Doc Code: MFEE.C.AD
Document Description: Maintenance Fee Address Change

PTO/AIA/47 (11-21)
Approved for use through 11/30/2024. OMB 0651-0016
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop Maintenance Fee
Director of the United States
Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

-OR-

Fax to:
571-273-6500

INSTRUCTIONS: The issue fee must have been paid for the application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application.

When to check the first box below: If you have a Customer Number to represent the fee address.

When to check the second box below: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

☑ Customer Number: 23399

OR

☐ The attached Request for Customer Number form (PTO/SB/125)

PATENT NUMBER (if known)	APPLICATION NUMBER
7,969,307 8,077,042 9,041,538 9,470,699 10,271,738	

Completed by (check one):

☐ Applicant/Inventor

☑ Attorney or Agent of record 43118 (Reg. No.)

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) is enclosed or was filed on _____ (Date)

/Randall L. Shoemaker/
Signature

Randall L. Shoemaker
Typed or printed name

248-689-3500
Requester's telephone number

May 3, 2022
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. If the assignee is a juristic entity, this form must be signed by a patent practitioner (attorney or agent) of record. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0016. Public burden for this form is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. 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.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects this information under authority of 5 CFR 1.290. The information in this system of records is used to manage all records of applicant including name, citizenship, residence, post office address and other information with respect to inventors and their legal representatives pertaining to the applicant's activities in connection with the invention for which a patent is sought. This information is protected from disclosure to third parties in accordance with the Privacy Act.

However, routine uses of this information may include disclosure to the following: to law enforcement and investigation in the event that the system of records indicates a violation or potential violation of law; to a Federal, state, local, or international agency, in response to its request; to an agency, organization, or individual for the purpose of performing audit or oversight operations as authorized by law; to non-federal personnel under contract to the agency; to a court for adjudication and litigation; to the Department of Justice for Freedom of Information Act (FOIA) assistance; to members of congress working on behalf of an individual; to the Office of Personnel Management (OPM) for personnel research purposes; to National Archives and Records Administration for inspection of records; and to the Office of Management and Budget (OMB)for legislative coordination and clearance. Failure to provide any part of the requested information may result in an inability to process requests for access and information. The applicable Privacy Act System of Records Notice for this information is COMMERCE/PAT-TM-7 Patent Application Files, available at Federal Register / Vol. 78, No. 61 / Friday, March 29, 2013 /Notices 19243. https://www.govinfo.gov/content/pkg/FR-2013-03-29pdf/2013-07341.pdf

Electronic Acknowledgement Receipt

EFS ID:	45629945
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	23399
Filer:	Randall L. Shoemaker/Noelle Schultz
Filer Authorized By:	Randall L. Shoemaker
Attorney Docket Number:	8768-3002-2
Receipt Date:	04-MAY-2022
Filing Date:	08-APR-2005
Time Stamp:	11:02:10
Application Type:	U.S. National Stage under 35 USC 371

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	Maintenance Fee Address Change	3002_Signed_Fee_Address_Change_5_3_2022.PDF	373895 f9fc4d5c37db37d7cf0680b6e87073ef0f8c4935	no	2

Warnings:

Information:	
Total Files Size (in bytes):	373895

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/530,901	04/08/2005	John P. Peeters	8766.3002.002

CONFIRMATION NO. 9490

23399
REISING ETHINGTON P.C.
755 W. BIG BEAVER ROAD
SUITE 1850
TROY, MI 48084

POA ACCEPTANCE LETTER

OC00000132585327

Date Mailed: 03/21/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/18/2022.

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

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

/vostuart/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/530,901	04/08/2005	John P. Peeters	29343-00001

CONFIRMATION NO. 9490

59582
Dickinson Wright PLLC - Troy
2600 West Big Beaver Rd.
Suite 300
Troy, MI 48084-3312

POWER OF ATTORNEY NOTICE

OC000000132585323

Date Mailed: 03/21/2022

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/18/2022.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

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

/vostuart/

PTO/AIA/81A (02-15)
Approved for use through 03/31/2021 OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Patent Number	7,969,307 B2
Issue Date	June 28, 2011
First Named Inventor	John P. Peeters
Title	Diagnostic Radio Frequency Identification Sensors and Applications Thereof
Attorney Docket No	8768.3002.002

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

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 23399

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent 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 patent to:

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

OR

☐ The address associated with the Customer Number identified in the box at right:

OR

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

I am the:

☐ Applicant.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on November 30, 2018.

SIGNATURE of Applicant or Patent Owner

Signature	[signature]	Date	03/13/22
Name	John P. Peeters	Telephone	240-494-2236
Title and Company	MANAGING PARTNER ALTIVERA LLC		

NOTE: Signatures of all the applicants or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of _____ 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 update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 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.

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	45260720
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Randall L. Shoemaker/Diana Castillo
Filer Authorized By:	Randall L. Shoemaker
Attorney Docket Number:	29343-00001
Receipt Date:	18-MAR-2022
Filing Date:	08-APR-2005
Time Stamp:	11:48:58
Application Type:	U.S. National Stage under 35 USC 371

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	Miscellaneous Incoming Letter	8768_3002_002_SIGNED_RevocationPOA.pdf	7859231 f160d4d7ade64f30259d4595d642b5a7292e79ab	no	2

Warnings:

Information:	
Total Files Size (in bytes):	7859231

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/530,901	04/08/2005	John P. Peeters	29343-00001

CONFIRMATION NO. 9490

59582
DICKINSON WRIGHT PLLC
2600 WEST BIG BEAVER ROAD
SUITE 300
TROY, MI 48084-3312

POA ACCEPTANCE LETTER

OC000000104399852

Date Mailed: 12/12/2018

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/30/2018.

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

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

/deelliott/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/530,901	04/08/2005	John P. Peeters	29343-00001

CONFIRMATION NO. 9490

59582
DICKINSON WRIGHT PLLC
2600 WEST BIG BEAVER ROAD
SUITE 300
TROY, MI 48084-3312

POWER OF ATTORNEY NOTICE

OC00000104399692

Date Mailed: 12/12/2018

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/30/2018.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

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

/deelliott/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
10/530,901	04/08/2005	John P. Peeters	29343-00001	76650

Acknowledgement of Change to Small Entity Status

The entity status change request below filed through Private PAIR on 12/03/2018 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant asserting small entity status. See 37 CFR 1.27.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Randall L. Shoemaker/
Name:	Randall L. Shoemaker
Registration Number:	43118

Electronic Acknowledgement Receipt

EFS ID:	34454043
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Randall Lee Shoemaker/Juli Lawrence
Filer Authorized By:	Randall Lee Shoemaker
Attorney Docket Number:	29343-00001
Receipt Date:	30-NOV-2018
Filing Date:	08-APR-2005
Time Stamp:	16:31:44
Application Type:	U.S. National Stage under 35 USC 371

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	Power of Attorney	29343_1_POA.pdf	2531933 108436e9039cd1fed73f26185a626e9b82b30128	no	4

Warnings:

Information:	
Total Files Size (in bytes):	2531933

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 01/31/2018. OMB 0651-0035
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.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	10/530,901
Filing Date	April 8, 2005
First Named Inventor	John P. Peeters
Title	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

SIGNATURE of Applicant or Patent Practitioner

Signature	/Randall L. Shoemaker/	Date (Optional)	November 30, 2018
Name	Randall L. Shoemaker	Registration Number	43,118
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

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

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 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.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0031
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

POWER OF ATTORNEY BY APPLICANT

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

Application Number	Filing Date
15/263,606	September 13, 2016

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

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 59582

OR

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

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

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

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

Altivera LLC

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

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

Signature	[signature]	Date (Optional)	02/14/2017
Name	JOHN P. PEETERS		
Title	GENERAL PARTNER		

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

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Altivera L.L.C.

Application No./Patent No.: 10/530,901 Filed/Issue Date: April 8, 2005

Titled: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Altivera L.L.C., a Corporation

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

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

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.

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

1. From: John P. Peeters To: Altivera L.L.C.

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

   Reel 017904, Frame 0623, or for which a copy thereof is attached.

2. From: John P. Peeters To: Altivera L.L.C.

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

   Reel 017923, Frame 0979, or for which a copy thereof is attached.

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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

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.

4. 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.

5. 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.

6. 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(s).

☑ As required by 37 CFR 3.73(c)(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.

/Randall L. Shoemaker/	November 30, 2018
Signature	Date
Randall L. Shoemaker	43,118
Printed or Typed Name	Title or Registration Number

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.
10/530,901	06/28/2011	7969307	29343-00001	9490

59582 7590 06/08/2011

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

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 72 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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

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

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

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

John P. Peeters, Bethesda, MD;

IR103 (Rev. 10/09)

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Bib Data Sheet

CONFIRMATION NO. 9490

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/530,901	04/08/2005 RULE	340	2612	29343-00001

APPLICANTS

John P. Peeters, Bethesda, MD;

**** CONTINUING DATA ***************************

This application is a 371 of PCT/US05/02171 01/24/2005 which claims benefit of 60/539,419 01/27/2004

**** FOREIGN APPLICATIONS ********************

IF REQUIRED, FOREIGN FILING LICENSE GRANTED
** 09/17/2006

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☐ no	MD	23	64	9
35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance				
Verified and Acknowledged Examiner's Signature Initials				

ADDRESS
59582

TITLE

DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

FILING FEE RECEIVED		
3106	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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

59582 7590 02/17/2011
DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

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.

Mary Ellen Donovan (Depositor's name)
Mary Ellen Donovan (Signature)
May 17, 2011 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

TITLE OF INVENTION: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	05/17/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
MEHMOOD, JENNIFER	2612	340-572100

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 Dickinson Wright PLLC
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Altivera LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Potomac, Maryland

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 May 17, 2011

Typed or printed name Randall L. Shoemaker Registration No. 43,118

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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Abbott
Exhibit 1002
Page 022

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Randall Lee Shoemaker/Mary Ellen Donovan
Attorney Docket Number:	29343-00001

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1510	1510
Publ. Fee- early, voluntary, or normal	1504	1	300	300

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

Electronic Acknowledgement Receipt

EFS ID:	10103935
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Randall Lee Shoemaker/Mary Ellen Donovan
Filer Authorized By:	Randall Lee Shoemaker
Attorney Docket Number:	29343-00001
Receipt Date:	17-MAY-2011
Filing Date:	08-APR-2005
Time Stamp:	09:33:43
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1810
RAM confirmation Number	8354
Deposit Account	041061
Authorized User	SHOEMAKER,RANDALL
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal.pdf	95215 f68a03d73ed8e6086cd8b7294750db7da7b2b6a3	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	32067 d37a98997c5ebc3b47cb4f202c26b4f0b53be79b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	127282		

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.

PTO/SB/08A (04-07)
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OLPE AUG 13 2007 PATENT & TRADEMARK OFFICE

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/530,901
Filing Date	4/08/2005
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	~~Unknown~~ Jennifer Mehmood
Attorney Docket Number	29343-00001

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JM/		US- 3,253,588	05/31/1966	Vuilleumier et al.	
		US- 5,634,468	06/03/1997	Platt et al.	
		US- 6,285,899	09/04/2001	Ghaem et al.	
		US- 6,287,252	09/11/2001	Lugo	
		US- 6,315,719	11/13/2001	Rode et al.	
		US- 2002/0180605 12	~~07/16/~~2002	Ozguz et al.	
		US- 6,428,475	08/06/2002	Shen	
		US- 2003/0187338 10	~~04/18/~~2003	Say et al.	
		US- 6,615,074	09/02/2003	Mickle et al.	
		US- 6,686,843	02/03/2004	Felkowitz	
		US- 7,148,803	12/12/2006	Bandy	
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

Change(s) applied to document,
/G.H./
4/4/2011

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Jennifer Mehmood/	Date Considered	02/19/2008

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 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, 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 (1-800-786-9199) 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

NOTICE OF ALLOWANCE AND FEE(S) DUE

59582 7590 02/17/2011
DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 02/17/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

TITLE OF INVENTION: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	05/17/2011

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.

PTOL-85 (Rev. 02/11)

Abbott
Exhibit 1002
Page 028

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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59582 7590 02/17/2011
DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

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.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

TITLE OF INVENTION: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	05/17/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
MEHMOOD, JENNIFER	2612	340-572100

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

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

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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

❑ A check is enclosed.

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

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

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

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

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Abbott
Exhibit 1002
Page 029

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 02/17/2011

DICKINSON WRIGHT PLLC
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BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 02/17/2011

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 72 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 72 day(s).

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

-- 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 *remarks filed on January 25, 2011*.

2. ☒ The allowed claim(s) is/are *65-74 and 83-93*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson'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 *20110209* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Jennifer Mehmood/
Primary Examiner, Art Unit 2612

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

All Participants:

(1) *JENNIFER MEHMOOD*.

(2) *Thomas E. Donohue*.

Status of Application: *Notice of Allowance*

(3) _____.

(4) _____.

Date of Interview: *9 February 2011*

Time: *2:15pm*

Type of Interview:
☒ Telephonic
☐ Video Conference
☐ Personal (Copy given to: ☐ Applicant ☐ Applicant's representative)

Exhibit Shown or Demonstrated: ☐ Yes ☒ No
If Yes, provide a brief description: .

Part I.

Rejection(s) discussed:
N/A

Claims discussed:
1, 65, 75, 83 AND 90

Prior art documents discussed:
N/A

Part II.

SUBSTANCE OF INTERVIEW DESCRIBING THE GENERAL NATURE OF WHAT WAS DISCUSSED:
Applicant's representative agreed to proposed examiner's amendments in order to place the case in better form for allowance.

Part III.

☒ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview directly resulted in the allowance of the application. The examiner will provide a written summary of the substance of the interview in the Notice of Allowability.
☐ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview did not result in resolution of all issues. A brief summary by the examiner appears in Part II above.

(Applicant/Applicant's Representative Signature – if appropriate)

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Thomas E. Donohue on February 9, 2011.

The application has been amended as follows:

Cancel claims 1, 2, 5, 6, 9, 11, 13, 19, 20, 28-34, 38-64 and 75-82.

For claim 65, (line 23) replace "or to first download" with –and--.

Allowable Subject Matter

2. Claims 65-74 and 83-93 are allowed.

3. The following is an examiner's statement of reasons for allowance:

For claim 65, "wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide."

In addition, on page 25 of the remarks, the Examiner agrees with the Applicant that Evanyk does not teach the claimed limitations wherein the remote server loads

software onto the wireless device relative to a particular sensor ID that was relayed to the server from the wireless device as claimed by the present invention.

For claim 83, "wherein the personal wireless device first checks the unique ID of said wireless skin patch, and if said ID is not recognized then the wireless device retrieves relevant information and software from said remote server via said public wireless network, wherein medical data of said at least one additional sensor are then transferred wirelessly from said diagnostic skin patch to the personal wireless device, and said internal microprocessor of said personal wireless device analyzes said medical condition, then after analization of said medical condition said microprocessor sends said data via an RF transmission via said wireless network."

In addition, on page 30 of the remarks, the Examiner agrees with the Applicant that neither Crowely nor Evanyk contemplate, teach or suggest the claimed limitations wherein the personal wireless device first checks unique ID of the sensor skin patch and retrieves relevant information and software from a remote server.

For claim 90, "wherein the RF addressable skin patch communicates with a wireless device with a unique wireless device ID that is coupled to a communications network linked to at least one remote server; and wherein the wireless device communicates with the RF addressable skin patch to obtain sensor data for transmission over the communications network; wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device said processed information relating to said sensor data; at least one external printable chemical sensor and one external reference

sensor, wherein said patch sensors and said unique sensor tag ID are directly readable with a personal wireless device coupled to a communications network linked to at least one remote server and comprising multiple radios, geolocation means and an interface, and a means to store and relay to said remote server results of said chemical sensors on said patch."

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

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached on M-F from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Benjamin Lee, can be reached at (571) 272.2963. 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).

/Jennifer Mehmood/
Primary Examiner
February 9, 2011

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	7	340/573.1,573.2.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot$4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/02/09 15:39
L2	5	600/300,306,309-367.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot$4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/02/09 15:40
L3	89	340/572.1-572.9.ccls. and ((reference baseline) near4 (level value) near12 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/02/09 15:40
L4	21	3 and @ad<"20040127"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/02/09 15:41

2/9/2011 3:42:24 PM
H:\East\EAST\Workspaces\biosensor RFID.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	**Art Unit**
	JENNIFER MEHMOOD	2612

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
340	572.1	G 0 8 B 13 / 14 (2006.01.01)	
CROSS REFERENCE(S)		G 0 8 B 23 / 00 (2006.01.01)	

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
340	573.1				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17		33		49	1	65		81				
	2		18		34		50	2	66		82				
	3		19		35		51	3	67	11	83				
	4		20		36		52	4	68	12	84				
	5		21		37		53	5	69	13	85				
	6		22		38		54	6	70	14	86				
	7		23		39		55	7	71	15	87				
	8		24		40		56	8	72	16	88				
	9		25		41		57	9	73	17	89				
	10		26		42		58	10	74	18	90				
	11		27		43		59		75	19	91				
	12		28		44		60		76	20	92				
	13		29		45		61		77	21	93				
	14		30		46		62		78						
	15		31		47		63		79						
	16		32		48		64		80						

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/JENNIFER MEHMOOD/ Primary Examiner.Art Unit 2612	2/9/2011	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	65	1

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

SEARCHED			
Class	Subclass	Date	Examiner
340	572.1-572.9, 573.1, 573.2	10/20/2010	JM
600	300,306,309-367	10/20/2010	JM

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	10/20/2010	JM
Updated East Search	2/9/2011	JM

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
340	572.1, 573.1	2/9/2011	JM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

AMENDMENT AND REQUEST FOR RECONSIDERATION

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Non-Final Office Action dated October 25, 2010. The present Amendment is filed within the three months allotted for response. Please charge any fees that may be due to Deposit Account No. 04-1061. Please amend the application as follows:

IN THE CLAIMS:

1. (Previously Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;

a radio frequency identification tag (RFID);

a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;

an autonomous wireless reader with a unique identification code for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network; and

wherein said biological stimulus is radiation.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Cancelled)

4. (Cancelled)

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Cancelled)

8. (Cancelled)

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Cancelled)

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Previously Presented) A system according to claim 1, wherein said RFID tag further includes a power generation module that powers said RFID tag.

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Previously Amended) A system according to claim 1, wherein said network is a wireless network that communicates through the use of a communication protocol selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Currently Amended) A system according to claim [25] 1, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

65. (Previously Presented) A radio frequency (RF) addressable diagnostic sensor unit comprising:

at least one sensor element;

at least one reference sensor element;

a unique identification ID number;

a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;

at least one antenna;

a substrate;

an RF power and communication interface coupled to the at least one antenna and sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface; and

a memory coupled to the controller and the sensor interface;

wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a

unique ID, whereby said wireless device is coupled to at least one communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data or to first download software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

66. (Currently Amended) The system according to claim 65 wherein said ~~personal~~ wireless device is a cell phone.

67. (Previously Presented) The system according to claim 65 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

68. (Previously Presented) The system according to claim 65 wherein said sensor is integrated into a disposable immunoassay.

69. (Previously Presented) The system according to claim 65 wherein said sensor is a chemical sensor.

70. (Previously Presented) The system according to claim 65 wherein said sensor is a radiation sensor.

71. (Previously Presented) The system according to claim 65 wherein said sensor is a MEMS sensor.

72. (Previously Presented) The system according to claim 65 wherein the unit includes a combination of chemical, MEMS and other sensors.

73. (Previously Presented) The system according to claim 65 wherein the system further includes a GPS means for geolocating said system.

74. (Previously Presented) The system according to claim 65 further including a non-GPS geolocation means for geolocating said system.

75. (Previously Presented) A stand-alone wireless diagnostic system comprising:

a non-invasive disposable flexible patch having an adhesive portion and adapted to be positioned on a skin surface of a human subject, said patch having a built-in temperature sensor and means to sense at least one additional medical condition from said human subject;

a radio frequency identification (RFID) chip with a unique ID and sensor module integrated with said patch and having at least one antenna, wherein said RFID chip and sensor module wirelessly transmit, through the use of said antenna, signals that correspond to said medical condition in said subject to a wireless cell phone reader adapted to communicate with

said RFID chip and sensor module, said cell phone reader being adapted to communicate over a wireless network through the use of multiple communication protocols.

