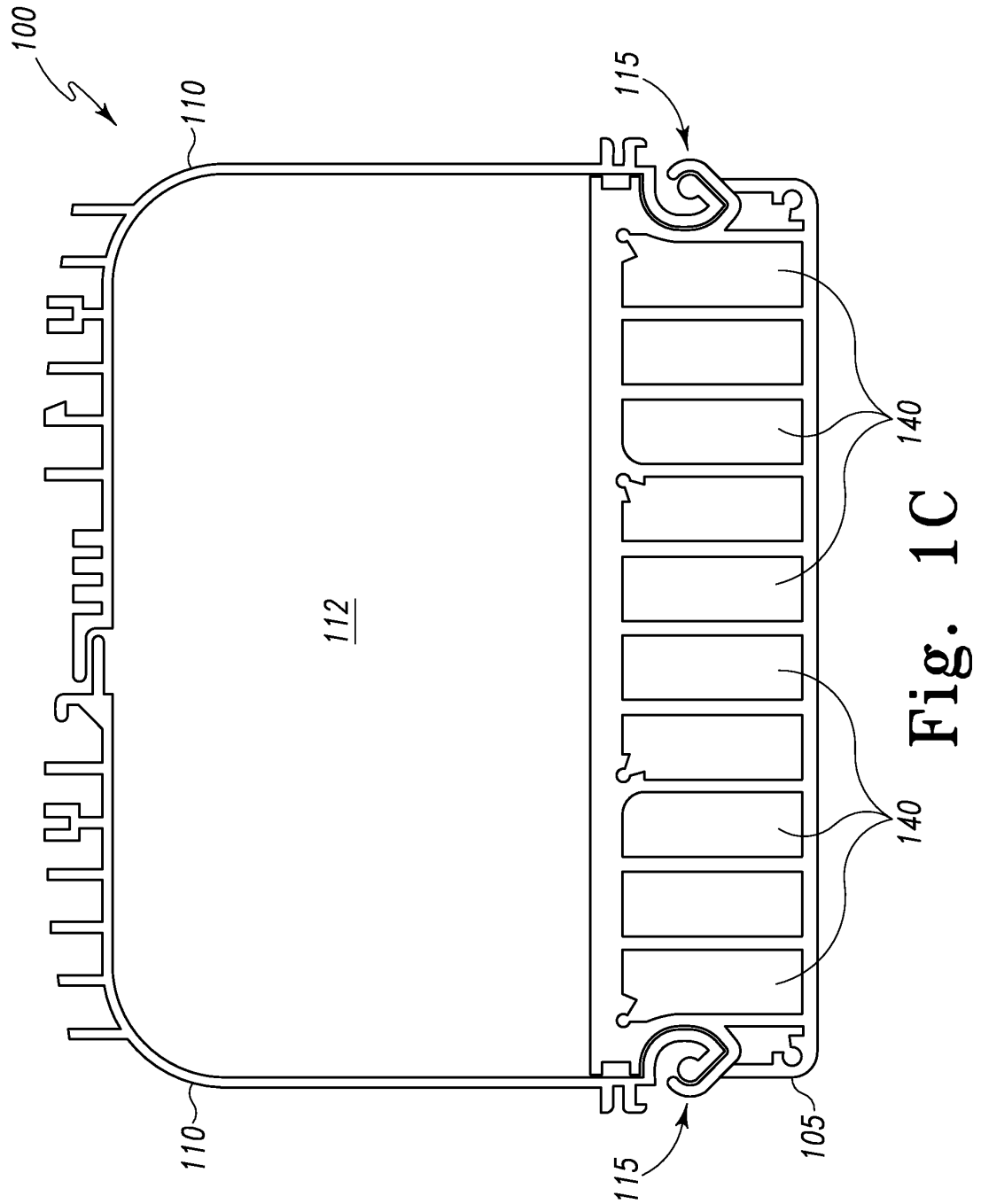


Fig. 1B



REPLACEMENT SHEET

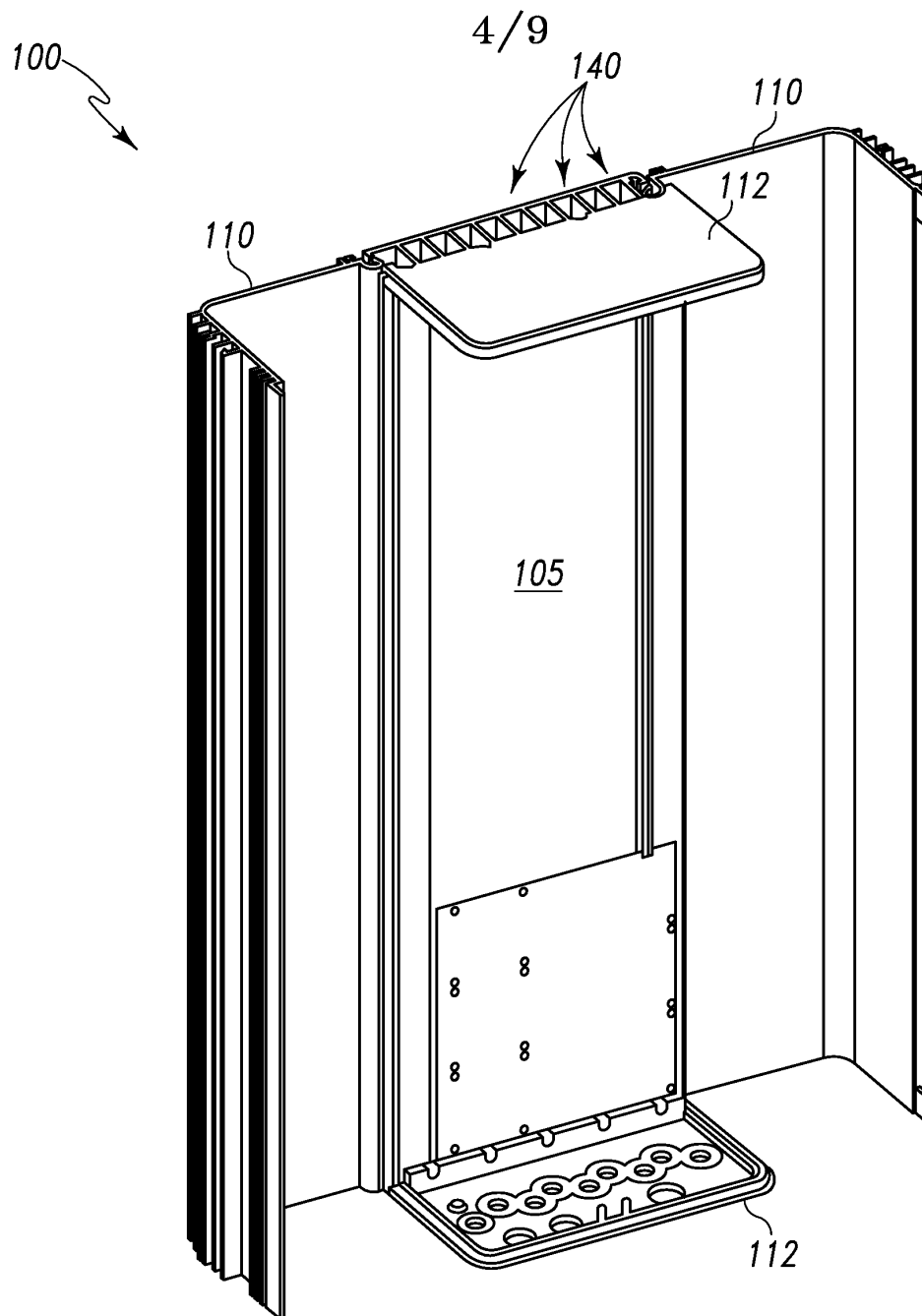


Fig. 1D

REPLACEMENT SHEET

5/9

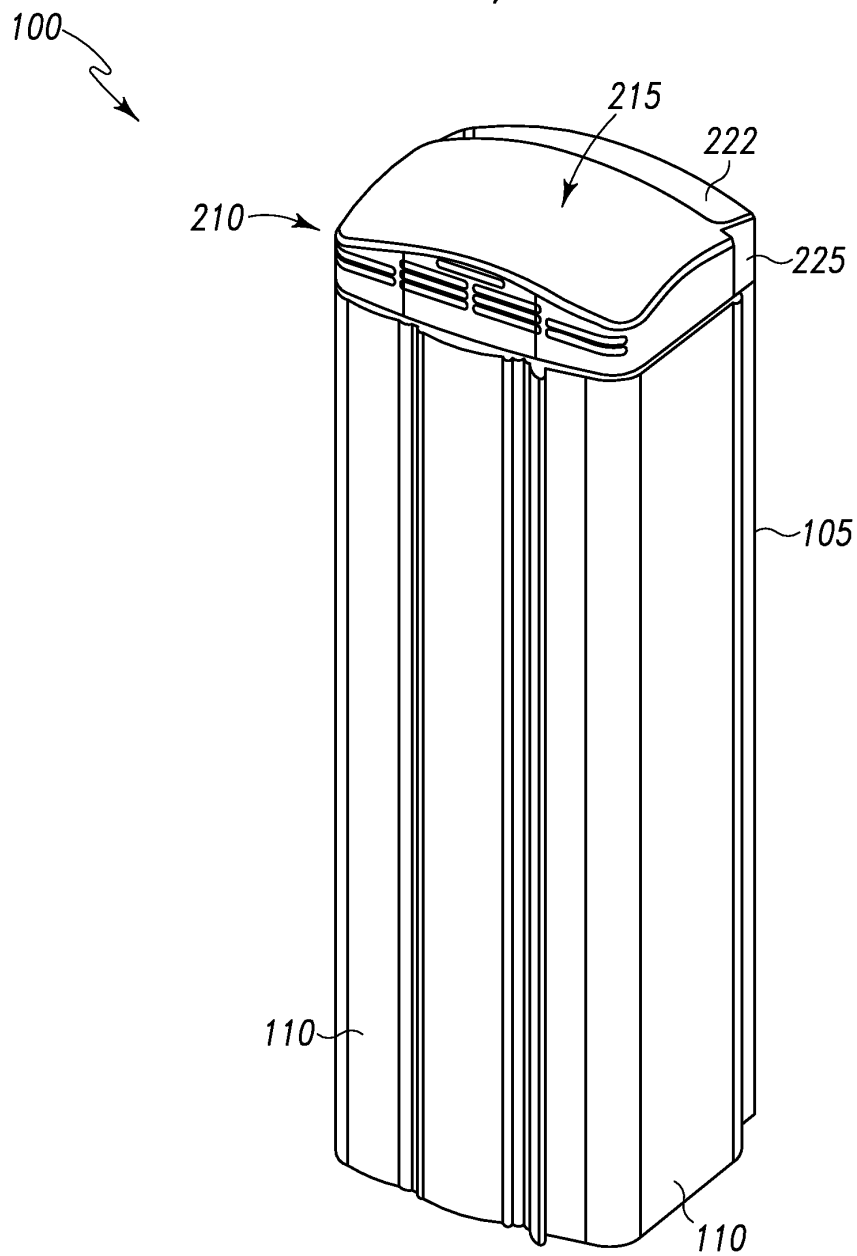


Fig. 2A

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6/9

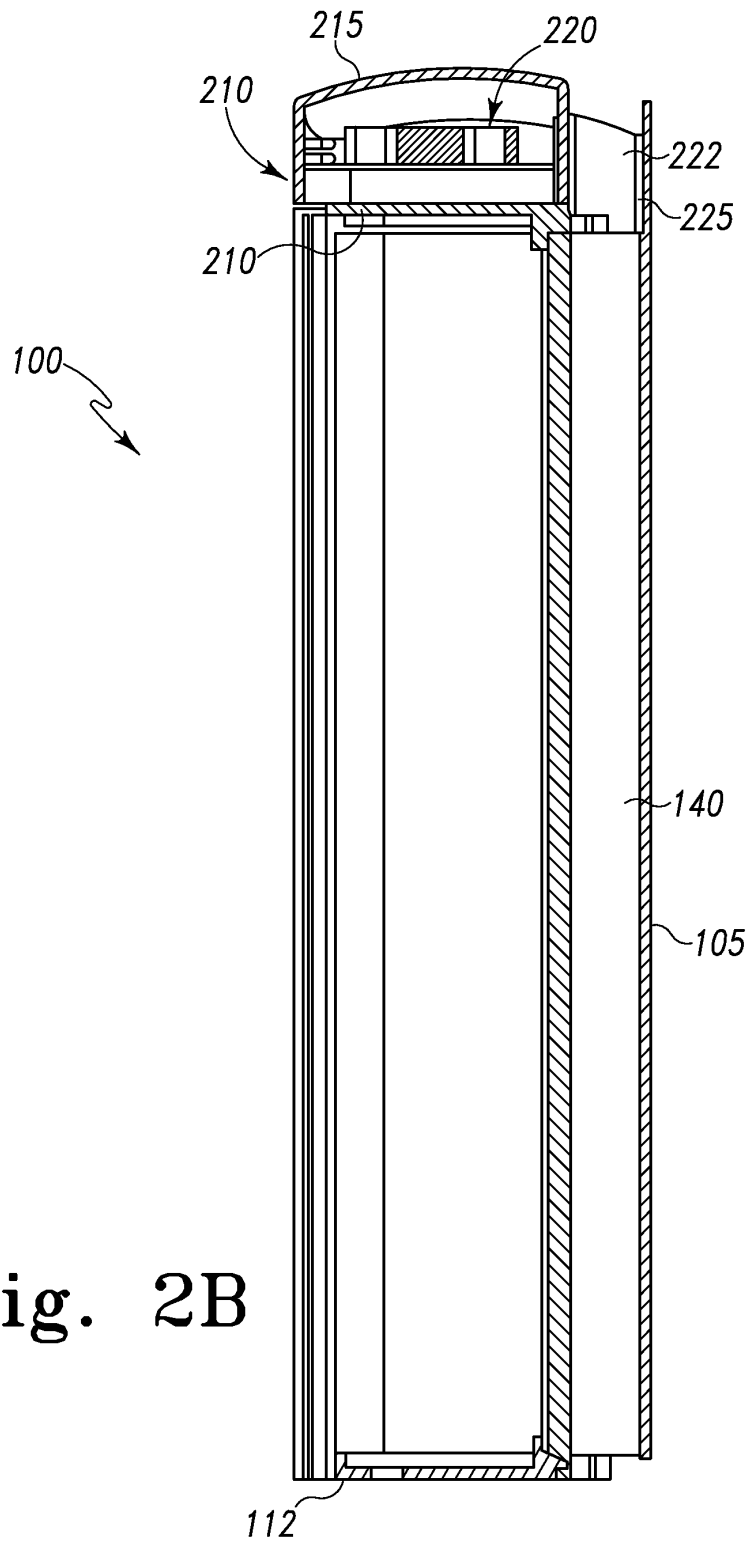


Fig. 2B

REPLACEMENT SHEET

7/9

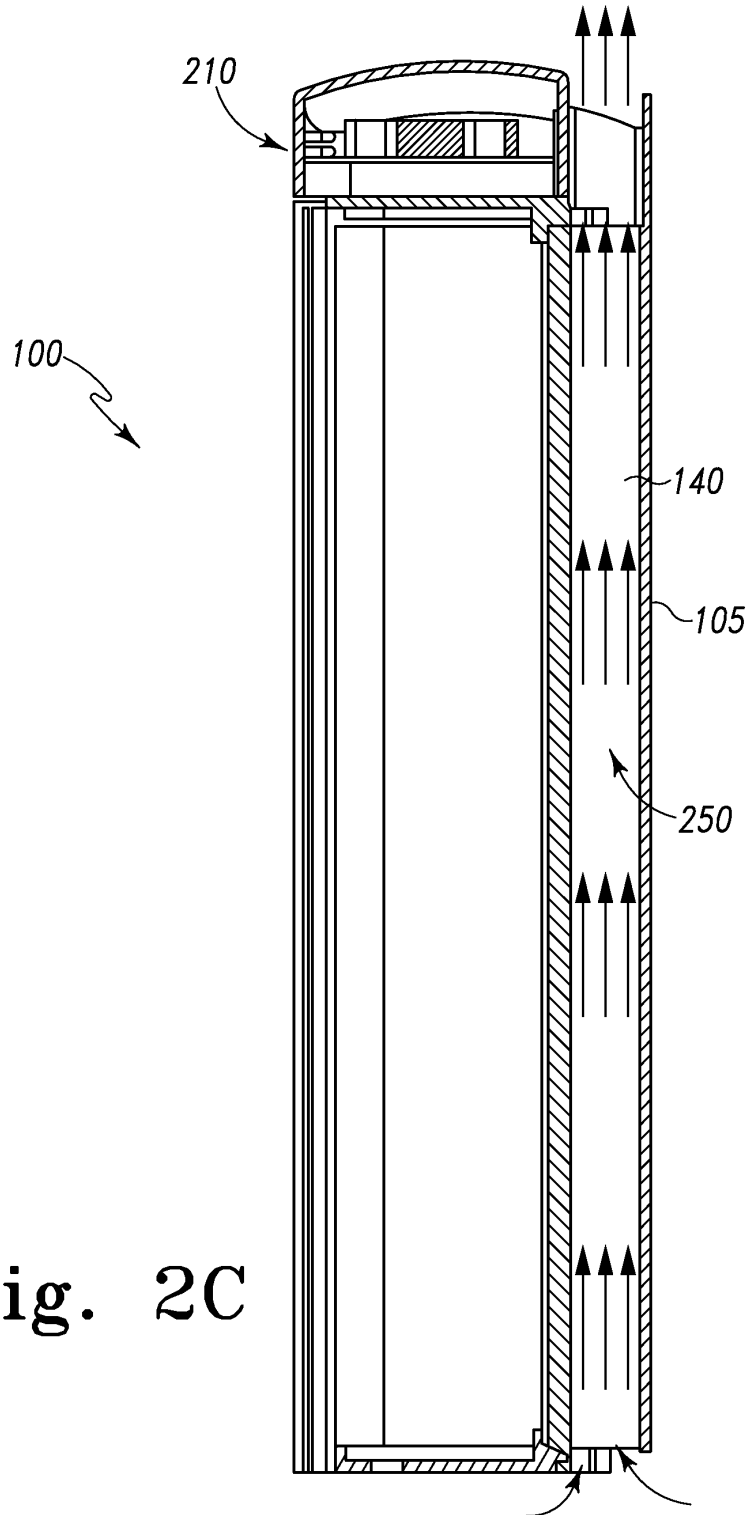


Fig. 2C

REPLACEMENT SHEET

8/9

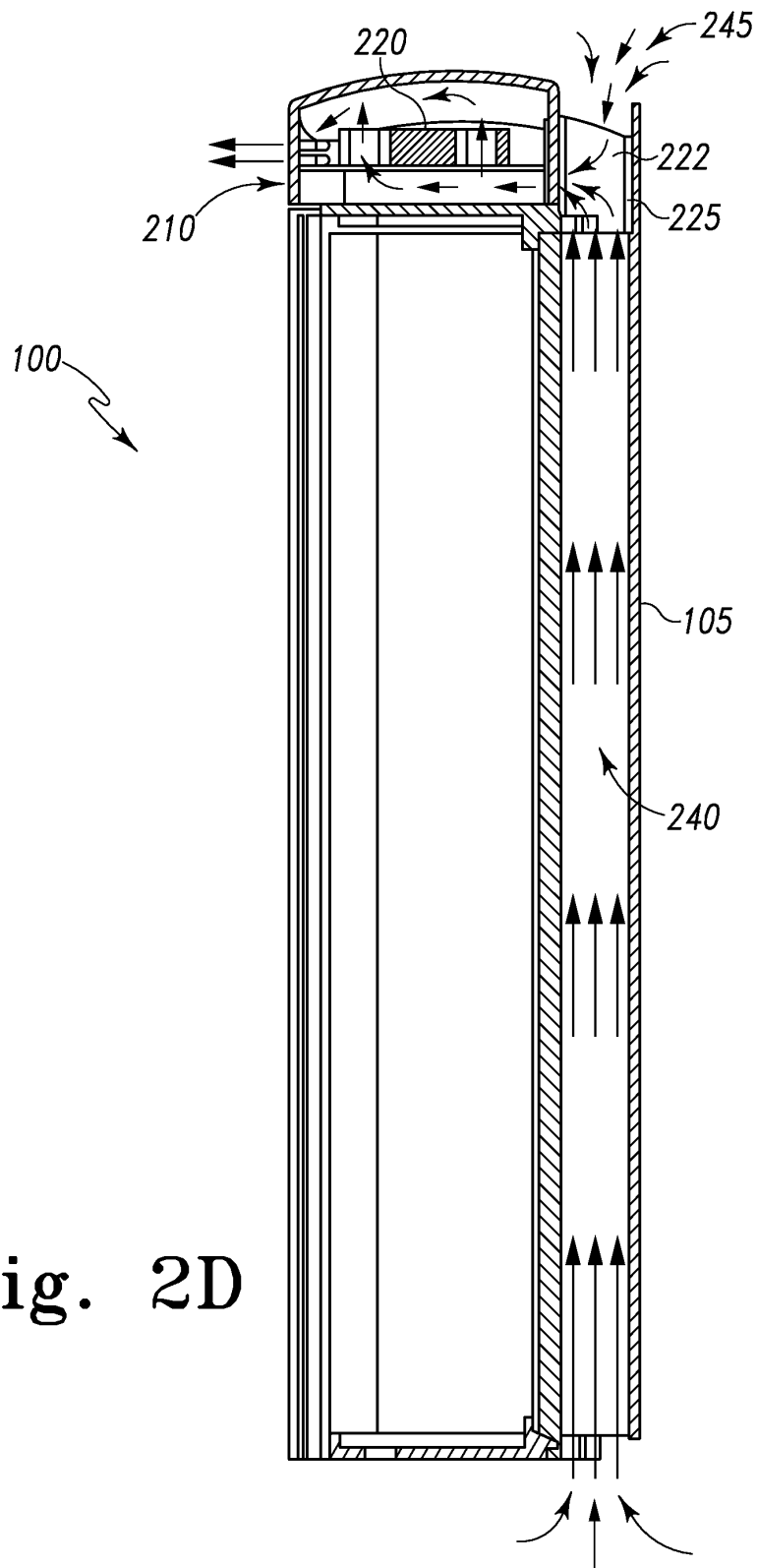


Fig. 2D

REPLACEMENT SHEET

9/9

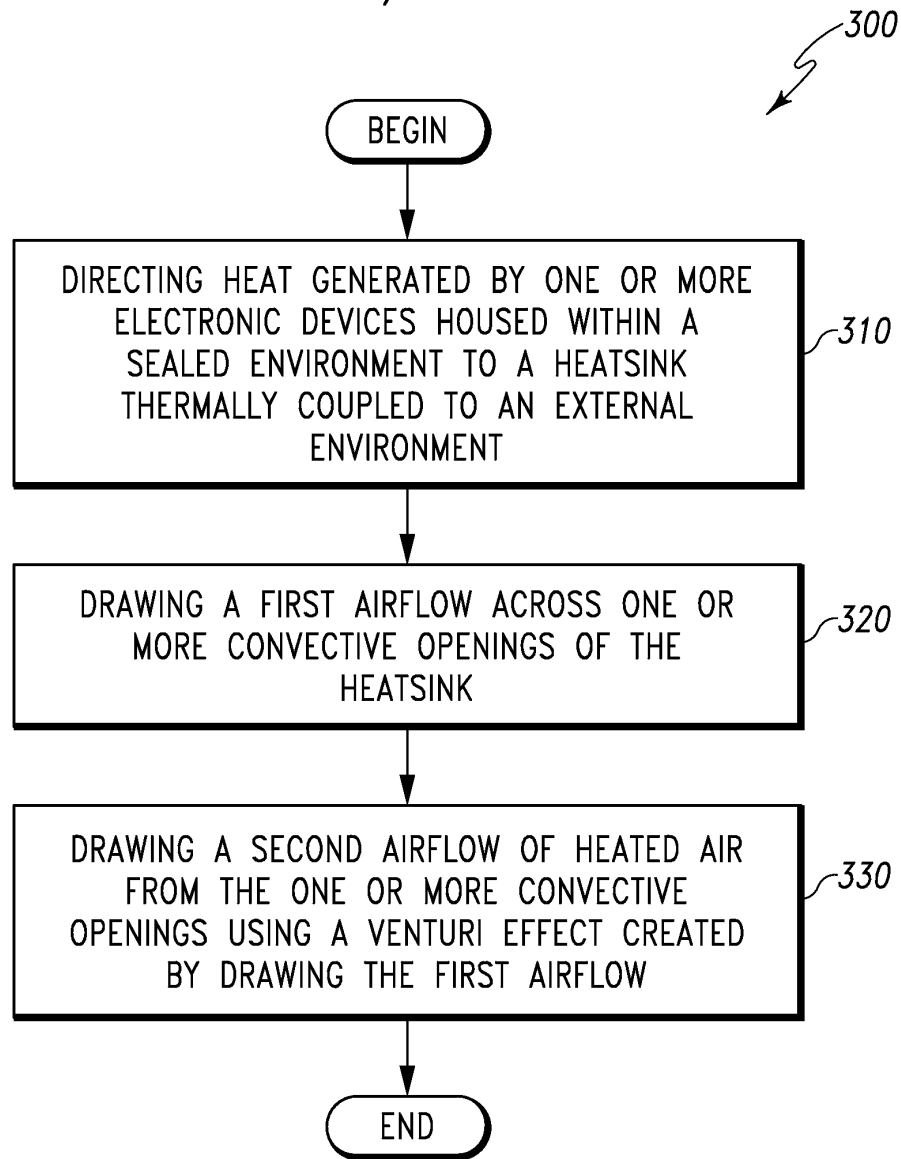


Fig. 3

Electronic Acknowledgement Receipt	
EFS ID:	3831864
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Lisa Gentry
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	25-AUG-2008
Filing Date:	11-JUN-2008
Time Stamp:	15:42:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	00134672.PDF	72568	no	1
			f0497f5239c95c289db32326db5abc3dfc662a42		
Warnings:					
Information:					

2	Drawings-only black and white line drawings	00134435.PDF	279817 5aae5a904bd4a98c2be50626d20bef00692f7808	no	9
Warnings:					
Information:					
Total Files Size (in bytes):				352385	
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/137,309	06/11/2008	2827	1240	100.1033US01	20	4

CONFIRMATION NO. 7255

FILING RECEIPT



OC000000030686402

34206
FOGG & POWERS LLC
10 SOUTH FIFTH STREET
SUITE 1000
MINNEAPOLIS, MN 55402

Date Mailed: 07/01/2008

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

Applicant(s)

Michael J. Nelson, Prior Lake, MN;
Michael J. Wayman, Waconia, MN;

Assignment For Published Patent Application

ADC TELECOMMUNICATIONS, INC., Eden Prairie, MN

Power of Attorney: The patent practitioners associated with Customer Number 34206

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 06/25/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/137,309**

Projected Publication Date: To Be Determined - pending completion of Corrected Papers

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

Preliminary Class

365

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/137,309	06/11/2008	Michael J. Nelson	100.1033US01

CONFIRMATION NO. 7255

FORMALITIES LETTER

34206
FOGG & POWERS LLC
10 SOUTH FIFTH STREET
SUITE 1000
MINNEAPOLIS, MN 55402



Date Mailed: 07/01/2008

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Filing Date Granted

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

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

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☐ See attached certification statement.

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

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Signature	/ J. Patrick Kendrick /	Date (YYYY-MM-DD)	2008-06-11
Name/Print	Kendrick, J. Patrick	Registration Number	53109

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SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] This application is related to the following commonly assigned co-pending U.S. Patent Applications, filed on even date herewith, each of which is incorporated herein by reference in its entirety, all of which are hereby incorporated herein by reference:

