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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/224,354	09/09/2005	David Jones	42US

MDS ANALYTICAL TECHNOLOGIES
1311 ORLEANS DRIVE
SUNNYVALE, CA 94089

CONFIRMATION NO. 9529
MISCELLANEOUS NOTICE



OC000000049576236

Date Mailed: 08/31/2011

A communication which cannot be delivered in electronic form has been mailed to the applicant.



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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/224,354	09/09/2005	David Jones	42US

CONFIRMATION NO. 9529

MDS ANALYTICAL TECHNOLOGIES
 1311 ORLEANS DRIVE
 SUNNYVALE, CA 94089



Cc: THE ECLIPSE GROUP LLP.
 6345 BALBOA BLVD
 SUITE 325
 ENCINO, CA 91316

Date Mailed: 08/31/11

DENIAL OF REQUEST FOR POWER OF ATTORNEY

The request for Power of Attorney filed 08/23/11 is acknowledged. However, the request cannot be granted at this time for the reason stated below.

- ☐ The Power of Attorney you provided did not comply with the new Power of Attorney rules that became effective on June 25, 2004. See 37 CFR 1.32.
- ☐ The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.
- ☒ The Power of Attorney is from an assignee and the Certificate required by 37 CFR 3.73(b) has not been received.
- ☐ The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.
- ☐ The inventor(s) is without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.
- ☐ The signature(s) of _____, a co-inventor in this application, has been omitted. The Power of Attorney will be entered upon receipt of confirmation signed by said co-inventor(s).
- ☐ The person(s) appointed in the Power of Attorney is not registered to practice before the U.S. Patent and Trademark Office.

Questions relating to this Notice should be directed to the Application Assistance Unit.


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

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

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	11/224,354
	Filing Date	September 9, 2005
	First Named Inventor	David Jones
	Title	Impedance measurement system...
	Art Unit	2858
	Examiner Name	John X Zhu
	Attorney Docket Number	IP-0042US

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

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

14887

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

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

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

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the:

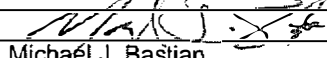
☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature		Date	July 28, 2011
Name	Michael J. Bastian	Telephone	508-383-7955
Title and Company	Assoc. General Counsel, AB SCIEX LLC and Molecular Devices LLC		

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

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: David Jones et al.Application No./Patent No.: 11/224,354Filed/Issue Date: September 9, 2005

Titled:

Impedance Measurement System with incorporated internal compensation network

Molecular Devices, Inc.

, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: David Jones et al.To: MDS Analytical Technologies

The document was recorded in the United States Patent and Trademark Office at

Reel 02140, Frame 0246, or for which a copy thereof is attached.2. From: David Jones et al.To: MDS Analytical Technologies

The document was recorded in the United States Patent and Trademark Office at

Reel 02140, Frame 0249, or for which a copy thereof is attached.3. From: MDS Analytical Technologies (US) Inc.To: Molecular Devices, Inc.

The document was recorded in the United States Patent and Trademark Office at

Reel 02491, Frame 0148, or for which a copy thereof is attached.☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

- ☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Michael J. Bastian
Signature

July 28, 2011

Date

Michael J. Bastian

Associate General Counsel

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 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.

Electronic Acknowledgement Receipt

EFS ID:	10796419
Application Number:	11224354
International Application Number:	
Confirmation Number:	9529
Title of Invention:	IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS
First Named Inventor/Applicant Name:	David Jones
Correspondence Address:	MDS ANALYTICAL TECHNOLOGIES - 1311 ORLEANS DRIVE - SUNNYVALE CA 94089 US 4087471700 legal@sciex.com
Filer:	Bella Fishman/DoNique Hill
Filer Authorized By:	Bella Fishman
Attorney Docket Number:	42US
Receipt Date:	23-AUG-2011
Filing Date:	09-SEP-2005
Time Stamp:	16:39:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)				
1		IP-0042US_Resubmitted_POA_and_Statement.pdf	103070 ffdef3c722a7bfb24456425b41c0e0aa5ff062	yes	2				
	Multipart Description/PDF files in .zip description								
	Document Description		Start	End					
	Power of Attorney		1	1					
	Assignee showing of ownership per 37 CFR 3.73(b).		2	2					
Warnings:									
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing									
Information:									
Total Files Size (in bytes):			103070						
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.									



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/224,354	09/09/2005	David Jones	42US

MDS ANALYTICAL TECHNOLOGIES
1311 ORLEANS DRIVE
SUNNYVALE, CA 94089

CONFIRMATION NO. 9529
MISCELLANEOUS NOTICE



OC000000049124539

Date Mailed: 08/04/2011

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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/224,354	09/09/2005	David Jones	42US

CONFIRMATION NO. 9529

MDS ANALYTICAL TECHNOLOGIES
 1311 ORLEANS DRIVE
 SUNNYVALE, CA 94089



OC000000049124539

Cc: THE ECLIPSE GROUP LLP
 6345 BALBOA BLVD
 SUITE 325
 ENCINO, CA 91316

Date Mailed: 08/04/2011

DENIAL OF REQUEST FOR POWER OF ATTORNEY

The request for Power of Attorney filed 07/29/2011 is acknowledged. However, the request cannot be granted at this time for the reason stated below.

- ☐ The Power of Attorney you provided did not comply with the new Power of Attorney rules that became effective on June 25, 2004. See 37 CFR 1.32.
- ☐ The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.
- ☒ The Power of Attorney is from an assignee and the Certificate required by 37 CFR 3.73(b) has not been received.
- ☐ The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.
- ☐ The inventor(s) is without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.
- ☐ The signature(s) of _____, a co-inventor in this application, has been omitted. The Power of Attorney will be entered upon receipt of confirmation signed by said co-inventor(s).
- ☐ The person(s) appointed in the Power of Attorney is not registered to practice before the U.S. Patent and Trademark Office.

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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	11/224,354
	Filing Date	September 9, 2005
	First Named Inventor	David Jones
	Title	Impedance measurement system...
	Art Unit	2858
	Examiner Name	John X. Zhu
	Attorney Docket Number	IP-0042US

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

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

14887

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

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

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

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature		Date	July 28, 2011
Name	Michael J. Bastian	Telephone	508-383-7955
Title and Company	Assoc. General Counsel, AB SCIEX LLC and Molecular Devices LLC		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.☒ *Total of 2 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: David Jones et al.Application No./Patent No.: 11/224,354Filed/Issue Date: September 9, 2005

Titled:

Impedance Measurement System with incorporated internal compensation network

Molecular Devices, Inc. , a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: David Jones et al.To: MDS Analytical Technologies

The document was recorded in the United States Patent and Trademark Office at

Reel 02140, Frame 0246, or for which a copy thereof is attached.2. From: David Jones et al.To: MDS Analytical Technologies

The document was recorded in the United States Patent and Trademark Office at

Reel 02140, Frame 0249, or for which a copy thereof is attached.3. From: MDS Analytical Technologies (US) Inc.To: Molecular Devices, Inc.

The document was recorded in the United States Patent and Trademark Office at

Reel 02491, Frame 0148, or for which a copy thereof is attached.☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

- ☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature

July 28, 2011

Date

Michael J. Bastian

Associate General Counsel

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 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.

Electronic Acknowledgement Receipt

EFS ID:	10627219
Application Number:	11224354
International Application Number:	
Confirmation Number:	9529
Title of Invention:	IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS
First Named Inventor/Applicant Name:	David Jones
Correspondence Address:	MDS ANALYTICAL TECHNOLOGIES - 1311 ORLEANS DRIVE - SUNNYVALE CA 94089 US 4087471700 legal@sciex.com
Filer:	Andrew T. Karnakis/DoNique Hill
Filer Authorized By:	Andrew T. Karnakis
Attorney Docket Number:	42US
Receipt Date:	29-JUL-2011
Filing Date:	09-SEP-2005
Time Stamp:	12:32:10
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		IP-0042USPOA.pdf	907323 4fa747815#58643aae12e0330#cbaf11106 #8caf	yes	2				
	Multipart Description/PDF files in .zip description								
	Document Description		Start	End					
	Power of Attorney		1	1					
	Assignee showing of ownership per 37 CFR 3.73(b).		2	2					
Warnings:									
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing									
Information:									
Total Files Size (in bytes):			907323						
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.									

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,459,918 B2
APPLICATION NO. : 11/224354
DATED : December 2, 2008
INVENTOR(S) : Jones et al.

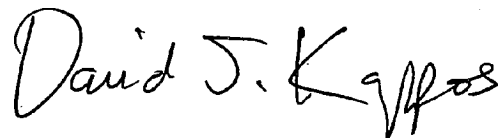
Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In line 10 of claim 15 (column 9, line 6) change “row” to --column--.

Signed and Sealed this

Eleventh Day of May, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos
Director of the United States Patent and Trademark Office

SPE RESPONSE FOR CERTIFICATE OF CORRECTION

DATE

10/30/09

Paper No.: _____

TO SPE OF

ART UNIT

283

Butierrez, Drego

SUBJECT

Request for Certificate of Correction for Appl. No.:

11/224354

Patent No.:

7459918

Please respond to this request for a certificate of correction within 7 days.

FOR IFW FILES:

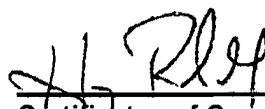
Please review the requested changes/corrections as shown in the **COCIN** document(s) in the IFW application image. No new matter should be introduced, nor should the scope or meaning of the claims be changed.

Please complete the response (see below) and forward the completed response to scanning using document code **COCX**.

FOR PAPER FILES:

Please review the requested changes/corrections as shown in the attached certificate of correction. Please complete this form (see below) and forward it with the file to:

Certificates of Correction Branch (CofC)
Randolph Square – 9D10-A
Palm Location 7580



Certificates of Correction Branch

703-756-1571

Thank You For Your Assistance**The request for issuing the above-identified correction(s) is hereby:**

Note your decision on the appropriate box.

☐ **Approved****All changes apply.**☐ **Approved in Part****Specify below which changes do not apply.**☐ **Denied****State the reasons for denial below.****Comments:** __________

SPE RESPONSE FOR CERTIFICATE OF CORRECTION

DATE : 10/30/09 Paper No.: _____
 TO SPE OF : ART UNIT 2831 Gutierrez, Diego
 SUBJECT : Request for Certificate of Correction for Appl. No.: 11/224354 Patent No.: 7459918

Please respond to this request for a certificate of correction within 7 days.

FOR IFW FILES:

Please review the requested changes/corrections as shown in the COCIN document(s) in the IFW application image. No new matter should be introduced, nor should the scope or meaning of the claims be changed.

Please complete the response (see below) and forward the completed response to scanning using document code COCX.

FOR PAPER FILES:

Please review the requested changes/corrections as shown in the attached certificate of correction. Please complete this form (see below) and forward it with the file to:

Certificates of Correction Branch (CofC)
Randolph Square – 9D10-A
Palm Location 7580

[Signature]
 Certificates of Correction Branch
 703-756-1571 _____

Thank You For Your Assistance

The request for issuing the above-identified correction(s) is hereby:

Note your decision on the appropriate box.

☒ **Approved**

All changes apply.

☐ **Approved in Part**

Specify below which changes do not apply.

☐ **Denied**

State the reasons for denial below.

Comments: [Signature] on 11/10/09

[Signature]
DIEGO GUTIERREZ
SUPERVISORY PATENT EXAMINER

SPE

11/10/09

2831

Art Unit

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Jones et al.

Attorney Docket No.: MDSSP002

Patent No.: 7,459,918 B2

Issued: December 2, 2008

Title: IMPEDANCE MEASUREMENT SYSTEM
WITH INCORPORATED INTERNAL
MEASUREMENT DRIFT COMPENSATION
NETWORKS

CERTIFICATE OF EFS-WEB TRANSMISSION

I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on September 2, 2009.

Signed: /s/ Deborah Neill

**COMMUNICATION REGARDING REQUEST FOR CERTIFICATE OF
CORRECTION OF APPLICANT'S MISTAKE
(35 U.S.C §255, 37 C.F.R. §1.323)**

Commissioner for Patents
Decisions & Certificates of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

A Request for Certificate of Correction was filed with regard to the referenced patent on August 12, 2009. The Request was denied in a Decision dated August 24, 2009. The Decision notes that the patent was printed in accordance with the record and therefore that no certificate of correction can be issued under 37 CFR §1.322.

However, the Request was made not under the provisions of 37 CFR §1.322, but under the provisions of 37 CFR §1.323. No mistake on the part of the Office is alleged. Instead, in accordance with 35 U.S.C. §255, it is asserted that a mistake of a clerical nature or of minor character, which was not the fault of the Office, appears in the patent, that the mistake occurred in good faith, and that the proposed change would not constitute new matter, nor require reexamination. Under the provisions of 37 CFR §1.323 the Office may issue a certificate of correction under these conditions.

The Decision dated August 24, 2009 requests a showing of evidence to support the requested correction. Column 4, lines 17-21 describe the embodiment of the invention that is clearly intended to be claimed by claim 15, in which each column, rather than each row of wells on a microtiter plate is associated with a daughter board. Claim 1 of the patent recites a row embodiment (see claim 1, col. 7, line 64, col. 8,

lines 4 and 5). Claim 15 of the patent recites a column embodiment (see claim 15, col. 9, lines 13 and 14), but mistakenly recites “row” rather than “column” in col. 9, line 6. The requested correction merely renders the claim internally consistent and consistent with the specification. The mistake occurred in good faith, the proposed corrective change would not constitute new matter since support is clearly provided in the specification as noted above, and the change does not require reexamination. It is respectfully submitted that the Office should issue a certificate of correction under these conditions in accordance with the provisions of 37 CFR §1.323.

As previously noted, the error together with the exact page and line number where the errors appear in the application file are as follows:

CLAIMS:

1. In line 10 of claim 15 (column 9, line 6) change “row” to --column--. This error appears in the application as filed on September 9, 2005, on page 21, line 6.

Form PTO-1050 (Certificate of Correction), at least one copy of which is suitable for printing, was submitted with the original request and is provided again with this filing.

The \$100.00 fee in accordance with 37 CFR § 1.20(a) was paid with the original Request filing. However, if it is determined that any additional fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 504480 (Order No. MDSSP002).

Respectfully submitted,
Weaver Austin Villeneuve & Sampson LLP
/jea/
James E. Austin
Registration No. 39,489

P.O. Box 70250
Oakland, CA 94612-0250
510-663-1100

(Also Form PT-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 7,459,918 B2

DATED : December 2, 2008

Page 1 of 1

INVENTOR(S) : Jones et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

CLAIMS:

1. In line 10 of claim 15 (column 9, line 6) change "row" to --column--.

MAILING ADDRESS OF SENDER:

PATENT NO. 7,459,918 B2

James E. Austin
WEAVER AUSTIN VILLENEUVE & SAMPSON LLP
P.O. Box 70250
Oakland, CA 94612-0250

No. of Additional Copies

1

Burden Hour Statement: This form is estimated to take 1.0 hour to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Electronic Acknowledgement Receipt

EFS ID:	6005280
Application Number:	11224354
International Application Number:	
Confirmation Number:	9529
Title of Invention:	IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS
First Named Inventor/Applicant Name:	David Jones
Correspondence Address:	MDS ANALYTICAL TECHNOLOGIES - 1311 ORLEANS DRIVE - SUNNYVALE CA 94089 US 4087471700 legal@sciex.com
Filer:	James Exon Austin/Deborah Neill
Filer Authorized By:	James Exon Austin
Attorney Docket Number:	42US
Receipt Date:	02-SEP-2009
Filing Date:	09-SEP-2005
Time Stamp:	18:39:32
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	Request for Certificate of Correction	CERT_OF_CORRECTION_COMMUNICATION.pdf	27214 8c45c62b3d2e85534a8f36c0b0b9c465c861	no	2
Warnings:					
Information:					
2	Request for Certificate of Correction	CERT_OF_CORRECTION_FORM.pdf	25515 04182f368d1432ac750111eb494186934ba477b7	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			52729		
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.					



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY OF COMMERCE AND
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, DC 20231

8/24/09

Patent No. :7459918
Inventor(s) :Jones et al.
Issued : 12/2/2008
Title : IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED
INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS
Atty.doc./File No.

Request for Certificates of Correction

Consideration has been given to your request for the issuance of a Certificate of Correction, for the above – identified patent under the provisions of CFR 1.322.

Inspection of the application for the patent reveals claim 15 col. 9 line 6 is printed in accordance with the record please show evidence of supporting data or amendment. Therefore being no fault on the Patent and Trademark Office, It has no authority to issue a certificate of correction under the provision of 1.322.

In view of the forgoing, your request in this matter, is hereby denied.

Future written correspondence concerning this matter should be filed and directed to Decisions & Certificates of Correction Branch.

Henry Randall
Decisions & Certificates
of Correction Branch
(703) 756-1571

WEAVER AUSTIN VILLENEUVE & SAMPSON
P.O. BOX 70250
OAKLAND, CA 94612-0250

HR



11 224 354

COFC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Jones et al.

Attorney Docket No.: MDSSP002

Patent No.: 7,459,918 B2

Issued: December 2, 2008

Title: IMPEDANCE MEASUREMENT SYSTEM
WITH INCORPORATED INTERNAL
MEASUREMENT DRIFT COMPENSATION
NETWORKS

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on August 12, 2009 in an envelope addressed to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed: _____

Quyen Vuong

**REQUEST FOR CERTIFICATE OF CORRECTION
OF APPLICANT'S MISTAKE
(35 U.S.C §255, 37 C.F.R. §1.323)**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Attn: Certificate of Correction

**Certificate
AUG 18 2009
of Correction**

Dear Sir:

Attached is Form PTO-1050 (Certificate of Correction) at least one copy of which is suitable for printing.

A mistake of a clerical or typographical nature, or minor in character appears in the above-referenced patent; however, the mistake occurred in good faith. The correction introduces no new matter nor requires reexamination. The errors together with the exact page and line number where the errors appear in the application file are as follows:

08/17/2009 KBLANCO 00000023 7459918

01 FC:1811

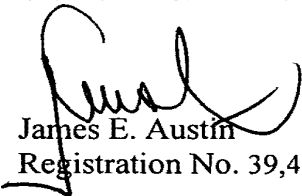
100.00 00

CLAIMS:

1. In line 10 of claim 15 (column 9, line 6) change "row" to --column--. This error appears in the application as filed on September 9, 2005, on page 21, line 6.

Check No. 3957 in the amount of \$100.00 is enclosed in accordance with 37 CFR § 1.20(a). However, if it is determined that any additional fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 504480 (Order No. MDSSP002).

Respectfully submitted,
Weaver Austin Villeneuve & Sampson LLP


James E. Austin
Registration No. 39,489

P.O. Box 70250
Oakland, CA 94612-0250
510-663-1100

(Also Form PT-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 7,459,918 B2

DATED : December 2, 2008

Page 1 of 1

INVENTOR(S) : Jones et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

CLAIMS:

1. In line 10 of claim 15 (column 9, line 6) change "row" to --column--.

MAILING ADDRESS OF SENDER:

PATENT NO. 7,459,918 B2

James E. Austin
WEAVER AUSTIN VILLENEUVE & SAMPSON LLP
P.O. Box 70250
Oakland, CA 94612-0250

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UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	12/02/2008	7459918	42US	9529

759 11/12/2008

MDS ANALYTICAL TECHNOLOGIES
1311 ORLEANS DRIVE
SUNNYVALE, CA 94089

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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

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

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

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

David Jones, Mentone, AUSTRALIA;
Dirk Kupershoek, Seaford, AUSTRALIA;
Peter Leigh-Jones, Gordon, AUSTRALIA;

PTO/SB/17 (10-07)

Approved for use through 06/30/2010. OMB 0651-0032

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

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JUL 15 2008Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4010).**FEE TRANSMITTAL**
For FY 2008☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 2980

Complete if Known

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	Jones et al.
Examiner Name	John Zhu
Art Unit	2858
Attorney Docket No.	42US

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):☒ Deposit Account Deposit Account Number: 502822 Deposit Account Name: MDS Sciex

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25

Each independent claim over 3 (including Reissues)

210	105
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Multiple dependent claims

370	185
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Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 20 or HP = x =

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 3 or HP = x =

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
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- 100 = / 50 = (round up to a whole number) x =

4. OTHER FEE(S)

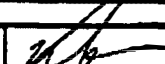
Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Petition for Revival of Unintentionally Abandoned Application; Issue

2980

SUBMITTED BY

Signature		Registration No. 48,999 (Attorney/Agent)	Telephone 408.548.6131
Name (Print/Type)	Kelvan P. Howard	Date	07/15/08

This collection of information is required by 37 CFR 1.138. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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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SUNNYVALE, CA 94089

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OCT 27 2008

OFFICE OF PETITIONS

In re Application of
David Jones et al
Application No. 11/224,354
Filed: September 9, 2005
Attorney Docket No. 42US

:
:
:
:
:

ON PETITION

This is a decision on the petition filed July 15, 2008 under 37 CFR 1.137(b), to revive the above-identified application.

The petition is **GRANTED**.

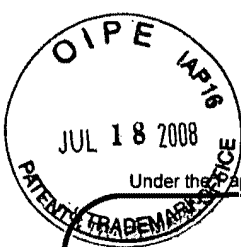
The above-identified application became abandoned for failure to submit the Issue fee and Publication fee in a timely manner in reply to the Notice of Allowance mailed January 30, 2008, which set a statutory period for reply of three (3) months. Accordingly, the above-identified application became abandoned on May 1, 2008.

The petition satisfies the conditions for revival pursuant to the provisions of 37 CFR 1.137(b) in that (1) the reply in the form of payment of the Issue fee and Publication fee; (2) the petition fee; and (3) the required statement of unintentional delay have been received. Accordingly, the issue fee is accepted as having been unintentionally delayed.

Telephone inquiries concerning this decision should be directed to the undersigned at (571) 272-3210.

This matter is being referred to the Office of Data Management for further processing.


Irvin Dingle
Petitions Examiner
Office of Petitions



DW

PTO/SB/122 (01-06)

Approved for use through 12/31/2008. OMB 0651-0035

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

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CHANGE OF CORRESPONDENCE ADDRESS *Application*

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

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	Jones et al.
Art Unit	2858
Examiner Name	Zhu, John
Attorney Docket Number	42US

Please change the Correspondence Address for the above-identified patent application to:

☐ The address associated with
Customer Number:

OR

☒ Firm or
Individual Name MDS Analytical Technologies

Address 1311 Orleans Drive

City Sunnyvale

State
Ca

Zip 94089

Country USA

Telephone 408.747.1700

Email
legal@sciex.com or kelvan.howard@moldev.com

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:

- ☐ Applicant/Inventor
- ☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).
- ☒ Attorney or agent of record. Registration Number 48999
- ☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number _____

Signature

Typed or Printed
Name Kelvan Howard

Date

07/15/08

Telephone 408.548.6131

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

☒ Total of 3 forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Analytical Technologies

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JUL 15 2008
MDS Analytical
Technologies
1311 Orleans Drive
Sunnyvale, CA 94089
(408) 548-6131 (direct)
(408) 548-6088 (fax)

Fax

To: Attention: Office of Petitions
Mail Stop Petition

From: Kelvan Patrick Howard

Fax: 571.273.8300

Pages: 4 (Including cover sheet)

Phone: 571.272.3282

Date: July 15, 2008

Re: 42US; App. No. 11/224,354

cc:

Petition for Revival of an Unintentionally
Abandoned Application

☐ Urgent

☐ For Review

☐ Please Comment

☐ Please Reply

☐ Please Recycle

Comments:

This message is intended for the individual or entity to which it is addressed and may contain confidential, privileged, or other information that is protected from disclosure. If you are not the intended recipient or an agent therefor, you are hereby notified that any disclosure, copying, or other form of dissemination is strictly prohibited.