76. (Previously Presented) The system in claim 75 wherein the said medical condition is diabetes.

77. (Previously Presented) The system in claim 75 wherein the said medical condition is a skin infection.

78. (Previously Presented) The system in claim 75 wherein the said medical condition is a heart condition.

79. (Previously Presented) The system in claim 75 wherein the said medical condition is a combination of fever and a skin infection.

80. (Previously Presented) The system according to claim 75 wherein said wireless cell phone reader has a unique ID.

81. (Previously Presented) The system according to claim 75 wherein the RF signals from the cell phone include Bluetooth.

82. (Previously Presented) The system according to claim 75 wherein said chip is a Zigbee chip.

83. (Currently Amended) A networkable personal wireless medical management system comprising:

a personal wireless reader device with a sensor module and an internal microprocessor, a wireless RF communication means compatible with a public wireless network, at least one additional reader for communicating with an external wireless device and a geolocation means;

a remote data storage system and server accessible via the public wireless network compatible via at least one protocol means included in said personal wireless device;

a disposable minimally invasive wireless diagnostic skin patch with a unique ID, a temperature sensor, a communications interface and at least one additional sensor to be applied on the surface of the skin to measure a condition in an individual, said at least one additional sensor compatible with at least one of the readers of said personal wireless device;

wherein the personal wireless device first checks the unique ID of said wireless skin patch, and if said ID is not recognized then the wireless device retrieves relevant information and software from said remote server via said public wireless network, wherein medical data of said ~~second~~ at least one additional sensor are then transferred wirelessly from said diagnostic skin patch to the personal wireless device, and ~~the~~ said internal microprocessor of said personal wireless device analyzes said medical condition, then after analization of said medical condition ~~in a second stage~~ said microprocessor sends said data via an RF transmission via said wireless network.

84. (Previously Presented) The system in claim 83 wherein one of the readers of said personal wireless reader device is an RFID radio.

85. (Previously Presented) The system in claim 83 wherein one of the readers of said personal wireless reader device is a Bluetooth radio.

86. (Previously Presented) The system recited in claim 83 wherein the combination of RFID and Bluetooth are used in said personal wireless device for said medical management system.

87. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a cell phone.

88. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a PDA.

89. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a wireless laptop.

90. (Currently Amended) An addressable quantitative passive radio frequency addressable skin patch comprising:

a skin patch having one or more sensor elements ~~at least one sensor~~ with a unique sensor tag ID;

a sensor interface having an analog to digital converter coupled to ~~the~~ said one or more sensor elements;

at least one antenna;

an RF power and communication interface coupled to the at least one antenna and the sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface, said controller receiving sensor data from said at least one sensor and generating processed information therefrom; and

a memory coupled to the controller and the sensor interface, wherein the memory is configured to store a unique tag identification ID number;

wherein the RF addressable skin patch communicates with a wireless device with a unique wireless device ID that is coupled to a communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable skin patch to obtain sensor data for transmission over the communications network;

wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device said processed information relating to said sensor data;

at least one external printable chemical sensor and one external reference sensor, wherein said patch sensors and said unique sensor tag ID are directly readable with a personal wireless device coupled to a communications network linked to at least one remote server and comprising multiple radios, geolocation means and an interface, and a means to store and relay to said remote server results of said chemical sensors on said patch.

91. (Previously Presented) The skin patch according to claim 90 further including a MEMS sensor and a battery.

92. (Previously Presented) The skin patch according to claim 90 further including at least one radiation sensor.

93. (Currently Amended) The skin patch in claim 90 whereby multiple chemical sensors are used to warn ~~the bearer~~ a user of said patch of an impending medical condition.

REMARKS

In the present action, claims 1,2,5,6,9,11,13,19,20,28,29 and 65-93 are pending and presently stand rejected. Claim 29 was objected to for depending on a previously cancelled claim. Claims 66,83,90 and 93 were rejected under 35 USC 112, second paragraph as containing indefinite terminology. Claims 1,2,9,11,13,19,20 and 28 were rejected under 35 USC 103(a) as being unpatentable over Crowely (7,142,114) in view of Nelson Jr (6,297,727), Quinn et al. (2005/0101843) and Evanyk et al. (2004/0225199). Claims 5 and 6 were rejected under 35 USC 103(a) as being unpatentable over Crowely in view of Nelson, Quinn, and Evanyk in further view of Ikefuji (5,774,062). Claim 29 was rejected under 35 USC 103(a) as being unpatentable over Crowely, Nelson Jr., Quinn et al., and Evanyk et al in further view of Zeps et al (6,937,154). Claims 65,69 and 74 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. in view of Jeutter et al. (6,583,722). Claim 66 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. and Jeutter et al. in further view of Zeps et al. Claim 67 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Crowley. Claim 68 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in view of Lye et al (2004/0100376). Claim 70 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Quinn (2005/0101843). Claims 71 and 72 were rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further vie of Anderson (7,026,941). Claim 73 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Ghazarian (7,034,683). Claims 75,77 and 79 were rejected under 35 USC 103(a) as being unpatentable over Crowley in further view of Lu et al (6,172,609), Zeps et al., and Levanon et al (7,652,188). Claims 76 and 78 were rejected under 35 USC 103(a) as being unpatentable over Crowley, Lu et al., Zeps et al., and

Levanon et al, in further view of Evanyk et al. Claims 81 and 82 were rejected under 35 USC 103(a) as being unpatentable over Crowley, Lue et al, Zeps et al., and Levanon et al., in further view of Stilp (7,023,341). Claims 83,84,.88, and 89 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al in further view of Crowely. Claim 87 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al, and Crowley, in further view of Janky et al (6,166,626). Claims 90,92 and 93 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. in further view of Quinn et al, and Jeutter et al. Claim 91 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al, Quinn et al., and Jeutter et al., in further view of Anderson (7,026,941)

Claim 29

Claim 29 was objected to for depending on a previously cancelled claim. Claim 29 has been amended to properly depend on independent claim 1.

Claims 66,83,90 and 83 - 35 USC 112 ,second paragraph

Claims 66,83,90 and 93 were rejected under 35 USC 112, second paragraph as containing indefinite terminology. Claim 66 was amended to remove the insufficient antecedent basis of the "said personal wireless device". Claim 83 was amended to address the antecedent basis for "second sensor", "internal mircroprocessor", and "second stage". Claim 90 was amended to address multiple antecedent term issues. Claim 93 was amended to address issue with "the bearer of said patch" language. Reconsideration is formally requested.

Claims 1,2,9,11,13,19,20 and 28 -- 35 USC 103(a)

Claims 1,2,9,11,13,19,20 and 28 were rejected under 35 USC 103(a) as being unpatentable over Crowely (7,142,114) in view of Nelson Jr (6,297,727), Quinn et al. (2005/0101843) and Evanyk et al. (2004/0225199). The Applicant respectfully traverses the Examiner's rejection and seeks reconsideration in light of the following amendments.

The Applicant respectfully traverses the Examiner's assertions that the Crowley reference discloses an autonomous wireless transmitter as claimed. The Examiner asserts that the interrogator (10) would be considered autonomous because it "is transmitting and responding independently with the transponder (40) without outside control". The Applicant respectfully asserts that this is in error. The term "autonomous" within the Applicant's claims clearly does not refer to the interaction between the receiver and the sensor as by that definition all wireless receivers would be autonomous (and the limitation was added to an already claimed wireless system). Instead, by the industry definition of autonomous the present invention claims a wireless reader that operates without requiring human activation (autonomously). The portable probe assembly described and claimed in Crowley clearly does not teach or suggest such an independently operating reader. Rather Crowely clearly teaches the use of a portable system to be operated by technicians by approaching a patient within a given range. The present invention, however, allows patients to be monitored without direct intervention, for test results to be relayed at any given time when finalized, and for these results to be automatically monitored without outside intervention. This is not taught or suggested by Crowley. Reconsideration is formally requested.

Additionally, the Examiner asserts that Nelson teaches a flexible transponder and therefore it would have been obvious to combine with Crowley to arrive at the claimed flexible

patch. The Applicant respectfully traverses this assertion and seeks reconsideration. The Applicant's claimed patch comprises more than a simply adding a flexible transmitter to the Crowely system. The present invention claims a flexible patch that incorporates both a RFID tag as well as a sensor responding to biological stimulus all within the flexible patch on a patient's skin. The mere mention of a semi-flexible id tag in Nelson would not, even in light of Crowley, suggest the incorporation of a multi-component testing and reporting flexible patch as claimed by the present invention. Reconsideration is formally requested.

The Applicant further asserts that the Quinn reference, while teaching the use of patches to incorporate a sensor for monitoring radiation, fails to assist the claimed autonomous limitation discussed above and purely relies on technician activated monitors. Reconsideration is formally requested.

Finally, while the Evanyk reference may teach the use of remote monitoring of traditional physical system functions, its descriptions are limited to athletic monitoring and the monitoring of patients in hospital or nursing home settings. The present invention, however, claims more than simple biological heart rate, etc. monitoring from remote environments. By monitoring radiation exposure the present invention claims structure and advantages not taught or contemplated by any of the cited references alone or in combination. If police, military, security, or rescue personnel were outfitted with the claimed structure, individual body responses would be registered corresponding to radiation exposure. With multiple sources combined with global positioning of the individuals, location of the radiation source could be quickly and easily identified. This advantage of the present invention is embodied by its autonomous wireless reader monitoring and relaying radiation data from the flexible patch sensor. Reconsideration is formally requested.

Claim 2

The Examiner recites portions of Crowley (Col 5, lines 15-22 and col 6, lines 52-60) in support of assertion that Crowely teaches a substantial portion of the RFID tag and sensor module being integrated into a substrate disc. The Applicant respectfully disagrees as the cited portions merely contemplate integrate of the sensor and fail to discuss integrating the RFID tag into the substrate.

Claim 9

The Applicant traverses the assertion the Crowley teaches or suggests the RFID reader consisting of a cellular telephone or personal digital assistant, beeper etc. as asserted. The cited portions of Crowley merely teach that the reader is a hand held portable device but make no efforts in either the drawings or the description to suggest or imply its integration into any other device. Rather, at all times the portable reader taught by Crowely appears and is discussed as a dedicated device for the single purpose of monitoring the sensor. Reconsideration is requested.

Claim 11

The Applicant believes that the insufficiencies of the rejection of the independent claim upon which claim 11 depends is sufficient to establish its allowability.

Claim 13

The Applicant respectfully asserts that the cited passages of Crowley (Col 5, lines 15-20 and col 6, lines 46-51) do not in fact teach or suggest an RFID tag in combination with a sensor formed as an integrated circuit as asserted by the Examiner. Reconsideration is requested.

Claim 19

The Applicant believes that the insufficiencies of the rejection of the independent claim upon which claim 19 depends is sufficient to establish its allowability.

Claim 20

The Applicant believes that the insufficiencies of the rejection of the independent claim upon which claim 20 depends is sufficient to establish its allowability.

Claim 28

The Applicant respectfully traverses the assertion that it would be obvious to one skilled in the art to use the wireless communication of Evanyk with Crowley to arrive at the claimed limitations. Crowley is directed towards monitoring patient condition within a hospital setting. Evanyk is directed towards monitoring patient general condition remotely. The present invention, however, monitors a biological response to radiation remotely which is not an obvious combination of the cited references, nor would it be suggested by either or both of the two references. Reconsideration is requested.

Claims 5 and 6 -- 35 USC 103(a)

Claims 5 and 6 were rejected under 35 USC 103(a) as being unpatentable over Crowely in view of Nelson, Quinn, and Evanyk in further view of Ikefuji (5,774,062). The Applicant respectfully incorporates by reference the above arguments setting forth the inadequacy of the underlying references to render obvious the claims upon which Applicant's claims 5 and 6 depend. Reconsideration is requested.

Claim 29 - 35 USC 103(a)

Claim 29 was rejected under 35 USC 103(a) as being unpatentable over Crowely, Nelson Jr., Quinn et al., and Evanyk et al in further view of Zeps et al (6,937,154). The Applicant respectfully traverses this rejection and seeks reconsideration. In addition to the aforementioned arguments regarding the underlying references, it should be noted that Zeps teaches the use of a

computer or PDA to be actively used by a user to verify security access including sending an image of the operator for verification. Zeps, in other words, teaches completely away from the claimed autonomous reader integrated into a cell phone. The entire purpose of Zeps is for the active operation of one attempting to get security access not for the autonomous monitoring as claimed by the present invention. The Applicant respectfully asserts that Zeps cannot be combined with the other asserted references to render claim 29 obvious. Reconsideration is formally requested.

Claims 65,69 and 74 -- 35 USC 103(a)

Claims 65,69 and 74 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. in view of Jeutter et al. (6,583,722). The Applicant traverses this rejection and seeks the Examiner's reconsideration. Most notably, the present invention in claim 65 actively recites limitation wherein the remote device communicates the unique sensor ID and unique wireless ID to a remote server which uses this information to send the wireless device the information or software necessary to communicate with the unique sensor ID. This allows the present invention to utilize a wireless device that can be made compatible with a wide plurality of unique sensors by uploading the data or software necessary to interact with them. The cited portions of Evanyk, however, merely recite that software may be located on receiver and that they may be "upgraded or updated". This does not teach the claimed limitations wherein the remote server loads software onto the wireless device relative to a particular sensor id that was relayed to the server from the wireless device as claimed by the present invention. Although the Applicant respectfully disagrees with the assertion that Jeutter teaches a substrate with both sensor and RFID, the Applicant asserts that as Evanyk fails to teach the underlying claimed

limitations of updating software or receiver data based on the transmittal of the sensor id that the combination fails. Reconsideration is formally requested.

Claim 66 - 35 USC 103(a)

Claim 66 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. and Jeutter et al. in further view of Zeps et al. The Applicant traverses this rejection and seeks the Examiner's reconsideration. Most notably, the present invention in claim 66 actively recites limitation wherein the remote device communicates the unique sensor ID and unique wireless ID to a remote server which uses this information to send the wireless device the information or software necessary to communicate with the unique sensor ID. This allows the present invention to utilize a wireless device that can be made compatible with a wide plurality of unique sensors by uploading the data or software necessary to interact with them. The cited portions of Evanyk, however, merely recite that software may be located on receiver and that they may be "upgraded or updated". This does not teach the claimed limitations wherein the remote server loads software onto the wireless device relative to a particular sensor id that was relayed to the server from the wireless device as claimed by the present invention. Although the Applicant respectfully disagrees with the assertion that Jeutter teaches a substrate with both sensor and RFID, the Applicant asserts that as Evanyk fails to teach the underlying claimed limitations of updating software or receiver data based on the transmittal of the sensor id that the combination fails.

Furthermore, the PDA discussed in Zeps fails to teach the advanced monitoring integration into a cell phone. Zeps fails to contemplate or suggest the referencing of a particular sensor ID to a remote server such that the cell phone can be sent the proper software to interact

with that particular sensor. Therefore, the addition of Zeps still fails to teach the underlying limitations of the claimed invention. Reconsideration is formally requested.

Claim 67 - 35 USC 103(a)

Claim 67 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Crowley. The Applicant respectfully incorporates by reference the arguments presented as the underling rejection of independent claim 65 upon which this claim depends. The Applicant asserts that this claim is allowable for at least those reasons.

Claim 68 -- 35 USC 103(a)

Claim 68 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in view of Lye et al (2004/0100376). The Applicant incorporates the objections to the Evanyk and Jeutter combination. In addition, the Applicant notes that the only discussion of immunoassay in Lye refers to test strips requiring "off-line extraction" which points away from their integration into the self sustaining sensor system of the present invention. Reconsideration is formally requested.

Claim 70 -- 35 USC 103(a)

Claim 70 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Quinn (2005/0101843). The Applicant respectfully traverses this rejection and seeks reconsideration. The Applicant respectfully notes that none of the cited references teaches the uploading of software to the wireless device by way of a remote server matching the required information or software to the unique sensor. Additionally, the claimed

interaction of the remote server in combination with radiation sensors provides a unique advantage for in the field anti-terrorism usages that would not be provided by a mere combination of Quinn with the cited reference.

Claims 71 and 72 -- 35 USC 103(a)

Claims 71 and 72 were rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further vie of Anderson (7,026,941). The Applicant respectfully traverses this rejection and seeks the Examiner's reconsideration. Although the Anderson reference describes the usage of a MEMS sensor, the Applicant respectfully asserts that none of the cited references teach or suggest the claimed flexible system of the present invention where the wireless receiver communicates with a remote server such that its communication software or data is modified to correspond to a unique sensor ID of the sensor it is monitoring. In this way the present invention provides a flexible and more universal monitoring system than is contemplated or suggested in any of the cited references either alone or in combination. Reconsideration is requested.

Claim 73 -- 35 USC 103(a)

Claim 73 was rejected under 35 USC 103(a) as being unpatentable over Evanyk and Jeutter in further view of Ghazarian (7,034,683). The Applicant respectfully traverses this rejection and seeks reconsideration. Neither the Ghazarian reference nor the Evanyk reference either alone or in combination teach or suggest the use of GPS in combination with the claimed adaptable receiver that is modified from a remote server such that it can properly receive and transmit data from a variety of different sensors as does the claimed invention. Reconsideration is formally requested.

Claims 75,77, and 79 -- 35 USC 103(a)

Claims 75,77 and 79 were rejected under 35 USC 103(a) as being unpatentable over Crowley in further view of Lu et al (6,172,609), Zeps et al., and Levanon et al (7,652,188). The Applicant respectfully traverses this rejection and seeks reconsideration. The Lu reference merely teaches a receiver with multiple protocols imbedded. The present invention claims much more as it claims a receiver that communicates a sensor unique id to a remote server and then receives information or software downloads to allow it to communicate with that particular unique sensor. The system in Lu still requires the various sensors actually being contemplated at the time of the receiver construction and does not provide the flexibility or benefits of the claimed invention. Furthermore, the Applicant notes that the Zeps reference fails to teach, as argued previously, the use of a cell phone to transmit medical condition through a cell phone over multiple communication protocols. The Zeps reference is a secure login identification system and therefore is not obvious to combine with Crowley and even doing so does not render the claims as a whole obvious. Reconsideration is formally requested.

Claims 76 and 78 -- 35 USC 103(a)

Claims 76 and 78 were rejected under 35 USC 103(a) as being unpatentable over Crowley, Lu et al., Zeps et al., and Levanon et al, in further view of Evanyk et al. The Applicant respectfully asserts that claims 76 and 78 are allowable for at least the same reasons asserted for allowability of independent claim 75 upon which they depend.

Claim 80 -- 35 USC 103(a)

Claim 80 was rejected under 35 USC 103(a) as being unpatentable over Crowley in view of Lue in view of Zeps in view of Levanon in further view of Janky. The Applicant respectfully traverses this rejection and seeks the Examiner's reconsideration. The Applicant respectfully asserts that Crowley does not disclose the use of a cell phone at all not to mention the use of one with a unique id. The Applicant respectfully submits that a patent directed towards hiding a transmitter within a vehicle to communicate with cell phone towers does not combine with Crowley to read on the present invention which comprises an integrated medical communication through a cell phone as claimed. Reconsideration is formally requested.

Claims 81 and 82 -- 35 USC 103(a)

Claims 81 and 82 were rejected under 35 USC 103(a) as being unpatentable over Crowley, Lue et al, Zeps et al., and Levanon et al., in further view of Stilp (7,023,341). The Applicant respectfully asserts that claims 81 and 82 are allowable for at least the same reasons as those stated for independent claim 75 upon which they depend.

Claims 83,84,88 and 89 -- 35 USC 103(a)

Claims 83,84,.88, and 89 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al in further view of Crowely. The Applicant respectfully traverses this rejection and seeks reconsideration. As stated above, neither Crowely nor Evanyk contemplate, teach or suggest the claimed limitations wherein the personal wireless device first checks unique id of the sensor skin patch and retrieves relevant information and software from a remote server. This is

not taught nor suggested by either Evanyk or Crowely. This is definitely not taught in the cited paragraphs 81-83. Reconsideration is formally requested.

Claim 87 -- 35 USC 103(a)

Claim 87 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al, and Crowley, in further view of Janky et al (6,166,626). The rejection is traversed for the same reasons set forth in the response to the rejection of claim 80.