[0002] United States patent application serial number ___/___ (attorney docket number 100.1027US01 entitled “COMMUNICATION MODULES”) and which is referred to here as the ‘1027 Application;

[0003] United States patent application serial number ___/___ (attorney docket number 100.1028US01 entitled “APPARATUS FOR MOUNTING A MODULE AND ENABLING HEAT CONDUCTION FROM THE MODULE TO THE MOUNTING SURFACE”) and which is referred to here as the ‘1028 Application;

[0004] United States patent application serial number ___/___ (attorney docket number 100.1029USPR entitled “SUSPENSION METHOD FOR COMPLIANT THERMAL CONTACT OF ELECTRONICS MODULES”) and which is referred to here as the ‘1029 Application;

[0005] United States patent application serial number ___/___ (attorney docket number 100.1030US01 entitled “ANGLED DOORS WITH CONTINUOUS SEAL”) and which is referred to here as the ‘1030 Application;

[0006] United States patent application serial number ___/___ (attorney docket number 100.1031USPR entitled “L-SHAPED DOOR WITH 3-SURFACE SEAL FOR ENDPLATES”) and which is referred to here as the ‘1031 Application;

[0007] United States patent application serial number ___/___ (attorney docket number 100.1032USPR entitled “L-SHAPED DOORS WITH TRAPEZOIDAL SEAL”) and which is referred to here as the ‘1032 Application;

[0008] United States patent application serial number ___/___ (attorney docket number 100.1034USPR entitled “COMBINATION EXTRUDED AND CAST METAL

OUTDOOR ELECTRONICS ENCLOSURE”) and which is referred to here as the ‘1034 Application;

[0009] United States patent application serial number __/____ (attorney docket number 100.1035USPR, entitled “SYSTEMS AND METHODS FOR CABLE MANAGEMENT”) and which is referred to here as the ‘1035 Application;

[0010] United States patent application serial number __/____ (attorney docket number 100.1037USPR entitled “CAM SHAPED HINGES”) and which is referred to here as the ‘1037 Application;

[0011] United States patent application serial number __/____ (attorney docket number 100.1038US01 entitled “SOLAR SHIELDS”) and which is referred to here as the ‘1038 Application;

[0012] United States patent application serial number __/____ (attorney docket number 100.1039USPR entitled “APPARATUS AND METHOD FOR BLIND SLOTS FOR SELF DRILLING/SELF-TAPPING SCREWS”) and which is referred to here as the ‘1039 Application;

[0013] United States patent application serial number __/____ (attorney docket number 100.1040USPR entitled “SYSTEMS AND METHODS FOR THERMAL MANAGEMENT”) and which is referred to here as the ‘1040 Application;

[0014] United States patent application serial number __/____ (attorney docket number 100.1062USPR entitled “SERF BOARD COMPONENTS”) and which is referred to here as the ‘1062 Application; and