Division of MDS Inc.

PAGE 1/4 * RCVD AT 7/15/2008 5:18:46 PM [Eastern Daylight Time] * SVR:USPTO-EFAXF-5/28 * DNIS:2738300 * CSID:4087473691 * DURATION (mm-ss):01-26

JUL 15 2008

PTO/SB/64 (01-08)

Approved for use through 06/30/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT
ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)**Docket Number (Optional)
42US

First named inventor: Jones et al.

Application No.: 11/224,354

Art Unit: 2858

Filed: 09/09/2005

Examiner: John Zhu

Title: Impedance Measurement System with Incorporated Internal Measurement Drift Compensation Networks

Attention: Office of Petitions

Mail Stop Petition

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

FAX (571) 273-8300

07/16/2008 HMARZ12 00000010 502822 11224354
01 FC:1453 1540.00 DA
07/16/2008 HMARZ12 00000010 502822 11224354
02 FC:1501 1440.00 DA

NOTE: If information or assistance is needed in completing this form, please contact Petitions Information at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the office notice or action plus an extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee - required for all utility and plant applications filed before June 8, 1995; and for all design applications; and
- (4) Statement that the entire delay was unintentional.

1. Petition fee☐ Small entity-fee \$ _____ (37 CFR 1.17(m)). Applicant claims small entity status. See 37 CFR 1.27.☒ Other than small entity - fee \$ 1540.00 (37 CFR 1.17(m))**2. Reply and/or fee**

A. The reply and/or fee to the above-noted Office action in the form of _____ (identify type of reply):

- ☐ has been filed previously on _____
- ☐ is enclosed herewith.

B. The issue fee and publication fee (if applicable) of \$ 1440

- ☐ has been paid previously on _____
- ☒ is enclosed herewith.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.137(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1.0 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: Mail Stop Petition, 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.

JUL 15 2008

PTO/SB/64 (01-08)

Approved for use through 06/30/2008. OMB 0651-0031

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

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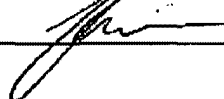
3. Terminal disclaimer with disclaimer fee

☐ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ _____ for a small entity or \$ _____ for other than a small entity) disclaiming the required period of time is enclosed herewith
PTO

4. STATEMENT: The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(b) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D)).]

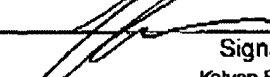
WARNING:

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


Signature07/15/08
DateKelvan Howard
Typed or printed name
MOS Analytical Technologies
1311 Orleans Drive
Address48,999
Registration Number, if applicableSunnyvale CA 94089
Address408.548.6131
Telephone NumberEnclosures: ☒ Fee Payment☐ Reply☐ Terminal Disclaimer Form☐ Additional sheets containing statements establishing unintentional delay☐ Other: _____

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

☐ Deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.☒ Transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.07/15/08
Date
Signature
Kelvan P. Howard
Typed or printed name of person signing certificate

PTO/SB/17 (10-07)

Approved for use through 08/30/2010. OMB 0951-0032

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

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.

RECEIVED
CENTRAL FAX CENTER
JUL 15 2008Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4018)**FEE TRANSMITTAL**
For FY 2008☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 2980

Complete If Known

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	Jones et al.
Examiner Name	John Zhu
Art Unit	2858
Attorney Docket No.	42US

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 502822 Deposit Account Name: MDS Sciex

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25

Each independent claim over 3 (including Reissues)

210 105

Multiple dependent claims

370 185

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
--------------	--------------	--	----------	---------------

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

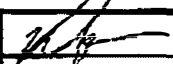
4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Petition for Revival of Unintentionally Abandoned Application; Is \$130 2980

SUBMITTED BY

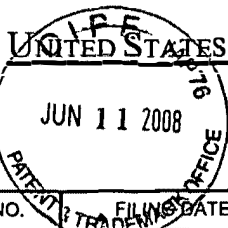
Signature		Registration No. (Attorney/Agent) 48,999	Telephone 408.548.6131
Name (Print/Type)	Kelvan P. Howard	Date	07/15/08

This collection of information is required by 37 CFR 1.138. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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.



UNITED STATES PATENT AND TRADEMARK OFFICE



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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 05/29/2008			EXAMINER	
Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080			ZHU, JOHN X	
			ART UNIT	PAPER NUMBER
			2858	
			MAIL DATE	DELIVERY MODE
			05/29/2008	PAPER

Notice of Abandonment

This application is abandoned in view of:

1. ☐ The applicant's failure to timely file a proper reply to the Office letter mailed on _____.
2. ☒ A reply was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the period for reply (including a total extension of _____ month(s)) which expired on _____.
 - (a) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113(a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of:
 - (1) a timely filed amendment which places the application in condition for allowance;
 - (2) a timely filed Notice of Appeal (with appeal fee);
 - (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
 - (b) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box e below).
 - (c) ☐ No reply has been received.
3. ☒ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____.
The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☒ The issue fee and publication fee, if applicable, has not been recieved.
4. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Trasmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawing have been received.
5. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
6. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filling of a continuing application.
7. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
8. ☐ The reason(s) below:

Petitions to revive under 37 CFR 1.137(a) or (b), or request to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Telephone inquiries should be directed to the Office of Data Management at (571) 272-4200.

Patent Publication Branch
Office of Data Management

Attachment to Notice of Abandonment

For questions concerning the notice contact Office of Patent Publication Image Assistance Center: 888-786-0101.

Information is also available on the USPTO Internet web site:
<http://www.uspto.gov/web/patents/pubs/abandonnotice.html>

Respond to the Notice of Abandonment by one of the following:

1. Petition To Withdraw Holding of Abandonment (See MPEP 711.03(c) I and 37 CFR § 1.181) No fee required

Where an applicant contends that the application is not in fact abandoned (e.g., a reply was in fact filed), a petition under 37 CFR § 1.181(a) requesting withdrawal of the holding of abandonment is the appropriate course of action. Any petition under 37 CFR § 1.181 to withdraw the holding of abandonment not filed within 2 months of the mail date of a Notice of Abandonment may be dismissed as untimely under 37 CFR § 1.181(f). In order for a petition to be granted, the evidence must be sufficient according to 37 CFR § 1.8(b) Certificate of Mailing, 37 CFR § 1.10 "Express Mail" mailing or MPEP 503 Postcard Receipt as Prima Facie Evidence. The petition should be addressed as follows:

By mail: Mail Stop: Issue Fee, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450
By facsimile: 571-273-8300

2. Petition To Withdraw Holding Of Abandonment Based On Failure To Receive Office Action (MPEP 711.03(c) II and 37 CFR § 1.181). No fee required

Where an applicant contends that the original Notice of Allowance and Fee(s) Due was never received, if adequately supported, the Office may grant the petition and remail the Office action. The showing required establishing non-receipt of an Office communication must include a statement from the practitioner stating that the Office communication was not received and attesting to the fact that a search of the file jacket and docket records indicates that the Office communication was not received. A copy of the docket record where the nonreceived Office would have been entered had it been received and docketed must be attached to and referenced in practitioner's statement.

Petition should be addressed to the Technology Center handling the application as follows:

By mail: Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450
By facsimile: 571-273-8300

3. Petition To Revive An Abandoned Application (See MPEP 711.03(c) III)

Where there is no dispute as to whether an application is abandoned (e.g., the applicant's contentions merely involve the cause of abandonment) a petition under 37 CFR § 1.137 (a) or (b) (accompanied by the appropriate petition fee) is necessary to revive the abandoned application. The text of these rules is available on the USPTO Internet Web site. Forms for these petitions, "Petition For Revival Of An Application For Patent Abandoned Unavoidably Under 37 CFR § 1.137(a)," PTO/SB/61, and "Petition For Revival Of An Application For Patent Abandoned Unintentionally Under 37 CFR 1.137(b)," PTO/SB/64, are available in the forms section of the USPTO website: <http://www.uspto.gov>.

Petitions under 37 CFR § 1.137 should be addressed to the Office of Petitions as follows:

By mail: Mail Stop Petition, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450
By facsimile: 571-273-8300

Note: Abandonment takes place by operation of law for failure to reply to an Office action or timely pay the issue fee, not by operation of the mailing of a Notice of Abandonment

Organization _____ Bldg./Room _____

UNITED STATES PATENT AND TRADEMARK OFFICE

P.O. Box 1450

Alexandria, VA. 22313-1450

If Undeliverable Return In Ten Days

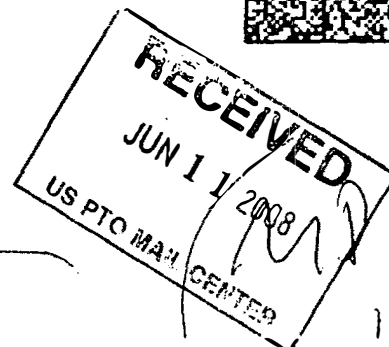
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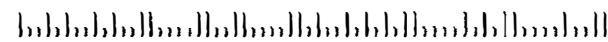
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UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 05/29/2008 Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080			EXAMINER ZHU, JOHN X	
			ART UNIT	PAPER NUMBER
			2858	
			MAIL DATE	DELIVERY MODE
			05/29/2008	PAPER

Notice of Abandonment

This application is abandoned in view of:

1. ☐ The applicant's failure to timely file a proper reply to the Office letter mailed on _____.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the period for reply (including a total extension of _____ month(s)) which expired on _____.
 - (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113(a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of:
 - (1) a timely filed amendment which places the application in condition for allowance;
 - (2) a timely filed Notice of Appeal (with appeal fee);
 - (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box e below).
 - (d) ☐ No reply has been received.
2. ☒ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____.
The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☒ The issue fee and publication fee, if applicable, has not been recieved.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Trasmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawing have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filling of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

Petitions to revive under 37 CFR 1.137(a) or (b), or request to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Telephone inquiries should be directed to the Office of Data Management at (571) 272-4200.

Patent Publication Branch
Office of Data Management

sensor 90 signals. Each daughter board 4 has multiplexing circuitry 70 allowing one or more measurement channels to address the sensors 90 for each well in the row.

Please replace original paragraph [009] with amended paragraph [009] as follows:

[009] (amended) In one embodiment, the PCBA 30 is a contact printed circuit board assembly created through the deposition of conductive inks or epoxies to form conductive traces directly on the insulating substrate of the PCBA. Conductive inks containing silver, gold, platinum, and/or carbon particles (such as those from companies such as Dupont and Acheson) are typical of those used for this purpose. Alternate circuit board embodiments utilize PCBAs created through photoengraving (which utilize a photomask and chemical etching to remove the insulator from the substrate) or PCB milling (which utilizes a mechanical milling system to mill away the insulator from the substrate).

Please replace original paragraph [010] with amended paragraph [010] as follows:

[010] (amended) Within the Impedance Measurement System the top contact PCBA 30 lies in a plane parallel to and immediately below the microtiter plate 10, while the daughter boards 4 are perpendicular to the plane of the microtiter plate 10. A horizontal mother board 40 is located below the daughter boards 4.

2/25/08
T.T.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

01/30/2008

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

EXAMINER

ZHU, JOHN X

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 01/30/2008

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

11/224,354

09/09/2005

David Jones

42US

9529

TITLE OF INVENTION: IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	04/30/2008

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 Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

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

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

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

7590 01/30/2008

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

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.
-----------------	-------------	----------------------	---------------------	------------------

11/224,354 09/09/2005 David Jones 42US 9529

TITLE OF INVENTION: IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$300 \$0 \$1740 04/30/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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ZHU, JOHN X 2858 324-649000

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 3.111. 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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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529

7590 01/30/2008

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

EXAMINER

ZHU, JOHN X

ART UNIT	PAPER NUMBER
----------	--------------

2858

DATE MAILED: 01/30/2008

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 0 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 0 day(s).

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TH

Notice of Allowability

Application No.

11/224,354

Examiner

John Zhu

Applicant(s)

JONES ET AL.

Art Unit

2858

-- 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 amendments filed on 7/12/07 and 11/21/07.
2. ☒ The allowed claim(s) is/are 1-28.
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).
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Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800



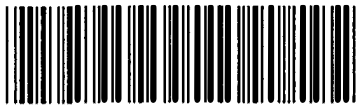
UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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BIB DATA SHEET

CONFIRMATION NO. 9529

SERIAL NUMBER 11/224,354	FILING or 371(c) DATE 09/09/2005 RULE	CLASS 439	GROUP ART UNIT 2858	ATTORNEY DOCKET NO. 42US
APPLICANTS David Jones, Mentone, AUSTRALIA; Dirk Kupershoek, Seaford, AUSTRALIA; Peter Leigh-Jones, Gordon, AUSTRALIA;				
** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 09/28/2005				
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /JOHN X ZHU/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY AUSTRALIA	SHEETS DRAWINGS 4	TOTAL CLAIMS 28
INDEPENDENT CLAIMS 2				
ADDRESS Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080 UNITED STATES				
TITLE Impedance measurement system with incorporated internal measurement drift compensation networks				
FILING FEE RECEIVED 1530	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	

Index of Claims 	Application/Control No. 11224354	Applicant(s)/Patent Under Reexamination JONES ET AL.
	Examiner Zhu, John	Art Unit 2858

✓	Rejected
=	Allowed

-	Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

☒ Claims renumbered in the same order as presented by applicant					☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE								
Final	Original	06/14/2006	03/27/2007	01/15/2008						
	1	O	O	=						
	2	O	O	=						
	3	O	O	=						
	4	O	O	=						
	5	O	O	=						
	6	O	O	=						
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	25	=	O	=						
	26	=	O	=						
	27	=	O	=						
	28	=	O	=						



Search Notes 	Application/Control No. 11224354	Applicant(s)/Patent Under Reexamination JONES ET AL.
	Examiner Zhu, John	Art Unit 2858

SEARCHED			
Class	Subclass	Date	Examiner
324	649, 629	6/7/06	MK
435	288.4, 287.1	6/7/06	MK

SEARCH NOTES		
Search Notes	Date	Examiner
Consult w/ David Redding for search in class 435	6/5/06	MK
search class 324 with keyword - please see EAST search	6/2/06	MK
search class 702 with keyword - please see EAST search	6/7/06	MK

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	.clm. keyword search, see notes for strategy	1/15/08	JZ

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: 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)

7590 01/30/2008

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

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.
-----------------	-------------	----------------------	---------------------	------------------

11/224,354 09/09/2005 David Jones 42US 9529

TITLE OF INVENTION: IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$300 \$0 \$1740 04/30/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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ZHU, JOHN X 2858 324-649000

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 3.111. 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)

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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

01/30/2008

Kelvan P. Howard
MDS Sciex (US) a division of
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1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

EXAMINER

ZHU, JOHN X

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 01/30/2008

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

11/224,354

09/09/2005

David Jones

42US

9529

TITLE OF INVENTION: IMPEDANCE MEASUREMENT SYSTEM WITH INCORPORATED INTERNAL MEASUREMENT DRIFT COMPENSATION NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	04/30/2008

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.

TH

Notice of Allowability

Application No.

11/224,354

Examiner

John Zhu

Applicant(s)

JONES ET AL.

Art Unit

2858

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

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ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800



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

ZHU, JOHN X

ART UNIT	PAPER NUMBER
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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICANTS David Jones, Mentone, AUSTRALIA; Dirk Kupershoek, Seaford, AUSTRALIA; Peter Leigh-Jones, Gordon, AUSTRALIA; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 09/28/2005					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /JOHN X ZHU/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY AUSTRALIA	SHEETS DRAWINGS 4	TOTAL CLAIMS 28	INDEPENDENT CLAIMS 2
ADDRESS Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080 UNITED STATES					
TITLE Impedance measurement system with incorporated internal measurement drift compensation networks					
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EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	(complex adj impedance and microtiter near2 plate and daughter adj board).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:05
L2	1	(complex adj impedance and microtiter near2 plate).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:05
L3	6	(impedance and microtiter near2 plate).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:06
L4	1	(impedance and microtiter near2 plate and multiplex\$4).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:07
L5	1	(impedance and microtiter near2 plate and motherboard).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:07
L6	1	(impedance and microtiter near2 plate and mother adj board).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:08
L7	3	(impedance and microtiter near2 plate and array).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:10
L8	1	(complex near2 impedance and microtiter).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:10
L9	6	(impedance and microtiter).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2008/01/15 17:10



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By

PATENT

Docket No. 0042US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jones et al.

Serial No.: 11/224,354

Filed: September 09, 2005

For: **Impedance Measurement System with
Incorporated Internal Measurement Drift
Compensation Networks**

Examiner: John Zhu

Art Unit: 2858

RESPONSE TO NOTICE OF NON-
COMPLIANT AMENDMENT MAILED
ON JULY 23, 2007

Assistant Commissioner for Patents
Alexandria, Virginia 22313-1450

Examiner Zhu:

In response to the Official Action of April 04, 2007 and the subsequent Notice of Non-Compliant Amendment of July 23, 2007, applicant requests reconsideration of the above-identified application in view of the following elections, amendments, and remarks.

Amendments to the Specification begin on page 2.

Amendments to the claims begin on page 9 of this paper.

Remarks begin on page 16 of this paper.

Specification Amendments

Please replace previously deleted paragraph [005] with amended paragraph [005] as follows:

- [005] (amended) **Fig. 2. Impedance Measurement System Component Structure**
Illustration of an embodiment of the main components of the Impedance
Measurement System (ZMS) and their relationships to each other.

Please replace previously deleted paragraph [006] with amended paragraph [006] as follows:

- [006] (amended) **Fig. 3. Impedance Measurement System Circuitry Schematic**
Illustration of an embodiment of the circuitry of the Impedance Measurement
System (ZMS).

Please replace previously amended paragraph [007] with newly amended paragraph [007] as follows:

- [007] (twice amended) Fig. 2 **4**. Thermal Control Scheme
Illustration of an embodiment of the thermal control scheme for the Impedance
Measurement System (ZMS).

Please replace amended paragraph [008] with newly amended paragraph [008] as follows:

- [008] (twice amended) **The overall system structure is displayed in Fig. 1.** In one embodiment
of the impedance measurement system shown in Figs. **2 and 3**, each row of sensors on a
microtiter plate **10** is addressed by measurement circuitry **75** (in the form of analog signal
conditioning circuits, multiplexing circuits **70**, analog-digital converters, and digital signal
processors) on a single daughter board **4**. The interconnection of each sensor **90** from a
particular well in a particular row of the microtiter plate **10** to the associated daughter board **4**
is made through a Top Contact printed circuit board assembly (PCBA) **30**, which carries all

sensor 90 signals. Each daughter board 4 has multiplexing circuitry 70 allowing one or more measurement channels to address the sensors 90 for each well in the row.

Please replace original paragraph [009] with amended paragraph [009] as follows:

[009] (amended) In one embodiment, the PCBA 30 is a contact printed circuit board assembly created through the deposition of conductive inks or epoxies to form conductive traces directly on the insulating substrate of the PCBA. Conductive inks containing silver, gold, platinum, and/or carbon particles (such as those from companies such as Dupont and Acheson) are typical of those used for this purpose. Alternate circuit board embodiments utilize PCBAs created through photoengraving (which utilize a photomask and chemical etching to remove the insulator from the substrate) or PCB milling (which utilizes a mechanical milling system to mill away the insulator from the substrate).

Please replace original paragraph [010] with amended paragraph [010] as follows:

[013] (amended) Within the Impedance Measurement System the top contact PCBA 30 lies in a plane parallel to and immediately below the microtiter plate 10, while the daughter boards 4 are perpendicular to the plane of the microtiter plate 10. A horizontal mother board 40 is located below the daughter boards 4.

Please replace original paragraph [011] with amended paragraph [011] as follows:

[011] (amended) A cell plate contact array 50 provides the electrical connection between the top contact PCBA 30 and the microtiter plate 10 via spring loaded pins (Pogo pins TM) located on the contact array which interface with contact pads on the under-side of the microtiter cell plate and the top surface of the PCBA. The contact pads are plated with a conductive metal, such as gold, silver, nickel, tin, or copper.

Please replace original paragraph [012] with amended paragraph [012] as follows:

[012] (amended) The top contact board 30, provides the connection between the daughter boards 4 and the microtiter plate sensors, as well as acting as a fluid barrier protecting the ZMS system from cell plate spills. The top contact board 30 is sufficiently thick to provide structural support against the contact forces generated by the spring contact pins of the cell plate contact array. In one embodiment, the thickness of the PCBA is in the range of 2mm to 5mm. In another embodiment, the PCBA thickness is in the range of 3mm to 4mm. In yet another embodiment, the PCBA thickness is around 3.2mm. Additionally, the PCBA may contain an electromagnetic compatibility (EMC) screening function and an internal ground plane.

Please replace original paragraph [013] with amended paragraph [013] as follows:

[013] (amended) The top contact PCBA 30 contains current sensing resistors for each sensor 90. The function of these resistors is to convert the current flowing through each sensor 90 into a voltage for further signal processing. This signal is referred to as the sensor current signal.

The top contact board 30 is interfaced to the daughter boards 4 via a “five wire” interface 60 or Kelvin connections, ~~wherein the contracts carrying the sensor voltage and the current~~ **signals** to reduce measurement errors.

Please replace original paragraph [014] with amended paragraph [014] as follows:

[014] (amended) The daughter boards 4 carry the electronic components to drive and process a row of wells. One daughter board 4 is assigned to each row of the microtiter plate 10. In one embodiment, the top edge of the daughter boards 4 is equipped with a row of well drivers and an interlaced set of multiplexing field effect transistors 70 (or FETs, a type of transistor commonly used for signal switching or amplification, or more generally, the multiplexing circuitry for this embodiment) for well selection within a row. Positioning the FETs at the top of the daughter board 4 provides for short and uniform connection paths, with insignificant impedance, to the well electrodes via the top contact 30 and cell plate contact array 50. Further down the board, a programmable amplifier may be positioned to provide an adjustable gain for the current (I) channel, ensuring that analog to digital conversion is not subject to significant bit loss. A digital-to-analog converter may be used to provide DC offset correction to the current channel to ensure the analog-to-digital converter input is centered on the common mode range. Additionally, the daughter boards may be equipped with multiple analog-to-digital converters (including one for the voltage channel and one for the current channel), digital control circuitry (e.g., digital signal processors, memory devices, field programmable gate arrays, and/or electrically programmable logic devices), and voltage regulation circuitry. In one embodiment, these additional components are arranged below and

to the side of the analog sections **(as displayed by elements 75, 76, 77, and 78 in Fig. 3).**

The impedance data for a microtiter plate row is processed by a digital signal processor dedicated to each row and located on the daughter boards **4**.

Please replace original paragraph [015] with amended paragraph [015] as follows:

[015] (amended) The ZMS may also contain deflector boards **(element 430 in Figure 4)** for thermal uniformity. The deflector boards ensure that the air flow and local heating environment for the outer ZMS daughter boards **4** is similar to that for the inner boards. In one embodiment, the deflector ~~boards~~ **boards 430** have local heat sources added to assist in the thermal control. In an additional embodiment, the heat source is located behind the deflector boards on a separate deflector. The deflector boards **430** also provide physical support for the ZMS board stack. The deflector boards **430** have the same connector arrangement as the daughter boards **4** but have additional mounting brackets which are screwed to the deflector ~~boards~~ **boards 430** and mother board **40** (and additionally, may be screwed to the PCBA, or top contact board **30**).

Please replace original paragraph [016] with amended paragraph [016] as follows:

[016] (amended) The ZMS daughter boards **4** mate at their lowest edge with the mother board **40**. The mother board **40** accommodates various electrical components and functions, including the digital signal source **42**, excitation low pass filtering, supervisory processing, ROM/RAM, host data communications, and may control enclosure temperature. The mother board processes the impedance measurement data **(via element 44 of Fig 3.)**, at a specific

time and frequency, of all wells of the microtiter plate 10 and communicates the results to the system controller.