Claim 90,92, and 93

Claims 90,92 and 93 were rejected under 35 USC 103(a) as being unpatentable over Evanyk et al. in further view of Quinn et al, and Jeutter et al. The Applicant respectfully traverses this rejection and seeks reconsideration. The Applicant notes that neither Evanyk, Quinn nor Jeutter teaches the limitation wherein the unique wireless device not only authenticates the unique sensor ID using a remote server but that the remote server then sends the wireless device information relative to the sensor data. As has been argued throughout this response, this flexibility allows the present invention to adapt wireless receivers to accommodate a wide variety of sensors and test strips with a remote flexibility not known in any of the cited art. Reconsideration is formally requested. Additionally, the Applicant respectfully reasserts the argument that Quinn's radiation detection is not properly combinable as previously asserted.

Claim 91 -- 35 USC 103(a)

Claim 91 was rejected under 35 USC 103(a) as being unpatentable over Evanyk et al, Quinn et al., and Jeutter et al., in further view of Anderson (7,026,941). The Applicant

respectfully traverses this rejection and seeks reconsideration. The Applicant notes that claim 91 is allowable for at least the same reasons set forth for the allowability of claim 90 upon which it depends.

The Applicant asserts that claims 1,2,5,6,9,11,13,19,20,28,29 and 65-93 are in condition for allowance and seeks expeditious response. Reconsideration and allowance are respectfully requested.

Respectfully Submitted,

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First Named Inventor/Applicant Name:	John P. Peeters
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	293431Response.pdf	4944220 1af05656a71db31c654b0fd3a7a3557bd281d12a	no	32

Warnings:	
Information:	

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

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

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

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

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/530,901	04/08/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT 01/25/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 72	Minus	** 72	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 11	Minus	***11	= 0	X $110 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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:
/VANESSA BARBER/

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.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 10/25/2010

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EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	**PAPER NUMBER**
2612	

MAIL DATE	DELIVERY MODE
10/25/2010	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

-- 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 *RCEx filed on February 15, 2010*.

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) *1,2,5,6,9,11,13,19,20,28,29 and 65-93* 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) *1, 2, 5, 6, 9, 11, 13, 19, 20, 28, 29, 65-93* is/are rejected.

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

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 15, 2010 has been entered.

Claim Objections

2. Claim 29 is objected to because of the following informalities: the dependency of claim 29 is based on a cancelled claim (claim 25). However, the examiner will assume that the dependency is from claim 1 instead of claim 25. Appropriate correction is required.

Claim Rejections - 35 USC § 112

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

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

4. Claims 66, 83, 90 and 93 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. For claim 90, it is unclear what processed information relating to sensor data (lines 19 and 20). The Applicant is required to specify and/or define the information processed relating to sensor data.

6. Claim 66 recites the limitations "said personal wireless device" in lines 1 and 2.

7. Claim 83 recites the limitations "said second sensor" in line 16, “the internal microprocessor” in line 17 and “a second stage" in line 18 (there is no “first stage” previous to “second stage”).

8. Claim 90 recites the limitations "the one or more sensor elements" in lines 4 and 5; “the RF addressable skin patch” in lines 13 and 16; “said unique wireless device ID” in line 19; “said wireless device processed information” in line 19; “ID” in line 22 (Is this the "unique ID”, the "tag ID”, the "device ID”?); and “said chemical sensors” in line 25.

9. Claim 93 recites the limitation "the bearer of said patch" in line 2.

There is insufficient antecedent basis for these limitations in the claims.

Claim Rejections - 35 USC § 103

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

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

11. Claims 1, 2, 9, 11, 13, 19, 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Nelson, Jr. (US 6,297,727), Quinn et al. (US 2005/0101843 A1) and Evanyk et al. (US 2004/0225199 A1).

For claim 1, Crowley discloses a diagnostics system comprising: a patch having an adhesive portion adapted to stick to the skin of a human subject (col 10, lns 10-20; Fig. 2, item 68); a radio frequency identification tag (RFID) (col 4, lns 14-20; col 7, lns 51-60); and a sensor module integrated with said patch, said patch further having an antenna (Fig. 1, item 42), an RFID chip (col 5, lns 15-17; col 7, lns 61-65), and at least one sensor associated with a unique identification code (col 4, lns 14-20), said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus (col 9, lns 44-56); an autonomous wireless reader with a unique identification code for communication with said RFID tag and sensor module (Fig. 1, item 10; col 4, lns 59-67; col 8, lns 25-49). The interrogator (10) disclosed by Crowley is considered autonomous because it is transmitting and responding independently with the transponder (40) without outside control. While Crowley discloses an adhesive RFID tag attached to the skin of a patient, Crowley does not specifically disclose that the patch is flexible. Nelson, on the other hand, discloses an adhesive, flexible RFID patch (col 4, lns 66-67; col 5, lns 1-5). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to construct the RFID patch, disclosed by Crowley, with a flexible material, as disclosed by Nelson, so that the RFID patch will move freely on a non-planar surface such as a patient's skin (Crowley - col 9, lns 5-10), while providing the patient optimal comfort of having a non-rigid, contoured structure attached to their skin. In addition, Crowley does not disclose that the biological stimulus is radiation. However, Quinn discloses a patch attached to a user that measures radiation (parags

0016 and 0047). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a patch located on a user, as disclosed by Crowley, that measures radiation, as disclosed by Quinn, in order to detect correct dosages of radiation, in order to ensure the correct treatment of a patient. While Crowley discloses an RFID reader, Crowley does not disclose that the reader is adapted to communicate information over a wireless network. Evanyk, on the other hand, discloses an RFID reader adapted to communicate information over a wireless network (parag 0061). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include the RFID reader, disclosed by Crowley, adapted to communicate information over a wireless network, as disclosed by Evanyk, in order to communicate via multiple communication paths so that information from the tag is received at multiple locations, thereby enhancing the versatility of the system.

For claim 2, Crowley discloses a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk (col 5, lns 15-22; col 6, lns 52-60).

For claim 9, Crowley discloses said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer (Figs. 3 and 5, item 10; col 7, lns 30-34; col 8, lns 34-42).

For claim 11, Crowley discloses said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module (col 8, lns 54-65; Fig. 1, items 46 and 50).

For claim 13, Crowley discloses an RFID tag and sensor formed as an integrated circuit (IC – col 5, lns 15-20; col 6, lns 46-51).

For claim 19, Crowley discloses said patch is disposable (col 4, lns 47-51).

For claim 20, Crowley discloses said RFID tag further includes a power generation module that powers said RFID tag (col 8, lns 13-15).

For claim 28, Crowley discloses a wireless network, but does not disclose communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G. However, Evanyk discloses communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G (parags 0025 and 0061). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include communicating information over a wireless network using a communication protocol, as disclosed by Evanyk, in order to communicate via multiple communication paths so that information from the tag is received at multiple locations, thereby enhancing the versatility of the system.

12. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727), Quinn et al. (US 2005/0101843 A1) and Evanyk et al. (US 2004/0225199 A1), and further in view of Ikefuji (US 5,774,062).

For claim 5, Crowley discloses a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module (col 5, lns 33-36 and 55-67; col 6, lns 1-12). Crowley, however, does not include a sensor interface having an analog to digital converter coupled to at least one sensor. Ikefuji, on the other hand, discloses a sensor interface having an analog to digital converter coupled to

at least one sensor (Fig. 1, item 18; Fig. 6, A/D; col 8, lns 10-15). It would have been obvious to include an analog digital converter coupled to the sensor, as disclosed by Ikefuji, and interfaced with the controller of Crowley, so that an abundant amount of information from the sensor is sent back to the interrogator/reader via digital signals so that a diagnosis is made in a timely manner.

For claim 6, Crowley discloses said controller stores a sensor ID number in said sensor data table (col 4, lns 10-20).

13. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727), Quinn et al. (US 2005/0101843 A1) and Evanyk et al. (US 2004/0225199 A1), and further in view of Zeps et al. (US 6,937,154).

For claim 29, Crowley discloses an RFID reader as a mobile, portable device, but does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

14. Claims 65, 69, 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) in view of Jeutter et al. (US 6,583,722 B2).

For claim 65, Evanyk discloses a radio frequency (RF) addressable diagnostic sensor unit comprising: at least one sensor element (parag 0050, lns 1-11); a unique identification ID number (parag 0020; parag 0050, lns 32-35); a sensor interface having an analog to digital converter coupled to the at least one sensor (Fig. 5A, items 76, 78;

parag 0050, lns 6-15); at least one antenna (parag 0067, lns 6-10; Fig. 5B, item 98); an RF power and communication interface coupled to the at least one antenna and sensor interface (parag 0067, lns 3-17; Fig. 5B, item 92); a controller (Fig. 5B, item 87; parag 0066, lns 18-35) coupled to the RF power and communications interface and the sensor interface; and a memory (Fig. 5B, item 88; parag 0067, lns 6-8) coupled to the controller and the sensor interface; wherein the RF addressable sensor communicates with a remote wireless device (parag 0072, lns 10-13), said wireless device having multiple wireless communication means (parag 0061), geolocation means (parags 0014 an d0015) and a unique ID (parag 0072, lns 10-13), whereby said wireless device is coupled to at least one communications network (Fig. 8, item 22) linked to at least one remote server (Fig. 8, item 75; parag 0056); and wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data (parag 0050, lns 33-40; Figs. 1-3, items 12 and 14); wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data (parag 0021, lns 10-20) or to first download software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide (parags 0080-0082). Evanyk does not disclose a substrate and a reference sensor, however, Jeutter, discloses a reference tag sensor located on a substrate (col 4, lns 65-67; col 5, lns 1-5; col 10, lns 8-20). The sensor 26, connected to transponder 28 (Figs. 3A and 4) is considered a reference sensor since it detects a first, dry condition and then detects a second condition (wet condition). It would have been obvious to one of

ordinary skill in the art, at the time the invention was made to include a reference sensor located on a substrate, as disclosed by Jeutter, and use it in lieu of the transponder, disclosed by Evanyk, so that initial (reference) values are sensed in order to determine and notify that a change has occurred for determining an alarm condition.

For claim 69, Evanyk discloses a sensor, but Evanyk does not disclose a chemical sensor. Jeutter, on the other hand, discloses a chemical sensor (col 9, lns 59-65). It would have been obvious to substitute the sensor disclosed by Evanyk for the chemical sensor disclosed by Jeutter, so that the sensor responds to chemical changes, thereby notifying appropriate parties of a chemical change in order to ensure the safety of a patient or monitored person whose body has experienced a chemical change.

For claim 74, Evanyk discloses a non-GPS geolocation means for geolocating said system (parag 0014).

15. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Zeps et al. (US 6,937,154).

Evanyk discloses a (personal) wireless device (parag 0013), but does not disclose that the wireless device is a cellular telephone. Zeps, however, discloses a wireless device as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the personal wireless device, disclosed by Evanyk, as a cellular telephone, as disclosed by Zeps, so that the wireless device is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

16. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Crowley (US 7,142,114).

Evanyk discloses a sensor unit integrated onto a wireless skin patch for diagnostic applications (parag 0018), but Evanyk does not disclose that the patch is disposable. However, Crowley, discloses a disposable, wireless skin patch (col 4, lns 39-51). It would have been obvious to design the wireless skin patch, disclosed by Evanyk, as a disposable skin patch, as disclosed by Crowley, so that the patch is thrown away after use for sanitary reasons.

17. Claim 68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Lye et al. (US 2004/0100376).

Evanyk disclose a wireless sensor tag, but does not disclose a that the sensor is integrated into a immunoassay. Lye, however, discloses a wireless sensor module integrated into a disposable immunoassay (Fig. 3, item 12; parags, 0101, 0164 and 0165). It would have been obvious to include the wireless tag sensor, disclosed by Evanyk, integrated into a disposable immunoassay, as disclosed by Lye, so that particular antigens are detected and communicated to a remote location for pharmaceutical purposes and then the immunoassay is disposed for sanitary purposes.

18. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Quinn et al. (US 2005/0101843 A1).

Evanyk discloses a sensor, but does not disclose a radiation sensor. Quinn, however, discloses a patch attached to a user that measures radiation (parags 0016 and 0047). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a patch located on a user, as disclosed by Evanyk, that measures radiation, as disclosed by Quinn, in order to detect correct dosages of radiation, in order to ensure the correct treatment of a patient.

19. Claims 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Anderson (US 7,026,941 B1).

Evanyk discloses a sensor, but does not disclose a MEMS sensor or a combination of chemical, MEMS and other sensors. Anderson, on the other hand, discloses a combination of chemical, MEMS and other sensors (col 3, lns 14-20). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to replace the sensor, disclosed by Evanyk, with the MEMS device, as disclosed by Anderson, in order to sense variables, such as temperature over a distance and operate on very little power thereby enhancing the efficiency of the transponder.

20. Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Jeutter et al. (US 6,583,722 B2), and further in view of Ghazarian (US 7,034,683).

Evanyk discloses a geolocating means, but does not disclose a GPS means for geolocating. Ghazarian, however, discloses a reader that includes a processor adapted to analyze and geolocate a patch through the use of GPS (Fig. 1A, items 32, 40, and

GPS; col 10, lns 37-50; col 17, lns 49-55). It would have been obvious to incorporate a GPS receiver, as disclosed by Ghazarian, into the tag reader disclosed by Evanyk so that a tag or patch's location is accounted for at all times, such as during inventory control, tracking of individuals, etc..

21. Claims 75, 77 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), and further in view of Lu et al. (US 6,172,609), Zeps et al. (US 6,937,154) and Levanon et al. (US 7,652,188 B2).

For claim 75, Crowley discloses a stand-alone wireless diagnostic system comprising: a non-invasive disposable flexible patch having an adhesive portion and adapted to be positioned on a skin surface of a human subject (col 4, lns 39-51; col 10, lns 10-19 - While Crowley does not specifically disclose the word “flexible”, the patch disclosed by Crowley is inherently flexible since it is removably detached to a user's dermal surface which is contoured), said patch having a built-in temperature sensor (Fig. 1, item 54; col 9, lns 20-23); a radio frequency identification (RFID) chip with a unique ID and sensor module integrated with said patch and having at least one antenna (col 9, lns 20-31), wherein said RFID chip and sensor module wirelessly transmit (col 4, lns 14-18), through the use of said antenna, signals that correspond to said medical condition in said subject to a wireless cell phone reader adapted to communicate with said RFID chip and sensor module. While Crowley discloses a reader for communication with said RFID tag and sensor module adapted to communicate information over a wireless network, Crowley does not disclose that the reader communicates through the use of multiple protocols with the RFID tag. Lu,

however, discloses a multi-protocol wireless RFID reader for communication with a RFID tag (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to modify the reader of Crowley whereby it communicates through the use of multiple protocols (col 1, lns 59-67), as disclosed by Lu, so that a single reader is used to communicate with multiple RFID tags, thereby providing an efficient system. In addition, while Crowley discloses an RFID reader as a mobile, portable device, Crowley does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader is used for multiple purposes such as interrogating transponders and communicating with another during an emergency. Furthermore, Crowley does not disclose sensing at least one additional medical condition from a human subject. Levanon, on the other hand, discloses sensing at least one additional medical condition from a human subject (col 2, lns 10-22). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to sense additional medical conditions from a human subject, as disclosed by Levanon, and apply it to the sensing of the temperature condition, disclosed by Crowley, in order to detect and acknowledge a particular condition, thereby acquiring the appropriate treatment for the condition.

For claim 77, Crowley does not disclose a medical condition; however, Levanon discloses a medical condition to include a skin infection. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to sense a skin condition, as disclosed by Levanon, and sense a skin infection via the sensor, disclosed

by Crowley, in order to detect and acknowledge a skin infection, thereby acquiring the appropriate treatment for the infection.

For claim 79, Crowley does not disclose a medical condition; however, a user of the reader may interpret a temperature reading as a fever (by a user interpreting the temperature reading of the display in Fig. 5; col 11, lns 10-22); however, Crowley does not disclose a combination of a skin infection. However, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 77 as stated above, regarding Levanon detecting a skin infection.

22. Claims 76 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Lu et al. (US 6,172,609) Zeps et al. (US 6,937,154), and Levanon et al. (US 7,652,188 B2), and further in view of Evanyk et al. (US 2004/0225199 A1).

Crowley does not disclose a medical condition; however, Evanyk discloses a medical condition to include diabetes (insulin levels) and a heart condition (heart rate). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to sense insulin levels and heart rate, which may be indications of diabetes and a heart condition, respectively, as disclosed by Evanyk, and sense insulin levels and heart rate via the sensor, disclosed by Crowley, in order to detect and acknowledge insulin levels and heart rate which may indications of diabetes and a heart condition, respectively, in order to ensure the proper treatment of a potentially diabetic person or a person with a heart condition.

23. Claim 80 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Lu et al. (US 6,172,609) Zeps et al. (US 6,937,154) and Levanon et al. (US 7,652,188 B2) and further in view of Janky et al. (US 6,166,626).

Crowley does not disclose a wireless cell phone reader that has a unique ID. Janky, however, discloses a wireless cell phone reader that has a unique ID (col 2, lns 61-67; col 3, lns 1-12). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a wireless cell phone reader that has a unique ID, as disclosed by Janky, into the reader disclosed by Crowley, in order to secure communications between a transmitter/tag and a receiver such as a cellular phone.

24. Claims 81 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Lu et al. (US 6,172,609) Zeps et al. (US 6,937,154) and Levanon et al. (US 7,652,188 B2, and further in view of Stilp (US 7,023,341 B2).

Crowley discloses RF signals, but does not disclose that the RF signals include Bluetooth or Zigbee. Stilp, however, discloses RF signals to include Bluetooth and Zigbee (col 20, lns 45-54). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to RF Bluetooth signals, as disclosed by Stilp, as communication between the transponder and reader, disclosed by Crowley, in order to provide a short range of communication between two devices using well-known standards, thereby enhancing the versatility of the devices.

25. Claims 83, 84, 88 and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and further in view of Crowley (US 7,142,114).

For claim 83, Evanyk discloses a networkable personal wireless medical management system comprising: a personal wireless reader device with a sensor module and an internal microprocessor (Figs. 5A-5C, item 76; parag 0066), a wireless RF communication means compatible with a public wireless network (parag 0061; Fig. 3, item 500, at least one additional reader for communicating with an external wireless device and a geolocation means (Fig. 3, items 14 and 40; parag 0050, lns 32-40); a remote data storage system and server accessible via the public wireless network compatible via at least one protocol means included in said personal wireless device (parag 0061, Fig. 3, item 41; parag 0082); a minimally invasive wireless diagnostic skin patch with a unique ID, a temperature sensor (parag 0066), a communications interface and at least one additional sensor to be applied on the surface of the skin to measure a condition in an individual (parag 0018), said at least one additional sensor (parag 0072) compatible with at least one of the readers of said personal wireless device; wherein the personal wireless device first checks the unique ID of said wireless skin patch (parag 0072), and if said ID is not recognized then the wireless device retrieves relevant information and software from said remote server via said public wireless network, wherein medical data of said second sensor are then transferred wirelessly from said diagnostic skin patch to the personal wireless device, and the internal microprocessor of said personal wireless device analyzes said medical condition, then in a second stage

said microprocessor sends said data via an RF transmission via said wireless network (parags 0081-0083). Evanyk discloses a sensor unit integrated onto a wireless skin patch for diagnostic applications (parag 0018), but Evanyk does not disclose that the patch is disposable. However, Crowley, discloses a disposable, wireless skin patch (col 4, lns 39-51). It would have been obvious to design the wireless skin patch, disclosed by Evanyk, as a disposable skin patch, as disclosed by Crowley, so that the patch is thrown away after use for sanitary reasons.

For claim 84, While Evanyk discloses a transmitter/receiver radio, Evanyk does not specifically disclose that the radio is an RFID radio. However, Crowley, on the other hand, discloses an RFID radio. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to replace the radio disclosed by Evanyk with an RFID radio, disclosed by Crowley, in order to incorporate RFID standards thereby enhancing the versatility of the system.

For claim 88, Evanyk discloses the wireless reader device is a PDA (parag 0027).

For claim 89, Evanyk discloses the wireless reader device is a laptop (parag 0021, lns 1-10).

26. Claims 85 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Crowley (US 7,142,114), and further in view of Stilp (US 7,023,341 B2).

For claim 85, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 81 as stated above.