[0015] United States patent application serial number __/____ (attorney docket number 100.1064US01 entitled “PULL-OUT SHELF FOR USE IN A CONFINED SPACE FORMED IN A STRUCTURE”) and which is referred to here as the ‘1064 Application.

BACKGROUND

[0016] In the field of telecommunications, there is a trend to reduce both the size and the expenses associated with infrastructure equipment. The result is a demand on telecommunications infrastructure equipment providers to manufacture smaller equipment that can be operated and maintained in a more cost effective manner, while retaining all the functionality of legacy equipment. The modularity of designs proposed for such equipment, along with the smaller sizes desired by system operators, has introduced new thermal management challenges for dissipating heat generated by telecommunications infrastructure equipment. For the reasons stated above and for other reasons stated below which will become apparent to those skilled in the art upon reading and understanding the specification, there is a need in the art for improved systems and methods for thermal management of telecommunications infrastructure equipment.

SUMMARY

[0017] The Embodiments of the present invention provide methods and systems for thermal management of telecommunications infrastructure equipment and will be understood by reading and studying the following specification.

[0018] In one embodiment, a cooling unit for an enclosure housing electronics is provided. The cooling unit comprises: a fan shroud having at least one electrical fan; and a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on. The Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention can be more easily understood and further advantages and uses thereof more readily apparent, when considered in view of the description of the preferred embodiments and the following figures in which:

[0019] Figures 1A, 1B, 1C and 1D illustrate an enclosure of one embodiment of the present invention.

[0020] Figures 2A, 2B, 2C and 2D illustrate a Venturi assisted cooling unit for the enclosure of one embodiment of the present invention.

[0021] Figure 3 is a flow chart illustrating a method of one embodiment of the present invention.

[0022] In accordance with common practice, the various described features are not drawn to scale but are drawn to emphasize features relevant to the present invention. Reference characters denote like elements throughout figures and text.

DETAILED DESCRIPTION

[0023] In the following detailed description, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of specific illustrative embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical and electrical changes may be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense.

[0024] This disclosure describes systems and methods for utilizing Venturi fan-assisted cooling of electrical equipment, such as but not limited to telecommunications equipment, housed inside an enclosure.