Please replace original paragraph [017] with amended paragraph [017] as follows:

[017] (amended) Electrical performance dictates that the daughter board assembly 4 be closely coupled to the top contact board 30 and that the circuitry be kept as tightly arranged as possible. The top contact board 30 must be maintained in an accurate physical relationship with the contact array 50 and is the reference point for the board assembly. The top contact board 30 and the top contact array 50 are aligned by means of locating features to positioning bars on the top plate.

Please replace original paragraph [018] with amended paragraph [018] as follows:

[018] (amended) The top contact board 30 supported peripherally by a top plate. A combined fluid seal and electromagnetic compatibility gasket is used between the board and plate. In one embodiment, the full board stack is suspended from the PCBA board 30 via the deflector boards 430 which provide a mechanical connection between the top contact board 30 and the mother board 40, eliminating the need for any mechanical supports from the base or side of the ZMS structure and eliminating the differential thermal expansion problems with board to board connections. The main ZMS chassis is created by a “U” shaped folded outer shell surrounding the thermal control heat exchanger extrusions and providing baffles 450 that control both the internal and external air flow 440. The top plate, front and rear covers are

made of sheet steel in one embodiment. In additional embodiments, these structures can be made from any combination of case, sheet milled steel, aluminum, or stainless steel.

Claim amendments

Claim 1.(currently amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

- (1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,
the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;
- (2) at least one top contact board,
each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,
the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;
- (3) a motherboard comprising signal generation and signal processing circuitry,
the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;

- (4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;
- (5) a means for thermal control; and
- (6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

Claim 2. (original) The impedance measurement system of claim 1, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 3. (original) The impedance measurement system of claim 1, wherein the at least one top contact board is a contact printed circuit board assembly.

Claim 4. (original) The impedance measurement system of claim 1, wherein the at least one printed top contact board has a thickness above 3mm and less than 4mm.

Claim 5. (currently amended) The impedance measurement system of claim 1, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a **five** wire.

Claim 6. (original) The impedance measurement system of claim 1, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 7. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 8. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 9. (original) The impedance measurement system of claim 1, wherein the means for system impedance drift compensation comprises four resistor-capacitor networks.

Claim 10. (original) The impedance measurement system of claim 9, wherein the three resistor-capacitor networks comprise a reference network with impedance values equivalent to a microtiter well sensor with cells, an R-C network with impedance characteristics above the reference network, and an R-C network with impedance characteristics below the reference network.

Claim 11. (original) The impedance measurement system of claim 1 additionally comprising an external interface means for data access and system control.

Claim 12. (original) The impedance measurement system of claim 11, wherein the external interface means is an instrument control computer.

Claim 13. (original) The impedance measurement system of claim 11, wherein the external interface means is an external storage device.

Claim 14. (original) The impedance measurement system of claim 11, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Claim 15. (currently amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly, each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement drift compensation comprising at least three resistor-capacitor networks.

Claim 16. (original) The impedance measurement system of claim 15, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 17. (original) The impedance measurement system of claim 15, wherein the at least one top contact board assembly is a contact printed circuit board assembly.

Claim 18. (original) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly has a thickness above 3mm and less than 4mm.

Claim 19. (currently amended) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a ~~5~~ five wire.

Claim 20. (original) The impedance measurement system of claim 15, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 21. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 22. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 23. (original) The impedance measurement system of claim 15, wherein the means for system impedance measurement drift compensation comprises three resistor-capacitor networks.

Claim 24. (original) The impedance measurement system of claim 23, wherein the three resistor-capacitor networks comprise (1) a reference R-C network with impedance values equivalent to a microtiter well with cells, (2) an R-C network with impedance characteristics above the impedance values of the reference R-C network, and (3) an R-C network with impedance characteristics below the impedance values of the reference R-C network.

Claim 25. (original) The impedance measurement system of claim 15 additionally comprising an external interface means for data access and system control.

Claim 26. (original) The impedance measurement system of claim 25, wherein the external interface means is an instrument control computer.

Claim 27. (original) The impedance measurement system of claim 25, wherein the external interface means is an external storage device.

Claim 28. (original) The impedance measurement system of claim 25, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Remarks

The original drawings were objected to under 37 CFR 1.83(a). New drawings Figures 2 and 3 have been added to show every feature of the invention specified in the claims. Each drawing sheet submitted has been labeled in the top margin as either "Replacement sheet" or "New sheet" pursuant to 37 CFR 1.121(d). Because the Examiner felt Fig. 1 was unclear, applicant has left Fig. 1 as a general overview of the device structure and added Figures 2 and 3 to display the different parts of the invention.

Paragraphs [005]-[018] have been amended to add drawing descriptions and element numbers for newly added drawings Figures 2 and 3. Applicant respectfully asserts that no new matter has been added with these amendments.

Claims 1 and 15 were objected to due to informalities. Claims 1 and 15 have been amended to correct these informalities. A semicolon has been added after limitation (3) to indicate a break.

Claims 5 and 19 were objected to due to informalities. Claims 5 and 19 have been amended to correct these informalities. Applicant has replaced "5 wire" with "five wire" to be consistent with the definition provided in the specification.

Applicant asserts that the amendments have not introduced new matter.

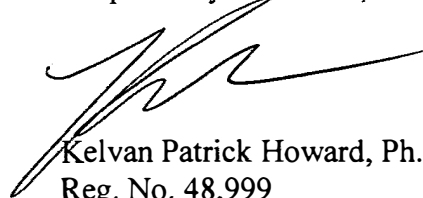
Conclusion:

In view of the amendments and remarks set out above, it is submitted that this application is now ready for allowance. Applicant respectfully requests reconsideration of the claimed matter.

If Examiner Zhu should believe that prosecution of this application can be expedited by discussion of any issue, the Examiner is invited to contact the undersigned at any of the numbers set out below.

Jones et al.
Serial No. 11/224,354
Page 17

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Kelvan Patrick Howard', written over the printed name.

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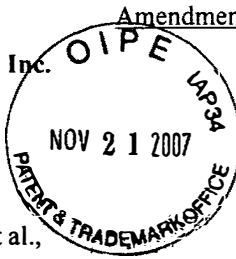
PTO/SB/22 (11-07)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2008 (Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)		Docket Number (Optional) <u>42US</u>	
Application Number <u>11/224,354</u>		Filed <u>09/09/2005</u>	
For <u>Impedance Measurement System with Incorporated ...</u>			
Art Unit <u>2858</u>		Examiner <u>ZHU</u>	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.			
The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
	Fee	Small Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
☐ Two months (37 CFR 1.17(a)(2))	\$460	\$230	\$ _____
☒ Three months (37 CFR 1.17(a)(3))	\$1050	\$525	\$ <u>1050.00</u>
☐ Four months (37 CFR 1.17(a)(4))	\$1640	\$820	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2230	\$1115	\$ _____
☐ Applicant claims small entity status. See 37 CFR 1.27.	11/21/2007 HLE333 00000040 502822 11224354		
☐ A check in the amount of the fee is enclosed.	01 FC:1253 1050.00 DA		
☐ Payment by credit card. Form PTO-2038 is attached.			
☒ The Director has already been authorized to charge fees in this application to a Deposit Account.			
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>502822</u> . I have enclosed a duplicate copy of this sheet.			
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I am the ☐ applicant/inventor.			
☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
☒ attorney or agent of record. Registration Number <u>48,999</u>			
☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____			
<u>[Signature]</u> Signature		<u>11/16/07</u> Date	
<u>Kevin Howard</u> Typed or printed name		<u>408.548.6131</u> Telephone Number	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
☐ Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Docket No. 42US _____

In re application of: Jones et al.,Application No.: 11/224,354Filed: September 09, 2005Group Art Unit: 2858

For: IMPEDANCE MEASUREMENT SYSTEM WITH
 INCORPORATED INTERNAL MEASUREMENT DRIFT
 COMPEANSATION NETWORKS

THE COMMISSIONER FOR PATENTS
Alexandria, VA 22313-1450

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 Alexandria, VA 22313-1450

Date of Deposit 11/16/07

By [Signature]
 Kelvan Patrick Howard, 48,999

Sir:

Transmitted herewith are the following documents in the above-identified application.

- ☒ Transmittal Form
☒ Petition for Extension of Time under 37 CFR 1.136(a);
☒ Reply/Amendment;
☒ Return Postcard.

If any extension of time is needed, then this response should be considered a petition therefor.
 The filing fee has been calculated as shown below:

(Col. 1)	(Col. 2)	(Col. 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	RATE	ADDIT. FEE		RATE	ADDIT. FEE
TOTAL	*28	MINUS ** 28	x \$9.00 =	\$0.00		x \$18.00 =	0
INDEP.	* 2	MINUS *** 2	x \$42.00 =	\$0.00		x \$84.00 =	0
[] FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			+ \$140.00 =	\$0.00		+ \$280.00 =	
			TOTAL ADDIT. FEE	\$0.00	OR	TOTAL	0

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

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, then write "3" in this space. The "Highest Number Previously Paid For" (Total or Independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment or the number of claims originally filed.

[X] No fee is due.

Please charge Deposit Account No. 502822 as follows:

[] Claims fee

[X] Any additional fees associated with this paper or during the pendency of this application.

NO extra copies of this sheet are enclosed.

MDS SCIEX, INC.

[Signature]
 Kelvan Howard, Reg. No. 48,999

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/224,354		Filing Date 09/09/2005		☐ 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 (\$)	OR	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 \$ =		OR	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)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	11/21/2007	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 28	Minus	** 28	=	0		X \$50=	0	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	=	0		X \$210=	0	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	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))							OR			
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
/STELLA LITTLE/

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

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H.A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 07/23/2007				
Kelvan P. Howard		EXAMINER		
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MDS Pharma Services, Inc.				
1170 Veteran's Blvd., Suite 200		ART UNIT		
South San Francisco, CA 94080		2858		
		MAIL DATE		
		07/23/2007		
		DELIVERY MODE		
		PAPER		

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 Non-Compliant
Amendment (37 CFR 1.121)**

Application No.

11/224354

Applicant(s)

Examiner

Zhu, J.

Art Unit

2858

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

The amendment document filed on 7/12/07 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____.
- ☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
- ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
 - ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
 - ☐ C. Other _____.
- ☒ 4. Amendments to the claims:
- ☒ A. A complete listing of all of the claims is not present.
 - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
 - ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☐ E. Other: _____.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment, an amendment filed after allowance, or a drawing submission (only). If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.
2. Applicant is given **one month**, or thirty (30) days, whichever is longer, from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a *Quayle* action. If any of above boxes 1. to 4. are checked, the correction required is only the **corrected section** of the non-compliant amendment in compliance with 37 CFR 1.121.

Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.

Failure to timely respond to this notice will result in:

Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or

Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

C. Mueni
Legal Instruments Examiner (LIE), if applicable

571 272 1599
Telephone No.

**REVISED AMENDMENT PRACTICE: 37 CFR 1.121 CHANGED
COMPLIANCE IS MANDATORY - Effective Date: July 30, 2003**

All amendments filed on or after the effective date noted above must comply with revised 37 CFR 1.121. See Final Rule: **Changes To Implement Electronic Maintenance of Official Patent Application Records** (68 *Fed. Reg.* 38611 (June 30, 2003), posted on the Office's website at: <http://www.uspto.gov/web/patents/ifw/> with related information. The amendment practice set forth in revised 37 CFR 1.121, and described below, replaces the voluntary revised amendment format available to applicants since February 2003. **NOTE: STRICT COMPLIANCE WITH THE REVISED 37 CFR 1.121 IS REQUIRED AS OF THE EFFECTIVE DATE (July 30, 2003).** The Office will notify applicants of amendments that are not accepted because they do not comply with revised 37 CFR 1.121 via a Notice of Non-Compliant Amendment. See MPEP 714.03 (Rev. 1, Feb. 2003). The non-compliant section(s) will have to be corrected and the entire corrected section(s) resubmitted within a set period.

Bold underlined italic font has been used below to highlight the major differences between the revised 37 CFR 1.121 and the voluntary revised amendment format that applicants could use since February, 2003.

Note: The amendment practice for reissues and reexamination proceedings, except for drawings, has not changed.

REVISED AMENDMENT PRACTICE

I. Begin each section of an amendment document on a separate sheet:

Each section of an amendment document (e.g., Specification Amendments, Claim Amendments, Drawing Amendments, and Remarks) must begin on a separate sheet. Starting each separate section on a new page will facilitate the process of separately indexing and scanning each section of an amendment document for placement in an image file wrapper.

II. Two versions of amended part(s) no longer required:

37 CFR 1.121 has been revised to **no longer require** two versions (a clean version and a marked up version) of each replacement paragraph or section, or amended claim. Note, however, the requirements for a clean version and a marked up version for **substitute specifications** under 37 CFR 1.125 have been retained.

A) Amendments to the claims:

Each amendment document that includes a change to an existing claim, cancellation of a claim or submission of a new claim, **must include a complete listing** of all claims in the application. After each claim number in the listing, the status must be indicated in a parenthetical expression, and **the text of each pending claim** (with markings to show **current** changes) must be presented. The claims in the listing will replace all prior claims in the application.

- (1) The current status of all of the claims in the application, including any previously canceled, not entered or withdrawn claims, must be given in a parenthetical expression following the claim number using only one of the following seven status identifiers: (original), (currently amended), (canceled), (withdrawn), (new), **(previously presented)** and **(not entered)**. The text of all pending claims, **including withdrawn claims**, must be submitted each time any claim is amended. Canceled **and not entered** claims must be indicated by only the claim number and status, without presenting the text of the claims.
- (2) The text of all claims **being currently amended** must be presented in the claim listing with markings to indicate the changes that have been made relative to the immediate prior version. The changes in any amended claim must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) **for deletion of five characters or fewer, double brackets may be used (e.g., [[error]]); and (2) if strikethrough cannot be easily perceived (e.g., deletion of the number "4" or certain punctuation marks), double brackets must be used (e.g., [[4]]).** **As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change (e.g., number 4 as number 14 as).** An accompanying clean version is not required and should not be presented. Only claims of the status "currently amended," and "withdrawn" that are being amended, may include markings.
- (3) The text of pending claims **not being currently amended, including withdrawn claims**, must be presented in the claim listing in clean version, i.e., without any markings. Any claim text presented in clean version will constitute an assertion that it has not been changed relative to the immediate prior version except to omit markings that may have been present in the immediate prior version of the claims.

- (4) A claim being canceled must be listed in the claim listing with the status identifier "canceled"; the text of the claim must not be presented. Providing an instruction to cancel is optional.
- (5) Any claims added by amendment must be presented in the claim listing with the status identifier "(new)"; the text of the claim must not be underlined.
- (6) All of the claims in the claim listing must be presented in ascending numerical order. Consecutive canceled, or not entered, claims may be aggregated into one statement (e.g., Claims 1 – 5 (canceled)).

Example of listing of claims (use of the word "claim" before the claim number is optional):

Claims 1-5 (canceled)

Claim 6 (previously presented): A bucket with a handle.

Claim 7 (withdrawn): A handle comprising an elongated wire.

Claim 8 (withdrawn): The handle of claim 7 further comprising a plastic grip.

Claim 9 (currently amended): A bucket with a ~~green~~ blue handle.

Claim 10 (original): The bucket of claim 9 wherein the handle is made of wood.

Claim 11 (canceled)

Claim 12 (not entered)

Claim 13 (new): A bucket with plastic sides and bottom.

B) Amendments to the specification:

Amendments to the specification, including the abstract, must be made by presenting a replacement paragraph or section or abstract marked up to show changes made relative to the immediate prior version. An accompanying clean version is not required and should not be presented. Newly added paragraphs or sections, including a new abstract (instead of a replacement abstract), must not be underlined. A replacement or new abstract must be submitted on a separate sheet, 37 CFR 1.72. If a substitute specification is being submitted to incorporate extensive amendments, both a clean version (which will be entered) and a marked up version must be submitted as per 37 CFR 1.125.

The changes in any replacement paragraph or section, or substitute specification must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) for deletion of five characters or fewer, double brackets may be used (e.g., [[eroor]]); and (2) if strikethrough cannot be easily perceived (e.g., deletion of the number "4" or certain punctuation marks), double brackets must be used (e.g., [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change (e.g., number 4 as number 14 as)

C) Amendments to drawing figures:

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment, and may be accompanied by a marked-up copy of one or more of the figures being amended, with annotations. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. Any marked-up (annotated) copy showing changes must be labeled "Annotated Marked-up Drawings" and accompany the replacement sheet in the amendment (e.g., as an appendix). The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Questions regarding the submission of amendments pursuant to the revised practice set forth in this flyer should be directed to: Elizabeth Dougherty or Gena Jones, Legal Advisors, or Joe Narcavage, Senior Special Projects Examiner, Office of Patent Legal Administration, by e-mail to patentpractice@uspto.gov or by phone at (703) 305-1616.

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

11/224354

CLAIMS AS FILED - PART I

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

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

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	7/12/07	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR
Total	*	28	Minus ** 28 =
Independent	*	2	Minus *** 3 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	150.00
X\$ 25=	
X100=	
+180=	
TOTAL	

RATE	FEE
BASIC FEE	300.00
X\$50=	
X200=	
+360=	
TOTAL	

(Column 1)

(Column 2)

(Column 3)

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

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

(Column 1)

(Column 2)

(Column 3)

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

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	



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By

PATENT

Docket No. 0042US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jones et al.

Serial No.: 11/224,354

Filed: September 09, 2005

For: **Impedance Measurement System with
Incorporated Internal Measurement Drift
Compensation Networks**

Examiner: John Zhu

Art Unit: 2858

RESPONSE TO OFFICE
COMMUNICATION MAILED
April 04, 2007

Assistant Commissioner for Patents
Alexandria, Virginia 22313-1450

Examiner Zhu:

In response to the Official Action of April 04, 2007, applicant requests reconsideration of the above-identified application in view of the following elections, amendments, and remarks.

Amendments to the Specification begin on page 2.

Amendments to the claims begin on page 8 of this paper.

Remarks begin on page 11 of this paper.

Specification Amendments

Please replace previously deleted paragraph [005] with amended paragraph [005] as follows:

- [005] (amended) **Fig. 2. Impedance Measurement System Component Structure**
Illustration of an embodiment of the main components of the Impedance
Measurement System (ZMS) and their relationships to each other.

Please replace previously deleted paragraph [006] with amended paragraph [006] as follows:

- [006] (amended) **Fig. 3. Impedance Measurement System Circuitry Schematic**
Illustration of an embodiment of the circuitry of the Impedance Measurement
System (ZMS).

Please replace previously amended paragraph [007] with newly amended paragraph [007] as follows:

- [007] (twice amended) Fig. 2 **4**. Thermal Control Scheme
Illustration of an embodiment of the thermal control scheme for the Impedance
Measurement System (ZMS).

Please replace amended paragraph [008] with newly amended paragraph [008] as follows:

- [008] (twice amended) **The overall system structure is displayed in Fig. 1.** In one embodiment of the impedance measurement system shown in Figs. **2 and 3**, each row of sensors on a microtiter plate **10** is addressed by measurement circuitry **75** (in the form of analog signal conditioning circuits, multiplexing circuits **70**, analog-digital converters, and digital signal processors) on a single daughter board **4**. The interconnection of each sensor **90** from a particular well in a particular row of the microtiter plate **10** to the associated daughter board **4** is made through a Top Contact printed circuit board assembly (PCBA) **30**, which carries all

sensor 90 signals. Each daughter board 4 has multiplexing circuitry 70 allowing one or more measurement channels to address the sensors 90 for each well in the row.

Please replace original paragraph [009] with amended paragraph [009] as follows:

[009] (amended) In one embodiment, the PCBA 30 is a contact printed circuit board assembly created through the deposition of conductive inks or epoxies to form conductive traces directly on the insulating substrate of the PCBA. Conductive inks containing silver, gold, platinum, and/or carbon particles (such as those from companies such as Dupont and Acheson) are typical of those used for this purpose. Alternate circuit board embodiments utilize PCBAs created through photoengraving (which utilize a photomask and chemical etching to remove the insulator from the substrate) or PCB milling (which utilizes a mechanical milling system to mill away the insulator from the substrate).

Please replace original paragraph [010] with amended paragraph [010] as follows:

[013] (amended) Within the Impedance Measurement System the top contact PCBA 30 lies in a plane parallel to and immediately below the microtiter plate 10, while the daughter boards 4 are perpendicular to the plane of the microtiter plate 10. A horizontal mother board 40 is located below the daughter boards 4.

Please replace original paragraph [011] with amended paragraph [011] as follows:

[011] (amended) A cell plate contact array 50 provides the electrical connection between the top contact PCBA 30 and the microtiter plate 10 via spring loaded pins (Pogo pinsTM) located on the contact array which interface with contact pads on the under-side of the microtiter cell plate and the top surface of the PCBA. The contact pads are plated with a conductive metal, such as gold, silver, nickel, tin, or copper.

Please replace original paragraph [012] with amended paragraph [012] as follows:

[012] (amended) The top contact board 30, provides the connection between the daughter boards 4 and the microtiter plate sensors, as well as acting as a fluid barrier protecting the ZMS system from cell plate spills. The top contact board 30 is sufficiently thick to provide structural support against the contact forces generated by the spring contact pins of the cell plate contact array. In one embodiment, the thickness of the PCBA is in the range of 2mm to 5mm. In another embodiment, the PCBA thickness is in the range of 3mm to 4mm. In yet another embodiment, the PCBA thickness is around 3.2mm. Additionally, the PCBA may contain an electromagnetic compatibility (EMC) screening function and an internal ground plane.

Please replace original paragraph [013] with amended paragraph [013] as follows:

[013] (amended) The top contact PCBA 30 contains current sensing resistors for each sensor 90. The function of these resistors is to convert the current flowing through each sensor 90 into a voltage for further signal processing. This signal is referred to as the sensor current signal.

The top contact board 30 is interfaced to the daughter boards 4 via a “five wire” interface 60 or Kelvin connections, ~~wherein the contracts carrying the sensor voltage and the current signals~~ to reduce measurement errors.

Please replace original paragraph [014] with amended paragraph [014] as follows:

[014] (amended) The daughter boards 4 carry the electronic components to drive and process a row of wells. One daughter board 4 is assigned to each row of the microtiter plate 10. In one embodiment, the top edge of the daughter boards 4 is equipped with a row of well drivers and an interlaced set of multiplexing field effect transistors 70 (or FETs, a type of transistor commonly used for signal switching or amplification, or more generally, the multiplexing circuitry for this embodiment) for well selection within a row. Positioning the FETs at the top of the daughter board 4 provides for short and uniform connection paths, with insignificant impedance, to the well electrodes via the top contact 30 and cell plate contact array 50. Further down the board, a programmable amplifier may be positioned to provide an adjustable gain for the current (I) channel, ensuring that analog to digital conversion is not subject to significant bit loss. A digital-to-analog converter may be used to provide DC offset correction to the current channel to ensure the analog-to-digital converter input is centered on the common mode range. Additionally, the daughter boards may be equipped with multiple analog-to-digital converters (including one for the voltage channel and one for the current channel), digital control circuitry (e.g., digital signal processors, memory devices, field programmable gate arrays, and/or electrically programmable logic devices), and voltage regulation circuitry. In one embodiment, these additional components are arranged below and

to the side of the analog sections (as displayed by elements 75, 76, 77, and 78 in Fig. 3).

The impedance data for a microtiter plate row is processed by a digital signal processor dedicated to each row and located on the daughter boards 4.