For claim 86, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 81 as stated above. In addition, while Evanyk discloses a personal wireless device for said medical management system, Evanyk does not disclose a combination of RFID and Bluetooth. However, Stilp discloses a combination of RFID and Bluetooth.

27. Claim 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and Crowley (US 7,142,114), and further in view of Janky et al. (US 6,166,626).

The claim is interpreted and rejected for the same reasons as stated in the rejection of claim 80 as stated above.

28. Claims 90, 92 and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1) and further in view of Quinn et al. (US 2005/0101843 A1) and Jeutter et al. (US 6,583,722 B2).

For claim 90, Evanyk discloses an addressable quantitative radio frequency addressable skin patch comprising: a skin patch having at least one sensor with a unique ID (parags 0019 and 0020); a sensor interface having an analog to digital converter coupled to the one or more sensor elements (parag 0018, lns 13-15); at least one antenna (Fig. 5B, items 91 and 98; parag 0067, lns 3-10); an RF power and communication interface coupled to the at least one antenna and the sensor interface (parag 0067, lns 4-17); a controller (Fig. 5B, item 87; parag 0066, lns 18-35) coupled to the RF power and communications interface and the sensor interface; and a memory (Fig. 5B, item 88; parag 0067, lns 6-8) coupled to the controller and the sensor

interface, wherein the memory is configured to store a unique tag identification ID number (parag 0050, lns 32-40); wherein the RF addressable skin patch communicates with a wireless device with a unique ID that is coupled to a communications network linked to at least one remote server (Figs. 1-3, items 14; Fig. 8, item 75; parag 0056); and wherein the wireless device communicates with the RF addressable skin patch to obtain sensor data for transmission over the communications network (Fig. 8); wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device (parag 0021, lns 10-20) processed information relating to said sensor data; wherein said patch sensors and ID are directly readable with a personal wireless device coupled to a communications network linked to at least one remote server and comprising multiple radios (Fig. 8, items 22, 75; parag 0056), geolocation means and an interface (parag 0014), and a means to store and relay to said remote server results of said chemical sensors on said patch. Evanyk, however, does not disclose that the sensor is passive and has at least at least one external printable chemical sensor and one external reference sensor. Quinn, however, discloses a passive sensor which has an external reference sensor (parag 0048, lns 11-15; parag 0052, lns 12-19). The interrogator 30 is considered an external reference sensor since it stores threshold values (reference values) and determines if the signals received or sensed by the transponder exceed the threshold values. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a passive sensor and an external reference sensor, as disclosed by Quinn, and use the passive sensor in lieu of the transponder disclosed by

Evanyk and the external reference sensor incorporated into the receiver disclosed by Evanyk in order to decrease the size of the transponder device (without having to use a power supply) and provide the receiver with appropriately triggering alarms that exceed threshold values in order to ensure the safety of individuals wearing the tags. In addition, while Evanyk discloses a sensor, Evanyk does not disclose a chemical sensor. Jeutter, on the other hand, discloses a chemical sensor (col 9, lns 59-65). It would have been obvious to substitute the sensor disclosed by Evanyk for the chemical sensor disclosed by Jeutter, so that the sensor responds to chemical changes, thereby notifying appropriate parties of a chemical change in order to ensure the safety of a patient or monitored person whose body has experienced a chemical change.

For claim 92, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above regarding the radiation sensor disclosed by Quinn.

For claim 93, Evanyk does not disclose any chemical sensors, however, Jeutter discloses a single chemical sensor which is used to warn a bearer of said patch of an impending medical condition. While Jeutter only discloses a single chemical sensor, it would have been an obvious design choice to include multiple chemical sensors in order to monitor several locations of a body to determine a chemical change, thereby providing a comprehensive means of monitoring for chemical changes on a body.

29. Claim 91 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanyk et al. (US 2004/0225199 A1), Quinn et al. (US 2005/0101843 A1) and Jeutter et al. (US

6,583,722 B2), and further in view of and further in view of Anderson (US 7,026,941 B1).

Evanyk discloses a skin patch sensor with a battery, but does the skin patch sensor is not a MEMS sensor. Anderson, on the other hand, discloses a MEMS sensor (col 3, lns 14-20). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to replace the sensor, disclosed by Evanyk, with the MEMS sensor, as disclosed by Anderson, in order to sense variables, such as temperature over a distance and operate on very little power thereby enhancing the efficiency of the transponder.

Response to Remarks

30. The Applicant did not present any arguments in the remarks filed on December 15, 2009 and no remarks were filed with the request for continued examination filed on February 15, 2010.

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

DeLuca et al. (US 6,238,338 B1) discloses an adhesive skin patch for monitoring biosignals and assigning ID codes to a skin patch.

Kwoen (US 6,903,658 B2) discloses a cell phone for monitoring parameters of a human and then sending status signals of parameters over a network.

Sakano (US 7,354,195 B2) and Felkowitz disclose a temperature sensor integrated with an adhesive flexible patch.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached 8:00-4:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Benjamin Lee can be reached at (571) 272.2963. The fax phone number for the organization where this application or proceeding is assigned is (571) 273.8300 for regular and after final communications.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272.2600.

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).

/Jennifer Mehmood/
Primary Examiner
October 22, 2010

Notice of References Cited	Application/Control No. 10/530,901	Applicant(s)/Patent Under Reexamination PEETERS, JOHN P.	
	Examiner JENNIFER MEHMOOD	Art Unit 2612	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,354,195	04-2008	Sakano, Motoya	374/208
*	B	US-6,583,722	06-2003	Jeutter et al.	340/573.1
*	C	US-7,652,188	01-2010	Levanon et al.	602/41
*	D	US-6,903,657	06-2005	Kwoen, O Seong	340/573.1
*	E	US-6,166,626	12-2000	Janky et al.	340/426.19
*	F	US-7,023,341	04-2006	Stilp, Louis A.	340/572.1
*	G	US-7,026,941	04-2006	Anderson, John William Crisman	340/573.1
	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					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

SEARCHED			
Class	Subclass	Date	Examiner
340	572.1-572.9	10/20/2010	JM
600	300,306,309-367	10/20/2010	JM

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	10/20/2010	JM

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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CLAIM		DATE								
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	70				✓					
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	72				✓					

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CLAIM		DATE								
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	92				✓					
	93				✓					

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"7023341".pn. and (cell$4 mobile)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 14:22
L2	152	340/572.1-572.9.ccls. and ((cell$4 mobile) near4 phone near7 (reader interrogat$4))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 14:25
L3	77	2 and protocol	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 14:25
L4	2	("20040225199").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/22 14:31
L5	1	"7023341".pn. and (cell$4 mobile)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 15:08
L6	1	4 and laptop	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 15:15
S1	42	"6297727".uref.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 11:41
S2	3	S1 and (authenticat$4 near5 (distance remot$4))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 11:55

S3	4	340/572.8.ccls. and ((tag patch transponder) near7 (skin human body) and remot$4 near7 authenticat $4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:05
S4	4	340/572.8.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot $4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:06
S5	4	340/572.1,572.8.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot$4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:06
S6	7	340/573.1,573.2.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot$4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:07
S7	5	600/300,306,309-367.ccls. and ((tag patch transponder) near7 (skin human diagnos$4 medical body) and remot$4 near7 authenticat$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:11
S8	6	("6238338" | "6471645" | "6659947").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/20 12:14
S9	65	("5168871" | "5464021" | "5483967" | "5564429" | "5634468" | "5678545" | "5791342" | "5862803" | "5879292").PN. OR ("6238338").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/20 12:17
S10	3	340/572.1-572.9.ccls. and (reference near4 (detect $4 sens$4) near50 substrate)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:18
S11	3	340/572.1-572.9.ccls. and ((reference baseline) near4 (detect$4 sens$4) near50 substrate)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:19

S13	186	340/572.1-572.9.ccls. and ((reference baseline) near4 (detect$4 sens$4) and substrate)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:22
S14	65	340/572.1-572.9.ccls. and ((reference baseline) near4 (detect$4 sens$4) same (tag transponder) and substrate)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:23
S15	112	340/572.1-572.9.ccls. and ((reference baseline) near4 (detect$4 sens$4) near12 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:31
S16	86	340/572.1-572.9.ccls. and ((reference baseline) near4 (level value) near12 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:37
S17	21	S16 and @ad<"20040127"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:39
S18	2	S17 and substrate	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:39
S19	683	340/572.8.ccls. and substrate	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 09:47
S20	2	"5864290".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 10:09
S21	1	"5864290".pn. and reference	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 10:10
S22	369	340/572.1-572.9.ccls. and ((reference baseline threshold) near4 (data value) near12 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 10:27

S23	37	340/572.1-572.9.ccls. and ((reference baseline threshold) near4 (data value) near12 (tag transponder) near15 (sensor detector))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 10:28
S24	5	S23 and @ad<"20040127"	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 10:29
S25	2	("20040100376").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/21 11:21
S26	2	S25 and (remov$4 discard $4 dispos$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 11:22
S27	188	340/572.1-572.9.ccls. and mems	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 11:38
S28	2	("20040225199").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/21 13:07
S29	0	S28 and protocol	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 13:08
S30	1	340/572.8.ccls. and ((tag patch transponder) near7 (skin human body) near20 temperature and (cell$4 mobile) near4 phone)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 13:13
S31	2	340/572.1-572.9.ccls. and ((tag patch transponder) near7 (skin human body) near20 temperature and (cell$4 mobile) near4 phone)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 13:14

S32	15	"340".clas. and ((tag patch transponder) near7 (skin human body) near20 temperature and (cell$4 mobile) near4 phone)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 13:15
S33	12	("5559497" | "5873892" | "5912624" | "5914660" | "5938619" | "6218946" | "6377177").PN. OR ("6686843").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 13:23
S34	1	"6937154".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 13:31
S35	1	"7142114".pn. and (id identify$4 identification RFID)	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 13:46
S36	1	"6686843".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 14:00
S37	1	"7652188".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 14:02
S38	0	"7652188".pn. and fever	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 14:31
S39	0	"7652188".pn. and temerature	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 14:31
S40	0	"7652188".pn. and temperature	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 14:31
S41	0	340/572.8.ccls. and (insulin near7 patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:31
S42	2	340/572.8.ccls. and (insulin and patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:32
S43	8	340/572.1-572.9.ccls. and (insulin and patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:32
S44	9	340/572.1-572.9.ccls. and (fever and patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:44

S45	10	340/572.1-572.9.ccls. and (fever)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:46
S46	150	340/572.1-572.9.ccls. and ((patch tag transponder sens$4 detect$4) near7 temperature near4 (exceed$4 beyond above))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/21 14:47
S47	1	"6937154".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 16:40
S49	325	((cell$4 mobile) near3 phone near12 (reader interrogat$4) near25 (ID identification))	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 16:53
S50	97	((cell$4 mobile) near3 phone near12 (reader interrogat$4) near25 (bluetooth))	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/21 17:12
S51	0	"7325132".pn. and zigbee	US-PGPUB; USPAT; USOCR	OR	ON	2010/10/22 09:05
S52	174	340/572.1-572.9.ccls. and zigbee	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 09:05
S53	128	340/572.1-572.9.ccls. and (zigbee same bluetooth)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 09:05
S54	0	("s28andpassiv$4").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/22 10:10
S55	2	("20040225199").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/22 10:13
S56	0	S55 and passiv$4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 10:13

S57	1	S55 and antenna	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 10:14
S58	2	("20050101843").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/22 10:40
S59	2	"6583722".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 10:59
S60	1	S55 and battery	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 11:01
S61	2	"6583722".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 11:07
S64	13	340/572.1-572.9.ccls. and ((multiple many several plurality) near4 chemical near5 (sens$4 detect$4))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/10/22 11:10
S65	2	("20050101843").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/10/22 11:18

10/22/2010 3:55:00 PM
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PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	10530901	Filing Date	2005-04-08	Docket Number (if applicable)	29343-1	Art Unit	2612
First Named Inventor	John P. Peeters			Examiner Name	Jennifer Mehmood		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☐ Enclosed

- ☐ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 041061

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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 contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Robert L. Kelly/	Date (YYYY-MM-DD)	2010-02-15
Name	Robert L. Kelly	Registration Number	31843

This collection of information is required by 37 CFR 1.114. 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.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Karen Hopf
Attorney Docket Number:	29343-00001

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
Total in USD ($)				**810**

Electronic Acknowledgement Receipt

EFS ID:	7011488
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Karen Hopf
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	15-FEB-2010
Filing Date:	08-APR-2005
Time Stamp:	15:53:06
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$810
RAM confirmation Number	11782
Deposit Account	041061
Authorized User	ARTZ,JOHN A.

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

Charge any Additional Fees required under 37 C.F.R. 1.492 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	29343-1-RCE.pdf	797432 d22c793f99135c9e305b32ee10a5d904940af3bd	no	3
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	29935 59ddaadd3ed77289fdd082016ec7f106ec6666dc	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	827367		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/06 (07-06)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/530,901	04/08/2005	

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), (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(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

AMENDMENT 02/15/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)		OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 72	Minus	** 64	= 8	X $26 =	208	OR	X $ =	
Independent (37 CFR 1.16(h))	* 11	Minus	***9	= 2	X $110 =	220	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	428	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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:
/DIANE JOHNSON/

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.

PTO/SB/06 (07-06)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 10/530,901	Filing Date 04/08/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT **02/15/2010**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 72	Minus	** 72	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 11	Minus	***11	= 0	X $110 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	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:
/MARTHA NEWMAN/

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.

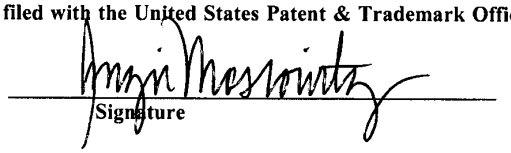
DO NOT ENTER: /JM/
12/29/2009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

December 15, 2009 **Angie Moscowitz**
Date of Deposit


Signature

AMENDMENT AND REQUEST FOR RECONSIDERATION TO FINAL OFFICE ACTION

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Final Office Action dated September 11, 2009. A Petition for Extension of Time (one month) accompanies this paper. Please amend the application as follows:

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 12/31/2009

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
12/31/2009	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.

Advisory Action Before the Filing of an Appeal Brief	Application No. 10/530,901	Applicant(s) PEETERS, JOHN P.	
	Examiner JENNIFER MEHMOOD	Art Unit 2612	

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

THE REPLY FILED 15 December 2009 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☐ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires *3* months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☒ The Notice of Appeal was filed on *15 December 2009*. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: another search is required.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Jennifer Mehmood/
Primary Examiner, Art Unit 2612

Abbott
Exhibit 1002
Page 122

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
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I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

December 15, 2009 **Angie Moscowitz**

Date of Deposit **Signature**

AMENDMENT AND REQUEST FOR RECONSIDERATION TO FINAL OFFICE ACTION

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Final Office Action dated September 11, 2009. A Petition for Extension of Time (one month) accompanies this paper. Please amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;

a radio frequency identification tag (RFID);

a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;

~~a multi-protocol~~ an autonomous wireless reader with a unique identification code for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network ~~through the use of multiple communication protocols~~; and

~~a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor and for wireless retrieval by said wireless reader~~ wherein said biological stimulus is radiation.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Cancelled)

4. (Cancelled)

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Cancelled)

8. (Cancelled)

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Cancelled)

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Previously Presented) A system according to claim 1, wherein said RFID tag further includes a power generation module that powers said RFID tag.

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Currently Amended) A system according to claim [25] 1, wherein said network is a wireless network that communicates through the use of a communication protocol selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Original) A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

65. (New) A radio frequency (RF) addressable diagnostic sensor unit comprising:

at least one sensor element;

at least one reference sensor element;

a unique identification ID number;

a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;

at least one antenna;

a substrate;

an RF power and communication interface coupled to the at least one antenna and sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface; and

a memory coupled to the controller and the sensor interface;

wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data or to first download software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

66. (New) The system according to claim 65 wherein said personal wireless device is a cell phone.

67. (New) The system according to claim 65 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

68. (New) The system according to claim 65 wherein said sensor is integrated into a disposable immunoassay.

69. (New) The system according to claim 65 wherein said sensor is a chemical sensor.

70. (New) The system according to claim 65 wherein said sensor is a radiation sensor.

71. (New) The system according to claim 65 wherein said sensor is a MEMS sensor.

72. (New) The system according to claim 65 wherein the unit includes a combination of chemical, MEMS and other sensors.

73. (New) The system according to claim 65 wherein the system further includes a GPS means for geolocating said system.

74. (New) The system according to claim 65 further including a non-GPS geolocation means for geolocating said system.

75. (New) A stand-alone wireless diagnostic system comprising:

a non-invasive disposable flexible patch having an adhesive portion and adapted to be positioned on a skin surface of a human subject, said patch having a built-in temperature sensor and means to sense at least one additional medical condition from said human subject;

a radio frequency identification (RFID) chip with a unique ID and sensor module integrated with said patch and having at least one antenna, wherein said RFID chip and sensor module wirelessly transmit, through the use of said antenna, signals that correspond to said medical condition in said subject to a wireless cell phone reader adapted to communicate with said RFID chip and sensor module, said cell phone reader being adapted to communicate over a wireless network through the use of multiple communication protocols.

76. (New) The system in claim 75 wherein the said medical condition is diabetes.

77. (New) The system in claim 75 wherein the said medical condition is a skin infection.

78. (New) The system in claim 75 wherein the said medical condition is a heart condition.

79. (New) The system in claim 75 wherein the said medical condition is a combination of fever and a skin infection.

80. (New) The system according to claim 75 wherein said wireless cell phone reader has a unique ID.

81. (New) The system according to claim 75 wherein the RF signals from the cell phone include Bluetooth.

82. (New) The system according to claim 75 wherein said chip is a Zigbee chip.

83. (New) A networkable personal wireless medical management system comprising:

a personal wireless reader device with a sensor module and an internal microprocessor, a wireless RF communication means compatible with a public wireless network, at least one additional reader for communicating with an external wireless device and a geolocation means;

a remote data storage system and server accessible via the public wireless network compatible via at least one protocol means included in said personal wireless device;

a disposable minimally invasive wireless diagnostic skin patch with a unique ID, a temperature sensor, a communications interface and at least one additional sensor to be applied on the surface of the skin to measure a condition in an individual, said at least one additional sensor compatible with at least one of the readers of said personal wireless device;

wherein the personal wireless device first checks the unique ID of said wireless skin patch, and if said ID is not recognized then the wireless device retrieves relevant

information and software from said remote server via said public wireless network, wherein medical data of said second sensor are then transferred wirelessly from said diagnostic skin patch to the personal wireless device, and the internal microprocessor of said personal wireless device analyzes said medical condition, then in a second stage said microprocessor sends said data via an RF transmission via said wireless network.

84. (New) The system in claim 83 wherein one of the readers of said personal wireless reader device is an RFID radio.

85. (New) The system in claim 83 wherein one of the readers of said personal wireless reader device is a Bluetooth radio.

86. (New) The system recited in claim 83 wherein the combination of RFID and Bluetooth are used in said personal wireless device for said medical management system.

87. (New) The system recited in claim 83 wherein the personal wireless reader device is a cell phone.

88. (New) The system recited in claim 83 wherein the personal wireless reader device is a PDA.

89. (New) The system recited in claim 83 wherein the personal wireless reader device is a wireless laptop.

90. (New) An addressable quantitative passive radio frequency addressable skin patch comprising:

a skin patch having at least one sensor with a unique ID;

a sensor interface having an analog to digital converter coupled to the one or more sensor elements;

at least one antenna;

an RF power and communication interface coupled to the at least one antenna and the sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface; and

a memory coupled to the controller and the sensor interface, wherein the memory is configured to store a unique tag identification ID number;

wherein the RF addressable skin patch communicates with a wireless device with a unique ID that is coupled to a communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable skin patch to obtain sensor data for transmission over the communications network;

wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data;

at least one external printable chemical sensor and one external reference sensor, wherein said patch sensors and ID are directly readable with a personal wireless device coupled

to a communications network linked to at least one remote server and comprising multiple radios, geolocation means and an interface, and a means to store and relay to said remote server results of said chemical sensors on said patch.

91. (New) The skin patch according to claim 90 further including a MEMS sensor and a battery.

92. (New) The skin patch according to claim 90 further including at least one radiation sensor.