[0025] Figures 1A, 1B, 1C and 1D are diagrams illustrating an enclosure 100 of one embodiment of the present invention. Enclosure 100 comprises a structural backplane 105, two doors 110 that each pivot around respective hinges 115 and two endplates 112 attached respectively to the ends of structural backplane 105 so that when doors 110 are closed, a sealed environment is created within enclosure 100. In alternate embodiments, enclosure 100 provides a weatherproof sealed environment.

[0026] Enclosure 100 is shown in Figure 1A with doors 110 in the open position and endplates 112 removed to reveal one or more electrical components 120 housed within enclosure 100. In the particular embodiment shown in Figure 1A, electrical components 120 include, but are not limited to, the radiofrequency (RF) transceiver modules discussed in the ‘1027 Application and ‘1028 Application, both of which are herein incorporated by reference. In the particular embodiment shown in Figures 1A-1D, enclosure 100 is the enclosure described in the ‘1030 Application, herein incorporated by reference, wherein doors 110 are the described “L-shaped” doors which are sealed against backplane 105 by a continuous seal (not shown). Also, in the particular embodiment shown in Figures 1A-1D, hinges 115 are the cam-shaped hinges as described in the ‘1037 Application herein incorporated by reference.

[0027] As explained in greater detail in the ‘1040 Application, herein incorporated by reference, electrical components 120 are designed so that high powered internal electronics (that is, those electronics generating the most heat) (shown generally at 130) are located to maximize the conductive transfer of that heat to backplane 105 which thus acts as a heatsink for the high powered internal electronics 130. In contrast, low power internal electronics (that is, components generating relatively less heat) (shown at 135) are placed to conductively transfer the heat they generate to doors 110, when then doors 110 are in their closed positions as shown in Figure 1B. Backplane 105 thus functions as a high power thermal interface, or in other words a heatsink, that provides a path for absorbing heat generated by the high powered internal electronics 130 and transferring that heat to the environment surrounding enclosure 100. Doors 110 similarly function as a heatsink for the low powered internal electronics 135 to transfer their heat to the environment surrounding enclosure 100.

[0028] As shown in Figures 1A-1D, backplane 105 further includes a plurality of convective openings 140 which comprise open voids that run the length of backplane 105 which promotes a natural convective heat transfer between backplane 105 and the air of the environment surrounding enclosure 100, some of which will naturally flow through convective openings 140 (illustrated in Figure 2C). The base of the backplane heatsink can also be thermally enhanced by the use of advanced materials such as integral vapor chambers, which serve to evenly distribute the absorbed heat load through the backplane

105. Another embodiment would be use of the vapor chambers as fins of the heatsink. This would maximize the equivalent thermal conductivity of the fins, spreading the heat more evenly between the base and the integral shield of the backplane heatsink (high power heatsink). In one such embodiment, the vapor chambers are installed and encapsulated into the base of the high-power heatsink, backplane 105. These vapor chambers would be large, rectangular, copper stampings that would interface directly with the high power electronics in order to spread any focused load out, evenly, to all vertical fins of the heatsink. In alternate embodiments, backplane 105 may also include a plurality of fins running the length of backplane 105, either instead of, or in addition to, vapor chambers for the purpose of further promoting heat exchange between backplane 105 and the air of the environment surrounding enclosure 100. In that case the open spaced between the fins at either end of backplane 105 would form similar convective openings.

[0029] Figures 2A, 2B, 2C and 2D are diagrams illustrating an enclosure 100 (with doors 110 closed), the enclosure 100 further comprising a fan assisted cooling unit 210 of one embodiment of the present invention, placed at the top of enclosure 100. Figure 2B illustrates a cut-away view of Figure 2A. Fan assisted cooling unit 210 comprises a fan shroud 215 having at least one electrical fan 220. In one embodiment, an assisted cooling unit 210 could include two fans with one fan being a primary fan and the second fan acting as a backup fan in case of the failure of the primary fan. One of ordinary skill in the art would appreciate that there are a number a methods to detect when the primary fan has failed. For example, in one embodiment, a backup fan is provided a setpoint to activate at a temperature threshold that would not be reached under normal design expectations if the primary fan was working properly.

[0030] Fan assisted cooling unit 210 further comprises a Venturi chamber 222 formed from a continuous wall 225 connected on each end to fan shroud 215. As shown in Figures 2B-2D, fan 220 is placed in an offset position outside of Venturi chamber 222 so as to not impede the natural circulation of air through convective openings 140 when fan 220 is not operating. Wall 225 extends upwards along the circumference of backplane 105 in order to encircle the top openings of convective openings 140 within Venturi chamber 222.

[0031] As shown in Figure 2D, because of the placement of wall 225, air drawn into fan 220 must flow into Venturi chamber 222 either through the convective openings 140 of backplane 105 (shown generally by airflow 240), or drawn in from above Venturi chamber 222 (shown generally by airflow 245). The airflow 240 flowing up from backplane 105 will be heated by the heat dissipated from high powered internal electronics (130) and thus will be significantly more buoyant than the ambient air of airflow 245. As a result, fan 220 will draw in more air from backplane 105 than it is going to draw in from the top of Venturi chamber 222.

[0032] Fan 220 pulls in the hot buoyant air off the top of backplane 105 and at the same time air from the top of Venturi chamber 222. The air coming in from the top of Venturi chamber 222 is directed across the heated airflow from the heatsink by wall 225 and the draw of fan 222. The combination of drawing both the heated airflow 240 from backplane 105 and the ambient airflow 245 from above into Venturi chamber 222 and through fan 220 produces a Venturi effect. That is, the ambient airflow 245 flowing over the top of wall 225 generates an increased airflow in the heated airflow 240 coming from below - such as when air flows over the top of an open straw. With this configuration, cooling unit 210 works very efficiently as a pump to draw the hot air from the top openings of the convective openings 140 of backplane 105 which in turn draws in relatively cool ambient air in from the bottom openings of convective openings 140.

[0033] One of ordinary skill in the art, upon reading this specification, would be able to determine both the optimal volume of Venturi chamber 222 and the height of wall 225 using skills and knowledge they possess and based on the heat removal requirements of the particular application. For example, one of ordinary skill in the art upon reading this specification would recognize that every size of fan is rated to produce a given volumetric flow, and that the dimensions of Venturi chamber 222 can be adjusted to optimize the use of a particular fan and draw the desired volume of air through backplane 105 when the fan 220 is on. Further, the height of wall 225 should be limited to avoid unnecessarily impeding vertical airflow through the generation of air friction, which will decrease the Venturi effect pulling hot air from backplane 105. As shown in Figures 2A-2D, for that particular embodiment, wall 225 is dimensioned to be approximately flush with the top of fan shroud 215.

[0034] Embodiments of the present invention, such as the cooling unit 210 described above, have distinct advantages over systems where a fan is placed directly over backplane 105. As illustrated in Figure 2D, air is drawn air through the heatsink of backplane 105 when the fan 220 is in operation. When fan 220 is not in operation, as illustrated by Figure 2C, having offset fans creates the free space available above backplane 105 (that is, the absence of obstructions) which allows a natural convection flow (shown generally at 250) to establish itself through convective openings 140.

[0035] In one embodiment, fan 220 is controlled to cycle on and off based on temperature thresholds. For example, in one embodiment when the temperature is less than a predetermined threshold (85 degrees Fahrenheit for example), the fan 220 turns off and natural convection flow through backplane 105 is utilized to remove heat from enclosure 100. When the temperature exceeds another predetermined threshold (90 degrees Fahrenheit for example), fan 220 is turned on to initiate forced air cooling as described above. As one of ordinary skill in the art upon reading this specification would appreciate, the upper and lower temperature thresholds can be set to avoid undue cycling of the fan. In alternate embodiments, the temperatures measured to determine when to operate the fan can include, but are not limited to, temperatures based on an ambient environmental air temperature, temperatures based on heat loads generated within enclosure 100, or a combination of both.

[0036] Figure 3 is a flow chart illustrating a method 300 of one embodiment of the present invention for cooling an enclosure for housing electronics. The method begins at 310 with directing heat generated by one or more electronic devices housed within a sealed environment to a heatsink thermally coupled to an external environment. In one embodiment, the sealed environment is formed by closing one or more doors of an enclosure, such as enclosure 100 discussed above. In other embodiments, other sealed environments may be used. The heatsink includes one or more convective openings which comprise open voids that run the length of the heatsink which promotes a natural convection heat transfer between the heatsink and the air of the environment surrounding the enclosure, some of which will naturally flow through the convective openings. The convective opening allow air from the surrounding environment to convectively flow through the heatsink and transfer thermal energy generated by electronic components

housed within the sealed environment to the external environment. In one embodiment, the convective openings are vapor chambers which also serve to evenly distribute the heat load generated by the electronic components throughout the heatsink.

[0037] The method proceeds to 320 with drawing a first airflow across one or more convective openings of the heatsink and to 330 with drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow. As explained in greater detail above with respect to Figures 2A-2D, the airflow flowing up from the heatsink's convective openings will be heated by the heat dissipated from high powered internal electronics and thus will be significantly more buoyant than the ambient first airflow. As a result, drawing the first airflow across the convective openings of the heatsink will establish a Venturi affect which will pull in more air through the heat sink than would flow naturally due to natural convention. In one embodiment, a fan draws in air from the top of a Venturi chamber to establish the first airflow. The first airflow is directed across the heated airflow from the heatsink by a wall of the Venturi chamber and the draw of the fan. The combination of drawing both the heated airflow from the heatsink and the ambient airflow from above is what produces the Venturi effect that generates an increased airflow through the heatsink which in turn draws in relatively cool ambient air in from the bottom side convective openings of the heatsink. In one embodiment, so as not to interfere with the natural convention of air through the heatsink when the fan is turned off, the fan is offset so that it is out of the path of the natural convection airflow. In alternate embodiments, the fan may be turned on and off based on one or more predetermined temperature thresholds as described in greater detail above.

[0038] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement, which is calculated to achieve the same purpose, may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. For example, electrical enclosures having only a single door, or multiple doors having shaped different from those described above are contemplated as within the scope of the present invention. Therefore, it is manifestly intended that this invention be limited only by the claims and the equivalents thereof.

CLAIMS

What is claimed is:

1. A cooling unit for an enclosure housing electronics, the cooling unit comprising:
a fan shroud having at least one electrical fan; and
a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;
wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.
2. The cooling unit of claim 1, wherein the fan shroud is offset from the Venturi chamber such that when the fan is not on, the fan shroud does not obstruct a natural circulation airflow entering the first inlet and exiting the second inlet of the Venturi chamber.
3. The cooling unit of claim 1, wherein the fan shroud includes a primary fan and a backup fan that becomes operational upon a failure of the primary fan.
4. The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.
5. The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow
6. An electronics enclosure, the enclosure comprising:
a sealed environment housing electronics, the sealed environment having a heatsink for dissipating heat generated by the electronics to an external environment; and

a cooling unit mounted above the sealed environment;

wherein the cooling unit comprises:

a fan shroud having at least one electrical fan; and

a Venturi chamber having a first inlet for receiving a heated airflow from the heatsink and a second inlet for receiving an airflow from the external environment and an outlet coupled to the fan shroud, the fan shroud drawing air from the Venturi chamber via the outlet when the fan is on;

wherein the Venturi chamber comprises a wall for directing the airflow from the external environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on;

wherein the fan shroud is offset with respect to the Venturi chamber so as to not obstruct a natural circulation of air through the heatsink when the fan is not on.