Please replace original paragraph [015] with amended paragraph [015] as follows:

[015] (amended) The ZMS may also contain deflector boards (element 430 in Figure 4) for thermal uniformity. The deflector boards ensure that the air flow and local heating environment for the outer ZMS daughter boards 4 is similar to that for the inner boards. In one embodiment, the deflector ~~boards~~ boards 430 have local heat sources added to assist in the thermal control. In an additional embodiment, the heat source is located behind the deflector boards on a separate deflector. The deflector boards 430 also provide physical support for the ZMS board stack. The deflector boards 430 have the same connector arrangement as the daughter boards 4 but have additional mounting brackets which are screwed to the deflector ~~boards~~ boards 430 and mother board 40 (and additionally, may be screwed to the PCBA, or top contact board 30).

Please replace original paragraph [016] with amended paragraph [016] as follows:

[016] (amended) The ZMS daughter boards 4 mate at their lowest edge with the mother board 40. The mother board 40 accommodates various electrical components and functions, including the digital signal source 42, excitation low pass filtering, supervisory processing, ROM/RAM, host data communications, and may control enclosure temperature. The mother board processes the impedance measurement data (via element 44 of Fig 3.), at a specific

time and frequency, of all wells of the microtiter plate 10 and communicates the results to the system controller.

Please replace original paragraph [017] with amended paragraph [017] as follows:

[017] (amended) Electrical performance dictates that the daughter board assembly 4 be closely coupled to the top contact board 30 and that the circuitry be kept as tightly arranged as possible. The top contact board 30 must be maintained in an accurate physical relationship with the contact array 50 and is the reference point for the board assembly. The top contact board 30 and the top contact array 50 are aligned by means of locating features to positioning bars on the top plate.

Please replace original paragraph [018] with amended paragraph [018] as follows:

[018] (amended) The top contact board 30 supported peripherally by a top plate. A combined fluid seal and electromagnetic compatibility gasket is used between the board and plate. In one embodiment, the full board stack is suspended from the PCBA board 30 via the deflector boards 430 which provide a mechanical connection between the top contact board 30 and the mother board 40, eliminating the need for any mechanical supports from the base or side of the ZMS structure and eliminating the differential thermal expansion problems with board to board connections. The main ZMS chassis is created by a “U” shaped folded outer shell surrounding the thermal control heat exchanger extrusions and providing baffles 450 that control both the internal and external air flow 440. The top plate, front and rear covers are

made of sheet steel in one embodiment. In additional embodiments, these structures can be made from any combination of case, sheet milled steel, aluminum, or stainless steel.

Claim amendments

Please amend claim 1 as follows:

Claim 1.(twice amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board,

each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry,

the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

Please amend claim 15 as follows:

15. (amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,
the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

- (2) at least one top contact board assembly,
each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column,
the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;
- (3) a motherboard comprising signal generation and signal processing circuitry,
the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;
- (4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;
- (5) a means for thermal control; and
- (6) a means for system impedance measurement drift compensation comprising at least three resistor-capacitor networks.

Please amend claim 5 as follows:

5. (amended) The impedance measurement system of claim 1, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a **5 five** wire.

Please amend claim 19 as follows:

19. (amended) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a **5 five** wire.

Remarks

The original drawings were objected to under 37 CFR 1.83(a). New drawings Figures 2 and 3 have been added to show every feature of the invention specified in the claims. Each drawing sheet submitted has been labeled in the top margin as either "Replacement sheet" or "New sheet" pursuant to 37 CFR 1.121(d). Because the Examiner felt Fig. 1 was unclear, applicant has left Fig. 1 as a general overview of the device structure and added Figures 2 and 3 to display the different parts of the invention.

Paragraphs [005]-[018] have been amended to add drawing descriptions and element numbers for newly added drawings Figures 2 and 3. Applicant respectfully asserts that no new matter has been added with these amendments.

Claims 1 and 15 were objected to due to informalities. Claims 1 and 15 have been amended to correct these informalities. A semicolon has been added after limitation (3) to indicate a break.

Claims 5 and 19 were objected to due to informalities. Claims 5 and 19 have been amended to correct these informalities. Applicant has replaced "5 wire" with "five wire" to be consistent with the definition provided in the specification.

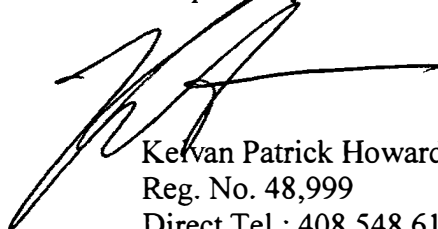
Applicant asserts that the amendments have not introduced new matter.

Conclusion:

In view of the amendments and remarks set out above, it is submitted that this application is now ready for allowance. Applicant respectfully requests reconsideration of the claimed matter.

If Examiner Zhu should believe that prosecution of this application can be expedited by discussion of any issue, the Examiner is invited to contact the undersigned at any of the numbers set out below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Kervan Patrick Howard', is written over the typed name and contact information.

Kervan Patrick Howard, Ph.D.
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Kelvan.howard@moldev.com

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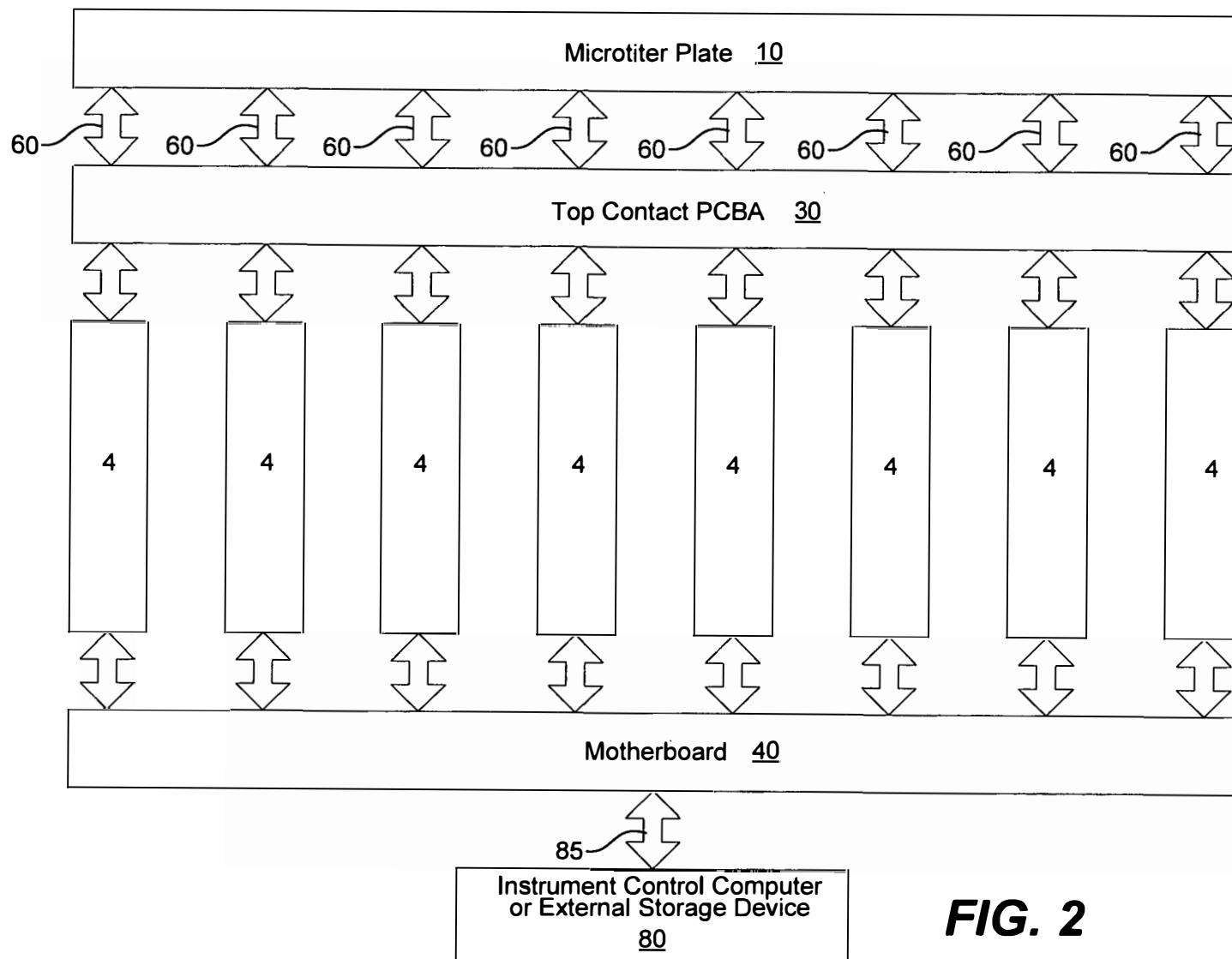


FIG. 2

NEW SHEET

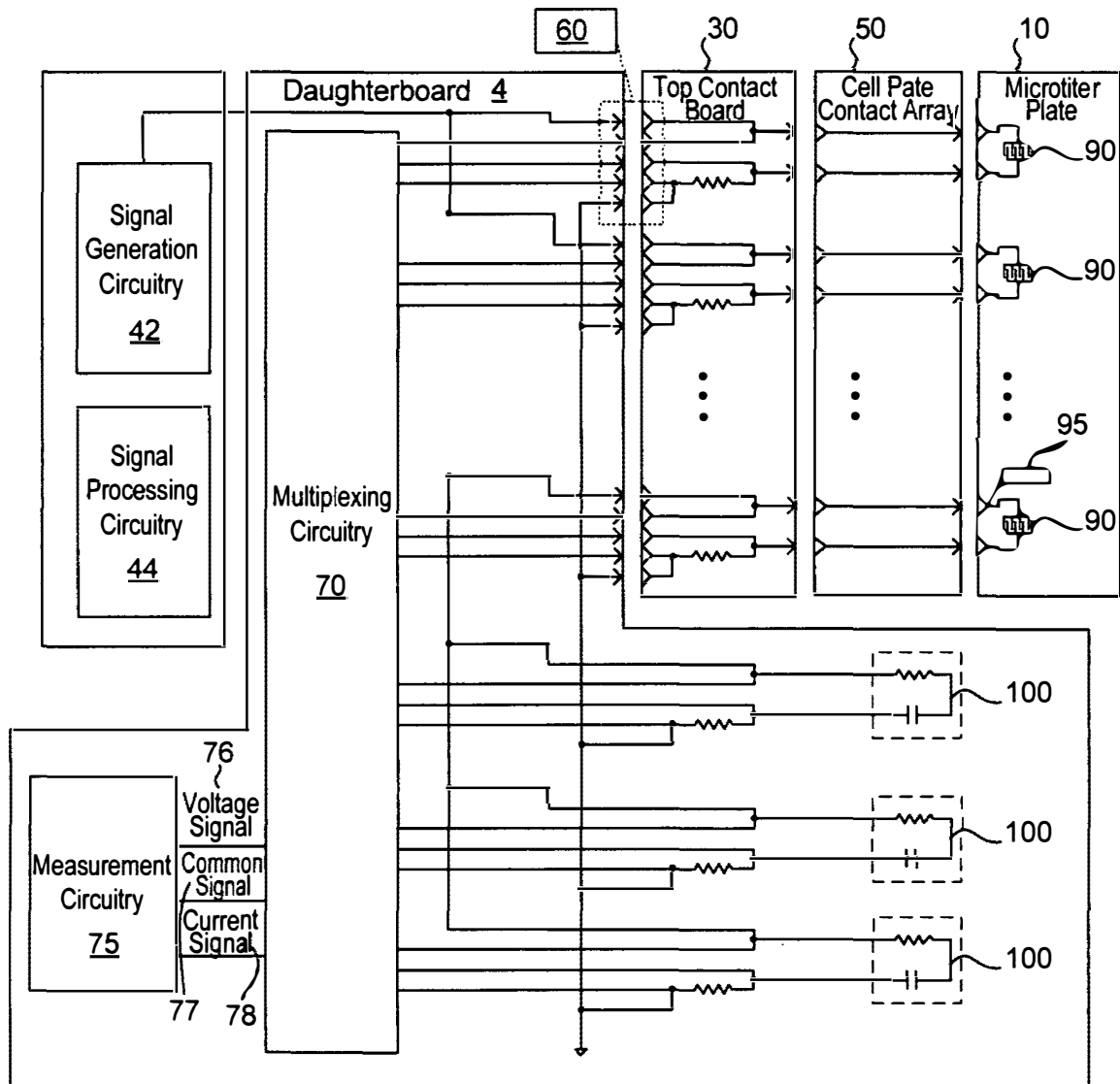


FIG. 3

REPLACEMENT SHEET

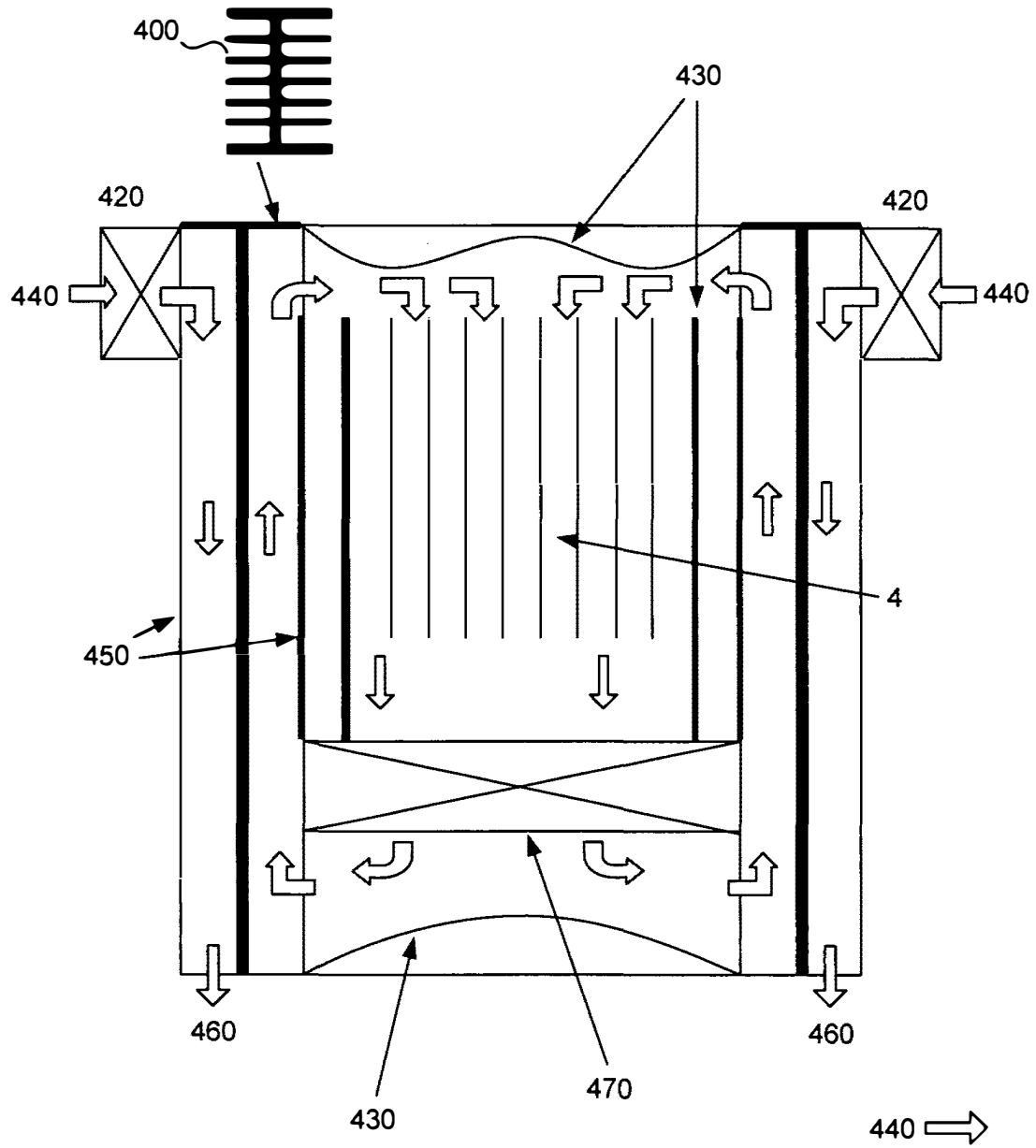


FIG. 4



JFW

PTO/SB/22 (04-07)

Approved for use through 09/30/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2006 (Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)		Docket Number (Optional)	
Application Number <u>11 1224,354</u>		Filed <u>09/09/05</u>	
For <u>Impedance Measurement System with Incorporated Internal</u>			
Art Unit <u>2858</u>		Examiner <u>Zhu</u>	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.			
The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
	Fee	Small Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
☒ Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ <u>450</u>
☐ Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ _____
☐ Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____
☐ Applicant claims small entity status. See 37 CFR 1.27.			
☐ A check in the amount of the fee is enclosed.			
☐ Payment by credit card. Form PTO-2038 is attached.			
☒ The Director has already been authorized to charge fees in this application to a Deposit Account.			
☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>502 822</u> . I have enclosed a duplicate copy of this sheet.			
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
I am the ☐ applicant/inventor.			
☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
☒ attorney or agent of record. Registration Number <u>48999</u>			
☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____			
_____ Signature		<u>07/10/07</u> Date	
<u>WELVAN Howard</u> Typed or printed name		<u>408-548-6131</u> Telephone Number	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
☐ Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: 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.



PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

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

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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number 11/224,354

Filing Date September 09, 2005

First Named Inventor Jones et al.

Art Unit 2858

Examiner Name John Zhu

Attorney Docket Number 42US

ENCLOSURES (Check all that apply)

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

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MDS Analytical Technologies		
Signature			
Printed name	Kelvin Howard		
Date	07/10/07	Reg. No.	48,999

CERTIFICATE OF TRANSMISSION/MAILING

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

Signature			
Typed or printed name	Kelvin Howard	Date	07/10/07

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 04/04/2007 Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080			EXAMINER ZHU, JOHN X	
			ART UNIT 2858	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
2 MONTHS		04/04/2007	PAPER	

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

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 11/224,354	Applicant(s) JONES ET AL.	
	Examiner John Zhu	Art Unit 2858	

-- 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 16 January 2007.
- 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) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-28 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 16 October 2006 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) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

EX PARTE QUAYLE

1. Response to communications filed on 1/16/2007.

Drawings

2. 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, elements such as a sensor, signal generation and signal processing circuitry, three resistor capacitor networks, etc. 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,

Art Unit: 2858

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.

3. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Fig. 1 is unclear because different parts of the invention are not labeled. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. 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). A replacement sheet must 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 the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Objections

4. Claims 1 and 15 are objected to because of the following informalities:

semicolon needed after limitation (3) to indicate break.

Appropriate correction is required.

5. Claims 5 and 19 are objected to because of the following informalities: "5 wire"

should be replaced by "five wire" to be consistent with the definition provided in the specification.

Appropriate correction is required.

Allowable Subject Matter

6. Claims 1-28 are objected to for formal matters but would be allowable if complied with all formal matters.

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7. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

The following is a statement of reasons for the indication of allowable subject matter:

Claims 1 and 15 would be allowable over the art of record because the prior art does not teach or render obvious the entire combination including specifically an impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate, the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly, each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column or the row, the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

Art Unit: 2858

(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement (IHR compensation comprising at least three resistor-capacitor networks.

Claims 2-14 and 16-28 are allowable as they depend from claims 1 and 15 respectively.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Zhu whose telephone number is (571) 272-5920. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (571) 272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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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.

John Zhu
Examiner
Art Unit 2858

JZ



ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Index of Claims 	Application/Control No. 11224354	Applicant(s)/Patent Under Reexamination JONES ET AL.
	Examiner Zhu, John	Art Unit 2858

✓	Rejected
=	Allowed

-	Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	06/14/2006	03/27/2007						
	1	O	O						
	2	O	O						
	3	O	O						
	4	O	O						
	5	O	O						
	6	O	O						
	7	O	O						
	8	O	O						
	9	O	O						
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	27	=	O						
	28	=	O						



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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/224,354	09/09/2005	David Jones	42US

CONFIRMATION NO. 9529

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA94080

Title: Impedance measurement system with incorporated internal measurement drift compensation networks

Publication No. US-2007-0057680-A1

Publication Date: 03/15/2007

NOTICE OF PUBLICATION OF APPLICATION

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

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

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <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.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 703-305-3028.

Pre-Grant Publication Division, 703-605-4283

epw



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By [Signature]

PATENT

Docket No. 0042US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jones et al.

Serial No.: 11/224,354

Filed: September 09, 2005

For: **Impedance Measurement System with
Incorporated Internal Measurement Drift
Compensation Networks**

Examiner: Marina Kramskaya

Art Unit: 2858

RESPONSE TO OFFICE
COMMUNICATION MAILED
June 14, 2006

Assistant Commissioner for Patents
Alexandria, Virginia 22313-1450

Examiner Kramskaya:

In response to the Notice of Non-Compliant Amendment of November 01, 2006 and the Official Action of June 14, 2006, applicant requests reconsideration of the above-identified application in view of the following elections, amendments, and remarks.

Amendments to the Specification begin on page 2.

Amendments to the claims begin on page 4 of this paper.

Remarks begin on page 11 of this paper.

Specification Amendments

Please delete paragraphs [005-006, and 032].

Please delete Figures 2 and 3.

Please replace original paragraph [007] with amended paragraph [007] as follows:

[007] (amended) Fig. 24. Thermal Control Scheme

Illustration of an embodiment of the thermal control scheme for the Impedance Measurement System (ZMS).

Please note that the '4' in 'Fig. 4' from the original paragraph [007] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Please replace original paragraph [008] with amended paragraph [008] as follows:

[008] (amended) In one embodiment of the impedance measurement system **shown in Fig. 1**, each row of sensors on a microtiter plate is addressed by measurement circuitry (in the form of analog signal conditioning circuits, multiplexing circuits, analog-digital converters, and digital signal processors) on a single daughter board. The interconnection of each sensor from a particular well in a particular row of the microtiter plate to the associated daughter board is made through a Top Contact printed circuit board assembly (PCBA), which carries all sensor signals. Each daughter board has multiplexing circuitry allowing one or more measurement channels to address the sensors for each well in the row.

Please replace original paragraph [043] with amended paragraph [043] as follows:

[043] (amended) The ZMS thermal control system is displayed in Figure 24. **In a representative embodiment, a variable speed fan 420 pulls air 440 past the baffles 450 and heat sinks 400, exiting to the rear of the system 460. Interior to the system, airflow 440 passes a**

**system of baffles 450, is deflected 430 onto the ZMS daughter boards 4, and the moves
past a high-flow, speed monitored fan 470. Deflectors 430 then direct the air flow 440
back towards the baffles 450.**

Please note that the '4' in 'Fig. 4' from the first sentence of original paragraph [043] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Claim amendments

Please amend claim 1 as follows:

Claim 1.(currently amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

- (1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,
the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;
- (2) at least one top contact board,
each ~~printed circuit~~ **top contact** board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,
the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;
- (3) a motherboard comprising signal generation and signal processing circuitry,
the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

- (4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;
- (5) a means for thermal control; and
- (6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

Claim 2. (original) The impedance measurement system of claim 1, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 3. (original) The impedance measurement system of claim 1, wherein the at least one top contact board is a contact printed circuit board assembly.

Claim 4. (original) The impedance measurement system of claim 1, wherein the at least one printed top contact board has a thickness above 3mm and less than 4mm.

Claim 5. (original) The impedance measurement system of claim 1, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

Claim 6. (original) The impedance measurement system of claim 1, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 7. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 8. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 9. (original) The impedance measurement system of claim 1, wherein the means for system impedance drift compensation comprises four resistor-capacitor networks.