93. (New) The skin patch in claim 90 whereby multiple chemical sensors are used to warn the bearer of said patch of an impending medical condition.

REMARKS

Applicant has amended the claims to more clearly point out the invention in light of the prior art. In accordance with paragraph [0061] of the specification, Applicant has incorporated the biological stimulus as being radiation from the application entitled "Method And Apparatus For Widespread Surveillance Of A Terrorist Or Personal Threat". Also, Applicant has in paragraph [0041] incorporated by reference the application entitled "Radio Frequency Identification Based (RFID) Sensor Networks." Applicant would be willing to submit a substitute specification with the necessary information incorporated by reference.

A Petition for Extension of Time (one month) accompanies this paper.

Reconsideration and allowance are respectfully requested.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

By: _____
Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant
38525 Woodward Ave., Suite 2000
Bloomfield Hills, MI 48304-2970
(248) 433-7578

Dated: December 15, 2009
BLOOMFIELD 29343-1 1027093

PTO/SB/22 (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT 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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2009** ***(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)***	Docket Number (Optional) 29343-00001
Application Number 10/530,901	Filed April 8, 2005
For Diagnostic Radio Frequency Identification Sensors And Applications Thereof	
Art Unit 2612	Examiner Jennifer Mehmood

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))	$130	$65	$ 130.00
☐	Two months (37 CFR 1.17(a)(2))	$490	$245	$
☐	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
☐	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
☐	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

☐ 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 04-1061.

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 31,843

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Signature	December 15, 2009 Date
Robert L. Kelly Typed or printed name	248-433-7578 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 1 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

December 15, 2009 **Angie Moscowitz** _____
Date of Deposit **Signature**

NOTIFICATION OF CHANGE IN STATUS

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

Dear Sir:

Applicant hereby advises the Commissioner that the owner of the above-captioned patent is not entitled to small entity status and thus, not entitled to pay small entity fees.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

By: _____
Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant
38525 Woodward Ave., Suite 2000
Bloomfield Hills, MI 48304-2970
(248) 433-7578

Dated: December 15, 2009
BLOOMFIELD 29343-1 1029261

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1615	8	52	416
Independent claims in excess of 3	1614	2	220	440
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	130	130
Miscellaneous:				
		Total in USD ($)		**986**

Electronic Acknowledgement Receipt

EFS ID:	6638296
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	15-DEC-2009
Filing Date:	08-APR-2005
Time Stamp:	14:08:15
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$986
RAM confirmation Number	566
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		29343_1FinalAmendment2.pdf	95704 bb2dd19a219475908a07daf4ff07e4bfbb3d107e	yes	19

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment After Final	1	1
Claims	2	18
Applicant Arguments/Remarks Made in an Amendment	19	19

Warnings:					
Information:					
2	Extension of Time	29343_1PetExtTime2.pdf	28823 51fe446cb48073823e34657673b27dec61a33042	no	1
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	29343_1ChangeEntityStatus.pdf	15075 8c392f8c4178c7a5a32689e32dd5fda050910861	no	1
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	33728 d53dc6779bb4c3139fa74374ef1a34833a54fc16	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	173330		

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/SB/31 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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.

NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): 29343-00001

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" [37 CFR 1.8(a)] on December 15 2009

Signature: [signature]

Typed or printed name: Angie Moscowitz

In re Application of: John P. Peeters

Application Number	Filed
10/530,901	April 8, 2005

For: Diagnostic Radio Frequency Identification Sensors And Applications Thereof

Art Unit	Examiner
2612	Jennifer Mehmood

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 540.00

- ☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____
- ☐ 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 No. 04-1061 .
- ☑ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

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 31,843 .
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

[signature]
Signature

Robert L. Kelly
Typed or printed name

248-433-7578
Telephone number

December 15, 2009
Date

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 41.31. 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, 1.14 and 41.6. 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.

PTO/SB/22 (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT 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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2009** ***(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)***	Docket Number (Optional) 29343-00001
Application Number 10/530,901	Filed April 8, 2005
For Diagnostic Radio Frequency Identification Sensors And Applications Thereof	
Art Unit 2612	Examiner Jennifer Mehmood

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))	$130	$65	$ 130.00
☐	Two months (37 CFR 1.17(a)(2))	$490	$245	$
☐	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
☐	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
☐	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

☐ 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 04-1061.

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 31,843

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Signature	December 15, 2009 Date
Robert L. Kelly Typed or printed name	248-433-7578 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 1 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.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Notice of appeal	1401	1	540	540
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	130	130
Miscellaneous:				
		Total in USD ($)		**670**

Electronic Acknowledgement Receipt

EFS ID:	6638368
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	15-DEC-2009
Filing Date:	08-APR-2005
Time Stamp:	14:12:46
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$670
RAM confirmation Number	640
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notice of Appeal Filed	29343_1NoticeofAppeal2.pdf	36129 f44e7216bc055a11bd5b10f3ecf968725fa80305	no	1
Warnings:					
Information:					
2	Extension of Time	29343_1PetExtTime3.pdf	28149 016c65aa3e9abe86cf4de430e31c6f7140ed1834	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32014 989e2a95ce97fc5017ae14351a40c5e5ff9f7c19	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	96292		

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 10/530,901	Filing Date 04/08/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT	12/15/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 72	Minus	** 64	= 8	X $26 =	208	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 11	Minus	***9	= 2	X $110 =	220	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	428	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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:
/KIMBERLY PANNELL/

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
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.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 09/11/2009

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
09/11/2009	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

-- 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 *22 July 2009*.

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) *1-9,11-14,16,18-20,22-25,27 and 28* is/are pending in the application.

4a) Of the above claim(s) *30-34, 38-64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-14,16,18-20,22-25,27 and 28* is/are rejected.

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

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

Claim Rejections - 35 USC § 103

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

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

2. Claims 1-4, 8, 9, 11, 13, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609).

For claim 1, Crowley discloses a diagnostics system comprising: a patch having an adhesive portion adapted to stick to the skin of a human subject (col 10, lns 10-20; Fig. 2, item 68); a radio frequency identification tag (RFID) (col 4, lns 14-20; col 7, lns 51-60); and a sensor module integrated with said patch, said patch further having an antenna (Fig. 1, item 42), an RFID chip (col 5, lns 15-17; col 7, lns 61-65), and at least one sensor associated with a unique identification code (col 4, lns 14-20), said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus (col 9, lns 44-56); a wireless reader for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network (Fig. 1, item 10; col 4, lns 59-67; col 8, lns 25-49); and a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor and for wireless retrieval by said wireless

reader (col 4, lns 7-20). While Crowley discloses an adhesive RFID tag attached to the skin of a patient, Crowley does not specifically disclose that the patch is flexible. Nelson, on the other hand, discloses an adhesive, flexible RFID patch (col 4, lns 66-67; col 5, lns 1-5). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to construct the RFID patch, disclosed by Crowley, with a flexible material, as disclosed by Nelson, so that the RFID patch will move freely on a non-planar surface such as a patient's skin (Crowley - col 9, lns 5-10), while providing the patient optimal comfort of having a non-rigid, contoured structure attached to their skin. While Crowley discloses a reader for communication with said RFID tag and sensor module adapted to communicate information over a wireless network, Crowley does not disclose that the reader communicates through the use of multiple protocols with the RFID tag. Lu, however, discloses a multi-protocol wireless RFID reader for communication with a RFID tag (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to modify the reader of Crowley whereby it communicates through the use of multiple protocols (col 1, lns 59-67), as disclosed by Lu, so that a single reader is used to communicate with multiple RFID tags, thereby providing an efficient system.

For claim 2, Crowley discloses a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk (col 5, lns 15-22; col 6, lns 52-60).

For claim 3, Crowley discloses said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the human skin when said patch is positioned on the human skin (Fig. 2, item 70; col 10, lns 17-27).

For claim 4, Crowley discloses a sensor integrated with a layer that is adapted to react to said stimulus from a surface (i.e. body temperature of a human or animal; col 4, lns 32-67; col 5, lns 15-23). However, Crowley does not disclose that the protective layer is formed of a semi- permeable material. Nelson, on the other hand, discloses said protective layer is formed of a semi-permeable material (col 4, lns 56-67; col 5, lns 1-8). It would have been obvious to substitute a semi-permeable material, as disclosed by Nelson (i.e. fabric), for the protective layer of Crowley, to provide a patient with a breathable, wearable device for optimal comfort.

For claim 8, Crowley discloses stimulus sensing includes sensing at least one electrical, chemical, biological, and physical elements of said surface (col 1, lns 5-11).

For claim 9, Crowley discloses said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer (Figs. 3 and 5, item 10; col 7, lns 30-34; col 8, lns 34-42).

For claim 11, Crowley discloses said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module (col 8, lns 54-65; Fig. 1, items 46 and 50).

For claim 13, Crowley discloses an RFID tag and sensor formed as an integrated circuit (IC – col 5, lns 15-20; col 6, lns 46-51).

For claim 19, Crowley discloses said patch is disposable (col 3, lns 47-51).

For claim 20, Crowley discloses said RFID tag further includes a power generation module that powers said RFID tag (col 8, lns 13-15).

3. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and and further in view of Ikefuji (US 5,774,062).

For claim 5, Crowley discloses a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module (col 5, lns 33-36 and 55-67; col 6, lns 1-12). Crowley, however, does not include a sensor interface having an analog to digital converter coupled to at least one sensor. Ikefuji, on the other hand, discloses a sensor interface having an analog to digital converter coupled to at least one sensor (Fig. 1, item 18; Fig. 6, A/D; col 8, lns 10-15). It would have been obvious to include an analog digital converter coupled to the sensor, as disclosed by Ikefuji, and interfaced with the controller of Crowley, so that an abundant amount of information from the sensor is sent back to the interrogator/reader via digital signals so that a diagnosis is made in a timely manner.

For claim 6, Crowley discloses said controller stores a sensor ID number in said sensor data table (col 4, lns 10-20).

For claim 7, Crowley discloses a temperature sensor communicative with said controller (col 6, lns 18-20).

4. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Valletta (US 6,970,105).

For claim 12, Crowley discloses a patch, but does not disclose a micro knife. Valletta, on the other hand, discloses a micro knife located on a patch adapted to dispense a substance when said patch is pressed on said surface, where said surface is the skin of the person (col 1, lns 43-49; col 3, lns 31-40; Fig. 2, items 13, 18, 29). While Valletta does not specifically disclose that the micro knife (syringe) is used to draw blood from the surface of the skin, the examiner takes official notice that it is well known that the syringe may used to draw blood from the surface of the skin as well as apply a therapy as disclosed by Valletta. Furthermore, it would have been obvious to include the feature of draw blood from a patch worn by a patient, as disclosed by Valletta, and apply it to the patch worn by a patient, disclosed by Crowley, in order to closely monitor blood characteristics of a patient thereby providing the most appropriate treatment.

For claim 16, Crowley does not disclose a cardiac sensor. Valletta, on the other hand, discloses a cardiac sensor (col 1, lns 47-50; col 3, lns 1-5). It would have been obvious to detect cardiac throbs, as disclosed by Valletta, via a patch worn by a patient, disclosed by Crowley, in order to closely monitor the heart rate of a patient to determine exercise limitations of a patient.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Townsend et al. (US 6,529,127).

Crowley discloses an RFID tag, but does not disclose an RFID stress sensor. Townsend, however, discloses RF tag and sensor module includes at least one

attachment point that enables attachment of the RF tag and sensor module to a structural stress, thereby forming a RF stress sensor (col 1, lns 25-47; col 2, lns 50-67; col 4, lns 8-27; Fig. 1, items 20a-20n). It would have been obvious to modify the RFID tag of Crowley to include a structural stress sensor disclosed by Townsend so that the integrity of a structure is maintained and confirmed as safe.

6. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Ghazarian (US 7,034,683).

Crowley discloses an RFID reader which includes a microprocessor adapted to analyze said patch, but Crowley does not disclose geolocating said patch. Ghazarian, however, discloses a reader that includes a processor adapted to analyze and geolocate a patch through the use of GPS (Fig. 1A, items 32, 40, and GPS; col 10, lns 37-50; col 17, lns 49-55). It would have been obvious to incorporate a GPS receiver as disclosed by Ghazarian into the reader disclosed by Crowley so that a tag or patch's location is accounted for at all times, such as during inventory control, tracking of individuals, etc..

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Lye et al. (US 2004/0100376).

Crowley discloses an RFID tag, but does not disclose a RFID sensor module integrated into an immunoassay testing strip. Lye, however, discloses a RFID sensor module integrated into an immunoassay testing strip (Fig. 3, item 12; parags 0164 and

0165). It would have been obvious to include the RFID tag sensor module, disclosed by Crowley, integrated into an immunoassay testing strip, as disclosed by Lye, so that particular antigens are detected and communicated to a remote location for pharmaceutical purposes.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Valletta (US 6,970,105) and Lye et al. (US 2004/0100376).

Crowley discloses a patch with a substrate, but does not disclose said patch having a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area. Valetta discloses a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture data that flow through said testing area. While Valletta discloses capturing data that flow through said testing area, Valletta does not disclose that antigens flow through said testing area. Lye, however, discloses capturing data pertaining to antigens flowing through said testing area (parags. 0148, 0159, 0164, and 0165). It would have been obvious to modify the patch disclosed by Crowley with capturing data with an input port disclosed by Valletta, specifically focusing on capturing data pertaining to antigens disclosed by Lye so that data of a patient is captured and stored for future reference, such as data deviating from a predetermined range.

9. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Lu et al. (US 6,172,609).

For claim 25, Crowley discloses a human diagnostics system comprising: a patch having an RFID tag and sensor module (col 1, lns 6-11; col 6, lns 38-51), and adapted to be attached to the surface of the skin and adapted to sense at least one predetermined biological condition through the skin and transmit signals corresponding to at least one predetermined biological condition (col 4, lns 36-50); a RFID reader communicative with said patch through the use of a network (col 10, lns 37-40) to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch (col 8, lns 34-41; Fig. 1, items 10, 18, and 22); a remote storage and data unit communicative wirelessly with said RFID reader over said network (Figs. 1 and 5, item 10), said remote storage and data unit analyzing and storing biological data from said patch and said RFID (col 7, ln 15) tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and said remote storage and data unit further having a remote database containing information adapted to be wirelessly downloaded to said RFID reader for reading and interpreting said sensor (single reader for plurality of measurements/sensor tags downloaded to a database located on the reader – col 4, lns 7-20; col 8, lns 34-42; col 10, lns 28-40). Crowley, however, does not disclose a RFID reader communicating to a tag through the use of multiple protocols. Lu, on the other hand, discloses a RFID reader communicating to a tag through the use of multiple protocols (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to

communicate through the use of multiple protocols with a RFID tag so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 26, Crowley discloses a remote wireless device (Fig. 5, item 10) adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module (col 7, lns 21-37; col 8, lns 34-49).

For claim 27, Crowley discloses said predetermined elements include one or more electrical, chemical, biological, and physical element of a person (col 1, lns 5-11).

10. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Zeps et al. (US 6,937,154).

For claim 28, Crowley discloses a wireless network, but does not disclose communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G. However, Zeps discloses communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G (Fig. 1; col 9, lns 30-67; col 10, lns 33-42). It would have been obvious to communicate through the use of a communication protocol so that numerous equipment communicates with one another via a standardized communication channel.

For claim 29, Crowley discloses an RFID reader as a mobile, portable device, but does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader

is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

Response to Remarks

11. Applicant's arguments filed July 22, 2009 have been fully considered but they are not persuasive.

The Applicant argues as follows:

On page 14, the Applicant contends that Crowley cannot transmit information wirelessly with a remote database other than the RFID tag and that Crowley does not even mention the possibility of using a network for wirelessly transmitting and receiving information by the reader.

The Examiner responds by first alluding to the claim language (for claim 1 – also applicable to claim 25) “a diagnostic system comprising:… “a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor and for wireless retrieval by said wireless reader”. The remote database is in reference to a network wherein information (ID, sensor data) is retrieved wirelessly by the reader. Based on the Applicant's remarks, the Applicant is interpreting that the remote database is in reference to some other database separate from the reader/tag sensor system, however, the claim limitations are not so narrow and disclose no such thing. Therefore, the Examiner is interpreting the memory located within the tag sensor as the remote database (col 6, lns 52-67) since the reader extracts sensor information and ID from the tag’s database for wireless

retrieval by the wireless reader. In addition, the reader can also be considered a remote database since the database is remote from the tag sensor and the reader's memory stores and compares data from either one or multiple tag sensors. Furthermore, the disclosure of Crowley is establishing a network (col 8, lns 25-32) by reading tags located on multiple patients (col 5, lns 37-45 and 56-65) and then downloading the information from the tags to a second computer database (col 4, lns 7-11).

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). See MPEP § 706.07(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached on M-F from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Toan Pham, can be reached at (571) 272.2967. 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).

/Jennifer Mehmood/
Primary Examiner
September 9, 2009

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/24/2008	03/20/2009	09/09/2009						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	✓	✓	✓						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	-	-						
	11	✓	✓	✓						
	12	✓	✓	✓						
	13	✓	✓	✓						
	14	✓	✓	✓						
	15	✓	-	-						
	16	✓	✓	✓						
	17	✓	-	-						
	18	✓	✓	✓						
	19	✓	✓	✓						
	20	✓	✓	✓						
	21	-	-	-						
	22	✓	✓	✓						
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	26	✓	✓	-						
	27	✓	✓	✓						
	28	✓	✓	✓						
	29	✓	✓	✓						
	30	N	N	N						
	31	N	N	N						
	32	N	N	N						
	33	N	N	N						
	34	N	N	N						
	35	-	-	-						
	36	-	-	-						

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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/24/2008	03/20/2009	09/09/2009						
	37	-	-	-						
	38	N	N	N						
	39	N	N	N						
	40	N	N	N						
	41	N	N	N						
	42	N	N	N						
	43	N	N	N						
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	57	N	N	N						
	58	N	N	N						
	59	N	N	N						
	60	N	N	N						
	61	N	N	N						
	62	N	N	N						
	63	N	N	N						
	64	N	N	N						

Abbott
Exhibit 1002
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

July 22, 2009 **Angie Moscowitz** **Signature**
Date of Deposit

AMENDMENT AND REQUEST FOR RECONSIDERATION TO NON-FINAL OFFICE ACTION

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Non-Final Office Action dated March 24, 2009. This response is being submitted with a Petition for Extension of Time (1 month). Please amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;

a radio frequency identification tag (RFID);

a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;

a multi-protocol wireless reader for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network through the use of multiple communication protocols; and

a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor and for wireless retrieval by said wireless reader.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Currently Amended) A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the ~~surface~~ human skin when said patch is positioned on the ~~surface~~ human skin.

4. (Original) A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Original) A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. (Previously Presented) A system according to claim 1, wherein responding to said stimulus includes sensing at least one electrical, chemical, biological, or physical elements of said surface.

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Original) A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Original) A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. (Cancelled)

16. (Original) A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. (Cancelled)

18. (Original) A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Currently Amended) A system according to claim 1, wherein said RFID ~~sensor~~ tag further includes a power generation module that powers said RFID ~~sensor~~ tag.

21. (Cancelled)

22. (Original) A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. (Original) A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. (Original) A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. (Currently Amended) A human diagnostics system comprising:

a patch having an RFID tag and sensor module, and adapted to be attached to the surface of the skin and adapted to sense at least one predetermined biological condition through the skin and transmit signals corresponding to said at least one predetermined biological condition;

a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch through the use of multiple communication protocols;

a remote storage and data unit communicative wirelessly with said RFID reader over said network, said remote storage and data unit analyzing and storing biological data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and

said remote storage and data unit further having a remote database containing information adapted to be wirelessly downloaded to said RFID reader for reading and interpreting said sensor.

26. (Cancelled)

27. (Previously Presented) A system according to claim 25, wherein said predetermined elements include one or more electrical, chemical, biological, and physical element of a person.

28. (Previously Presented) A system according to claim 25, wherein said network is a wireless network that communicates through the use of a communication protocol selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Original) A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFLD reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

REMARKS

Applicant would like to thank the Examiner for the Office Action of March 24, 2009. The claims all stand rejected over various combinations of prior art. Applicant respectfully traverses the rejections.

In the Office Action, the Examiner makes the statement:

> "said RFID reader being adapted to communicate information over a wireless network (Fig. 1, item 10; col 4, lns 59-67; col 8, lns 34-49); and a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor (col 4, lns 7-20)."