7. The enclosure of claim 6, the sealed environment further comprising a backplane; and
at least one door pivotally attached to the backplane, wherein at least one electrical component is mounted to the backplane to conductively transfers heat to the backplane.
8. The enclosure of claim 6, wherein the enclosure further comprising:
a backplane;
at least two doors pivotally attached to the backplane; and
two endplates attached to the backplane;
wherein where the at least two doors are closed, the sealed environment is formed.
9. The enclosure of claim 6, the heatsink including a plurality of vapor chambers spreading the heat generated by the electronics to fins of the heatsink.

10. The enclosure of claim 6, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.

11. The enclosure of claim 6, wherein the fan shroud includes a primary fan and a backup fan that becomes operational upon a failure of the primary fan.

12. The enclosure of claim 6, wherein the fan shroud is offset from the Venturi chamber such that when the fan is not on, the fan shroud does not obstruct a natural circulation airflow entering the first inlet and exiting the second inlet of the Venturi chamber.

13. The enclosure of claim 6, wherein when the fan is on, air entering the Venturi chamber from the second inlet is cooler than air entering the Venturi chamber from the first inlet.

14. A method for cooling an enclosure for housing electronics, the method comprising:

- directing heat generated by one or more electronic devices housed within a sealed environment to a heatsink thermally coupled to an external environment;

- drawing a first airflow across one or more convective openings of the heatsink;

- drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.

15. The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;

- wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;

- the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.

16. The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.
17. The method of claim 15, wherein the fan is located offset with respect to the Venturi chamber to not impede a natural circulation of airflow through the Venturi chamber when the fan is not in operation.
18. The method of claim 15, further comprising operating the fan when a temperature exceeds a predetermined threshold.
19. A method for cooling an enclosure for housing electronics, the method comprising:
- directing heat generated by one or more electronic devices housed within a sealed environment to a heatsink thermally coupled to an external environment;
 - when a temperature exceeds a first predetermined threshold, operating a fan to draw a first airflow across convective openings of the heatsink and a second airflow of heated air from the convective openings of the heatsink using a Venturi effect created by drawing the first airflow;
 - when the temperature does not exceed a second predetermined threshold, allowing a natural circulation airflow to flow from the convective openings of the heatsink by not operating the fan.
20. The method of claim 19, wherein the fan is located such as to not impede the natural circulation airflow when the fan is not in operation.

ABSTRACT

Systems and methods for Venturi fan-assisted cooling of electrical equipment are provided. In one embodiment, a cooling unit for an enclosure housing electronics is provided. The cooling unit comprises: a fan shroud having at least one electrical fan; and a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on. The Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		
First Named Inventor/Applicant Name:		Michael J. Nelson		
Filer:		Joseph Patrick Kendrick./Shawna Mack		
Attorney Docket Number:		100.1033US01		
Filed as Large Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	310	310
Utility Search Fee	1111	1	510	510
Utility Examination Fee	1311	1	210	210
Pages:				
Claims:				
Independent claims in excess of 3	1201	1	210	210
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1240

Electronic Acknowledgement Receipt

EFS ID:	3440762
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Shawna Mack
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	11-JUN-2008
Filing Date:	
Time Stamp:	17:31:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1240
RAM confirmation Number	3205
Deposit Account	502432
Authorized User	KENDRICK,J. PATRICK
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Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Drawings-only black and white line drawings	00128173.PDF	285595	no	9
			76d4a500d1bd68ddc162642091d3ce4922e85b36		

Warnings:

Information:

2	Application Data Sheet	00128527.PDF	1062109	no	4
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Warnings:

Information:

3	Oath or Declaration filed	00128734.PDF	48346	no	2
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Warnings:

Information:

4	Information Disclosure Statement (IDS) Filed	00128525.PDF	724179	no	4
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Warnings:

Information:

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Multipart Description/PDF files in .zip description

Document Description		Start	End
Specification		1	9
Claims		10	13
Abstract		14	14

Warnings:

Information:

6	Fee Worksheet (PTO-06)	fee-info.pdf	8503	no	2
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Electronic Acknowledgement Receipt

EFS ID:	3440762
Application Number:	12137309
International Application Number:	
Confirmation Number:	7255
Title of Invention:	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING
First Named Inventor/Applicant Name:	Michael J. Nelson
Customer Number:	34206
Filer:	Joseph Patrick Kendrick./Shawna Mack
Filer Authorized By:	Joseph Patrick Kendrick.
Attorney Docket Number:	100.1033US01
Receipt Date:	11-JUN-2008
Filing Date:	
Time Stamp:	17:31:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1240
RAM confirmation Number	3205
Deposit Account	502432
Authorized User	KENDRICK,J. PATRICK
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Drawings-only black and white line drawings	00128173.PDF	285595	no	9
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Warnings:

Information:

2	Application Data Sheet	00128527.PDF	1062109	no	4
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Information:

3	Oath or Declaration filed	00128734.PDF	48346	no	2
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Warnings:

Information:

4	Information Disclosure Statement (IDS) Filed	00128525.PDF	724179	no	4
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Information:

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Multipart Description/PDF files in .zip description

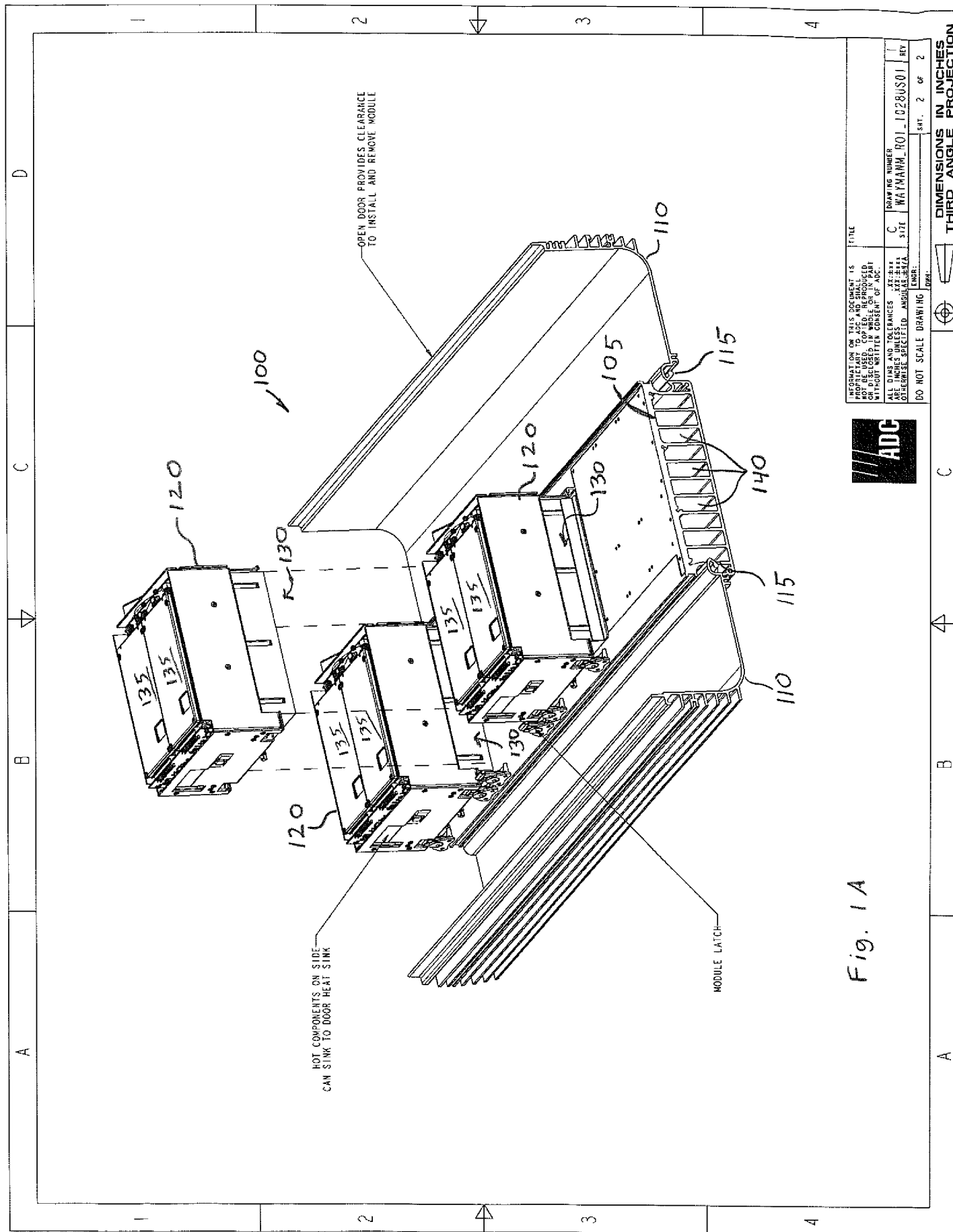
Document Description	Start	End
Specification	1	9
Claims	10	13
Abstract	14	14

Warnings:

Information:

6	Fee Worksheet (PTO-06)	fee-info.pdf	8503	no	2
			764593361b8f6bee3e04b7b94368b64ff d313c0b		

Warnings:	
Information:	
Total Files Size (in bytes):	2227748
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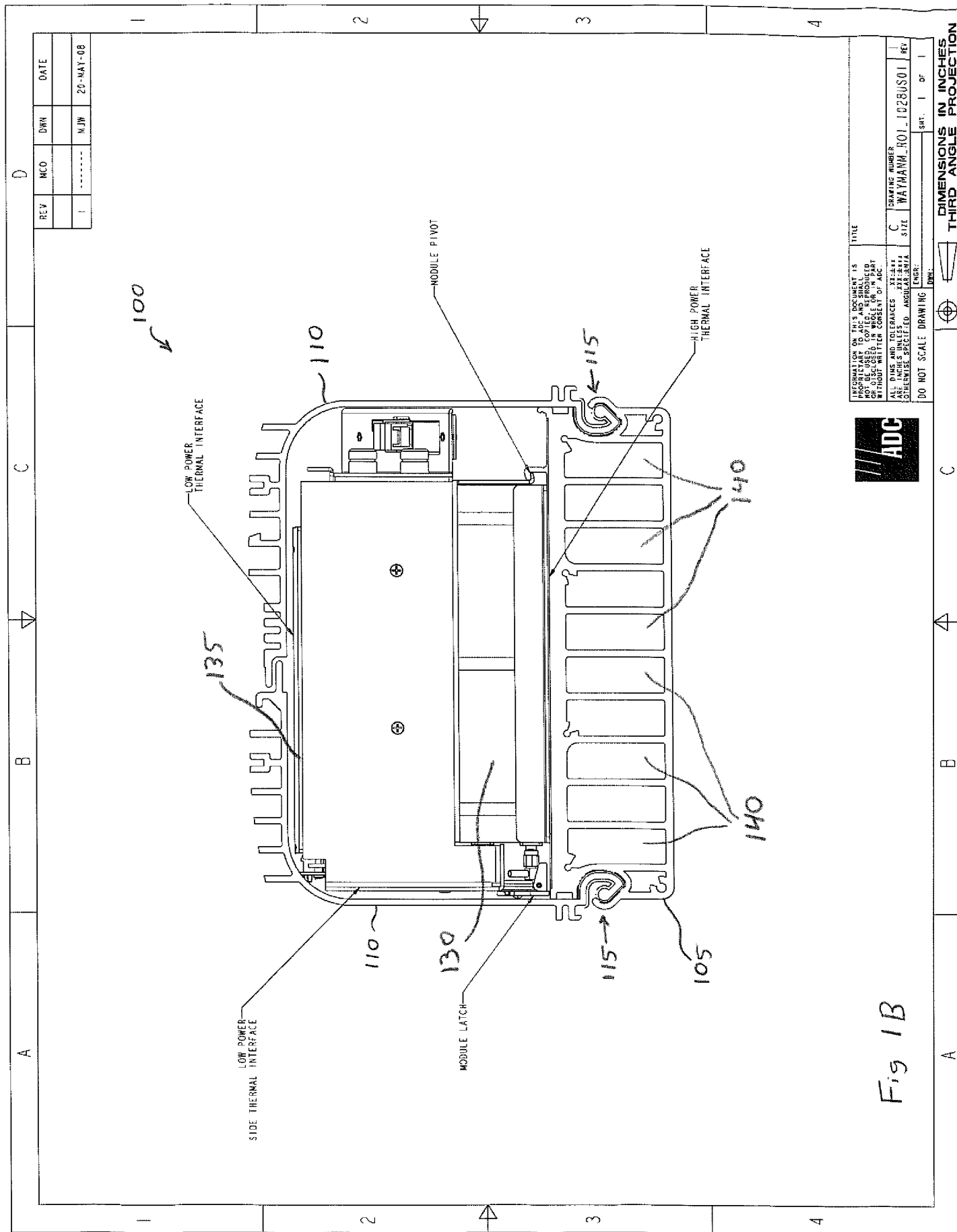


Fig 1B



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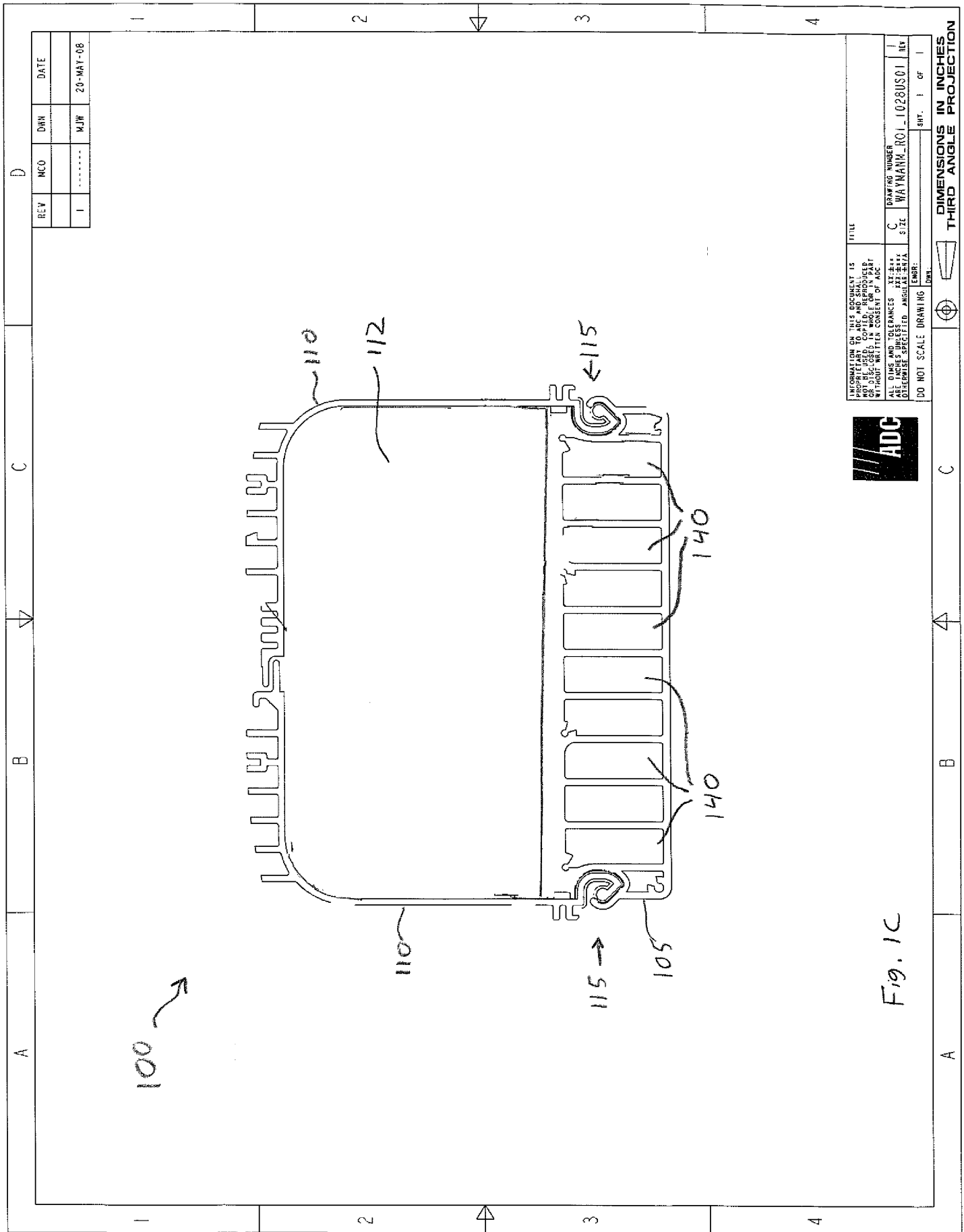
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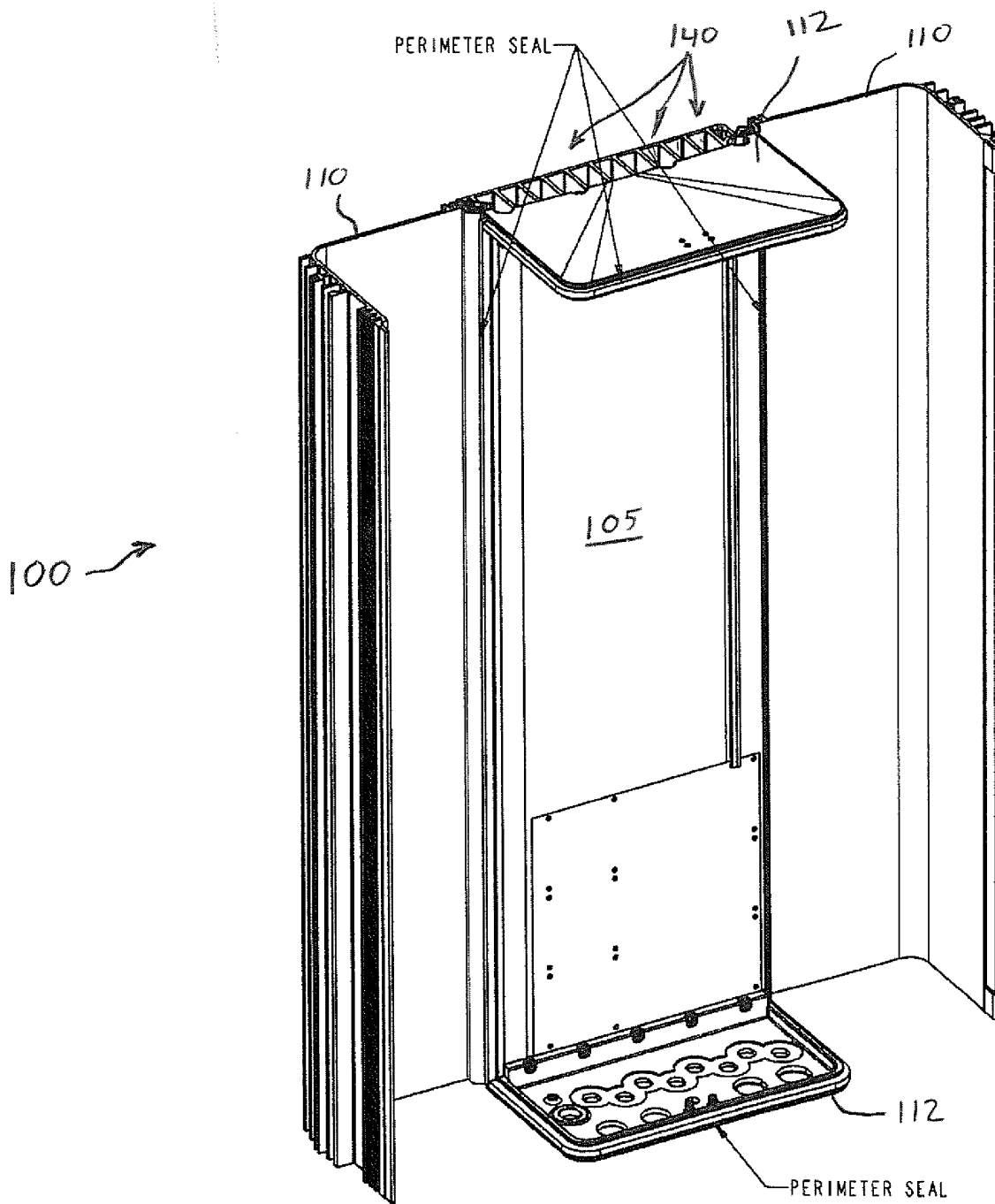