Claim 10. (original) The impedance measurement system of claim 9, wherein the three resistor-capacitor networks comprise a reference network with impedance values equivalent to a microtiter well sensor with cells, an R-C network with impedance characteristics above the reference network, and an R-C network with impedance characteristics below the reference network.

Claim 11. (original) The impedance measurement system of claim 1 additionally comprising an external interface means for data access and system control.

Claim 12. (original) The impedance measurement system of claim 11, wherein the external interface means is an instrument control computer.

Claim 13. (original) The impedance measurement system of claim 11, wherein the external interface means is an external storage device.

Claim 14. (original) The impedance measurement system of claim 11, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Claim 15. (original) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly,

each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement drift compensation comprising at least three resistor-capacitor networks.

Claim 16. (original) The impedance measurement system of claim 15, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 17. (original) The impedance measurement system of claim 15, wherein the at least one top contact board assembly is a contact printed circuit board assembly.

Claim 18. (original) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly has a thickness above 3mm and less than 4mm.

Claim 19. (original) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

Claim 20. (original) The impedance measurement system of claim 15, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 21. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 22. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 23. (original) The impedance measurement system of claim 15, wherein the means for system impedance measurement drift compensation comprises three resistor-capacitor networks.

Claim 24. (original) The impedance measurement system of claim 23, wherein the three resistor-capacitor networks comprise (1) a reference R-C network with impedance values equivalent to a microtiter well with cells, (2) an R-C network with impedance characteristics

above the impedance values of the reference R-C network, and (3) an R-C network with impedance characteristics below the impedance values of the reference R-C network.

Claim 25. (original) The impedance measurement system of claim 15 additionally comprising an external interface means for data access and system control.

Claim 26. (original) The impedance measurement system of claim 25, wherein the external interface means is an instrument control computer.

Claim 27. (original) The impedance measurement system of claim 25, wherein the external interface means is an external storage device.

Claim 28. (original) The impedance measurement system of claim 25, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Remarks

The drawings have been amended to include reference numerals necessary for understanding of the invention. Figure 1 has been redrawn to make visible all the parts of the invention. Figures 2 and 3 have been deleted and all references to them have been removed.

Claim 1 has been amended. The term "each printed circuit board" was inappropriately used instead of "top contact board".

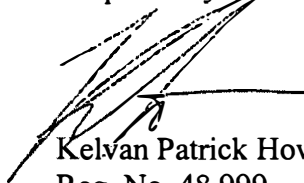
Applicant asserts that the amendments have not introduced new matter.

Conclusion:

In view of the amendments and remarks set out above, it is submitted that this application is now ready for allowance. Applicant respectfully request reconsideration of the claimed matter.

If Examiner Kramskaya should believe that prosecution of this application can be expedited by discussion of any issue, the Examiner is invited to contact the undersigned at any of the numbers set out below.

Respectfully submitted,

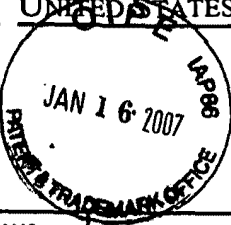


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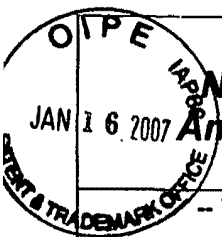


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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 12/20/2006 Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080			EXAMINER KRAMSKAYA, MARINA	
			ART UNIT	PAPER NUMBER
			2858	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
30 DAYS		12/20/2006	PAPER	

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Notice of Non-Compliant Amendment (37 CFR 1.121)

Application No.

11/224354

Applicant(s)

Examiner

Art Unit

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

The amendment document filed on 04 December 2006 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
 - ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____.
- ☐ 2. Abstract:
 - ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
 - ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
 - ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
 - ☐ C. Other _____.
- ☒ 4. Amendments to the claims:
 - ☐ A. A complete listing of all of the claims is not present.
 - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
 - ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☒ E. Other: CLAIM 1 SHOULD READ CURRENTLY AMENDED, MUST BEGIN ON A SEPARATE SHEET FROM THE SPECIFICATION.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment or an amendment filed after allowance. If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.
2. Applicant is given **one month**, or thirty (30) days, whichever is longer, from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a *Quayle* action. If any of above boxes 1. to 4. are checked, the correction required is only the **corrected section** of the non-compliant amendment in compliance with 37 CFR 1.121.

Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.

Failure to timely respond to this notice will result in:

Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or

Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

NICOLE LAWRENCE

Legal Instruments Examiner (LIE), if applicable

571-272-1025

Telephone No.

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 11/224,354		Filing Date 09/09/2005		☐ 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 \$ =		OR	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)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	01/16/2007	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 28	Minus	** 28	= 0	X \$ =		OR	X \$50=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$ =		OR	X \$200=	0
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
Patsy Zimmerman

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529
7590 Kelvan P. Howard MDS Sciex (US) a division of MDS Pharma Services, Inc. 1170 Veteran's Blvd., Suite 200 South San Francisco, CA 94080			EXAMINER KRAMSKAYA, MARINA	
			ART UNIT 2858	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE 30 DAYS		MAIL DATE 12/20/2006	DELIVERY MODE PAPER	

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**Notice of Non-Compliant
Amendment (37 CFR 1.121)**

Application No.

11/224354

Examiner

Applicant(s)

Art Unit

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The amendment document filed on 04 December 2006 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____.
- ☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
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 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☒ E. Other: CLAIM 1 SHOULD READ CURRENTLY AMENDED, MUST BEGIN ON A SEPARATE SHEET FROM THE SPECIFICATION.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

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Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

NICOLE LAWRENCE

Legal Instruments Examiner (LIE), if applicable

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Telephone No.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 11224354		Filing Date: 09/09/2005		☐ 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 \$25 =		OR	X \$50 =			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =			X \$100 =			X \$200 =			
☐ 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 A	101606	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(g))	• 28	Minus	• 28	= 0	X \$25 =		OR	X \$50 =	0
	Independent (37 CFR 1.16(h))	• 3	Minus	• 3	= 0	X \$100 =		OR	X \$200 =	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	
12.4106										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(g))	29	Minus	28	= 1	X \$25 =		OR	X \$50 =	
	Independent (37 CFR 1.16(h))	3	Minus	3	= 0	X \$100 =		OR	X \$200 =	
	☐ 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	
CALCULATE										
* 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.										

Legal Instrument Examiner:
Patsy Zimmerman

ifw



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By [Signature]

PATENT

Docket No. 0042US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jones et al.

Serial No.: 11/224,354

Filed: September 09, 2005

For: **Impedance Measurement System with Incorporated Internal Measurement Drift Compensation Networks**

Examiner: Marina Kramskaya

Art Unit: 2858

RESPONSE TO OFFICE
COMMUNICATION MAILED
June 14, 2006

Assistant Commissioner for Patents
Alexandria, Virginia 22313-1450

Examiner Kramskaya:

In response to the Notice of Non-Compliant Amendment of November 01, 2006 and the Official Action of June 14, 2006, applicant requests reconsideration of the above-identified application in view of the following elections, amendments, and remarks.

Amendments to the Specification begin on page 2.

Amendments to the claims begin on page 3 of this paper.

Remarks begin on page 10 of this paper.

Specification Amendments

Please delete paragraphs [005-006, and 032].

Please delete Figures 2 and 3.

Please replace original paragraph [007] with amended paragraph [007] as follows:

[007] (amended) Fig. 24. Thermal Control Scheme

Illustration of an embodiment of the thermal control scheme for the Impedance Measurement System (ZMS).

Please note that the '4' in 'Fig. 4' from the original paragraph [007] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Please replace original paragraph [008] with amended paragraph [008] as follows:

[008] (amended) In one embodiment of the impedance measurement system **shown in Fig. 1**, each row of sensors on a microtiter plate is addressed by measurement circuitry (in the form of analog signal conditioning circuits, multiplexing circuits, analog-digital converters, and digital signal processors) on a single daughter board. The interconnection of each sensor from a particular well in a particular row of the microtiter plate to the associated daughter board is made through a Top Contact printed circuit board assembly (PCBA), which carries all sensor signals. Each daughter board has multiplexing circuitry allowing one or more measurement channels to address the sensors for each well in the row.

Please replace original paragraph [043] with amended paragraph [043] as follows:

[043] (amended) The ZMS thermal control system is displayed in Figure 2 4. **In a representative embodiment, a variable speed fan 420 pulls air 440 past the baffles 450 and heat sinks 400, exiting to the rear of the system 460. Interior to the system, airflow 440 passes a**

system of baffles 450, is deflected 430 onto the ZMS daughter boards 4, and the moves past a high-flow, speed monitored fan 470. Deflectors 430 then direct the air flow 440 back towards the baffles 450.

Please note that the '4' in 'Fig. 4' from the first sentence of original paragraph [043] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Claim amendments

Please amend claim 1 as follows:

Claim 1.(amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board,

each ~~printed circuit~~ **top contact** board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;
(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;
(5) a means for thermal control; and
(6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

Claim 2. (original) The impedance measurement system of claim 1, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 3. (original) The impedance measurement system of claim 1, wherein the at least one top contact board is a contact printed circuit board assembly.

Claim 4. (original) The impedance measurement system of claim 1, wherein the at least one printed top contact board has a thickness above 3mm and less than 4mm.

Claim 5. (original) The impedance measurement system of claim 1, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

Claim 6. (original) The impedance measurement system of claim 1, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 7. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 8. (original) The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 9. (original) The impedance measurement system of claim 1, wherein the means for system impedance drift compensation comprises four resistor-capacitor networks.

Claim 10. (original) The impedance measurement system of claim 9, wherein the three resistor-capacitor networks comprise a reference network with impedance values equivalent to a microtiter well sensor with cells, an R-C network with impedance characteristics above the reference network, and an R-C network with impedance characteristics below the reference network.

Claim 11. (original) The impedance measurement system of claim 1 additionally comprising an external interface means for data access and system control.

Claim 12. (original) The impedance measurement system of claim 11, wherein the external interface means is an instrument control computer.

Claim 13. (original) The impedance measurement system of claim 11, wherein the external interface means is an external storage device.

Claim 14. (original) The impedance measurement system of claim 11, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Claim 15. (original) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly,

each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry,

the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement drift compensation comprising at least three resistor-capacitor networks.

Claim 16. (original) The impedance measurement system of claim 15, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

Claim 17. (original) The impedance measurement system of claim 15, wherein the at least one top contact board assembly is a contact printed circuit board assembly.

Claim 18. (original) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly has a thickness above 3mm and less than 4mm.

Claim 19. (original) The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

Claim 20. (original) The impedance measurement system of claim 15, wherein the means for thermal control comprises deflector boards and at least one heat source.

Claim 21. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

Claim 22. (original) The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

Claim 23. (original) The impedance measurement system of claim 15, wherein the means for system impedance measurement drift compensation comprises three resistor-capacitor networks.

Claim 24. (original) The impedance measurement system of claim 23, wherein the three resistor-capacitor networks comprise (1) a reference R-C network with impedance values equivalent to a microtiter well with cells, (2) an R-C network with impedance characteristics above the impedance values of the reference R-C network, and (3) an R-C network with impedance characteristics below the impedance values of the reference R-C network.

Claim 25. (original) The impedance measurement system of claim 15 additionally comprising an external interface means for data access and system control.

Claim 26. (original) The impedance measurement system of claim 25, wherein the external interface means is an instrument control computer.

Claim 27. (original) The impedance measurement system of claim 25, wherein the external interface means is an external storage device.

Claim 28. (original) The impedance measurement system of claim 25, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Remarks

The drawings have been amended to include reference numerals necessary for understanding of the invention. Figure 1 has been redrawn to make visible all the parts of the invention. Figures 2 and 3 have been deleted and all references to them have been removed.

Claim 1 has been amended. The term "each printed circuit board" was inappropriately used instead of "top contact board".

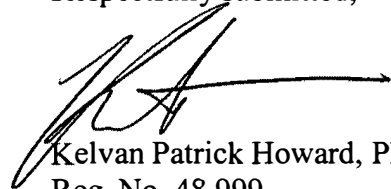
Applicant asserts that the amendments have not introduced new matter.

Conclusion:

In view of the amendments and remarks set out above, it is submitted that this application is now ready for allowance. Applicant respectfully request reconsideration of the claimed matter.

If Examiner Kramskaya should believe that prosecution of this application can be expedited by discussion of any issue, the Examiner is invited to contact the undersigned at any of the numbers set out below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'K. Howard', with a long horizontal stroke extending to the right.

Kelvan Patrick Howard, Ph.D.
Reg. No. 48,999
Direct Tel.: 650.635.4386
Kelvan.howard@sciex.com

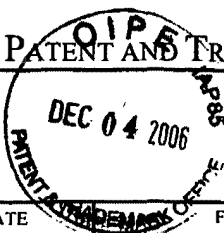
Jones et al.
Serial No. 11/224,354
Page 11



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529

7590 11/01/2006
Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

EXAMINER

KRAMSKAYA, MARINA

ART UNIT PAPER NUMBER

2858

DATE MAILED: 11/01/2006

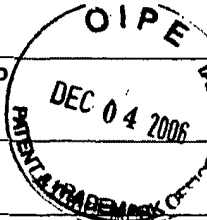
Please find below and/or attached an Office communication concerning this application or proceeding.

**Notice of Non-Compliant
Amendment (37 CFR 1.121)**

Application No.
11/224,354

Applicant(s)
JONES ET AL.

Art Unit
2800



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

The amendment document filed on October 16, 2006 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
 - ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____.
- ☐ 2. Abstract:
 - ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
 - ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
 - ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
 - ☐ C. Other _____.
- ☒ 4. Amendments to the claims:
 - ☒ A. A complete listing of all of the claims is not present.
 - ☒ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
 - ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☐ E. Other: _____.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

- 1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment or an amendment filed after allowance, or a drawing submission (only) If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.
- 2. Applicant is given **one month**, or thirty (30) days, whichever is longer, from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a Quayle action. If any of above boxes 1 to 4 are checked, the correction required is only the corrected section of the non-compliant amendment in compliance with 37 CFR 1.121.

Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.

Failure to timely respond to this notice will result in:

Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or

Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental

Legal Instruments Examiner (LIE), if applicable Patsy Zimmerman

Telephone No: (571)272-7289



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529

7590 11/01/2006

Kelvan P. Howard
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EXAMINER

KRAMSKAYA, MARINA

ART UNIT PAPER NUMBER

2858

DATE MAILED: 11/01/2006

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

Notice of Non-Compliant Amendment (37 CFR 1.121)	Application No. 11/224,354	Applicant(s) JONES ET AL.	
		Art Unit 2800	

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

The amendment document filed on October 16, 2006 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
 - ☐ A. Amended paragraph(s) do not include markings.
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 - ☐ C. Other _____.
- ☐ 2. Abstract:
 - ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
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 - ☐ C. Other _____.
- ☒ 4. Amendments to the claims:
 - ☒ A. A complete listing of all of the claims is not present.
 - ☒ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
 - ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☐ E. Other: _____.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

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2. Applicant is given **one month**, or thirty (30) days, whichever is longer, from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a Quayle action. If any of above boxes 1 to 4 are checked, the correction required is only the corrected section of the non-compliant amendment in compliance with 37 CFR 1.121.

Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a Quayle action.

Failure to timely respond to this notice will result in:

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Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental

Legal Instruments Examiner (LIE), if applicable Patsy Zimmerman

Telephone No: (571)272-7289



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Commissioner for Patents,
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By 

PATENT

Docket No. 0042US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jones et al.

Serial No.: 11/224,354

Filed: September 09, 2005

For: **Impedance Measurement System with
Incorporated Internal Measurement Drift
Compensation Networks**

Examiner: Marina Kramskaya

Art Unit: 2858

RESPONSE TO OFFICE
COMMUNICATION MAILED
June 14, 2006

Assistant Commissioner for Patents
Alexandria, Virginia 22313-1450

Examiner Kramskaya:

In response to the Official Action of June 14, 2006, applicant requests reconsideration of the above-identified application in view of the following elections, amendments, and remarks.

Amendments to the Specification begin on page 2.

Amendments to the claims begin on page 3 of this paper.

Remarks begin on page 4 of this paper.

Specification Amendments

Please delete paragraphs [005-006, and 032].

Please delete Figures 2 and 3.

Please replace original paragraph [007] with amended paragraph [007] as follows:

[007] (amended) Fig. 24. Thermal Control Scheme

Illustration of an embodiment of the thermal control scheme for the Impedance Measurement System (ZMS).

Please note that the '4' in 'Fig. 4' from the original paragraph [007] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Please replace original paragraph [008] with amended paragraph [008] as follows:

[008] (amended) In one embodiment of the impedance measurement system shown in Fig. 1, each row of sensors on a microtiter plate is addressed by measurement circuitry (in the form of analog signal conditioning circuits, multiplexing circuits, analog-digital converters, and digital signal processors) on a single daughter board. The interconnection of each sensor from a particular well in a particular row of the microtiter plate to the associated daughter board is made through a Top Contact printed circuit board assembly (PCBA), which carries all sensor signals. Each daughter board has multiplexing circuitry allowing one or more measurement channels to address the sensors for each well in the row.

Please replace original paragraph [043] with amended paragraph [043] as follows:

[043] (amended) The ZMS thermal control system is displayed in Figure 2 4. In a representative embodiment, a variable speed fan 420 pulls air 440 past the baffles 450 and heat sinks 400, exiting to the rear of the system 460. Interior to the system, airflow 440 passes a system of baffles 450, is deflected 430 onto the ZMS daughter boards 4, and the moves

past a high-flow, speed monitored fan 470. Deflectors 430 then direct the air flow 440 back towards the baffles 450.

Please note that the '4' in 'Fig. 4' from the first sentence of original paragraph [043] has been struck through in the above amended paragraph to denote the deletion of the '4' and the inclusion of a '2'.

Claim amendments

Please amend claim 1 as follows:

Claim 1.(amended) An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board,

each ~~printed circuit~~ **top contact** board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;
(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;
(5) a means for thermal control; and
(6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

Remarks

The drawings have been amended to include reference numerals necessary for understanding of the invention. Figure 1 has been redrawn to make visible all the parts of the invention. Figures 2 and 3 have been deleted and all references to them have been removed.

Claim 1 has been amended. The term "each printed circuit board" was inappropriately used instead of "top contact board".

Applicant asserts that the amendments have not introduced new matter.

Conclusion:

In view of the amendments and remarks set out above, it is submitted that this application is now ready for allowance. Applicant respectfully request reconsideration of the claimed matter.

If Examiner Kramskaya should believe that prosecution of this application can be expedited by discussion of any issue, the Examiner is invited to contact the undersigned at any of the numbers set out below.

Respectfully submitted,



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1/2

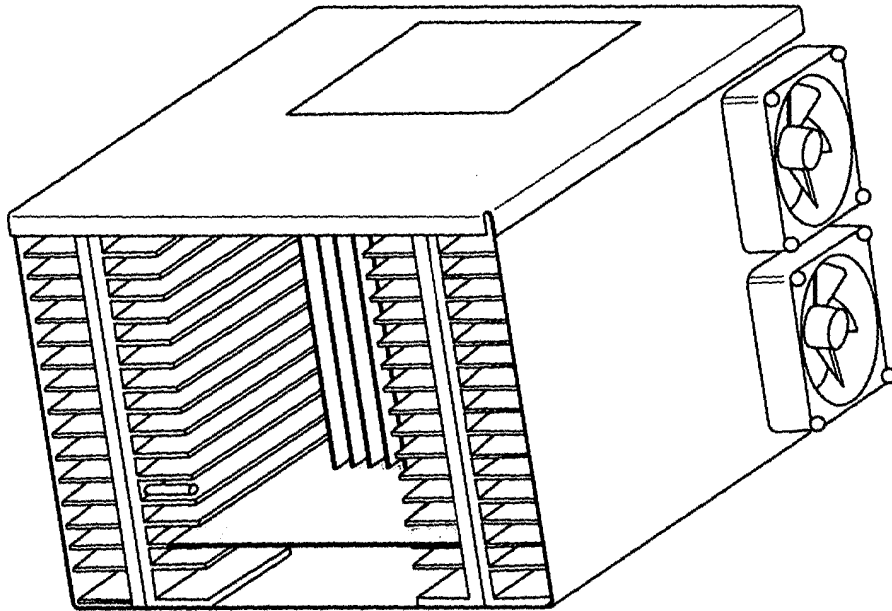


FIG. 1

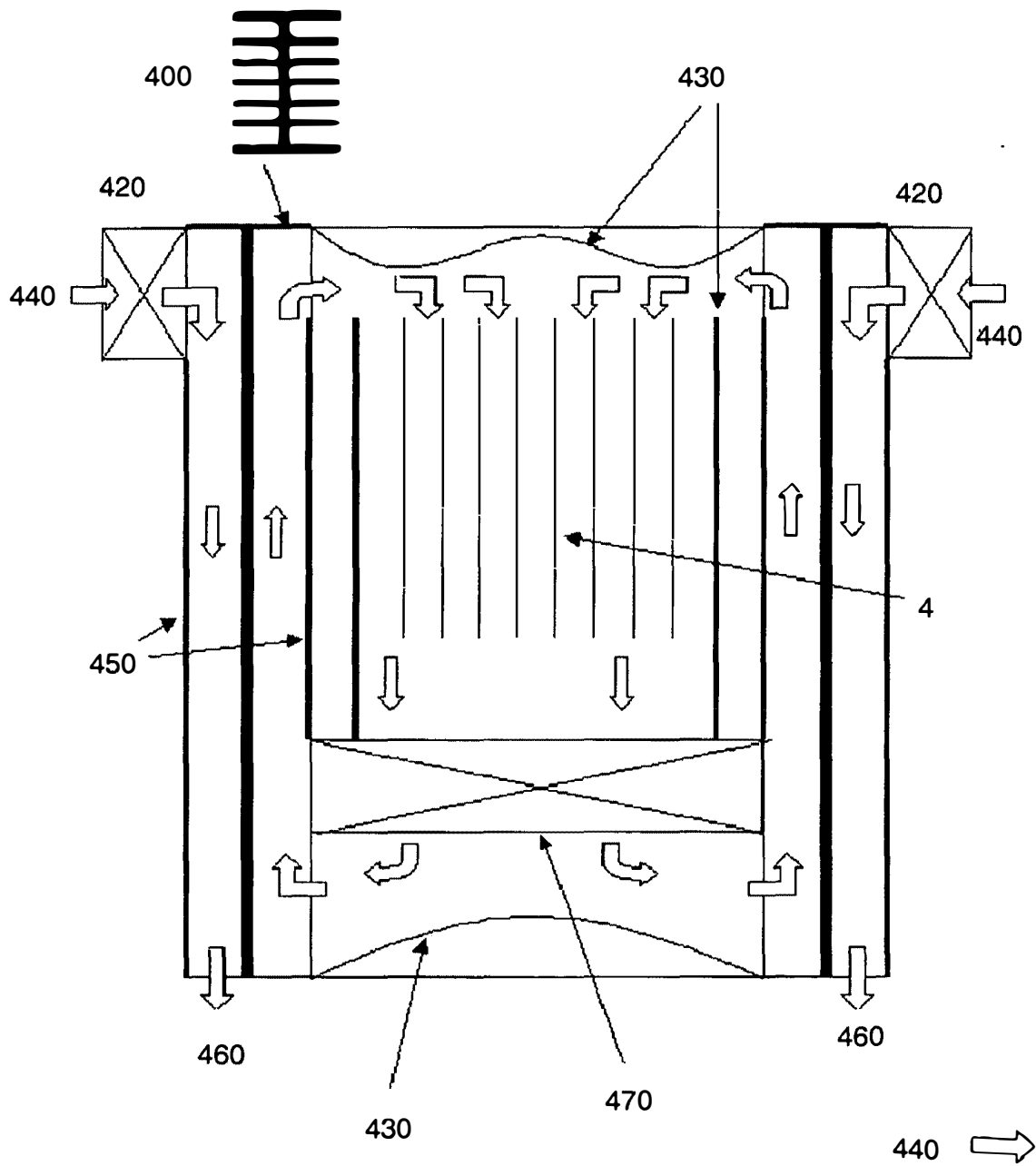


Fig. 2



PTO/SB/22 (09-06)

Approved for use through 03/31/2007. OMB 0651-0031

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

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional)

FY 2006

42 US

(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)

Application Number

11224,354

Filed

09109105

For

Impedance Measurement System with Incorporated Internal..