However, upon careful examination, the Crowley device does not and cannot transmit information wirelessly with a remote database other than the RFID tag. The "memory" in Figure 10 on provides:

> "For example, the memory may include algorithms, R-C time profiles or resistance values that correspond to known temperature data associated with the temperature sensing means 54 the transponder sensor 40."

[Co. 10, lns. 2-6].

Crowley does not even mention the possibility of using a network for wirelessly transmitting and receiving information by the reader. Applicant does not agree with the examiner that Crowley describes a wireless networkable device beyond the communication part to the RFID sensor. The Crowley application appears to describe essentially a wireless logger with a download port and a wireless reader probe. There is **no** disclosure in the Crowley application that there is any on-the-fly wireless communication of the sensor data to a remote database. If there were, then that would be shown in Figs. 1, 5 or 8. Crowley says specifically in Col 4, Ins 7-14, "Furthermore, such temperatures may be stored in a memory contained within the portable probe such that they may be **later** recorded and/or downloaded to a computer

database." This is repeated in Col 10, Lns 32-40, and again in Claim 30. The patent also discloses that the reader 10 has "an input/output port (not shown) such that after a plurality of measurements are made (e.g. for a plurality of patients) such measurements may be downloaded into a database" (Col 10 Ins 37-40).

This is also true with the Nelson and Lu references. In Figure 4 of Lu, there is shown a serial I/O port at reference numeral 98. Similarly, there is no disclosure in Nelson of any wireless transmitting connection with a remote database.

Having misread the Crowley reference, the Examiner similarly cannot make a case of obviousness based on these leading three references.

Reconsideration and allowance are respectfully requested. A Petition for Extension of Time (1 month) accompanies this paper.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

By: _____
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Attorney for Applicant
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(248) 433-7578

Dated: July 22, 2009
BLOOMFIELD 29343-1 1001694v1

PTO/SB/22 (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2009** ***(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)***	Docket Number (Optional) 29343-00001
Application Number 10/530,901	Filed April 8, 2005
For Diagnostic Radio Frequency Identification Sensors And Applications Thereof	
Art Unit 2612	Examiner Jennifer Mehmood

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))	$130	$65	$ 65.00
☐ Two months (37 CFR 1.17(a)(2))	$490	$245	$
☐ Three months (37 CFR 1.17(a)(3))	$1110	$555	$
☐ Four months (37 CFR 1.17(a)(4))	$1730	$865	$
☐ Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

☑ 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 04-1061.

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 31,843

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Signature

July 21, 2009
Date

Robert L. Kelly
Typed or printed name

248-433-7578
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 1 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.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Small Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**65**

Electronic Acknowledgement Receipt

EFS ID:	5746438
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	22-JUL-2009
Filing Date:	08-APR-2005
Time Stamp:	12:37:13
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$65
RAM confirmation Number	7957
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		29343_1Amendment.pdf	82501 eeef80b28c0e3c34fbbcf4d6dde623e1ef6f1222	yes	15
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	13	
	Applicant Arguments/Remarks Made in an Amendment		14	15	
Warnings:					
Information:					
2	Extension of Time	29343_1PetExtTime.pdf	28337 5719e236248145df45027e90c3a86f3cbfb8150d	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30395 9e38fcc9bd878873ba010c0fdd4087c80d5e24d2	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	141233		

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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/530,901	04/08/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT 07/22/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 56	Minus	** 64	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 8	Minus	***9	= 0	X $110 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	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:
/DENISE HOPKINS/

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.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 03/24/2009

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
03/24/2009	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

-- 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 *27 February 2009*.

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) *1-14,16,18-20,22-34 and 38-64* is/are pending in the application.

4a) Of the above claim(s) *30-34, 38-64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16,18-20 and 22-29* is/are rejected.

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

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/9/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 27, 2009 has been entered.

Claim Rejections - 35 USC § 112

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

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

3. Claims 3 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 3 recites the limitation "the surface" in line 3.

5. Claim 20 recites the limitation "the RFID sensor" in lines 1 and 2.

There is insufficient antecedent basis for these limitations in the claims.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-4, 8, 9, 11, 13, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609).

For claim 1, Crowley discloses a diagnostics system comprising: a patch having an adhesive portion adapted to stick to the skin of a human subject (col 10, lns 10-20; Fig. 2, item 68); a radio frequency identification tag (RFID) (col 4, lns 14-20; col 7, lns 51-60); and a sensor module integrated with said patch, said patch further having an antenna (Fig. 1, item 42), an RFID chip (col 5, lns 15-17; col 7, lns 61-65), and at least one sensor associated with a unique identification code (col 4, lns 14-20), said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus (col 9, lns 44-56); a wireless reader for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network (Fig. 1, item 10; col 4, lns 59-67; col 8, lns 34-49); and a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor (col 4, lns 7-20). While Crowley discloses an adhesive RFID tag attached to the skin of a patient, Crowley does not specifically disclose that the patch is flexible. Nelson, on the other hand, discloses an adhesive, flexible RFID patch (col 4, lns 66-67; col 5, lns 1-5). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to construct the RFID

patch, disclosed by Crowley, with a flexible material, as disclosed by Nelson, so that the RFID patch will move freely on a non-planar surface such as a patient's skin (Crowley - col 9, lns 5-10), while providing the patient optimal comfort of having a non-rigid, contoured structure attached to their skin. While Crowley discloses a reader for communication with said RFID tag and sensor module adapted to communicate information over a wireless network, Crowley does not disclose that the reader communicates through the use of multiple protocols with the RFID tag. Lu, however, discloses a multi-protocol wireless RFID reader for communication with a RFID tag (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to modify the reader of Crowley whereby it communicates through the use of multiple protocols (col 1, lns 59-67), as disclosed by Lu, so that a single reader is used to communicate with multiple RFID tags, thereby providing an efficient system.

For claim 2, Crowley discloses a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk (col 5, lns 15-22; col 6, lns 52-60).

For claim 3, Crowley discloses said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface (Fig. 2, item 70; col 10, lns 17-27).

For claim 4, Crowley discloses a sensor integrated with a layer that is adapted to react to said stimulus from a surface (i.e. body temperature of a human or animal; col 4, lns 32-67; col 5, lns 15-23). However, Crowley does not disclose that the protective layer is formed of a semi- permeable material. Nelson, on the other hand, discloses said protective layer is formed of a semi-permeable material (col 4, lns 56-67; col 5, lns 1-8).

It would have been obvious to substitute a semi-permeable material, as disclosed by Nelson (i.e. fabric), for the protective layer of Crowley, to provide a patient with a breathable, wearable device for optimal comfort.

For claim 8, Crowley discloses stimulus sensing includes sensing at least one electrical, chemical, biological, and physical elements of said surface (col 1, lns 5-11).

For claim 9, Crowley discloses said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer (Figs. 3 and 5, item 10; col 7, lns 30-34; col 8, lns 34-42).

For claim 11, Crowley discloses said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module (col 8, lns 54-65; Fig. 1, items 46 and 50).

For claim 13, Crowley discloses an RFID tag and sensor formed as an integrated circuit (IC – col 5, lns 15-20; col 6, lns 46-51).

For claim 19, Crowley discloses said patch is disposable (col 3, lns 47-51).

For claim 20, Crowley discloses said RFID sensor further includes a power generation module that powers said RFID sensor (col 8, lns 13-15).

8. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and and further in view of Ikefuji (US 5,774,062).

For claim 5, Crowley discloses a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module (col 5, lns 33-

36 and 55-67; col 6, lns 1-12). Crowley, however, does not include a sensor interface having an analog to digital converter coupled to at least one sensor. Ikefuji, on the other hand, discloses a sensor interface having an analog to digital converter coupled to at least one sensor (Fig. 1, item 18; Fig. 6, A/D; col 8, lns 10-15). It would have been obvious to include an analog digital converter coupled to the sensor, as disclosed by Ikefuji, and interfaced with the controller of Crowley, so that an abundant amount of information from the sensor is sent back to the interrogator/reader via digital signals so that a diagnosis is made in a timely manner.

For claim 6, Crowley discloses said controller stores a sensor ID number in said sensor data table (col 4, lns 10-20).

For claim 7, Crowley discloses a temperature sensor communicative with said controller (col 6, lns 18-20).

9. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Valletta (US 6,970,105).

For claim 12, Crowley discloses a patch, but does not disclose a micro knife. Valletta, on the other hand, discloses a micro knife located on a patch adapted to dispense a substance when said patch is pressed on said surface, where said surface is the skin of the person (col 1, lns 43-49; col 3, lns 31-40; Fig. 2, items 13, 18, 29). While Valletta does not specifically disclose that the micro knife (syringe) is used to draw blood from the surface of the skin, the examiner takes official notice that it is well known that the syringe may used to draw blood from the surface of the skin as well as

apply a therapy as disclosed by Valletta. Furthermore, it would have been obvious to include the feature of draw blood from a patch worn by a patient, as disclosed by Valletta, and apply it to the patch worn by a patient, disclosed by Crowley, in order to closely monitor blood characteristics of a patient thereby providing the most appropriate treatment.

For claim 16, Crowley does not disclose a cardiac sensor. Valletta, on the other hand, discloses a cardiac sensor (col 1, lns 47-50; col 3, lns 1-5). It would have been obvious to detect cardiac throbs, as disclosed by Valletta, via a patch worn by a patient, disclosed by Crowley, in order to closely monitor the heart rate of a patient to determine exercise limitations of a patient.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Townsend et al. (US 6,529,127).

Crowley discloses an RFID tag, but does not disclose an RFID stress sensor. Townsend, however, discloses RF tag and sensor module includes at least one attachment point that enables attachment of the RF tag and sensor module to a structural stress, thereby forming a RF stress sensor (col 1, lns 25-47; col 2, lns 50-67; col 4, lns 8-27; Fig. 1, items 20a-20n). It would have been obvious to modify the RFID tag of Crowley to include a structural stress sensor disclosed by Townsend so that the integrity of a structure is maintained and confirmed as safe.

11. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609),

and further in view of Ghazarian (US 7,034,683).

Crowley discloses an RFID reader which includes a microprocessor adapted to analyze said patch, but Crowley does not disclose geolocating said patch. Ghazarian, however, discloses a reader that includes a processor adapted to analyze and geolocate a patch through the use of GPS (Fig. 1A, items 32, 40, and GPS; col 10, lns 37-50; col 17, lns 49-55). It would have been obvious to incorporate a GPS receiver as disclosed by Ghazarian into the reader disclosed by Crowley so that a tag or patch's location is accounted for at all times, such as during inventory control, tracking of individuals, etc..

12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Lye et al. (US 2004/0100376).

Crowley discloses an RFID tag, but does not disclose a RFID sensor module integrated into an immunoassay testing strip. Lye, however, discloses a RFID sensor module integrated into an immunoassay testing strip (Fig. 3, item 12; parags 0164 and 0165). It would have been obvious to include the RFID tag sensor module, disclosed by Crowley, integrated into an immunoassay testing strip, as disclosed by Lye, so that particular antigens are detected and communicated to a remote location for pharmaceutical purposes.

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Nelson, Jr. (US 6,297,727) and Lu et al. (US 6,172,609), and further in view of Valletta (US 6,970,105) and Lye et al. (US 2004/0100376).

Crowley discloses a patch with a substrate, but does not disclose said patch having a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area. Valetta discloses a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture data that flow through said testing area. While Valletta discloses capturing data that flow through said testing area, Valletta does not disclose that antigens flow through said testing area. Lye, however, discloses capturing data pertaining to antigens flowing through said testing area (parags. 0148, 0159, 0164, and 0165). It would have been obvious to modify the patch disclosed by Crowley with capturing data with an input port disclosed by Valletta, specifically focusing on capturing data pertaining to antigens disclosed by Lye so that data of a patient is captured and stored for future reference, such as data deviating from a predetermined range.

14. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Lu et al. (US 6,172,609).

For claim 25, Crowley discloses a human diagnostics system comprising: a patch having an RFID tag and sensor module (col 1, lns 6-11; col 6, lns 38-51), and adapted to be attached to the surface of the skin and adapted to sense at least one predetermined biological condition through the skin and transmit signals corresponding to at least one predetermined biological condition (col 4, lns 36-50); a RFID reader communicative with said patch through the use of a network (col 10, lns 37-40) to

analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch (col 8, lns 34-41; Fig. 1, items 10, 18, and 22); a remote storage and data unit communicative with said RFID reader over said network (Figs. 1 and 5, item 10), said remote storage and data unit analyzing and storing biological data from said patch and said RFID (col 7, ln 15) tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and said remote storage and data unit further having a remote database containing information adapted to be downloaded to said RFID reader for reading and interpreting said sensor (single reader for plurality of measurements/sensor tags downloaded to a database – col 4, lns 7-20; col 8, lns 34-42; col 10, lns 28-40). Crowley, however, does not disclose a RFID reader communicating to a tag through the use of multiple protocols. Lu, on the other hand, discloses a RFID reader communicating to a tag through the use of multiple protocols (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to communicate through the use of multiple protocols with a RFID tag so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 26, Crowley discloses a remote wireless device (Fig. 5, item 10) adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module (col 7, lns 21-37; col 8, lns 34-49).

For claim 27, Crowley discloses said predetermined elements include one or more electrical, chemical, biological, and physical element of a person (col 1, lns 5-11).

15. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Zeps et al. (US 6,937,154).

For claim 28, Crowley discloses a wireless network, but does not disclose communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G. However, Zeps discloses communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G (Fig. 1; col 9, lns 30-67; col 10, lns 33-42). It would have been obvious to communicate through the use of a communication protocol so that numerous equipment communicates with one another via a standardized communication channel.

For claim 29, Crowley discloses an RFID reader as a mobile, portable device, but does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

Response to Remarks

16. Applicant's arguments filed February 7, 2007 have been fully considered but they are not persuasive.

The Applicant argues as follows:

1. On page 12 of the remarks, the Applicant contends that it is implausible to suggest one would combine Crowley with Nelson. 2. None of the references, alone or in combination, disclose or make obvious the present invention's use of a remote database that includes information for reading and interpreting sensors for reading virtually any communications protocol. 3) Neither Nelson, Crowley or Lu disclose a remote database accessible to download information to the reader for reading and interpreting the sensor.

The Examiner responds as follows:

The combination of Crowley and Nelson is reasonable since they both disclose RFID tags which communicate with interrogators. Crowley includes the feature of monitoring a biological condition via a sensor disposed on the RFID tag. Furthermore, both references disclose adhering the tag to an individual. Thus, the combination of Crowley and Nelson is logical.

While Crowley discloses a remote database that includes information for reading and interpreting sensors (col 4, lns 7-20), the Examiner admits that Crowley does not disclose using multiple communication protocols to read RFID sensors. Lu, on the other hand, discloses several tags within a wireless network where a RFID reader and transponders communicate information over a wireless network through the use of multiple protocols, whereby the RFID system minimizes delays associated with identifying a specific transponder protocol.

The RFID tag, which stores data is considered a database which is downloaded to the reader for reading and interpreting the sensor data contained within the RFID tag (col 6, lns 52-67).

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached 8:00-4:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Toan Pham can be reached at (571) 272.2967. The fax phone number for the organization where this application or proceeding is assigned is (571) 273.8300 for regular and after final communications.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272.2600.

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).

/Jennifer Mehmood/
Primary Examiner

March 20, 2009

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/24/2008	03/20/2009							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	-							
	11	✓	✓							
	12	✓	✓							
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	27	✓	✓							
	28	✓	✓							
	29	✓	✓							
	30	N	N							
	31	N	N							
	32	N	N							
	33	N	N							
	34	N	N							
	35	-	-							
	36	-	-							

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CLAIM		DATE								
Final	Original	06/24/2008	03/20/2009							
	37	-	-							
	38	N	N							
	39	N	N							
	40	N	N							
	41	N	N							
	42	N	N							
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	63	N	N							
	64	N	N							

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	10530901
Filing Date	2005-04-08
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

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/JM/	1	20030004403	A1	2003-01-02	Drinan et al.	
/JM/	2	20040225199	A1	2004-11-11	Evanyk et al.	
/JM/	3	20050009122	A1	2005-01-13	Whelan et al.	

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	1							☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

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NON-PATENT LITERATURE DOCUMENTS [Remove]

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Jennifer Mehmood/	Date Considered	03/20/2009

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

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

PTO/SB/30EFS (01-09)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	10530901	Filing Date	2005-04-08	Docket Number (if applicable)	29343-00001	Art Unit	2612
First Named Inventor	John P. Peeters			Examiner Name	Jennifer Mehmood		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 041061

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (01-09)
Approved for use through 02/28/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Signature of Registered U.S. Patent Practitioner			
Signature	/Robert L. Kelly/	Date (YYYY-MM-DD)	2009-02-27
Name	Robert L. Kelly	Registration Number	31843

This collection of information is required by 37 CFR 1.114. 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.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

January 9, 2009 **Angie Moscowitz** **Signature**

Date of Deposit

AMENDMENT AND REQUEST FOR RECONSIDERATION AFTER FINAL

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Final Office Action dated July 9, 2008. This response is being submitted with a Petition for Extension of Time (3 mos.). Please amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion ~~and~~ adapted to ~~be positioned on a surface~~ stick to the skin of a human subject;

a radio frequency identification ~~(RFID)~~ tag (RFID); ~~and~~

a sensor module integrated with said patch, said flexible patch further ~~and~~ having an antenna, an RFID ~~electronic~~ chip, and at least one sensor associated with a unique ~~ID~~ identification code, said RFID ~~tag~~ and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna[[,]] signals that correspond to said biological stimulus;

a multi-protocol wireless ~~RFID~~ reader for communication with said RFID tag and sensor module, said RFID reader being ~~capable of communicating~~ adapted to communicate information over a wireless network through the use of multiple communication protocols; and

a remote database associated with said network, said database containing ~~data or software~~ information associated with said ID for reading and interpreting said sensor.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Previously Presented) A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. (Original) A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Original) A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. (Previously Presented) A system according to claim 1, wherein responding to said stimulus includes sensing at least one electrical, chemical, biological, or physical elements of said surface.

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Original) A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Original) A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. (Cancelled)

16. (Original) A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. (Cancelled)

18. (Original) A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Original) A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. (Cancelled)

22. (Original) A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. (Original) A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. (Original) A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. (Currently Amended) A human diagnostics system comprising:

a patch having an RFID tag and sensor module, and ~~being attachable~~ adapted to be attached to the surface of the skin and adapted to sense at least one predetermined ~~elements~~ biological condition through the skin and transmit signals corresponding to said at least one predetermined ~~elements~~ biological condition;

a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch through the use of multiple communication protocols;

a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing biological data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and

said remote storage and data unit further having ~~software which can~~ a remote database containing information adapted to be downloaded to said RFID reader for reading and interpreting said sensor.

26. (Original) A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. (Previously Presented) A system according to claim 25, wherein said predetermined elements include one or more electrical, chemical, biological, and physical element of a person.

28. (Currently Amended) A system according to claim 25, wherein said network is a wireless network that ~~enables communication~~ communicates through the use of a communication protocol ~~including,~~ selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Original) A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFLD reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

REMARKS

Applicant would like to thank the Examiner for the Office Action of July 9, 2008. Applicant has reviewed the references cited in the Office Action and has amended the claims to more precisely recite the present invention. Please note that claims 1 and 25 have also been amended to address the §112 objections as well.

The two remaining independent claims after the cancellation of claim 35 are claims 1 and 25. Claim 1 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in light of Crowley and Lu et al. Claim 25 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in view of Lu et al.

Claim 1 now recites:

> 1. A diagnostics system comprising:
>
> a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;
>
> a radio frequency identification tag (RFID);
>
> a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;
>
> a multi-protocol wireless reader for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network through the use of multiple communication protocols; and
>
> a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor.

Claim 25 now recites:

> 25. A human diagnostics system comprising:
>
> a patch having an RFID tag and sensor module, and adapted to be attached to the surface of the skin and adapted to sense at least one predetermined biological condition through the skin and transmit signals corresponding to said at least one predetermined biological condition;
>
> a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch through the use of multiple communication protocols;
>
> a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing biological data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and
>
> said remote storage and data unit further having a remote database containing information adapted to be downloaded to said RFID reader for reading and interpreting said sensor.