Fig. 1 D

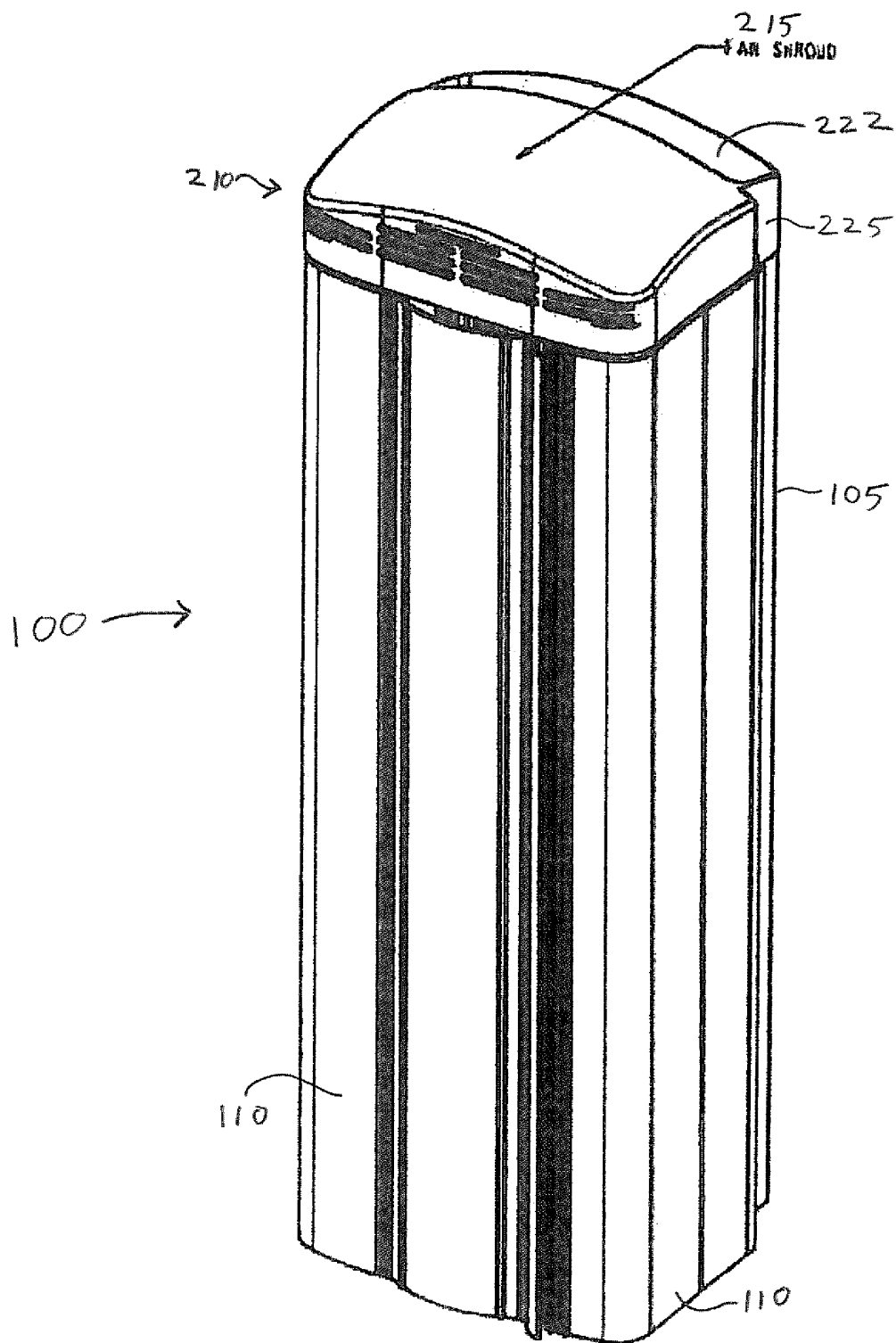


Fig. 2A

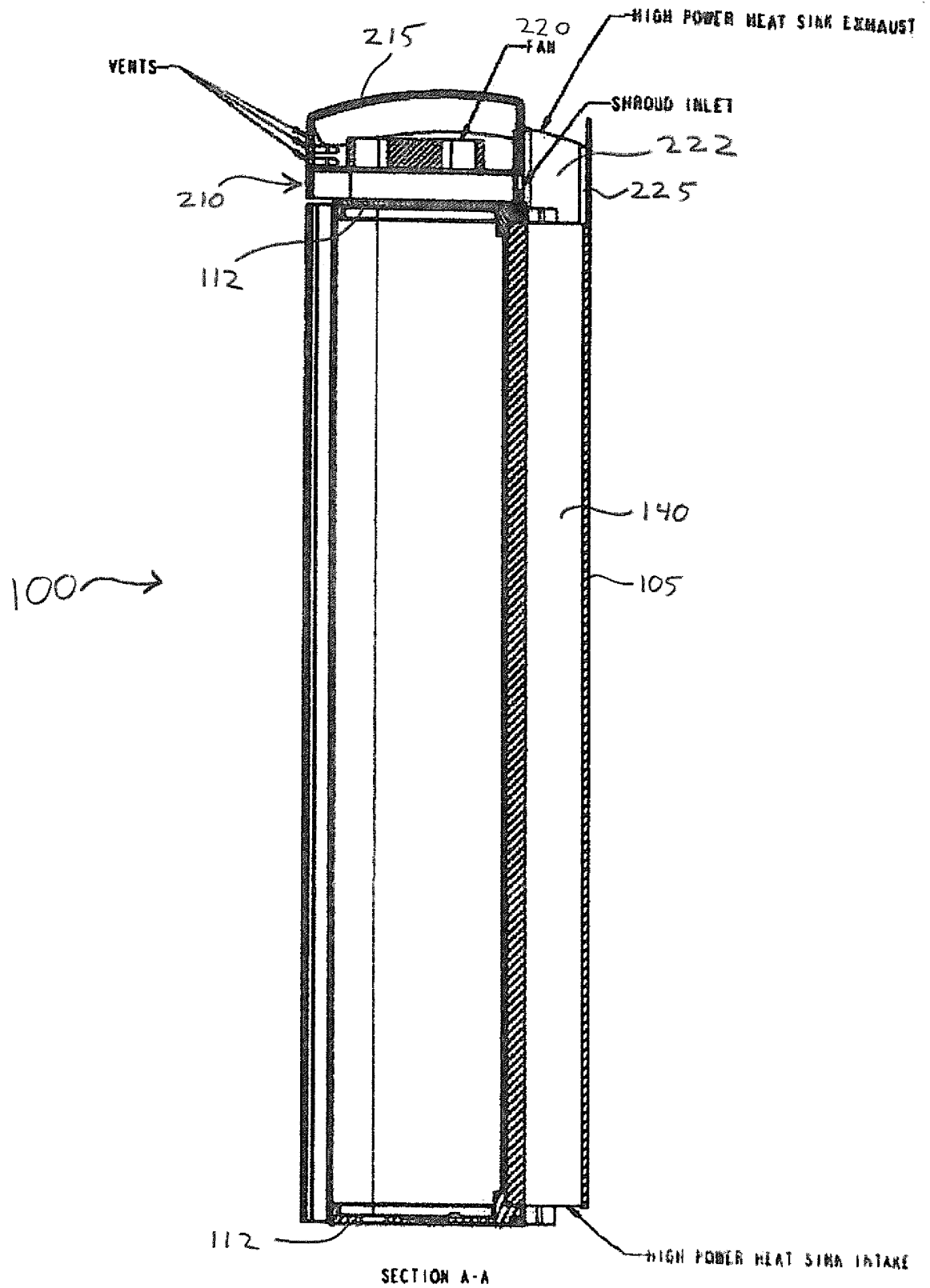
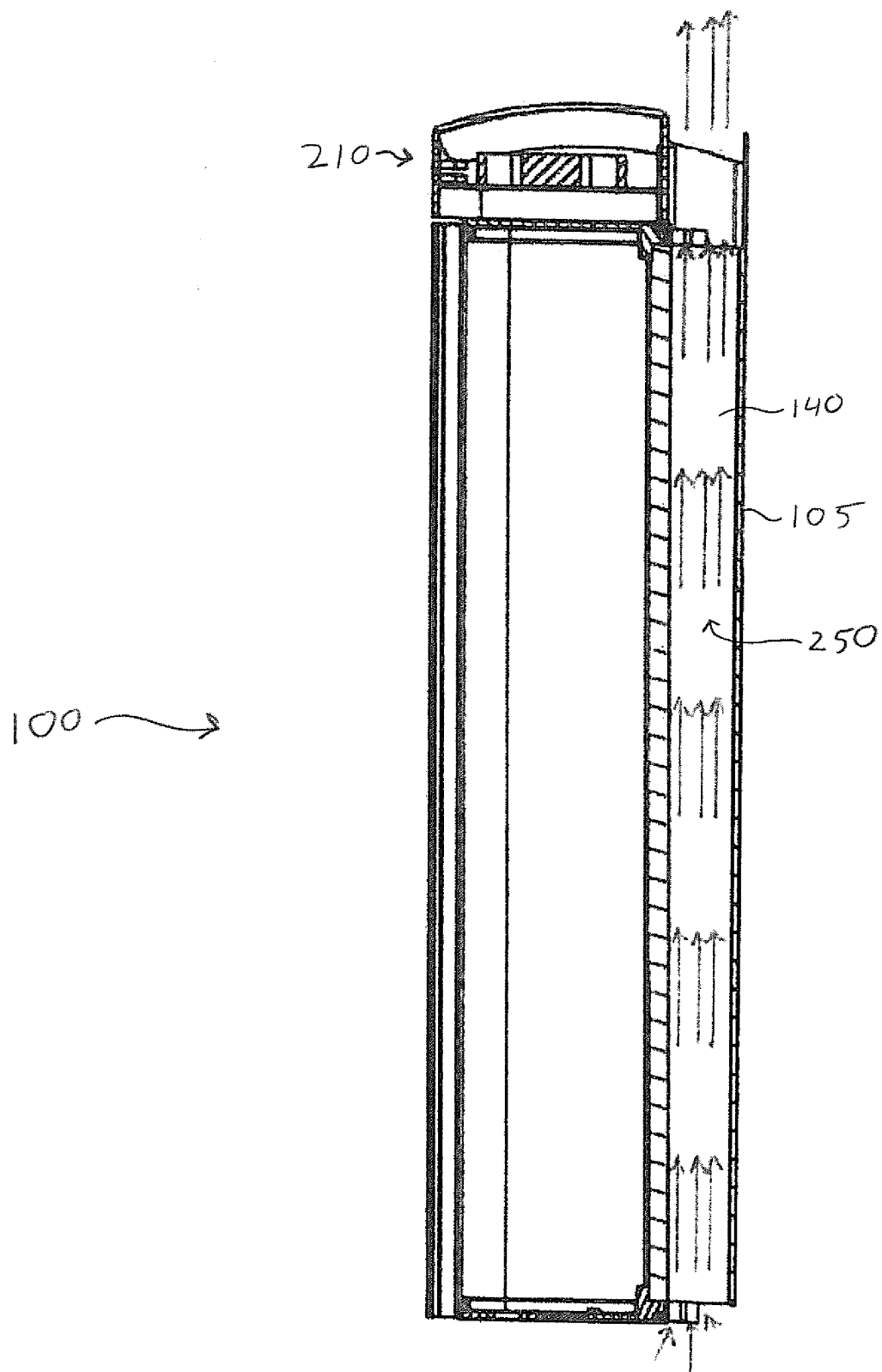