Art Unit

2858

Examiner

Kramskaya

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
☒ Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ <u>450</u>
☐ Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ _____
☐ Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____

☐ Applicant claims small entity status. See 37 CFR 1.27.

10/17/2006 BABRAMA1 00000015 502822 11224354

01 FC:1252

450.00 DA

☐ A check in the amount of the fee is enclosed.☐ Payment by credit card. Form PTO-2038 is attached.☒ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 502822. I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the ☐ applicant/inventor.☐ assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ attorney or agent of record. Registration Number 48,999☐ attorney or agent under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 _____

Signature

10/13/06

Date

Kelvin N Howard

Typed or printed name

650.635.4386

Telephone Number

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

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: 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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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Application Number	11/224,354
Filing Date	September 09, 2005
First Named Inventor	Jones et al.
Art Unit	2858
Examiner Name	Marina kramskaya
Attorney Docket Number	42US

Total Number of Pages in This Submission

ENCLOSURES (Check all that apply)

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

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MDS Sciex		
Signature			
Printed name	Kelvan Howard		
Date	10/13/2006	Reg. No.	48,999

CERTIFICATE OF TRANSMISSION/MAILING

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

Signature			
Typed or printed name	Kelvan Howard	Date	10/13/06

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

MDS Sciex, Inc.
1170 Veteran's Way
S. San Francisco, California 94080
Tel: (650) 635-4386



Amendment Transmittal

Docket No. 42US_____

LFW

In re application of: Jones et al.,

Application No.: 11/224,354

Filed: September 09, 2005

Group Art Unit: 2858

For: IMPEDANCE MEASUREMENT SYSTEM WITH
INCORPORATED INTERNAL MEASUREMENT DRIFT
COMPEANSATION NETWORKS

I hereby certify that this correspondence is being
deposited with the United States Postal Service as
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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date of Deposit 10/13/05

By Kelvan Howard
Kelvan Patrick Howard, 48,999

THE COMMISSIONER FOR PATENTS
Alexandria, VA 22313-1450

Sir:

Transmitted herewith are the following documents in the above-identified application.

- ☒ Transmittal Form
- ☒ Petition for Extension of Time under 37 CFR 1.136(a);
- ☒ Reply/Amendment;
- ☒ Return Postcard.

If any extension of time is needed, then this response should be considered a petition therefor.
The filing fee has been calculated as shown below:

(Col. 1)	(Col. 2)	(Col. 3)		
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA
TOTAL	*28	MINUS	** 28	= 0
INDEP.	* 2	MINUS	*** 2	= 0
[] FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDIT. FEE		RATE	ADDIT. FEE
x \$9.00 =	\$0.00		x \$18.00 =	0
x \$42.00 =	\$0.00		x \$84.00 =	0
+ \$140.00 =	\$0.00		+ \$280.00 =	
TOTAL ADDIT. FEE	\$0.00	OR	TOTAL	0

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

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, then write "3" in this space. The "Highest Number Previously Paid For" (Total or Independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment or the number of claims originally filed.

☒ No fee is due.

Please charge Deposit Account No. 502822 as follows:

☐ Claims fee \$_____

☒ Any additional fees associated with this paper or during the pendency of this application.

NO extra copies of this sheet are enclosed.

MDS SCIEX, INC.

Kelvan Howard, Reg. No. 48,999

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 11224354		Filing Date: 09/09/2005		☐ 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 (\$)	OR		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), (i), 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(j))	minus 20 = *		X \$25 =				X \$50 =		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X \$100 =				X \$200 =		
☐ 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))			+ \$180				+ \$360		
			TOTAL				TOTAL		
* If the difference in column 1 is less than zero, enter "0" in column 2.									
APPLICATION AS AMENDED – PART II									
(Column 1)			(Column 2)	(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT A	101606	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 28	Minus	** 28	= 0	X \$25 =		OR	X \$50 = 0
	Independent (37 CFR 1.16(h))	* 3	Minus	** 3	= 0	X \$100 =		OR	X \$200 = 0
	☐ Application Size Fee (37 CFR 1.16(s))							OR	
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR	
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
(Column 1)			(Column 2)	(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$25 =		OR	X \$50 =
	Independent (37 CFR 1.16(h))	*	Minus	**	=	X \$100 =		OR	X \$200 =
	☐ Application Size Fee (37 CFR 1.16(s))							OR	
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR	
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
CALCULATE									
* 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: Patsy Zimmerman									

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/224,354	09/09/2005	David Jones	42US	9529

7590 06/14/2006

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

EXAMINER

KRAMSKAYA, MARINA

ART UNIT PAPER NUMBER

2858

DATE MAILED: 06/14/2006

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

Office Action Summary	Application No.		Applicant(s)	
	11/224,354		JONES ET AL.	
	Examiner		Art Unit	
	Marina Kramskaya		2858	

-- 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 2 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 ____.
- 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) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-28 is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☒ Claim(s) 1-14 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 09/09/2005 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) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) ☐ Other: ____. |

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figure 1 is unclear because different parts of the invention are not visible.

Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

2. The drawings are objected to because they lack reference numeral necessary for understanding of the invention.

37 CFR 1.84 (p) states:

(p) Numbers, letters, and reference characters.

(1) Reference characters (numerals are preferred), sheet numbers, and view numbers must be plain and legible, and must not be used in association with brackets or inverted commas, or enclosed within outlines, e.g., encircled. They must be oriented in the same direction as the view so as to avoid having to rotate the sheet. Reference characters should be arranged to follow the profile of the object depicted.

(2) The English alphabet must be used for letters, except where another alphabet is customarily used, such as the Greek alphabet to indicate angles, wavelengths, and mathematical formulas.

(3) Numbers, letters, and reference characters must measure at least .32 cm. (1/8 inch) in height. They should not be placed in the drawing so as to interfere with its comprehension. Therefore, they should not cross or mingle with the lines. They should not be placed upon hatched or shaded surfaces. When necessary, such as indicating a surface or cross section, a reference character may be underlined and a blank space may be left in the hatching or shading where the character occurs so that it appears distinct.

- (4) The same part of an invention appearing in more than one view of the drawing must always be designated by the same reference character, and the same reference character must never be used to designate different parts.
- (5) Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

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.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the

Art Unit: 2858

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). A replacement sheet must 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 the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Objections

3. Claim 1 is objected to because of the following informalities: Claim 1 recites the limitation "each printed circuit board assembly" in line 12. There is insufficient antecedent basis for this limitation in the claim. It is unclear if the term "each printed

circuit board assembly" is referring to the "daughter board", the "top contact board", or an entirely different board.

Appropriate correction is required.

Allowable Subject Matter

4. Claims 1-14 is objected to for formal matters.
5. Claims 15-28 are allowed.
6. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).
7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to anticipate or make obvious in combination an impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly, each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column or the row,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board;

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement (IHR compensation comprising at least three resistor-capacitor networks.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pisharody et al. (US 6,824,974), Potyrailo et al. (US 6,684,683), Mansky et al. (US 6,668,230 & US 6,553,318), and Xu (US 2005/0153425) disclose a system for testing a substance in a microtiter plate utilizing impedance sensing. Wolf et

al. (US 6,376,233) discloses a system for detecting impedance of individual wells of a microtiter plate situated on a semiconductor sensor substrate.

This application is in condition for allowance except for the following formal matters detailed above.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. 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.

MK

Marina Kramskaya
Examiner
Art Unit 2858



DIANE LEE
SUPERVISORY PATENT EXAMINER

Notice of References Cited	Application/Control No. 11/224,354		Applicant(s)/Patent Under Reexamination JONES ET AL.	
	Examiner Marina Kramskaya		Art Unit 2858	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,824,974	11-2004	Pisharody et al.	435/4
*	B	US-6,684,683	02-2004	Potyrailo et al.	73/24.06
*	C	US-6,668,230	12-2003	Mansky et al.	702/30
*	D	US-6,553,318	04-2003	Mansky, Paul	702/22
*	E	US-6,376,233	04-2002	Wolf et al.	435/288.4
*	F	US-2005/0153425	07-2005	Xu et al.	435/287.1
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	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	
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	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. 9529

SERIAL NUMBER 11/224,354	FILING OR 371(c) DATE 09/09/2005 RULE	CLASS 324	GROUP ART UNIT 2858	ATTORNEY DOCKET NO. 42US
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APPLICANTS

David Jones, Mentone, AUSTRALIA;
Dirk Kupershoek, Seaford, AUSTRALIA;
Peter Leigh-Jones, Gordon, AUSTRALIA;

** CONTINUING DATA *****

None, MK

** FOREIGN APPLICATIONS *****

None, MK

IF REQUIRED, FOREIGN FILING LICENSE GRANTED **

09/28/2005

Foreign Priority claimed ☐ yes ☒ no	STATE OR COUNTRY AUSTRALIA	SHEETS DRAWING 4	TOTAL CLAIMS 28	INDEPENDENT CLAIMS 2
35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance				
Verified and Acknowledged Examiner's Signature <i>M. R. [Signature]</i> Initials <i>MR</i>				

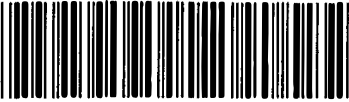
ADDRESS

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA94080

TITLE

Impedance measurement system with incorporated internal measurement drift compensation networks

FILING FEE RECEIVED 1530	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

Index of Claims 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	11/224,354		JONES ET AL.	
	Examiner		Art Unit	
	Marina Kramskaya		2858	

√	Rejected
=	Allowed

—	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
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A	Appeal
O	Objected

Claim		Date						
Final	Original	6/2/08						
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Search Notes

Application/Control No.

11/224,354

Examiner

Marina Kramskaya

Applicant(s)/Patent under
Reexamination

JONES ET AL.

Art Unit

2858

SEARCHED

Class	Subclass	Date	Examiner
324	649	6/7/2006	MK
324	629	6/7/2006	MK
435	288.4	6/7/2006	MK
435	287.1	6/7/2006	MK

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
Consult w/David Redding for search in class 435	6/5/2006	MK
search class 324 with keyword - please see EAST Search	6/2/2006	MK
search class 702 with keyword - please see EAST Search	6/7/2006	MK

BRS	S1	46404	microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:40
BRS	S2	533	S1 and impedance	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:43
BRS	S3	6	S2 and "324"/\$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:40
BRS	S4	0	S2 and motherboard	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:41
BRS	S5	1	S2 and (mother adj board)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:41
BRS	S6	53	S2 and (PCB or (print\$3 adj circuit adj board))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:23
BRS	S7	293	S1 and impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:46
BRS	S10	110	S1 and capacitive with (measur\$6 or test\$3 or sens\$3 or detect\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:47
BRS	S11	3522	S1 and resistance with (measur\$6 or test\$3 or sens\$3 or detect\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/2/2006 10:49
BRS	S12	46406	microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 10:08
BRS	S13	80	S12 and resistivity with (measur\$6 or test\$3 or sens\$3 or detect\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 10:08
BRS	S14	46406	microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:24
BRS	S15	293	S14 and impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:27
BRS	S16	40	S15 and (PCB or (print\$3 adj circuit adj board) or motherboard or (mother adj board) or daughterboard or (daughter adj board))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:27
BRS	S17	295	S14 and impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6 or alalyz\$3 or	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:27
BRS	S18	40	S17 and (PCB or (print\$3 adj circuit adj board) or motherboard or (mother adj board) or daughterboard or (daughter adj board))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:50
BRS	S19	12	6,132,683	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/5/2006 14:48
BRS	S20	4	10705615	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:35
BRS	S21	677	435/288.4.CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:46
BRS	S22	46	S21 and impedance	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:46
BRS	S23	187	S21 and microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:47
BRS	S24	15	S23 and S22	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:45
BRS	S25	15	S24 and well	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:47
BRS	S26	1759	435/287.1.CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:46
BRS	S27	218	S26 and impedance	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:46
BRS	S28	167	S26 and (impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6 or alalyz\$3 or	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:46
BRS	S29	16	S28 and microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:47
BRS	S30	16	S29 and well	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:47
BRS	S31	9975	324/\$.ccls. and (impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6 or	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:52
BRS	S32	160	324/649.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:48
BRS	S33	444	324/649-651.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:49
BRS	S34	101	324/629.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:49
BRS	S35	593	324/629-648.ccls. and (impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6 or alalyz\$3 or analys\$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:50
BRS	S36	0	S35 and microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:50
BRS	S37	397	S35 and well	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:50
BRS	S38	55	S35 and (PCB or (print\$3 adj circuit adj board) or motherboard or (mother adj board) or daughterboard or (daughter adj board))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:51
BRS	S39	8	S33 and (PCB or (print\$3 adj circuit adj board) or motherboard or (mother adj board) or daughterboard or (daughter adj board))	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:51
BRS	S40	23	324/\$.ccls. and microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:52
BRS	S41	579	702/\$.ccls. and microtiter	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:52
BRS	S42	15	S41 and (impedance with (measur\$6 or test\$3 or sens\$3 or detect\$6 or alalyz\$3 or	US-PGPUB; USPAT; EPO; JPO; DERWENT	6/7/2006 16:52



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

IFW\$

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/224,354	09/09/2005	Graham Leith	42US

CONFIRMATION NO. 9529

FORMALITIES
 LETTER

Kelvan P. Howard
 MDS Sciex (US) a division of
 MDS Pharma Services, Inc.
 1170 Veteran's Blvd., Suite 200
 South San Francisco, CA 94080

Date Mailed: 09/29/2005

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

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

- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$130** for a Large Entity

- \$130** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts

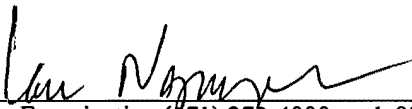
11/01/2005 DENMANU1 00000023 502822 11224354

01 FC:1051

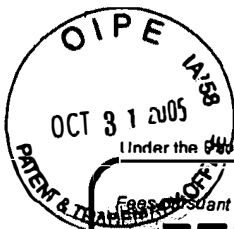
130.00 DA

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

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 1 - ATTORNEY/APPLICANT COPY



Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

Complete if Known

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	David Jones et al.
Examiner Name	NA
Art Unit	2833
Attorney Docket No.	42US

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 502822 Deposit Account Name: MDS Sciex

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25
200	100
360	180

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
--------------	--------------	----------	---------------

- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
---------------	--------------	----------	---------------

- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims

Fee (\$)	Fee Paid (\$)
----------	---------------

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
--------------	--------------	--	----------	---------------

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Missing Parts

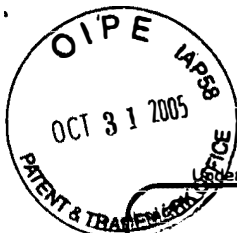
\$130.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	48,999	Telephone	650. 685. 4386
Name (Print/Type)	Kelvan Patrick Howard	Date	10/28/05		

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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.



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.

**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	42US
First Inventor	David Jones et al.
Title	Impedance Measurement System with
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ **Fee Transmittal Form** (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☐ **Applicant claims small entity status.**
See 37 CFR 1.27.
3. ☐ **Specification** [Total Pages _____]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
4. ☐ **Drawing(s)** (35 U.S.C. 113) [Total Sheets _____]
5. **Oath or Declaration** [Total Sheets _____]
 - a. ☒ Newly executed (original or copy)
 - b. ☐ A copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
name in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).
6. ☒ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or
Computer Program (Appendix)
☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
(if applicable, items a. – c. are required)
 - a. ☐ Computer Readable Form (CRF)
 - b. **Specification Sequence Listing on:**
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ Paper
 - c. ☐ Statements verifying identity of above copies

ADDRESS TO: Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450**ACCOMPANYING APPLICATION PARTS**

9. ☒ **Assignment Papers** (cover sheet & document(s))
Name of Assignee MDS Sciex (US) a division of MDS
Pharma Services (US), Inc.
10. ☒ **37 CFR 3.73(b) Statement** ☒ **Power of Attorney**
(when there is an assignee)
11. ☐ **English Translation Document** (if applicable)
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
☐ Copies of citations attached
13. ☐ **Preliminary Amendment**
14. ☒ **Return Receipt Postcard** (MPEP 503)
(Should be specifically itemized)
15. ☐ **Certified Copy of Priority Document(s)**
(if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i).
Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Prior application information: Examiner _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS☐ The address associated with Customer Number: _____ OR ☒ Correspondence address below

Name	Kelvan Patrick Howard				
Address	1170 Veteran's Blvd., Suite 200				
City	South San Francisco	State	CA	Zip Code	94080
Country	USA	Telephone	650.635.4386	Email	kelvan.howard@sciex.com
Signature				Date	10/28/05
Name (Print/Type)	Kelvan Patrick Howard			Registration No. (Attorney/Agent)	48,999

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/D1A (09-04)

Approved for use through 07/31/2008. OMB 0651-0032

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

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

Title of Invention	Impedance Measurement System with Incorporated Internal Measurement Drift Compensation Networks
--------------------	---

As the below named Inventor(s), I/we declare that:

This declaration is directed to:

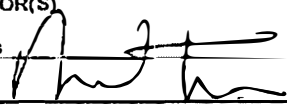
- ☐ The attached application, or
- ☒ Application No. 11/224,354, filed on 09/09/2005,
- ☐ as amended on _____ (if applicable);

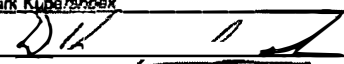
I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

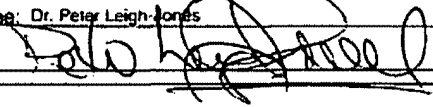
I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 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.

All statements made herein of my/own knowledge are true, all statements made herein 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 are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)	
Inventor one: <u>David Jones</u>	
Signature: _____	Citizen of: <u>Australia</u>

Inventor two: <u>Dirk Kuipershoek</u>	
Signature: _____	Citizen of: <u>Australia</u>

Inventor three: <u>Dr. Peter Leigh-Jones</u>	
Signature: _____	Citizen of: <u>Australia</u>

Inventor four: _____	_____
Signature: _____	Citizen of: _____

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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



Patent Application Data Entry Format

Inventor Information

Inventor One Given Name:: David
Family Name:: Jones
Postal Address Line One:: 2b San Antonio Court
City:: Mentone
State or Province:: Victoria
Postal or Zip Code:: 3192
Citizenship Country:: Australia

Inventor Two Given Name:: Dirk
Family Name:: Kupershoek
Postal Address Line One:: 78 Centenary Street
City:: Seaford
State or Province:: Victoria
Postal or Zip Code:: 3198
Citizenship Country:: Australia

Inventor Three Given Name:: Peter
Family Name:: Leigh-Jones
Postal Address Line One:: 109 Gascards Lane
City:: Gordon
State or Province:: Victoria
Postal or Zip Code:: 3345
Citizenship Country:: Australia

Correspondence Information

Name Line One:: Kelvan P. Howard
Name Line Two:: MDS Sciex (US) a division of MDS Pharma Services, Inc.
Address Line One:: Suite 200
Address Line Two:: 1170 Veteran's Blvd.
City:: South San Francisco
State or Province:: CA
Postal or Zip Code:: 94080
Telephone One:: (650) 635-4386
Fax:: (650) 635-4399
Electronic Mail:: kelvan.howard@sciex.com

Application Information

Title Line One:: Impedance Measurement System with Incorporated
Title Line Two:: Internal Measurement Drift Compensation Networks
Total Drawing Sheets:: 4
Formal Drawings?:: Yes

Application Type:: Utility
Docket Number:: 42US

Representative Information

Registration Number One:: 48,999

Continuity Information

Prior Foreign Applications



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PTO/SB/81 (04-06)

Approved for use through 11/30/2005, OMB 0651-0035

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

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**POWER OF ATTORNEY
and
CORRESPONDENCE ADDRESS
INDICATION FORM**

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	David Jones
Title	Impedance Measurement System with
Art Unit	2833
Examiner Name	NA
Attorney Docket Number	42US

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

I hereby appoint:

☐ Practitioners associated with the Customer Number:

OR

☒ Practitioner(s) named below:

Name	Registration Number
Kelvan P. Howard	48,999

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

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

☐ The address associated with the above-mentioned Customer Number:

OR

☐ The address associated with Customer Number:

OR

☒ Firm or Individual Name	MDS Sclex (US)		
Address	1170 Veterans Blvd., Suite 200		
City	South San Francisco	State	CA
Country	USA		
Telephone	650.635.4386	Email	kelvan.howard@sclex.com

I am the:

☒ Applicant/Inventor.

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

SIGNATURE of Applicant or Assignee of Record

Signature		Date	OCT 21, 2005
Name	David Jones	Telephone	613 9211 7791
Title and Company	Consultant Invetech Pty. Ltd.		

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

☒ Total of 03 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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



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PTO/SB/81 (04-05)

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

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**POWER OF ATTORNEY
and
CORRESPONDENCE ADDRESS
INDICATION FORM**

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	David Jones
Title	Impedance Measurement System with
Art Unit	2633
Examiner Name	NA
Attorney Docket Number	42US

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

I hereby appoint:

☐ Practitioners associated with the Customer Number:

OR

☒ Practitioner(s) named below.

Name	Registration Number
Kelvan P. Howard	48,999

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

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

☐ The address associated with the above-mentioned Customer Number:
OR

☐ The address associated with Customer Number:
OR

☒ Firm or Individual Name	MDS Sciex (US)				
Address	1170 Veteran's Blvd., Suite 200				
City	South San Francisco	State	CA	Zip	94080
Country	USA				
Telephone	650.635.4386	Email	kelvan.howard@sciex.com		

I am the:

☒ Applicant/Inventor.

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

SIGNATURE of Applicant or Assignee of Record

Signature	<i>Dirk Kuperhoeke</i>	Date	OCT 21, 2005
Name	Dirk Kuperhoeke	Telephone	613 921 7836
Title and Company	PRINCIPAL ENGINEER INVECTECH PTY LTD.		

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

☒ Total of 03 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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



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PTO/SB/81 (04-05)

Approved for use through 11/30/2005, OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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**POWER OF ATTORNEY
and
CORRESPONDENCE ADDRESS
INDICATION FORM**

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	David Jones
Title	Impedance Measurement System with
Art Unit	2833
Examiner Name	NA
Attorney Docket Number	42US

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

I hereby appoint:

☐ Practitioners associated with the Customer Number:

OR

☒ Practitioner(s) named below:

Name	Registration Number
Kelvan P. Howard	48,999

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

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

☐ The address associated with the above-mentioned Customer Number:

OR

☐ The address associated with Customer Number:

OR

☒ Firm or Individual Name: MDS Sciex (US)

Address: 1170 Veteran's Blvd., Suite 200

City: South San Francisco State: CA Zip: 94080

Country: USA

Telephone: 650.635.4386 Email: kelvan.howard@sciex.com

I am the:

☒ Applicant/Inventor.