The claims have been amended to more clearly distinguish any possible obviousness rejection over the combination of Nelson and Crowley. Claims 1 and 25 now specifically recite that the "stimulus" and "signals" correspond to a biological condition picked up by the sensor module. The Examiner has admitted that Nelson does not disclose a sensor module; even under the standards set forth in KSR, it is implausible to suggest one would combine Crowley with Nelson.

Moreover, none of the references, alone or in combination, disclose or make obvious the present invention's use of a remote database that includes information for reading and interpreting sensors for reading virtually any communications protocol:

> Additionally, the RFID reader is adapted to read and analyze virtually any RFID tag and sensor module. As such, the RFID reader is adapted to retrieve the electronic identification of a tag and sensor module and download software that enables reading and analyses of the tag and sensor from a database. (Paragraph [0009])

The specification states further at paragraph [0076]:

> Since each RFID tag 10 contains its own electronic identification number 64, wireless device 2 can immediately recognize the type of sensor involved and perform the correct analysis. This is because a given modified cell phone can download the necessary software, data tables, etc. from a remote location via a wireless link and can instantly become a "smart" device for any given type of RFID sensor.

Finally, in paragraph [0093] of the specification:

> Using a low cost wireless device such as a cell phone 2 with RFID multi-protocol reader capability, complex drug interaction tests can be performed on-the-spot at a very low cost. This is possible by wireless access to cell phone towers 380, access to Internet 390 and to a remote storage/ data processing unit 400. In one embodiment remote storage/data processing unit 400 is embodied as a computer or electronic database. Accordingly through the use of computer 400 (hereinafter remote store/ data processing unit 400 shall be referred to as computer 400), a patient can either download data to computer 400 or upload into the cell phone the necessary information to conduct any given test by matching the ID of the RFID sensor with given software and data tables stored remotely on computer 400 via link 392.

Neither Nelson, Crowley or Lu disclose a remote database accessible to download information to the reader for reading and interpreting the sensor.

At most, Nelson discloses "that is, the database would include a plurality of records containing data representative of a plurality of identification codes and data representative of the code recipient information correspondingly associated with the plurality of identification codes." (Col. 9, lns. 2-6).

This is far removed from the present invention's remote access to information useful for reading and interpreting the sensor of the present invention.

Reconsideration and allowance are respectfully requested.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

By: _____
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Dated: January 9, 2009
BLOOMFIELD 29343-1 963483v1

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
Total in USD ($)				**810**

Electronic Acknowledgement Receipt

EFS ID:	4871716
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	27-FEB-2009
Filing Date:	08-APR-2005
Time Stamp:	11:47:07
Application Type:	U.S. National Stage under 35 USC 371

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Payment Type	Credit Card
Payment was successfully received in RAM	$810
RAM confirmation Number	8081
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	sb0030e_fill.pdf	782253 dd131441959e31c735de75f58c490d94c2a06575	no	3
Warnings:					
Information:					
2	Amendment Submitted/Entered with Filing of CPA/RCE	29343_1FinalAmendment.pdf	382276 9969b16c9aaa15b9bbdb77c28f7d4b7af3c8b555	no	14
Warnings:					
Information:					
3	Fee Worksheet (PTO-06)	fee-info.pdf	30166 dc9481e3fdc4ad9c8ee54059b7072c1a63856ec8	no	2
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<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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 02/09/2009

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EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	**PAPER NUMBER**
2612	

MAIL DATE	DELIVERY MODE
02/09/2009	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.

Advisory Action Before the Filing of an Appeal Brief	Application No. 10/530,901	Applicant(s) PEETERS, JOHN P.	
	Examiner JENNIFER MEHMOOD	Art Unit 2612	

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

THE REPLY FILED 09 January 2009 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires *3* months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: Another search is required.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Toan N Pham/
Primary Examiner, Art Unit 2612

DO NOT ENTER: /JM/
02/06/2009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

January 9, 2009 **Angie Moscowitz** **Signature**
Date of Deposit

AMENDMENT AND REQUEST FOR RECONSIDERATION AFTER FINAL

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Final Office Action dated July 9, 2008. This response is being submitted with a Petition for Extension of Time (3 mos.). Please amend the application as follows:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

January 9, 2009 **Angie Moscowitz**

Date of Deposit **Signature**

AMENDMENT AND REQUEST FOR RECONSIDERATION AFTER FINAL

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Final Office Action dated July 9, 2008. This response is being submitted with a Petition for Extension of Time (3 mos.). Please amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion ~~and~~ adapted to ~~be positioned on a surface~~ stick to the skin of a human subject;

a radio frequency identification ~~(RFID)~~ tag (RFID); ~~and~~

a sensor module integrated with said patch, said flexible patch further ~~and~~ having an antenna, an RFID ~~electronic~~ chip, and at least one sensor associated with a unique ~~ID~~ identification code, said RFID ~~tag~~ and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna[[,]] signals that correspond to said biological stimulus;

a multi-protocol wireless ~~RFID~~ reader for communication with said RFID tag and sensor module, said RFID reader being ~~capable of communicating~~ adapted to communicate information over a wireless network through the use of multiple communication protocols; and

a remote database associated with said network, said database containing ~~data or software~~ information associated with said ID for reading and interpreting said sensor.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Previously Presented) A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. (Original) A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Original) A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. (Previously Presented) A system according to claim 1, wherein responding to said stimulus includes sensing at least one electrical, chemical, biological, or physical elements of said surface.

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Original) A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Original) A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. (Cancelled)

16. (Original) A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. (Cancelled)

18. (Original) A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Original) A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. (Cancelled)

22. (Original) A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. (Original) A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. (Original) A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. (Currently Amended) A human diagnostics system comprising:

a patch having an RFID tag and sensor module, and ~~being attachable~~ adapted to be attached to the surface of the skin and adapted to sense at least one predetermined ~~elements~~ biological condition through the skin and transmit signals corresponding to said at least one predetermined ~~elements~~ biological condition;

a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch through the use of multiple communication protocols;

a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing biological data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and

said remote storage and data unit further having ~~software which can~~ a remote database containing information adapted to be downloaded to said RFID reader for reading and interpreting said sensor.

26. (Original) A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. (Previously Presented) A system according to claim 25, wherein said predetermined elements include one or more electrical, chemical, biological, and physical element of a person.

28. (Currently Amended) A system according to claim 25, wherein said network is a wireless network that ~~enables communication~~ communicates through the use of a communication protocol ~~including,~~ selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Original) A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFLD reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

REMARKS

Applicant would like to thank the Examiner for the Office Action of July 9, 2008. Applicant has reviewed the references cited in the Office Action and has amended the claims to more precisely recite the present invention. Please note that claims 1 and 25 have also been amended to address the §112 objections as well.

The two remaining independent claims after the cancellation of claim 35 are claims 1 and 25. Claim 1 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in light of Crowley and Lu et al. Claim 25 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in view of Lu et al.

Claim 1 now recites:

> 1. A diagnostics system comprising:
>
> a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;
>
> a radio frequency identification tag (RFID);
>
> a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;
>
> a multi-protocol wireless reader for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network through the use of multiple communication protocols; and
>
> a remote database associated with said network, said database containing information associated with said ID for reading and interpreting said sensor.

Claim 25 now recites:

> 25. A human diagnostics system comprising:
>
> a patch having an RFID tag and sensor module, and adapted to be attached to the surface of the skin and adapted to sense at least one predetermined biological condition through the skin and transmit signals corresponding to said at least one predetermined biological condition;
>
> a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals corresponding to said at least one predetermined biological condition from said patch through the use of multiple communication protocols;
>
> a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing biological data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and
>
> said remote storage and data unit further having a remote database containing information adapted to be downloaded to said RFID reader for reading and interpreting said sensor.

The claims have been amended to more clearly distinguish any possible obviousness rejection over the combination of Nelson and Crowley. Claims 1 and 25 now specifically recite that the "stimulus" and "signals" correspond to a biological condition picked up by the sensor module. The Examiner has admitted that Nelson does not disclose a sensor module; even under the standards set forth in KSR, it is implausible to suggest one would combine Crowley with Nelson.

Moreover, none of the references, alone or in combination, disclose or make obvious the present invention's use of a remote database that includes information for reading and interpreting sensors for reading virtually any communications protocol:

> Additionally, the RFID reader is adapted to read and analyze virtually any RFID tag and sensor module. As such, the RFID reader is adapted to retrieve the electronic identification of a tag and sensor module and download software that enables reading and analyses of the tag and sensor from a database. (Paragraph [0009])

The specification states further at paragraph [0076]:

> Since each RFID tag 10 contains its own electronic identification number 64, wireless device 2 can immediately recognize the type of sensor involved and perform the correct analysis. This is because a given modified cell phone can download the necessary software, data tables, etc. from a remote location via a wireless link and can instantly become a "smart" device for any given type of RFID sensor.

Finally, in paragraph [0093] of the specification:

> Using a low cost wireless device such as a cell phone 2 with RFID multi-protocol reader capability, complex drug interaction tests can be performed on-the-spot at a very low cost. This is possible by wireless access to cell phone towers 380, access to Internet 390 and to a remote storage/ data processing unit 400. In one embodiment remote storage/data processing unit 400 is embodied as a computer or electronic database. Accordingly through the use of computer 400 (hereinafter remote store/ data processing unit 400 shall be referred to as computer 400), a patient can either download data to computer 400 or upload into the cell phone the necessary information to conduct any given test by matching the ID of the RFID sensor with given software and data tables stored remotely on computer 400 via link 392.

Neither Nelson, Crowley or Lu disclose a remote database accessible to download information to the reader for reading and interpreting the sensor.

At most, Nelson discloses "that is, the database would include a plurality of records containing data representative of a plurality of identification codes and data representative of the code recipient information correspondingly associated with the plurality of identification codes." (Col. 9, lns. 2-6).

This is far removed from the present invention's remote access to information useful for reading and interpreting the sensor of the present invention.

Reconsideration and allowance are respectfully requested.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

By: _____
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Dated: January 9, 2009
BLOOMFIELD 29343-1 963483v1

PTO/SB/22 (12-08)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2009** ***(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)***	Docket Number (Optional) 29343-00001
Application Number 10/530,901	Filed April 8, 2005
For Diagnostic Radio Frequency Identification Sensors And Applications Thereof	
Art Unit 2612	Examiner Jennifer Mehmood

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))	$130	$65	$
☐	Two months (37 CFR 1.17(a)(2))	$490	$245	$
☑	Three months (37 CFR 1.17(a)(3))	$1110	$555	$ 555.00
☐	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
☐	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

☑ 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 04-1061.

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 31,843

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Signature — January 9, 2009 (Date)

Robert L. Kelly (Typed or printed name) — 248-433-7578 (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 1 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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/530,901
Filing Date:	April 8, 2005
Applicant(s):	John P. Peeters
Group Art Unit:	2612
Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
Attorney Docket:	29343-00001

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

January 9, 2009 **Angie Moscowitz**

Date of Deposit **Signature**

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, the references listed on the enclosed Form PTO/SB/08A are submitted for consideration by the Examiner in the examination of the above-identified patent application.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form PTO/SB/08A, thereby indicating the Examiner's consideration of each of the references.

The submission of the references listed on the Form PTO/SB/08A is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

☐ (a) within three months of the filing date of the patent application, (b) within three months of the date of entry into the national stage as set forth in 37 C.F.R. § 1.491 of the international application, or (c) before the mailing date of a first Office Action on the merits.

☒ **after** (a), (b), or (c) above, but before the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution of the application, and is accompanied by one of:

- ☒ the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below).
- ☒ the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

☐ **after** the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution but is filed on or before payment of the issue fee, and includes the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below), and the fee set forth in 37 C.F.R. § 1.17(p).

Copies Of The References

☐ Copies of the references (other than cited U.S. Patents and published U.S. Patent Applications) listed on the enclosed Form PTO/SB/08A are enclosed herewith. Attached to each reference not in the English language is a concise explanation of the relevance pursuant to 37 C.F.R. § 1.98(a)(3).

☐ A copy of the foreign search report is enclosed herewith.

☐ The references listed on the enclosed Form PTO/SB/08A were previously identified in the parent application(s) of the present application, and copies of the references were furnished at that time. Accordingly, additional copies of the references are not submitted herewith, so as not to burden the file with duplicate copies of references. The Examiner is respectfully requested to carefully review the references in accordance with the requirements set out in the Manual of Patent Examining Procedure. In accordance with 37 C.F.R. § 1.98(d), the details

of the parent application(s) relied upon for an earlier filing date under 35 U.S.C. § 120 in which copies of the references were previously furnished are set out below:

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				
3. 0 /				

☐ This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. If the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

Other Applications

☐ The Examiner's attention is directed to the following U.S. patent application(s):

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				

Certification

☐ The **undersigned attorney** hereby certifies that each item of information contained in the Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign patent application not more than three months prior to the filing of the Information Disclosure Statement.

☒ The **undersigned attorney** hereby certifies that no item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application or, to the knowledge of the attorney signing after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

Fees

☐ **No fee** is owed by the applicant(s).

☐ The Commissioner is hereby authorized to charge $_____ fee to Dickinson Wright PLLC's Dep. Acc't No. 04-1061.

☒ The fee is being paid concurrently with the submission of these documents via credit card.

Authorization To Charge Additional Fees

☒ If any additional fees are owed in connection with this communication, please charge Deposit Account No. 04-1061.

Respectfully submitted,

DICKINSON WRIGHT PLLC

Date: January 9, 2009

By:_____
Robert L. Kelly, Reg. No. 31,843
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	10530901
Filing Date	2005-04-08
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

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	2	20040225199	A1	2004-11-11	Evanyk et al.	
	3	20050009122	A1	2005-01-13	Whelan et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

☐ None

SIGNATURE

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

Signature	/Robert L. Kelly/	Date (YYYY-MM-DD)	2009-01-09
Name/Print	Robert L. Kelly	Registration Number	31843

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Small Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with $0 paid	2253	1	555	555

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**735**

Electronic Acknowledgement Receipt

EFS ID:	4584757
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	09-JAN-2009
Filing Date:	08-APR-2005
Time Stamp:	12:49:10
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$735
RAM confirmation Number	7365
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		29343_1FinalAmendment.pdf	382276 9969b16c9aaa15b9bbdb77c28f7d4b7af3c8b555	yes	14
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment After Final		1	1	
	Claims		2	10	
	Applicant Arguments/Remarks Made in an Amendment		11	14	
Warnings:					
Information:					
2	Extension of Time	29343_1PetExtTime.pdf	45080 f578d828d763227c81511ff5ef9ed3be0e9eda9f	no	1
Warnings:					
Information:					
3	Information Disclosure Statement Letter	29343_1FourthSuppDS.pdf	120595 698f447e3ca9c33b025e7ccd0f043eb1a85b762d	no	4
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Filed (SB/08)	US_IDS_Form__SB_08a.pdf	816363 06b0891c5157bbe9a404b5b49e44975741ec4684	no	4
Warnings:					
Information:					
5	Fee Worksheet (PTO-06)	fee-info.pdf	31909 b88ff13236d9d4e1367fe320d23b86a06ce0b086	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1396223		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/31 (01-08)
Approved for use through 07/31/2008. OMB 0651-0031
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.

NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): 29343-00001

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" [37 CFR 1.8(a)] on January 9, 2009

Signature: [signature]

Typed or printed name: Angie Moscowitz

In re Application of: John P. Peeters

Application Number	Filed
10/530,901	04/08/2005

For: Diagnostic Radio Frequency Identification

Art Unit	Examiner
2612	Jennifer Mehmood

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 540.00

☑ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ 270.00

☐ 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. I have enclosed a duplicate copy of this sheet.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 04-1061 . I have enclosed a duplicate copy of this sheet.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

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 31,843

☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34.

[signature]
Signature

Robert L. Kelly
Typed or printed name

248-433-7578
Telephone number

January 9, 2009
Date

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 41.31. 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, 1.14 and 41.6. 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 Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001

Filed as Small Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Notice of appeal	2401	1	270	270
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**270**

Electronic Acknowledgement Receipt

EFS ID:	4584792
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	09-JAN-2009
Filing Date:	08-APR-2005
Time Stamp:	12:52:51
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$270
RAM confirmation Number	7399
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notice of Appeal Filed	29343_1NoticeofAppeal.pdf	48503 4cd55211595eb5bd77e1ba39863fba92e5921876	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-06)	fee-info.pdf	30240 2137d13f8836deaae17781c6081f684c3650771e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	78743		

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☒ To be Mailed
10/530,901	04/08/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT	01/09/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 57	Minus	** 64	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 8	Minus	***9	= 0	X $110 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	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:
/KATRINA HARLING/

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
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.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 07/09/2008

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
07/09/2008	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	JENNIFER MEHMOOD	2612	

-- 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 *07 May 2008*.

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

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

Disposition of Claims

4)☒ Claim(s) *1-20 and 22-29* is/are pending in the application.

4a) Of the above claim(s) *30-34 and 38-64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20 and 22-29* is/are rejected.

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

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/16/08; 4/10/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Election/Restrictions

1. The Applicant is reminded that a complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

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

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

3. Claims 1 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 1 and 25, the phrases "capable of" and “can be” render the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

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

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

6. Claims 1-4, 8-11, 13, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727) and further in view of Crowley (US 7,142,114) and Lu et al. (US 6,172,609).

For claim 1, Nelson discloses a diagnostics system comprising: a flexible patch having an adhesive portion and adapted to be positioned on a surface (col 3, lns 5-10; col 4, lns 51-54; Fig. 1a, item 20; Fig. 2, items 24 and 26); a radio frequency identification (RFID) tag (Fig. 1a, item 22) and said patch and having an antenna (col 6, lns 40-46; Fig. 4), an RFID electronic chip (col 6, lns 8-21; Fig. 2, item 22) associated with a unique ID (col 5, lns 59-67), said RFID tag responding to a stimulus by wirelessly transmitting, through the use of said antenna, signals that correspond to said stimulus; and a wireless RFID reader for communication with said RFID tag, said RFID reader being capable of communication over a wireless network (col 6, lns 40-55; col 8, lns 37-46; col 9, lns 1-5; Figs. 7a and 7b) and a database associated with said network, said database containing data or software associated with said ID (col 8, lns 65-67; col 9, lns 1-6, 26-30 and 40-45; col 10, lns 1-54). Nelson, however, does not disclose a sensor module. Crowley, on the other hand, discloses a sensor module associated with a unique ID (col 7, lns 20-34; col 10, lns 10-15; Fig. 1, items 40 and 54). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a sensor module, as disclosed by Crowley, on the RFID tag, disclosed by Nelson, so that specific information of a patient, such as temperature, is obtained in order to make the most appropriate patient diagnosis. Nelson also does not disclose that a reader communicates through the use of multiple protocols with said RFID tag. Lu, however, discloses a multi-protocol wireless RFID reader for communication with said RFID tag (col 1, lns 49-55; col 2, lns 37-47), said RFID reader being capable of communicating information over a wireless network through the use of multiple

protocols. It would have been obvious to communicate through the use of multiple protocols (col 1, lns 59-67), as disclosed by Lu, with the RFID tag disclosed by Nelson, so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 2, Nelson discloses a substantial portion of said RFID tag is integrated onto a substrate disk (Fig. 2, item 24; col 4, lns 51-53). However, Nelson does not disclose a sensor. Furthermore, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above regarding the sensor disclosed by Crowley. It would have been obvious to include the sensor disclosed by Crowley integrated with the disk disclosed by Nelson so that a single medium includes both the sensor and the tag in order to decrease material costs by having two objects located on the same medium.

For claim 3, Nelson discloses said substrate disk includes a protective layer attached thereto (Fig. 2, items 24 and 26), said protective layer being in direct contact with the surface when said patch is positioned on the surface (col 4, lns 51-67; col 5, lns 25).

For claim 4, Nelson discloses said protective layer is formed of a semi-permeable material (col 4, lns 56-67; col 5, lns 1-8), but Nelson does not disclose that the layer is adapted to react to said stimulus from said surface. Crowley, however, discloses a sensor integrated with a layer that is adapted to react to said stimulus from a surface (i.e. body temperature of a human or animal; col 4, lns 32-67; col 5, lns 15-23). It would have been obvious to include the protective layer of Nelson adapted to

react to said stimulus from a surface as disclosed by Crowley so that specific characteristics of a human or animal are obtained to make the most appropriate diagnosis in a medical environment.