Fig. 2B



FANS OFF
NATURAL CONVECTION COOLING ONLY

Fig. 2C

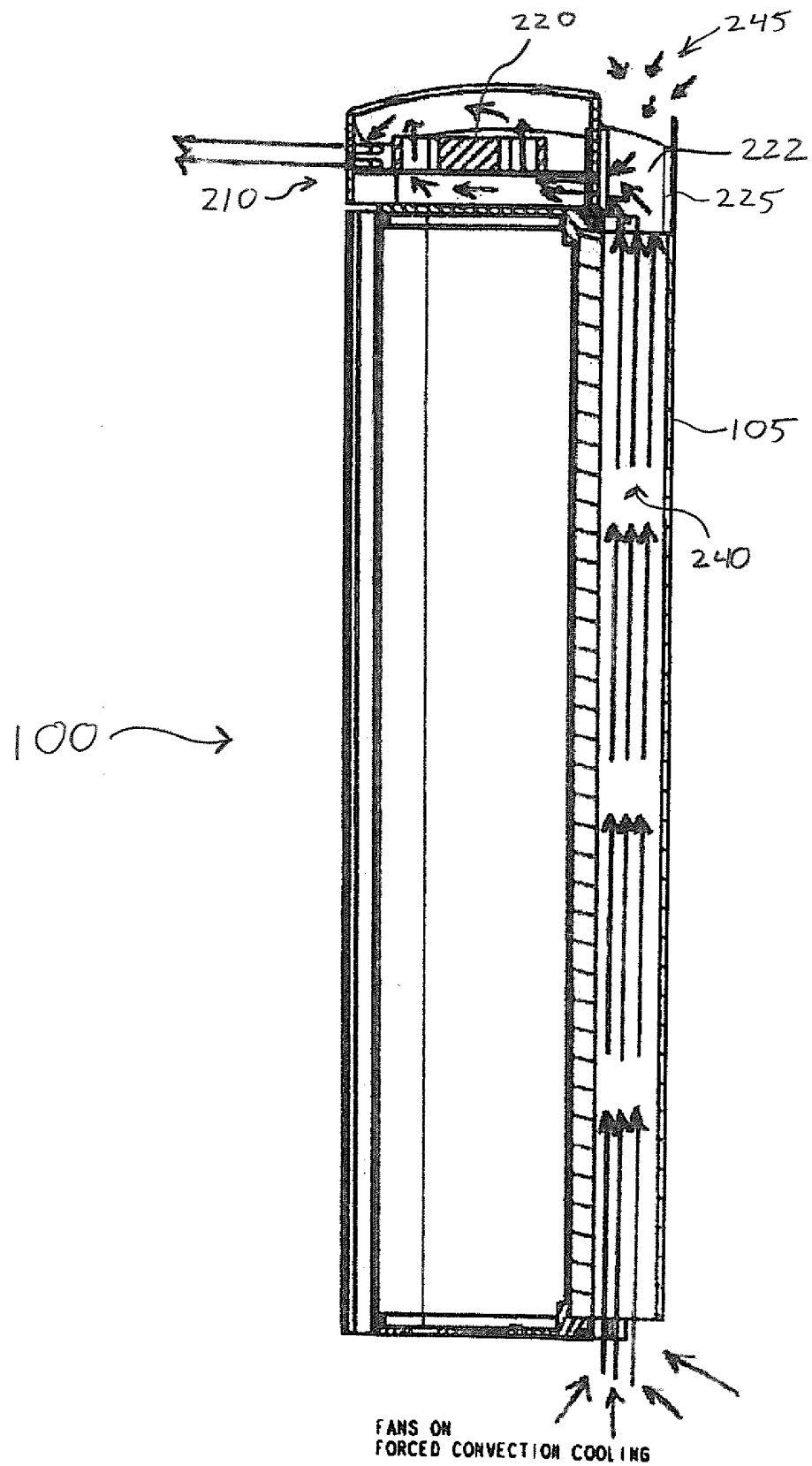


Fig. 2D

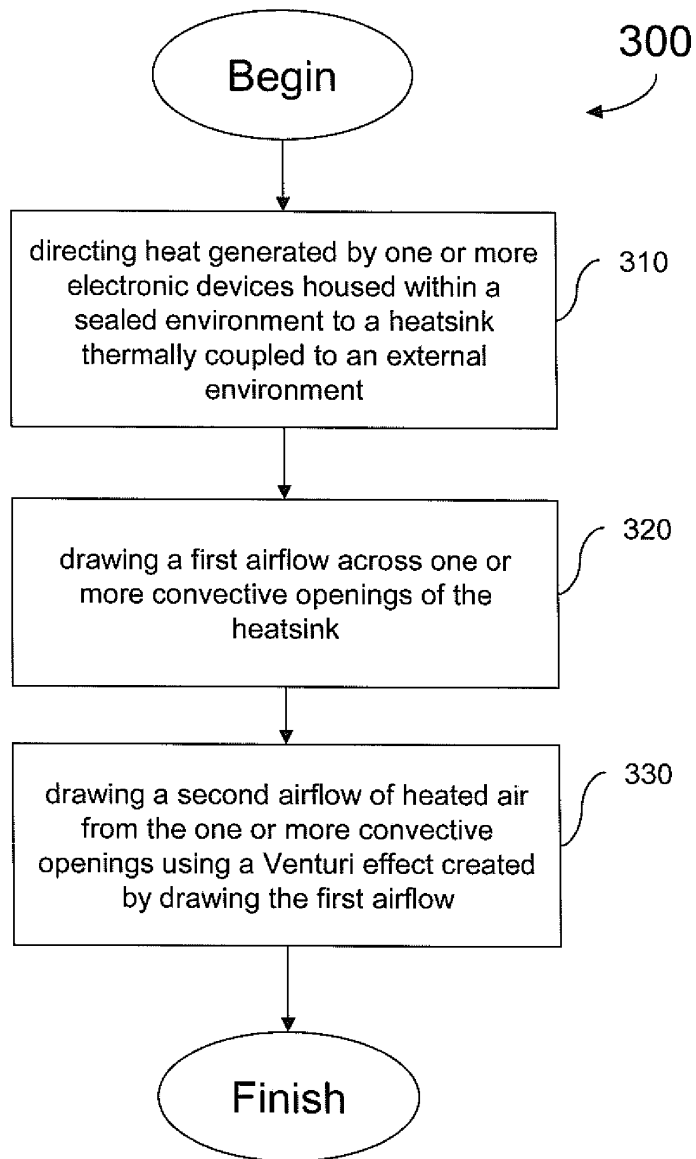


Fig. 3

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.1033US01
		Application Number	
Title of Invention	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1						Remove	
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix			
	Michael	J.	Nelson				
Residence Information (Select One)		☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Prior Lake	State/Province	MN	Country of Residence i	US		
Citizenship under 37 CFR 1.41(b) i		US					
Mailing Address of Applicant:							
Address 1		15418 Wood Duck Trail NW					
Address 2							
City	Prior Lake	State/Province	MN				
Postal Code	55372	Country i	US				
Applicant 2						Remove	
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix			
	Michael	J.	Wayman				
Residence Information (Select One)		☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Waconia	State/Province	MN	Country of Residence i	US		
Citizenship under 37 CFR 1.41(b) i		US					
Mailing Address of Applicant:							
Address 1		1149 Windmill Creek South					
Address 2							
City	Waconia	State/Province	MN				
Postal Code	55387	Country i	US				
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.							

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).
☐ An Address is being provided for the correspondence Information of this application.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.1033US01	
		Application Number		
Title of Invention	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING			
Customer Number	34206			
Email Address	docketing@fogglaw.com	Add Email		Remove Email

Application Information:

Title of the Invention	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING			
Attorney Docket Number	100.1033US01	Small Entity Status Claimed ☐		
Application Type	Nonprovisional			
Subject Matter	Utility			
Suggested Class (if any)		Sub Class (if any)		
Suggested Technology Center (if any)				
Total Number of Drawing Sheets (if any)	9	Suggested Figure for Publication (if any)		

Publication Information:

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

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Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	34206		

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This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.1033US01
		Application Number	
Title of Invention	SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING		

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove			
Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☒ Yes ☐ No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Assignee Information:

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Assignee 1			
If the Assignee is an Organization check here. ☒			
Organization Name	ADC Telecommunications, Inc.		
Mailing Address Information:			
Address 1	13625 Technology Drive		
Address 2			
City	Eden Prairie	State/Province	MN
Country ⁱ	US	Postal Code	55344-2252
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/ J. Patrick Kendrick /		Date (YYYY-MM-DD)	2008-06-11
First Name	J. Patrick	Last Name	Kendrick	Registration Number
				53109

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

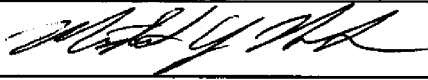
United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

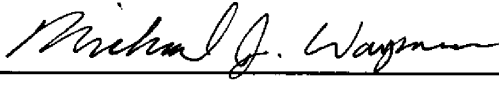
X	Declaration Submitted with Initial Filing	Or		Declaration Submitted After Initial Filing (surcharge 37 CFR 1.16(e) required)	Atty. Docket No. 100.1033US01
					First Named Inventor: Michael J. Nelson
As below named inventor(s), we declare that: Our citizenships are as stated below next to our names. We believe that we are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled: SYSTEMS AND METHODS FOR VENTURI FAN-ASSISTED COOLING.					
The specification of which is attached hereto and the preliminary amendment (if any) filed herewith. We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims as amended and by any amendment specifically referred to above.					
We acknowledge the duty to disclose information that is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.					
We claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed.					
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached	
As named inventor(s), we appoint the registered practitioners of Fogg & Powers, LLC					
at Customer Number(s)			34206		
to prosecute this application and to transact all business in the United States Patent and Trademark Office connected herewith, with full right of substitution.					
Please direct all correspondence in this case to: Customer No. 34206 Fogg & Powers LLC PO Box 581339 Minneapolis, MN 55458-1339 Tel (612) 332-4720 Fax (612) 332-4731					

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

Inventor No. 1

Given Name (First and Middle [if any])		Family Name or Surname	
Michael J.		Nelson	
Inventor's Signature		Date	6/11/08
		Citizenship	US

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Given Name (First and Middle [if any])		Family Name or Surname	
Michael J.		Wayman	
Inventor's Signature		Date	6/11/08
		Citizenship	US

06/11/08

PTO/SB/06 (12-04)

Approved for use through 7/31/2006. OMB 0651-0032

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

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Substitute for Form PTO-875					12/137,309	
APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)	FEE (\$)	
BASIC FEE (37 CFR 1.16(a), (b), or (c))						
SEARCH FEE (37 CFR 1.16(k), (i), or (m))						310
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))						510
						210
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 =		X\$25=		X\$50=
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 =		X\$105=		X\$210=
APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR				
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				N/A		N/A
				TOTAL		TOTAL 1240
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	Minus	**	=	X =	
	Independent (37 CFR 1.16(h))	Minus	***	=	X =	
	Application Size Fee (37 CFR 1.16(s))					
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				N/A	
				TOTAL ADD'T FEE		TOTAL ADD'T FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	Minus	**	=	X =	
	Independent (37 CFR 1.16(h))	Minus	***	=	X =	
	Application Size Fee (37 CFR 1.16(s))					
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				N/A	
				TOTAL ADD'T FEE		TOTAL ADD'T FEE
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

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

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

EX-1002

Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.

0140