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

SIGNATURE of Applicant or Assignee of Record

Signature:  Date: 09/09/2005

Name: Dr. Peter Leigh-Jones Telephone: 613 904 7780

Title and Company: Principal Engineer, Tamlesh Pty Ltd

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

☒ *Total of 03 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

BEST AVAILABLE COPY

File No. -42US
Appl. No. 11/224,354
Filing date 09/09/2005

ASSIGNMENT OF PATENT APPLICATION

JOINT

WHEREAS, David Jones, a citizen of Australia residing at 2b San Antonio Court, Mentone, Victoria, Australia 3192; and Dirk Kupershoek, a citizen of Australia residing at 78 Centenary Street, Seaford, Victoria, Australia 3198; and Dr. Peter Leigh-Jones, a citizen of Australia residing at 109 Gascards Lane, Gordon, Victoria, Australia 3345, hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention: IMPEDANCE MEASUREMENT SYSTEM WITH
INCORPORATED INTERNAL MEASUREMENT DRIFT
COMPENSATION NETWORKS

Date(s) of execution of Declaration: 10/24 - 10/25/05

Filing Date: 09/09/2005

Application No.: 11/224,354 ; and

WHEREAS, MDS Sciex (US) a division of MDS Pharma Services (US) Inc, located at Suite 200, 1170 Veteran's Blvd, South San Francisco, California 94080, USA, hereinafter referred to as "ASSIGNEE," is desirous of acquiring an interest in the invention and application and in any U.S. Letters Patent and Registrations which may be granted on the same;

For good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have assigned, and by these presents do assign to Assignee all right, title and interest in and to the invention and application and to all foreign counterparts (including patent, utility model and industrial designs), and in and to any Letters Patent and Registrations which may hereafter be granted on the same in the United States and all countries throughout the world, and to claim the priority from the application as provided by the Paris Convention. The right, title and interest is to be held and enjoyed by Assignee and Assignee's successors and assigns as fully and exclusively as it would have been held and enjoyed by Assignors had this Assignment not been made, for the full term of any Letters Patent and Registrations which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

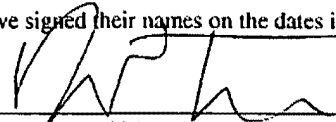
Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, (a) cooperate with Assignee in the prosecution of U.S. Patent applications and foreign counterparts on the invention and any improvements, (b) execute, verify, acknowledge and deliver all such further papers, including patent applications and instruments of transfer, and (c) perform such other acts as Assignee lawfully may request to obtain or maintain Letters Patent and Registrations for the invention and improvements in any and all countries, and to vest title thereto in Assignee, or Assignee's successors and assigns.

BEST AVAILABLE COPY

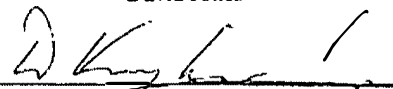
Assignment
File No. -42US
Appl. No. 11/224,354
Filing date 09/09/2005
Page 2

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

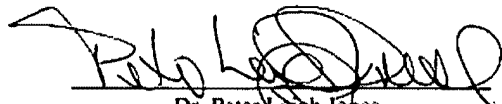
Dated: 24 Oct. 2005

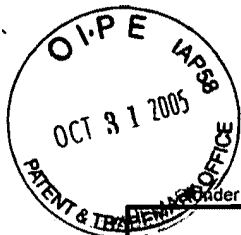

David Jones

Dated: OCT 24 2005


Dirk Kupershock

Dated: Oct 25, 2005


Dr. Peter Leigh Jones



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.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: MDS Sciex (US)

Application No./Patent No.: 11224354 Filed/Issue Date: 09/09/2005

Entitled: Impedance Measurement System With Incorporated Internal measurement Drift Compensation Networks

MDS Sciex (US), a Division of MDS MDS Pharma (US) Inc.
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☐ Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

[Signature]
Signature

10/28/05
Date

Kelvan Patrick Howard
Printed or Typed Name

650.635.4386
Telephone Number

Patent Agent
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
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IFW\$

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/224,354	09/09/2005	Graham Leith	42US

CONFIRMATION NO. 9529

FORMALITIES
LETTER

Kelvan P. Howard
 MDS Sciex (US) a division of
 MDS Pharma Services, Inc.
 1170 Veteran's Blvd., Suite 200
 South San Francisco, CA 94080

Date Mailed: 09/29/2005

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

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

- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$130** for a Large Entity

- \$130** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts

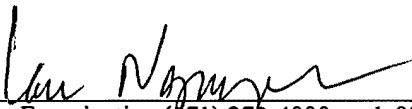
11/01/2005 DENMANU1 00000023 502822 11224354

01 FC:1051

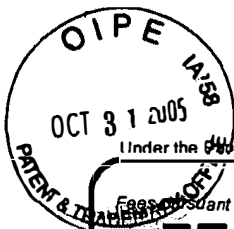
130.00 DA

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

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 1 - ATTORNEY/APPLICANT COPY



Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

Complete if Known

Application Number	11/224,354
Filing Date	09/09/2005
First Named Inventor	David Jones et al.
Examiner Name	NA
Art Unit	2833
Attorney Docket No.	42US

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 502822 Deposit Account Name: MDS Sciex

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25
200	100
360	180

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
--------------	--------------	----------	---------------

- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
---------------	--------------	----------	---------------

- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
--------------	--------------	--	----------	---------------

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Missing Parts

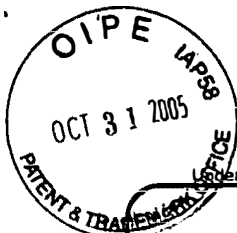
\$130.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	48,999	Telephone	650. 685. 4386
Name (Print/Type)	Kelvan Patrick Howard	Date	10/28/05		

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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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**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	42US
First Inventor	David Jones et al.
Title	Impedance Measurement System with
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ **Fee Transmittal Form** (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☐ **Applicant claims small entity status.**
See 37 CFR 1.27.
3. ☐ **Specification** [Total Pages _____]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
4. ☐ **Drawing(s)** (35 U.S.C. 113) [Total Sheets _____]
5. **Oath or Declaration** [Total Sheets _____]
 - a. ☒ Newly executed (original or copy)
 - b. ☐ A copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
name in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).
6. ☒ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or
Computer Program (Appendix)
☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
(if applicable, items a. – c. are required)
 - a. ☐ Computer Readable Form (CRF)
 - b. **Specification Sequence Listing on:**
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ Paper
 - c. ☐ Statements verifying identity of above copies

ADDRESS TO: Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450**ACCOMPANYING APPLICATION PARTS**

9. ☒ **Assignment Papers** (cover sheet & document(s))
Name of Assignee MDS Sciex (US) a division of MDS
Pharma Services (US), Inc.
10. ☒ **37 CFR 3.73(b) Statement** ☒ **Power of Attorney**
(when there is an assignee)
11. ☐ **English Translation Document** (if applicable)
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
☐ Copies of citations attached
13. ☐ **Preliminary Amendment**
14. ☒ **Return Receipt Postcard** (MPEP 503)
(Should be specifically itemized)
15. ☐ **Certified Copy of Priority Document(s)**
(if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i).
Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation	☐ Divisional	☐ Continuation-in-part (CIP)	of prior application No.: _____
Prior application information: _____		Examiner _____	Art Unit: _____

19. CORRESPONDENCE ADDRESS☐ The address associated with Customer Number: _____ OR ☒ Correspondence address below

Name	Kelvan Patrick Howard				
Address	1170 Veteran's Blvd., Suite 200				
City	South San Francisco	State	CA	Zip Code	94080
Country	USA	Telephone	650.635.4386	Email	kelvan.howard@sciex.com
Signature				Date	10/28/05
Name (Print/Type)	Kelvan Patrick Howard			Registration No. (Attorney/Agent)	48,999

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/224,354	09/09/2005	Graham Leith	42US

CONFIRMATION NO. 9529
FORMALITIES
LETTER

Kelvan P. Howard
MDS Sciex (US) a division of
MDS Pharma Services, Inc.
1170 Veteran's Blvd., Suite 200
South San Francisco, CA 94080

Date Mailed: 09/29/2005

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

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

- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
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SUMMARY OF FEES DUE:

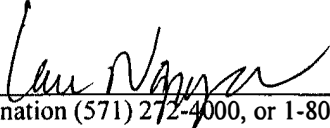
Total additional fee(s) required for this application is **\$130** for a Large Entity

- **\$130** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts

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

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 3 - OFFICE COPY

090905

16138 U.S. PTO

PTO/SB/05 (04-05)

Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

42US

First Inventor

Graham Leith et al.

Title

Impedance Measurement System with...

Express Mail Label No.

62 454500 601

13013 U.S. PTO
1/22/05

090905

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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(Submit an original and a duplicate for fee processing)
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3. ☒ **Specification** [Total Pages _____]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
4. ☒ **Drawing(s)** (35 U.S.C. 113) [Total Sheets _____]
5. **Oath or Declaration** [Total Sheets _____]
 - a. ☐ Newly executed (original or copy)
 - b. ☐ A copy from a prior application (37 CFR 1.63(d))
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 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
name in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).
6. ☒ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or
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☐ Landscape Table on CD
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 - a. ☐ Computer Readable Form (CRF)
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(when there is an assignee)
11. ☐ **English Translation Document** (if applicable)
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
☐ Copies of citations attached
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Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Prior application information: Examiner: _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS

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Signature		Date	09/09/05
Name (Print/Type)	Kelvan Patrick Howard	Registration No. (Attorney/Agent)	48999

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

Complete if Known

Application Number	Not Assigned
Filing Date	Filed Herewith
First Named Inventor	Graham Leith
Examiner Name	Not Assigned
Art Unit	Not Assigned
Attorney Docket No.	42 US

METHOD OF PAYMENT (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☐ Deposit Account Deposit Account Number: 502822 Deposit Account Name: MDS Sciex

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	\$1000.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
28 - 20 or HP =	8	50	400			
HP = highest number of total claims paid for, if greater than 20.						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
2 - 3 or HP =	0					0
HP = highest number of independent claims paid for, if greater than 3.						

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
29 - 100 =	0	/ 50 =	(round up to a whole number) x	0

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SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 48,999	Telephone 650-635-4386
Name (Print/Type)	Kelyan Patrick Howard	Date	09/09/05

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PATENT APPLICATION

**Impedance Measurement System with Incorporated Internal Measurement
Drift Compensation Networks**

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FIELD OF INVENTION

[001] This technology relates to impedance measurement systems for the measurement of the impedance of each well of a microtitre plate.

BACKGROUND OF INVENTION

[002] The present technology is novel in that it provides an impedance measurement system with massive parallelism, high temporal sampling, and a means for interconnecting multiple microtiter plate sensors to impedance measurement channels. The technology also includes a method for internal compensation of impedance measurement drift due to temperature changes or component aging.

SUMMARY OF THE INVENTION

[003] The present technology provides an Impedance Measurement System (ZMS) for measuring the complex impedance of each well of a single well or multiwell microtiter plate. The ZMS utilizes a novel combination of parallel impedance measurement channels and the multiplexing of impedance measurement channels for interconnecting multiple microtiter plate sensors and reference impedance networks to the channels, allowing internal correction of impedance measurement drift, maximized measurement accuracy, and minimized system size. The system is self-contained, thermally controlled, provides well excitation and measurement, and allows the measurement data to be stored or communicated to an external host computer. The system can be used for impedance measurements of varying time periods, single or multiple frequencies, and various measurement rates. Additionally, the ZMS employs parallelism to obtain the required throughput at the repeatability required and

incorporates novel calibration, self-check, and in-run compensation schemes as well as internal temperature control to ensure increased measurement accuracy and stabilization against thermal drift.

BRIEF DESCRIPTION OF DRAWINGS

[004] Fig. 1. ZMS General Structure

Illustration of an embodiment of the Impedance Measurement System overall structure (ZMS).

[005] Fig. 2. Mother board digital circuitry

Illustration of an embodiment of a mother board for the Impedance Measurement System (ZMS).

[006] Fig.3. Daughter board digital circuitry

Illustration of an embodiment of a daughter board for the Impedance Measurement System (ZMS).

[007] Fig. 4. Thermal Control Scheme

Illustration of an embodiment of the thermal control scheme for the Impedance Measurement System (ZMS).

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Structural Components

- [008] In one embodiment of the impedance measurement system, each row of sensors on a microtiter plate is addressed by measurement circuitry (in the form of analog signal conditioning circuits, multiplexing circuits, analog-digital converters, and digital signal processors) on a single daughter board. The interconnection of each sensor from a particular well in a particular row of the microtiter plate to the associated daughter board is made through a Top Contact printed circuit board assembly (PCBA), which carries all sensor signals. Each daughter board has multiplexing circuitry allowing one or more measurement channels to address the sensors for each well in the row.
- [009] In one embodiment, the PCBA is a contact printed circuit board assembly created through the deposition of conductive inks or epoxies to form conductive traces directly on the insulating substrate of the PCBA. Conductive inks containing silver, gold, platinum, and/or carbon particles (such as those from companies such as Dupont and Acheson) are typical of those used for this purpose. Alternate circuit board embodiments utilize PCBAs created through photoengraving (which utilize a photomask and chemical etching to remove the insulator from the substrate) or PCB milling (which utilizes a mechanical milling system to mill away the insulator from the substrate).
- [010] Within the Impedance Measurement System the top contact PCBA lies in a plane parallel to and immediately below the microtiter plate, while the daughter boards are perpendicular to the plane of the microtiter plate. A horizontal mother board is located below the daughter boards.

- [011] A cell plate contact array provides the electrical connection between the top contact PCBA and the microtiter plate via spring loaded pins (Pogo pins TM) located on the contact array which interface with contact pads on the under-side of the microtiter cell plate and the top surface of the PCBA. The contact pads are plated with a conductive metal, such as gold, silver, nickel, tin, or copper.
- [012] The top contact board, provides the connection between the daughter boards and the microtiter plate sensors, as well as acting as a fluid barrier protecting the ZMS system from cell plate spills. The top contact board is sufficiently thick to provide structural support against the contact forces generated by the spring contact pins of the cell plate contact array. In one embodiment, the thickness of the PCBA is in the range of 2mm to 5mm. In another embodiment, the PCBA thickness is in the range of 3mm to 4mm. In yet another embodiment, the PCBA thickness is around 3.2mm. Additionally, the PCBA may contain an electromagnetic compatibility (EMC) screening function and an internal ground plane.
- [013] The top contact PCBA contains current sensing resistors for each sensor. The function of these resistors is to convert the current flowing through each sensor into a voltage for further signal processing. This signal is referred to as the sensor current signal. The top contact board is interfaced to the daughter boards via a “five wire” interface or Kelvin connections, wherein the contracts carrying the sensor voltage and the current signals to reduce measurement errors.

[014] The daughter boards carry the electronic components to drive and process a row of wells. One daughter board is assigned to each row of the microtiter plate. In one embodiment, the top edge of the daughter boards is equipped with a row of well drivers and an interlaced set of multiplexing field effect transistors (or FETs, a type of transistor commonly used for signal switching or amplification) for well selection within a row. Positioning the FETs at the top of the daughter board provides for short and uniform connection paths, with insignificant impedance, to the well electrodes via the top contact and cell plate contact array. Further down the board, a programmable amplifier may be positioned to provide an adjustable gain for the current (I) channel, ensuring that analog to digital conversion is not subject to significant bit loss. A digital-to-analog converter may be used to provide DC offset correction to the current channel to ensure the analog-to-digital converter input is centered on the common mode range. Additionally, the daughter boards may be equipped with multiple analog-to-digital converters (including one for the voltage channel and one for the current channel), digital control circuitry (e.g., digital signal processors, memory devices, field programmable gate arrays, and/or electrically programmable logic devices), and voltage regulation circuitry. In one embodiment, these additional components are arranged below and to the side of the analog sections. The impedance data for a microtiter plate row is processed by a digital signal processor dedicated to each row and located on the daughter boards.

[015] The ZMS may also contain deflector boards for thermal uniformity. The deflector boards ensure that the air flow and local heating environment for the outer ZMS daughter boards is similar to that for the inner boards. In one embodiment, the deflector boards have local heat sources added to assist in the thermal control. In an additional embodiment, the heat source

is located behind the deflector boards on a separate deflector. The deflector boards also provide physical support for the ZMS board stack. The deflector boards have the same connector arrangement as the daughter boards but have additional mounting brackets which are screwed to the deflector boards and mother board (and additionally, may be screwed to the PCBA, or top contact board).

[016] The ZMS daughter boards mate at their lowest edge with the mother board. The mother board accommodates various electrical components and functions, including the digital signal source, excitation low pass filtering, supervisory processing, ROM/RAM, host data communications, and may control enclosure temperature. The mother board processes the impedance measurement data, at a specific time and frequency, of all wells of the microtiter plate and communicates the results to the system controller.

[017] Electrical performance dictates that the daughter board assembly be closely coupled to the top contact board and that the circuitry be kept as tightly arranged as possible. The top contact board must be maintained in an accurate physical relationship with the contact array and is the reference point for the board assembly. The top contact board and the top contact array are aligned by means of locating features to positioning bars on the top plate.

[018] The top contact board is supported peripherally by a top plate. A combined fluid seal and electromagnetic compatibility gasket is used between the board and plate. In one embodiment, the full board stack is suspended from the PCBA board via the deflector boards which provide a mechanical connection between the top contact board and the mother board,

eliminating the need for any mechanical supports from the base or side of the ZMS structure and eliminating the differential thermal expansion problems with board to board connections. The main ZMS chassis is created by a “U” shaped folded outer shell surrounding the thermal control heat exchanger extrusions and providing baffles that control both the internal and external air flow. The top plate, front and rear covers are made of sheet steel in one embodiment. In additional embodiments, these structures can be made from any combination of case, sheet milled steel, aluminum, or stainless steel.

[019] This physical arrangement and electrical configuration maximizes the accuracy of the impedance measurements by minimizing the electrical path length and stray impedances associated with connecting the microtiter plate sensor to the measurement circuit. The minimized path length also optimizes phase and gain tracking, and maximizes the immunity to noise.

[020] The physical configuration minimizes the number of needed mechanical supports and eliminates key thermal expansion problems associated with other designs. The configuration minimizes the size of the Impedance Measurement System thereby allowing more efficient internal packaging and thermal stabilization of the electronic components (due to reduced convection). The minimized path length also optimizes phase and gain tracking, and maximizes the immunity to noise.

[021] In an additional embodiment, each column of sensors, rather than each row of sensors, on a microtiter plate is addressed by measurement circuitry on a single daughter board with the system arrangement of the boards remaining the same.

Functional Elements

[022] For each impedance datum in the domain (characterized by well number, frequency, and time), each well is excited with a sinusoidally-varying voltage wave, and the resultant voltage across and current through the well are measured. At a particular point in time, all wells on the plate are excited by sine waves of the same frequency and phase to minimize well interaction and the risk of intermodulation (the “multiplication” or amplification of one frequency in a nonlinear element of a system by other frequencies transmitted through the system).

Digitally Generated “Sine Wave” Signal Source

[023] The sine wave excitation signal is produced by a high speed direct digital synthesizer located on the mother board. In one embodiment, the synthesizer runs at a clock frequency of 256MHz. Alternate frequencies include any frequency from 50 MHz to 400 MHz, with appropriate filtering and a compatible synthesizer device. At high frequencies, the number of points per cycle is reduced, where the number of points is dictated by the ratio of master clock and drive frequencies; higher clock frequencies are desirable.

Sine Low Pass Filters

[024] The digitally generated sine wave is low pass filtered to reduce the stair step (the sudden increases in amplitude) resulting from time step limiting at high frequencies and any amplitude resolution limiting at lower frequencies. The low pass filtering occurs on the mother board and is accomplished with three filter groups each covering one third (on a log scale) of the frequency range. The choice of filter bank in use at a given point in time is selected by amplifiers with output disable (high impedance, Z) capability. Four cascaded first order stages are used in each filter group. This approach has been selected to provide maximum stability and minimum settling time. Each filter group has less than 6db fall off in output at the high end of its frequency range but provides 40db attenuation for the lowest stair step frequency component in the digitized sine wave, the result being a very clean, and agile sine source.

Well Driver/Buffer Array

[025] The output of the direct digital synthesizer (DDS) filter group is buffered by a driver array. A master buffer drives a set of row drivers (one per Daughter board). The row drivers each drive a set of individual well drivers (sixteen per daughter board). Each well drive is a short circuit proof, low impedance, fixed output, voltage source. This approach isolates each well and permits the drive signal to be closely coupled to the well, thereby avoiding the phase shifts that would be incurred had long drive cables been used. Drive current is limited to 100mA root mean square (RMS). Drive voltage has an upper limit of 2volts peak to peak. Actual well drive will be of the order of 100mV peak to peak to maximize signal levels without introducing significant distortion.

Excitation

[026] Each well is subject to a stepped sweep (a series of single frequency bursts-one burst for each selected frequency). The bursts consist of an integral number of cycles. In one embodiment, the number of cycles is typically 15. The number of cycles for additional embodiments are chosen to be sufficient for well and gain multiplexer switching transients to settle and to obtain the necessary number of sample points. From preliminary modeling and testing, no more than 68.2 ms per well for all frequencies is required to obtain sufficient samples. For an embodiment in which a 96 well plate with 12 wells per row plus four reference network channels, calculations to determine sufficient samples suggest a 1091 mS measurement period, leaving 409 mS for multiplexer switching and signal settling within the target 1.5 second update period.

Programmable Current Gain Stage with offset Adjustment

[027] The programmable current gain stage provides gain in multiples of two from 1 through 64. The gain bandwidth of this stage is matched to the frequency range. Gain selection is via a multiplexer in the feedback path of the cascaded gain stages in the current path. The gain multiplexer is replicated in the voltage path to preserve the optimum phase tracking. Residual phase and gain errors are reduced by linear correction techniques within the digital signal processor from the scan to scan measurements of the reference resistance/capacitance networks. Offset adjustment is accomplished by injecting a current into the stage summing node. This current is produced by a digital to analog converter under software control to ensure the signal presented to the analog to digital converter ADC is centered about the AC common mode voltage. The significance of offset adjustment requirements has been reduced through the adoption of higher current sense “shunt” resistance value.

- [028] The gain/phase and DC offset compensation provides an “adjustment free” design which corrects for component to component variation as well as any drift in components.

High Speed Clipper

- [029] During gain switching and well selection, transients are generated even though zero crossing voltage points are selected. The amplitude of these transients is clipped by high speed limiting amplifiers to ensure the analog to digital converters are not taken outside their linear input limits.

Differential Analog to Digital Converter Drivers

- [030] A buffer/differential driver provides complimentary signals centered about the analog to digital converter common mode voltage.

Analog to Digital Converters

- [031] A high speed, high resolution ADC is used for each of the current and the voltage channels. The ADCs are 14bit, 60Mega Samples per second to provide high speed and accuracy (especially at the lower current values anticipated in some circumstances). To ensure the lowest drift the ADC's will operate at constant high clock rate with excess samples then being discarded by the field programmable gate array FPGA or electrically programmable logic device EPLD. An FPGA or EPLD is used on both mother and daughter boards to perform general housekeeping duties and also specific high speed functions related to excitation frequency generation and data acquisition.

[032] Representative digital circuitry for the mother board and daughter board is shown in Fig. 2 and Fig. 3, respectively

[033] The current through and the voltage across each well is scaled, converted to digital values, and transmitted via the measurement channels to either a storage device or an associated computer. Careful matching of both signal levels and topology of the current and voltage channels ensures excellent phase-tracking especially at high frequencies. On board calibration channels are referenced to minimize residual gain and phase errors.

Data and Control Interface

[034] An embedded instrument control computer is the external interface for data and control for the ZMS. The interface must be able to accommodate an expected data rate of approximately 5000 data points per second. In one embodiment, this serial link is provided by a USB 1.1. The USB would also support a possible interface directly between the ZMS and an external computer. Alternative interfaces include ethernet, USB, RS-485, or Firewire.

Internal Calibration

[035] The ZMS provides for calibration, self-check, in-run compensation, and drift compensation.

[036] Calibration of the unit is performed by measuring precision, calibration resistor networks on a "calibration plate" and correcting the internal reference networks.

[037] Self-checking is performed by exercising the ZMS over a defined frequency set on the internal reference networks and comparing results with the stored factory calibration values. For self-tests, the ZMS performs a stepped sweep on all reference RC networks without any calibration factors applied. The results are compared with a set of values downloaded from the instrument computer. The stored values are established at the time of manufacture. The results returned from the sweep must lie within the bounds set by the stored values. .

[038] In-run auto compensation is performed by including high stability RC networks as reference channels which are treated as an additional well and applying compensation derived from the reference data set to the well data set. For in-run compensation, three precision RC networks are included in the system. In one embodiment, three precision RC networks are included. An alternative embodiment includes four reference networks. Additional embodiments may include any number greater than three. The principal reference network has values set to match the gross characteristics of a well with cells. The other networks have values that provide an impedance characteristic both above and below the primary network to allow checking and compensation for system non-linearity. These networks are also used with the self-checking feature of the ZMS.

[039] Drift compensation is achieved by performing a stepped sweep on the calibration networks and the wells at the start of each run to determine the DC basic offset, gain, and phase correction factors required for each frequency and current gain setting. During the per row scan interval, the ZMS performs a stepped sweep on the reference RC networks. Any changes from the values obtained from the start of run values is used to determine drift

compensation that is applied to the well results. The compensation factors required to bring the calibration networks to their start of run value are applied to the well results, greatly reducing temperature effects and other possible drift effects including aging and component to component variation. The stability and precision over any run is primarily determined by the reference RC networks.

THERMAL CONTROL

- [040] In addition to the temperature compensation provided by the self calibration and in-run calibration networks, the ZMS requires a stable controlled thermal environment. To achieve the desired rate of ZMS accuracy and repeatability, temperature control to within ± 1.5 °C is necessary. In an additional embodiment, the temperature control must be within ± 1.0 °C. In yet a further embodiment, the temperature control must be within ± 0.5 °C.
- [041] The ZMS thermal control system includes a high flow rate, forced air circulation system to provide spatial temperature uniformity ability to remove waste heat generated by ZMS heating to maintain optimum operating temperature temperature monitoring of gross air temperature and gradients a heat exchanger to prevent build-up of contaminants causing surface leakage currents
- [042] The ZMS thermal control system maintains very high linear air velocities over the daughter boards to keep amplifier devices to reasonable temperatures, to reduce noise, and to improve component reliability. The thermal control system achieves this using a two part scheme. A sealed inner air volume around the ZMS circuit boards recirculates air at high speed between

boards and an inner heat exchanger surface. The heat generated is then removed by external fans blowing air at ambient temperature across the outer heat exchanger surface. The control scheme uses coarse control of the external fan speed to compensate for changes in ambient air temperature as an open loop control. Accurate internal air temperature is maintained by adding heat with a heater (or heaters) mounted on the heat exchangers or another internal surface. This is a precise closed loop linear control. The temperature control element for the ZMS may be located either within the ZMS itself or external to the system.

[043] The ZMS thermal control system is displayed in Figure 4.

SUMMARY

[044] While the above is a complete description of possible embodiments of the device, various alternatives, modifications, and equivalents may be used. The above description should be viewed as only expemplary embodiments of the device, the boundaries of which are appropriately defined by the metes and bounds of the following claims.

What is claimed is:

1. An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising sensors in the well bottoms and contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board,

each printed circuit board assembly providing an interconnection means between a sensor associated with a particular well in a particular row and the daughter board associated with the row,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry, the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance drift compensation comprising at least three resistor-capacitor networks.

2. The impedance measurement system of claim 1, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

3. The impedance measurement system of claim 1, wherein the at least one top contact board is a contact printed circuit board assembly.

4. The impedance measurement system of claim 1, wherein the at least one printed top contact board has a thickness above 3mm and less than 4mm.

5. The impedance measurement system of claim 1, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

6. The impedance measurement system of claim 1, wherein the means for thermal control comprises deflector boards and at least one heat source.

7. The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

8. The impedance measurement system of claim 1 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

9. The impedance measurement system of claim 1, wherein the means for system impedance drift compensation comprises four resistor-capacitor networks.

10. The impedance measurement system of claim 9, wherein the three resistor-capacitor networks comprise a reference network with impedance values equivalent to a microtiter well sensor with cells, an R-C network with impedance characteristics above the reference network, and an R-C network with impedance characteristics below the reference network.

11. The impedance measurement system of claim 1 additionally comprising an external interface means for data access and system control.

12. The impedance measurement system of claim 11, wherein the external interface means is an instrument control computer.

13. The impedance measurement system of claim 11, wherein the external interface means is an external storage device.

14. The impedance measurement system of claim 11, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

15. An impedance measurement system for measuring the complex impedance of each well of a microtiter plate, the microtiter plate wells being formed in an array of rows and columns, the microtiter plate having a topside and an underside, the microtiter plate comprising contact pads on the underside of the microtiter plate, the impedance measurement system comprising:

(1) at least one daughter board comprising measurement and multiplexing circuitry, each daughter board being associated with a particular row of wells on the microtiter plate,

the at least one daughter board lying in a plane perpendicular to the plane of the microtiter plate;

(2) at least one top contact board assembly,

each top contact board assembly providing an interconnection means between a sensor associated with a particular well in a particular column and the daughter board associated with the column,

the at least one top contact board lying in a plane which is parallel to the plane of the microtiter plate, above the at least one daughter board, and below the microtiter plate;

(3) a motherboard comprising signal generation and signal processing circuitry,

the mother board lying in a plane which is parallel to the plane of the microtiter plate and below the at least one daughter board

(4) a cell plate contact array providing a means for electrical connection between the at least one printed circuit board assembly and the microtiter plate contact pads;

(5) a means for thermal control; and

(6) a means for system impedance measurement drift compensation comprising at least three resistor-capacitor networks.

16. The impedance measurement system of claim 15, wherein the microtiter plate has 96 wells arranged in an array of 8 rows and 12 columns.

17. The impedance measurement system of claim 15, wherein the at least one top contact board assembly is a contact printed circuit board assembly.

18. The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly has a thickness above 3mm and less than 4mm.

19. The impedance measurement system of claim 15, wherein the at least one printed circuit board assembly interfaces with the at least one daughter board via a 5 wire.

20. The impedance measurement system of claim 15, wherein the means for thermal control comprises deflector boards and at least one heat source.

21. The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.5 °C.

22. The impedance measurement system of claim 15 wherein the means for thermal control is able to control the system temperature to within ± 1.0 °C.

23. The impedance measurement system of claim 15, wherein the means for system impedance measurement drift compensation comprises three resistor-capacitor networks.

24. The impedance measurement system of claim 23, wherein the three resistor-capacitor networks comprise (1) a reference R-C network with impedance values equivalent to a microtiter well with cells, (2) an R-C network with impedance characteristics above the impedance values of the reference R-C network, and (3) an R-C network with impedance characteristics below the impedance values of the reference R-C network.

25. The impedance measurement system of claim 15 additionally comprising an external interface means for data access and system control.

26. The impedance measurement system of claim 25, wherein the external interface means is an instrument control computer.

27. The impedance measurement system of claim 25, wherein the external interface means is an external storage device.

28. The impedance measurement system of claim 25, wherein the external interface means interfaces with the impedance measurement system via a USB serial cable.

Abstract:

[045] The present technology provides an Impedance Measurement System (ZMS) for measuring the complex impedance of each well of a single well or multiwell microtiter plate utilizing a novel combination of parallel impedance measurement channels, multiplexing, and reference impedance networks, allowing internal correction of impedance measurement drift, maximized measurement accuracy, and minimized system size.

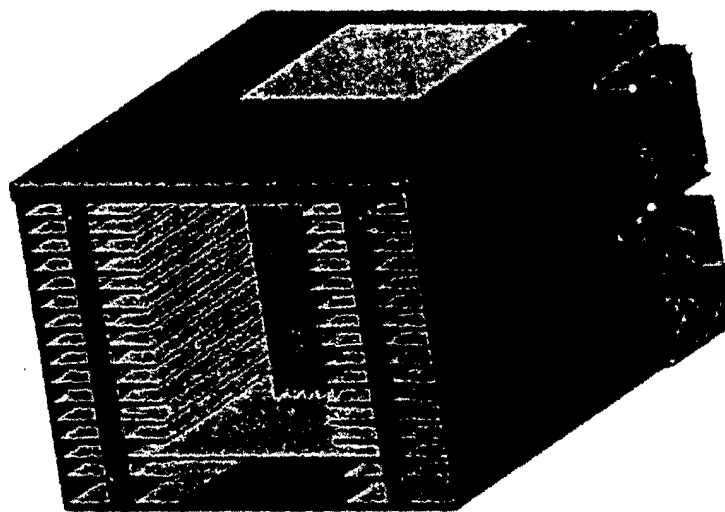


Fig. 1.

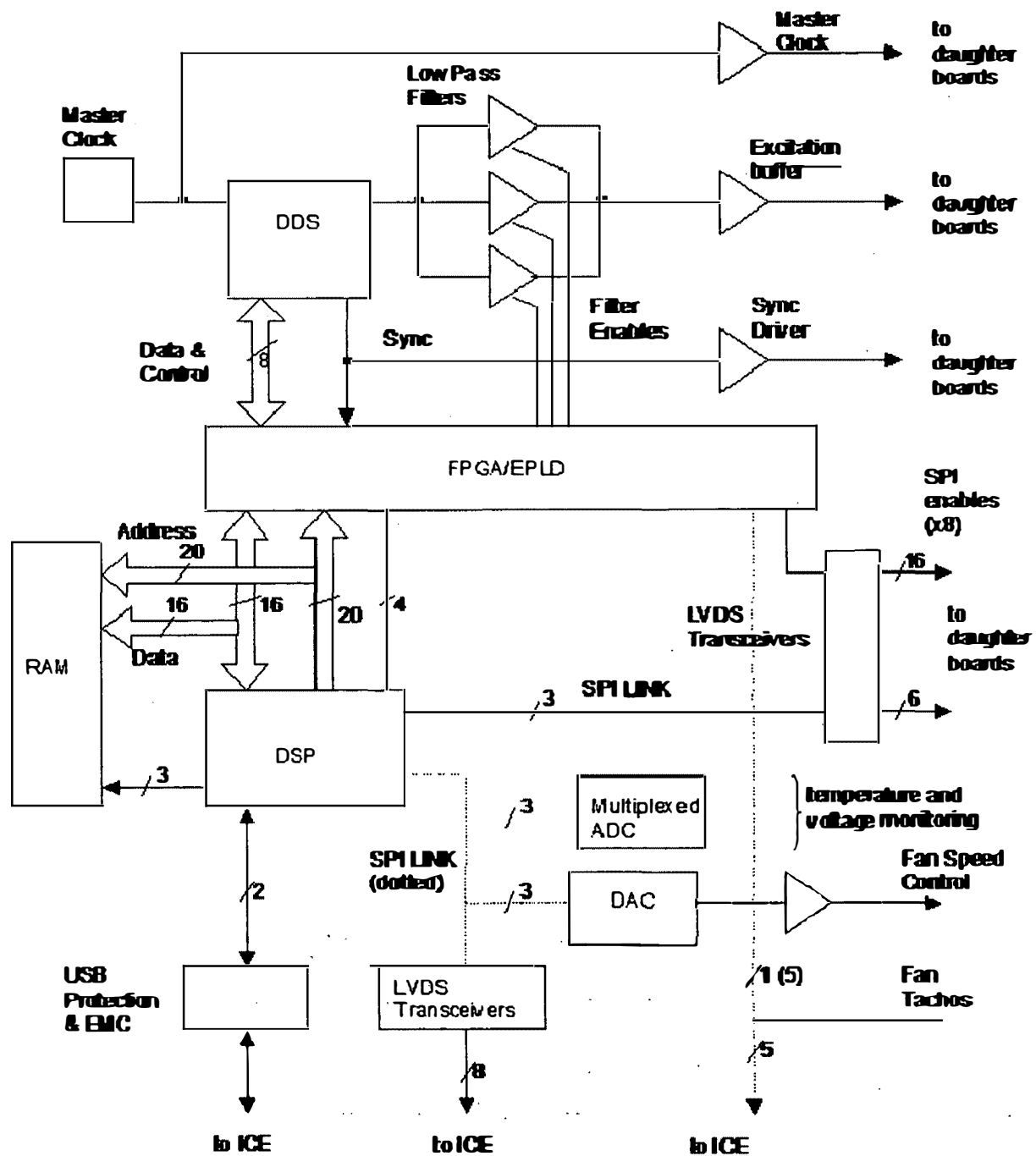


Fig. 2.

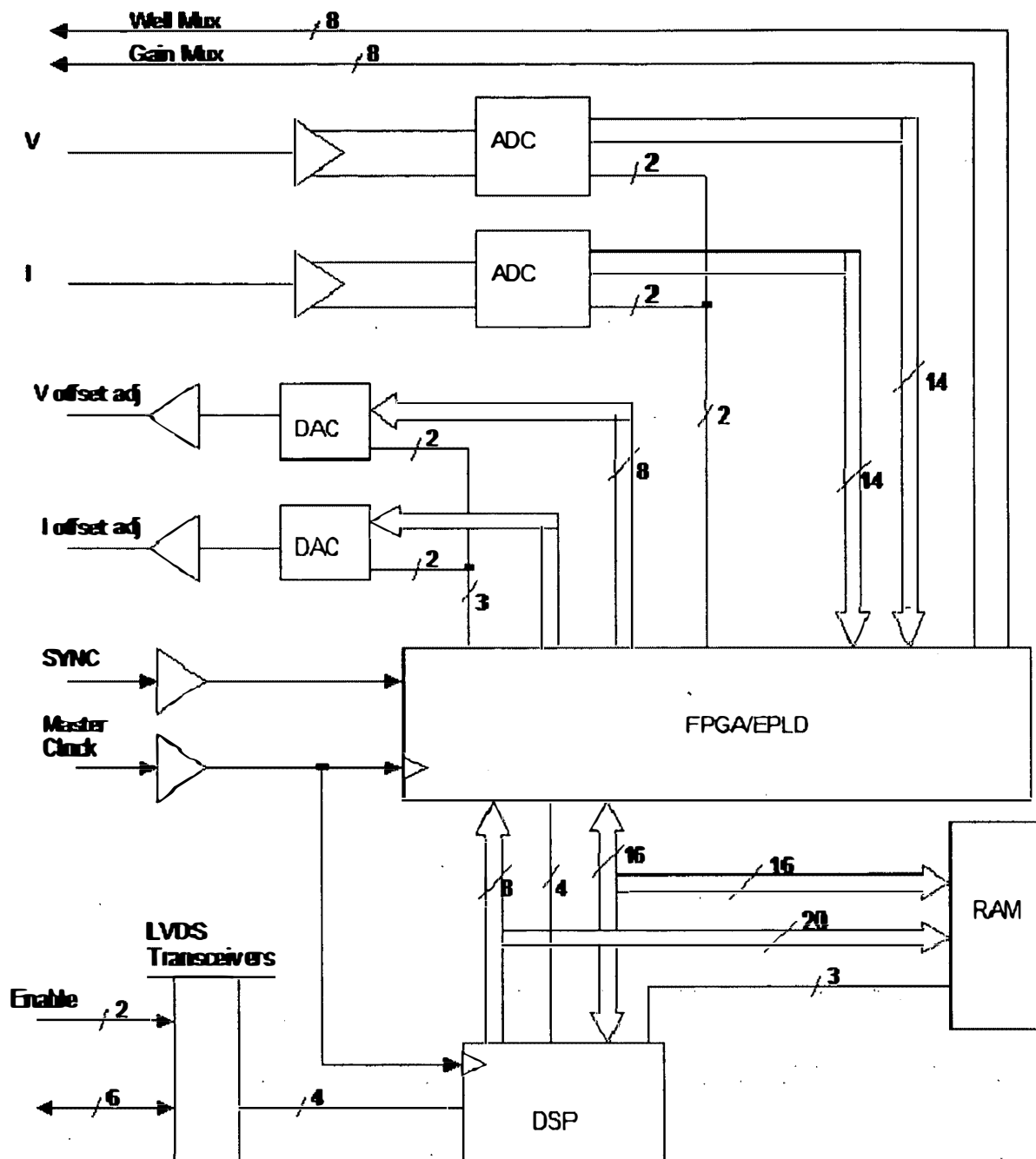


Fig. 3.

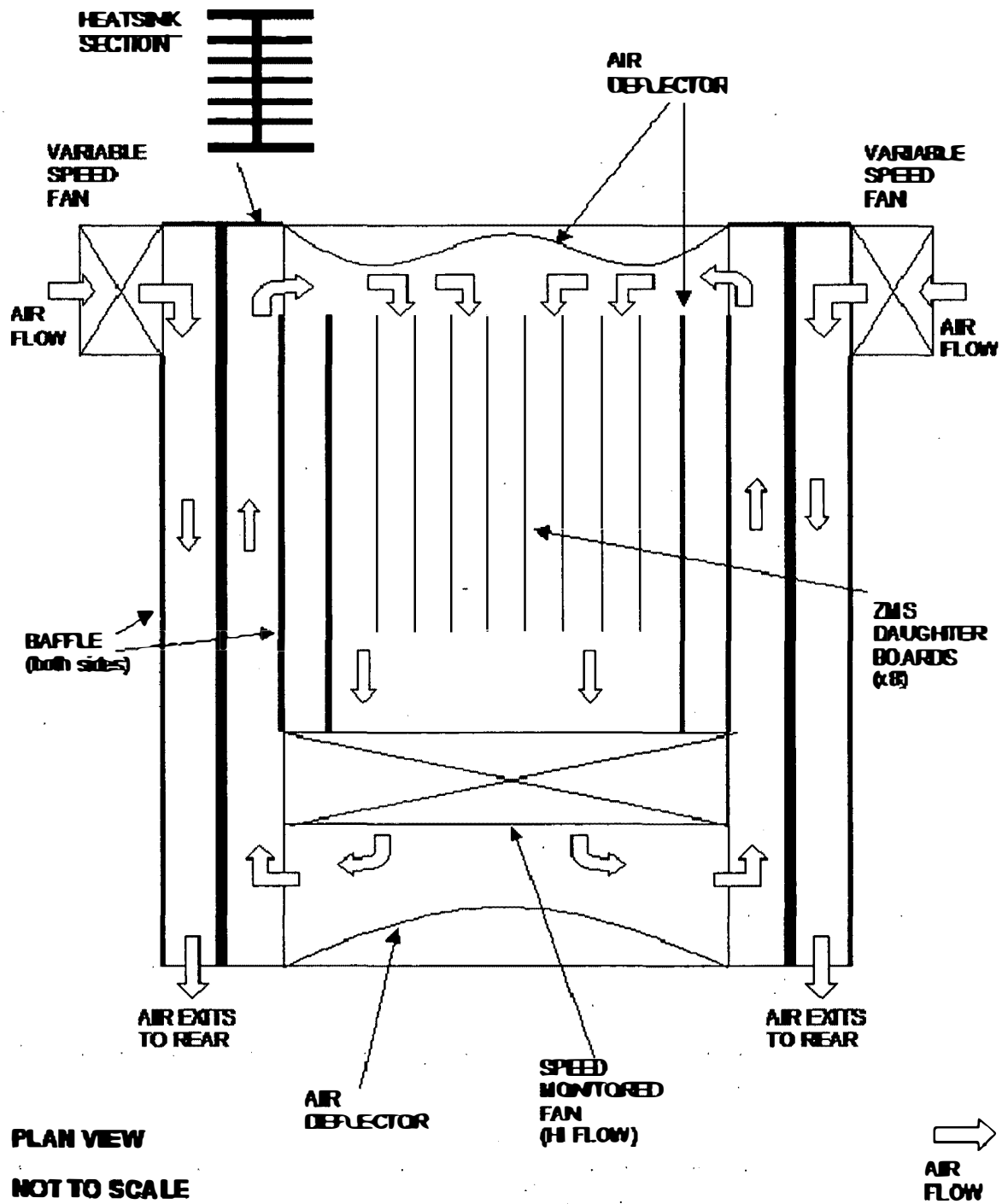


Fig. 4.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875 Effective December 8, 2004

Application or Docket Number

11224354

APPLICATION AS FILED - PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

OTHER THAN SMALL ENTITY

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A
SEARCH FEE (37 CFR 1.16(h), (i), or (m))	N/A	N/A
EXAMINATION FEE (37 CFR 1.16(d), (p), or (q))	N/A	N/A
TOTAL CLAIMS (37 CFR 1.16(i))	28 minus 20 =	8
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	
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))		

RATE (\$)	FEE (\$)
N/A	150.00
N/A	\$250
N/A	\$100
X\$ 25 =	
X100 =	
+180=	
TOTAL	

RATE (\$)	FEE (\$)
N/A	300.00
N/A	\$500
N/A	\$200
X\$50 =	400
X200 =	
+360=	
TOTAL	1400

* 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

OR

OTHER THAN SMALL ENTITY

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	Minus	**	=
Independent (37 CFR 1.16(h))	Minus	***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X\$ 25 =	
X100 =	
+180=	
TOTAL ADD'L FEE	

RATE (\$)	ADDITIONAL FEE (\$)
X\$50 =	
X200 =	
+360=	
TOTAL ADD'L FEE	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	Minus	**	=
Independent (37 CFR 1.16(h))	Minus	***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X\$ 25 =	
X100 =	
+180=	
TOTAL ADD'L FEE	

RATE (\$)	ADDITIONAL FEE (\$)
X\$50 =	
X200 =	
+360=	
TOTAL ADD'L FEE	

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

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

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

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

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

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

PATENT APPLICATION FEE DETERMINATION RECORD						Application or Docket Number			
Substitute for Form PTO-875									
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))	28	minus 20 =	• 8	X =		X 50 =	400		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 =	• 0	X =		X 200 =	0		
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	400		
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	•	Minus	**	X =		X =		
	Independent (37 CFR 1.16(h))	•	Minus	***	X =		X =		
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
	TOTAL ADD'L FEE								
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	•	Minus	**	X =		X =		
	Independent (37 CFR 1.16(h))	•	Minus	***	X =		X =		
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
	TOTAL ADD'L FEE								
* 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.

PATENT APPLICATION SERIAL NO _____

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

09/15/2005 NMOLDGE1 00000001 11224354

01 FC:1011	300.00	OP
02 FC:1111	500.00	OP
03 FC:1311	200.00	OP
04 FC:1202	400.00	OP

PTO-1556
(5/87)

Patent Application Data Entry Format

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State or Province::
Postal or Zip Code::
Citizenship Country::

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Application Information

Title Line One::	Impedance Measurement System with Incorporated
Title Line Two::	Internal Measurement Drift Compensation Networks
Total Drawing Sheets::	4
Formal Drawings?::	Yes
Application Type::	Utility
Docket Number::	42US

Representative Information

Registration Number One::	48,999
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Continuity Information

Prior Foreign Applications

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc.. Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

11224354CA
Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☐

CD(s) containing:

computer program listing

Doc Code: Computer

pages of specification

and/or sequence listing

and/or table

Doc Code: Artifact -

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Bound Document(s)

Doc Code: Artifact Artifact Type Code: B

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Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.

Doc Code: Artifact Artifact Type Code X

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Other, description: _____

Doc Code: Artifact Artifact Type Code: Z