For claim 8, Nelson discloses a tag placed on a surface, but does not disclose a stimulus sensing of a surface. Crowley, however, discloses stimulus sensing includes sensing at least one electrical, chemical, biological, and physical elements of said surface (col 1, lns 5-11). It would have been obvious to include stimulus sensing of a surface so that parameters of a patient's skin are measured in a non-intrusive manner (col 1, lns 49-58), as disclosed by Crowley.

For claim 9, Nelson discloses said RFID reader, but does not specifically disclose that the reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer. Crowley, discloses an RFID reader as a PDA (Fig. 5, item 10; col 7, lns 50-60). It would have been obvious to have the reader as disclosed by Nelson incorporated into a PDA, as disclosed by Crowley, so that the reader is mobile and will read several tags in multiple locations.

For claim 10, Nelson discloses said surface is the skin surface of a person (col 2, lns 60-65; col 4, lns 65-67; col 5, lns 1-8).

For claim 11, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above, regarding the sensor module. In addition, Nelson discloses said RFID tag further comprises a power unit adapted to stabilize voltage within said RFID tag (col 6, lns 26-48).

For claim 13, Nelson discloses an RFID tag, but does not disclose an RFID tag and sensor formed as an integrated circuit (IC). Crowley, however, discloses an RFID tag and sensor formed as an integrated circuit (IC – col 5, lns 15-20; col 6, lns 46-51). It would have been obvious to include both an RFID tag and sensor formed as an IC so that a patient easily wears the RFID tag and sensor in one location on the patient's body.

For claim 19, Nelson discloses said patch is disposable (col 5 lns 26-32).

For claim 20, Nelson discloses said RFID tag further includes a power generation module that powers said RFID tag (col 6, lns 26-39). While Nelson discloses powering said RFID tag, Nelson does not disclose an RFID tag sensor. Crowley, on the other hand, discloses powering an RFID tag sensor (col 6, lns 5-14; col 8, lns 13-15). It would have been obvious to include a power source for a RFID tag sensor so that the sensor produces and stores readings of the sensor for future reference.

7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Ikefuji (US 5,774,062).

For claim 5, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above, regarding the sensor. In addition, Nelson discloses said RFID tag comprises: and a controller communicative with an interface, said controller (RFID interrogator – col 5, lns 42-67; col 10, lns 37-56) having a memory with a data table being adapted to analyze said data within said RFID tag (Fig. 7b, items 52; col 7, lns 35-45; col 8, lns 37-47). Nelson, however, does not include a sensor

interface having an analog to digital converter coupled to at least one sensor. Ikefuji, on the other hand, discloses a sensor interface having an analog to digital converter coupled to at least one sensor (Fig. 1, item 18; Fig. 6, A/D; col 8, lns 10-15). It would have been obvious to include an analog digital converter coupled to the sensor of Crowley and interfaced with the controller of Nelson so that an abundant amount of information from the sensor is sent back to the interrogator/reader of Nelson via digital signals so that a diagnosis is made in a timely manner.

For claim 6, Nelson discloses said controller stores an ID number in a data table (col 5, lns 42-67; Fig. 1a, item 52; col 7, lns 35-45). Nelson, however, does not disclose a sensor. Crowley, on the other hand, discloses a sensor (col 7, lns 20-34; col 10, lns 10-15; Fig. 1, items 40 and 54). It would have been obvious to include a sensor ID number in the data table disclosed by Nelson in order to distinguish among several sensors that sense different types of characteristics of a patient.

For claim 7, Nelson discloses a tag communicative with said controller, but Nelson does not disclose a temperature sensor. Crowley, however, discloses a temperature sensor (col 1, lns 5-11). It would have been obvious to include a temperature sensor integrated with the tag disclosed by Nelson so that a patient's temperature is measured in a non-intrusive manner.

8. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Valletta (US 6,970,105).

For claim 12, Nelson discloses a patch, but does not disclose a micro knife. Valletta, on the other hand, discloses a micro knife located on a patch adapted to dispense a substance when said patch is pressed on said surface, where said surface is the skin of the person (col 1, lns 43-49; col 3, lns 31-40; Fig. 2, items 13, 18, 29). While Valletta does not specifically disclose that the micro knife (syringe) is used to draw blood from the surface of the skin, the examiner takes official notice that it is well known that the syringe may used to draw blood from the surface of the skin as well as apply a therapy as disclosed by Valletta. Furthermore, it would have been obvious to draw blood from a patch worn by a patient in order to closely monitor blood characteristics of a patient thereby providing the most appropriate treatment.

For claim 16, Nelson does not disclose a cardiac sensor. Valletta, on the other hand, discloses a cardiac sensor (col 1, lns 47-50; col 3, lns 1-5). It would have been obvious to detect cardiac throbs via a patch worn by a patient in order to closely monitor the heart rate of a patient to determine exercise limitations of a patient.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Forcier et al. (US 7,061,381).

Nelson does not disclose a glucose sensor. Forcier discloses a glucose sensor (Fig. 9; col 11, lns 65-67; col 12, lns 1-10). It would have been obvious to modify the RFID tag of Nelson to include a glucose sensor disclosed by Forcier so that a patient is alerted to dangerous blood sugar levels.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Quinn et al. (US 2005/0101843).

Nelson does not disclose a radiation sensor. Quinn, however, discloses a radiation sensor (Fig. 1, items 20, 24; parag 0016). It would have been obvious to modify the RFID tag of Nelson to include a radiation sensor disclosed by Quinn so that a patient is alerted to dangerous levels of radiation.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Townsend et al. (US 6,529,127).

Nelson discloses an RFID tag, but does not disclose an RFID stress sensor. Townsend, however, discloses RF tag and sensor module includes at least one attachment point that enables attachment of the RF tag and sensor module to a structural stress, thereby forming a RF stress sensor (col 1, lns 25-47; col 2, lns 50-67; col 4, lns 8-27; Fig. 1, items 20a-20n). It would have been obvious to modify the RFID tag of Nelson to include a structural stress sensor disclosed by Townsend so that the integrity of a structure is maintained and confirmed as safe.

12. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Ghazarian (US 7,034,683).

Nelson discloses a reader, but does not disclose that the reader includes a processor adapted to analyze and geolocate said patch through the use of GPS.

Ghazarian, however, discloses a reader that includes a processor adapted to analyze and geolocate said patch through the use of GPS (Fig. 1A, items 32, 40, and GPS; col 10, lns 37-50; col 17, lns 49-55). It would have been obvious to incorporate a GPS receiver as disclosed by Ghazarian into the reader disclosed by Nelson so that a tag or patch's location is accounted for at all times, such as during inventory control, tracking of individuals, etc..

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Lye et al. (US 2004/0100376).

Nelson discloses an RFID tag, but does not disclose a RFID sensor module integrated into an immunoassay testing strip. Lye, however, discloses a RFID sensor module integrated into an immunoassay testing strip (Fig. 3, item 12; parags 0164 and 0165). It would have been obvious to include a RFID tag sensor module integrated into an immunoassay testing strip so that particular antigens are detected and communicated to a remote location for pharmaceutical purposes.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Valletta (US 6,970,105) and Lye et al. (US 2004/0100376).

Nelson discloses a patch with a substrate, but does not disclose said patch having a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area. Valetta discloses a sample input port

enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture data that flow through said testing area. While Valletta discloses capturing data that flow through said testing area, Valletta does not disclose that antigens flow through said testing area. Lye, however, discloses capturing data pertaining to antigens flowing through said testing area (parags. 0148, 0159, 0164, and 0165). It would have been obvious to modify the patch disclosed by Nelson with capturing data with an input port disclosed by Valletta, specifically focusing on capturing data pertaining to antigens disclosed by Lye so that data of a patient is captured and stored for future reference, such as data deviating from a predetermined range.

15. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Lu et al. (US 6,172,609).

Crowley discloses a human diagnostics system comprising: a patch having an radio frequency identification (RFID) tag and sensor module (col 1, lns 6-11; col 6, lns 38-51), and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements (col 4, lns 36-50); a RFID reader communicative with said patch through the use of a network (col 10, lns 37-40) to analyze, receive, and transmit the signals from said patch (col 8, lns 34-41; Fig. 1, items 10, 18, and 22); and a remote storage and data unit communicative with said RFID reader over said network (Figs. 1 and 5, item 10), said remote storage and data unit analyzing and storing data from said patch and said RFID (col 7, ln 15), said remote storage and data unit transmitting said

analyzed and stored data to said RFID reader through the use of said network; and said remote storage and data unit further having software which can be downloaded to said RFID reader for reading and interpreting said sensor (single reader for plurality of measurements/sensor tags downloaded to a database – col 4, lns 7-20; col 8, lns 34-42; col 10, lns 28-40). Crowley, however, does not disclose a RFID reader communicating to a tag through the use of multiple protocols. Lu, on the other hand, discloses a RFID reader communicating to a tag through the use of multiple protocols (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to communicate through the use of multiple protocols with a RFID tag so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 26, Crowley discloses a remote wireless device (Fig. 5, item 10) adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module (col 7, lns 21-37; col 8, lns 34-49).

For claim 27, Crowley discloses said predetermined elements include one or more electrical, chemical, biological, and physical element of a person (col 1, lns 5-11).

16. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Zeps et al. (US 6,937,154).

For claim 28, Crowley discloses a wireless network, but does not disclose communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G. However, Zeps discloses communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G

(Fig. 1; col 9, lns 30-67; col 10, lns 33-42). It would have been obvious to communicate through the use of a communication protocol so that numerous equipment communicates with one another via a standardized communication channel.

For claim 29, Crowley discloses an RFID reader as a mobile, portable device, but does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

Response to Remarks

17. Applicant's arguments filed May 7, 2008 have been fully considered but they are not persuasive.

The Applicant argues as follows:

None of the references, alone or in combination, disclose or make obvious the present invention's use of a database that includes software for reading a plurality of RFID sensors through multiple communication protocols (page 13). The remainder of the remarks (pages 14-16) contain citations of the prior art allegedly providing evidence that the art does not teach the use of a database that includes software for reading a plurality of RFID sensors through multiple communication protocols.

While the Examiner admits (see rejection to claim one in first and second office actions) that Nelson does not disclose using multiple communication protocols to read RFID sensors, Nelson discloses a database associated with a network where the

database contains software or data associated with stored identification information located in and RFID tag's memory. Nelson provides examples of a networked RFID system for the purpose of storing data files via a centralized computer database for authorization and security purposes.

Lu discloses several tags within a wireless network where a RFID reader and transponders communicate information over a wireless network through the use of multiple protocols, whereby the RFID system minimizes delays associated with identifying a specific transponder protocol.

Based on claim amendments, the Examiner maintains the position that the Crowley reference includes a sensor module that is associated with a unique ID since the sensor is part of a passive transponder where a reader interrogates (and powers the transponder) to extract data from the transponder's memory. Therefore, since Crowley explicitly describes an RFID system, the transponder and sensor combination are associated with a unique data string in order for the reader to acknowledge and identify a respective transponder.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). See MPEP § 706.07(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached on M-F from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. George Bugg, can be reached at (571) 272.2998. 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).

Jennifer Mehmood
June 23, 2008

/George A Bugg/
Acting SPE of Art Unit 2612

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Updated East Search - no new classes/subclasses searched	6/23/2008	JM

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S77	2	"6172609".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/23 15:32
S78	2	"6297727".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/23 15:43
S79	2	"7142114".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 08:51
S80	2	"7142114".pn. and (ID identify$4 identif$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 08:53
S81	505	340/572.1.ccls. and ((RFID transponder (radio near3 frequency near3 (ID identify$4 identification identifi$4))) near7 sensor)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 08:59
S82	3	340/572.1.ccls. and ((RFID transponder (radio near3 frequency near3 (ID identify$4 identification identifi$4))) near7 sensor near25 patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 09:00
S83	3	340/568.1-572.9.ccls. and ((RFID transponder (radio near3 frequency near3 (ID identify$4 identification identifi$4))) near7 sensor near25 patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 09:01
S84	86	340/568.1-572.9.ccls. and ((RFID transponder (radio near3 frequency near3 (ID identify$4 identification identifi$4))) near7 sensor and patch)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 09:01

S85	276	S81 and (label sticker adhesive)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 09:14
S86	2	("20040145474").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/06/24 10:13
S87	1	S86 and temperature	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/06/24 10:14

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10530901	PEETERS, JOHN P.
	Examiner	Art Unit
	JENNIFER MEHMOOD	2612

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/24/2008								
	1	✓								
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	33	N								
	34	N								
	35	-								
	36	-								

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CLAIM		DATE								
Final	Original	06/24/2008								
	37	-								
	38	N								
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Abbott
Exhibit 1002
Page 290

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(Not for submission under 37 CFR 1.99)

Application Number	10530901
Filing Date	2005-04-08
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

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/JM/	1	6031454		2000-02-29	Lovejoy et al.	
/JM/	2	7109859		2006-09-19	Peeters	

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	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

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Examiner Signature	/Jennifer Mehmood/	Date Considered	06/24/2008

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PTO/SB/08a (03-08)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	10530901
Filing Date	2005-04-08
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/JM/	1	6437692	B1	2002-08-20	Petite et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/JM/	1	2387106	CA	A1	2003-11-21	Information Mediary Corp		☐
/JM/	2	2308947	GB	A	1997-07-09	I D Systems Ltd		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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Examiner Signature	/Jennifer Mehmood/	Date Considered	06/24/2008

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/530,901
Filing Date:	April 8, 2005
Applicant(s):	John P. Peeters
Group Art Unit:	2612
Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
Attorney Docket:	29343-00001

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

June 16, 2008	Angie Moscowitz	
Date of Deposit		**Signature**

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, the references listed on the enclosed Form PTO/SB/08A are submitted for consideration by the Examiner in the examination of the above-identified patent application.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form PTO/SB/08A, thereby indicating the Examiner's consideration of each of the references.

The submission of the references listed on the Form PTO/SB/08A is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

☐ (a) within three months of the filing date of the patent application, (b) within three months of the date of entry into the national stage as set forth in 37 C.F.R. § 1.491 of the international application, or (c) before the mailing date of a first Office Action on the merits.

☒ **after** (a), (b), or (c) above, but before the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution of the application, and is accompanied by one of:

- ☒ the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below).
- ☒ the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

☐ **after** the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution but is filed on or before payment of the issue fee, and includes the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below), and the fee set forth in 37 C.F.R. § 1.17(p).

Copies Of The References

☐ Copies of the references (other than cited U.S. Patents and published U.S. Patent Applications) listed on the enclosed Form PTO/SB/08A are enclosed herewith. Attached to each reference not in the English language is a concise explanation of the relevance pursuant to 37 C.F.R. § 1.98(a)(3).

☐ A copy of the foreign search report is enclosed herewith.

☐ The references listed on the enclosed Form PTO/SB/08A were previously identified in the parent application(s) of the present application, and copies of the references were furnished at that time. Accordingly, additional copies of the references are not submitted herewith, so as not to burden the file with duplicate copies of references. The Examiner is respectfully requested to carefully review the references in accordance with the requirements set out in the Manual of Patent Examining Procedure. In accordance with 37 C.F.R. § 1.98(d), the details

of the parent application(s) relied upon for an earlier filing date under 35 U.S.C. § 120 in which copies of the references were previously furnished are set out below:

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				
3. 0 /				

☐ This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. If the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

Other Applications

☐ The Examiner's attention is directed to the following U.S. patent application(s):

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				

Certification

☐ The **undersigned attorney** hereby certifies that each item of information contained in the Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign patent application not more than three months prior to the filing of the Information Disclosure Statement.

☒ The **undersigned attorney** hereby certifies that no item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application or, to the knowledge of the attorney signing after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

Fees

☐ **No fee** is owed by the applicant(s).

☐ The Commissioner is hereby authorized to charge $_____ fee to Dickinson Wright PLLC's Dep. Acc't No. 04-1061.

☒ The fee is being paid concurrently with the submission of these documents via credit card.

Authorization To Charge Additional Fees

☒ If any additional fees are owed in connection with this communication, please charge Deposit Account No. 04-1061.

Respectfully submitted,

DICKINSON WRIGHT PLLC

Date: June 13, 2008

By:_____
Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant

Dickinson Wright PLLC
38525 Woodward Ave., Ste. 2000
Bloomfield Hills, MI 48304-5092
(248) 433-7578

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Attorney Docket Number	29343-00001

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2387106	CA	A1	2003-11-21	Information Mediary Corp		☐
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	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

CERTIFICATION STATEMENT

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

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

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☒ See attached certification statement.

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

☐ None

SIGNATURE

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

Signature	/Robert L. Kelly/	Date (YYYY-MM-DD)	2008-06-13
Name/Print	Robert L. Kelly	Registration Number	31843

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

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

CA2387106

Publication Title:

METHOD FOR MEASURING TEMPERATURE USING A REMOTE, PASSIVE, CALIBRATED RF/RFID TAG INCLUDING A METHOD FOR CALIBRATION

Abstract:

Abstract not available for CA2387106
Abstract of corresponding document: WO03098175

A system for tracking environmental parameters, such as temperature, associated with a package during transportation and storage thereof, comprises a passive RFID (Radio Frequency Identification) tag adapted for containment within the package and at least an RFID reader adapted to communicate with such passive RFID tag. The tag includes means for sensing an environmental parameter, such as temperature, means for storing information respecting such parameter, and means for transmitting such information upon activation by such reader. The reader includes means for activating such tag, means for receiving and storing information received from such tag, and means for making such received information available to an interested party. The system may also include a master tag for external association with the package, the master tag prompting the slave tag to transmit data at specific intervals. If the sensed parameter is temperature the slave tag may utilize a tick oscillator, the transmission frequency of which changes in response to temperature changes, the master tag then determining the temperature on the basis of the frequency change. Data supplied from the esp@cenet database - Worldwide bdf

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(40) 21.11.2003
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(22) 21.05.2002

(51) Int. Cl.[7]: G08C 17/02, B65D 73/00, G01V 15/00, G01K 1/02

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WILSON, ALLAN (CA).

(74) MACRAE & CO.

(54) METHODE DE MESURE DE LA TEMPERATURE A L'AIDE D'UNE ETIQUETTE RF/RFID ETALONNEE, PASSIVE, ELOIGNEE, Y COMPRIS UNE METHODE D'ETALONNAGE

(54) METHOD FOR MEASURING TEMPERATURE USING A REMOTE, PASSIVE, CALIBRATED RF/RFID TAG INCLUDING A METHOD FOR CALIBRATION

Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2387106 A1 2003/11/21

(21) 2 387 106

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(22) Date de dépôt/Filing Date: 2002/05/21

(41) Mise à la disp. pub./Open to Public Insp.: 2003/11/21

(51) Cl.Int.^{7}/Int.Cl.^{7} G08C 17/02, B65D 73/00, G01K 1/02, G01V 15/00

(71) Demandeur/Applicant:
INFORMATION MEDIARY CORPORATION, CA

(72) Inventeurs/Inventors:
PETERSEN, MICHAEL, CA;
WILSON, ALLAN, CA;
SHERSTYUK, MYKOLA, CA

(74) Agent: MACRAE & CO.

(54) Titre : METHODE DE MESURE DE LA TEMPERATURE A L'AIDE D'UNE ETIQUETTE RF/RFID ETALONNEE, PASSIVE, ELOIGNEE, Y COMPRIS UNE METHODE D'ETALONNAGE

(54) Title: METHOD FOR MEASURING TEMPERATURE USING A REMOTE, PASSIVE, CALIBRATED RF/RFID TAG INCLUDING A METHOD FOR CALIBRATION

METHOD FOR MEASURING TEMPERATURE USING A REMOTE, PASSIVE, CALIBRATED RF/RFID TAG INCLUDING A METHOD FOR CALIBRATION

The present invention relates to a system that includes a passive, remote radio frequency identification (RFID) tag, and a control device, such as an active smart RFID tag or RFID reader/writer that can communicate with the passive tag giving it instructions and receiving data from it and that can analyze and store data so received. In the case of this control device being an active smart RFID tag, the system would further require a reader/writer that can instruct the active RFID tag and can read data created during use of the tags. The system will be utilized primarily in the transport and storage field, or any other field of use where detecting changes in temperature at distance without the use of a direct probe is desirable. The system utilizes a unique means for determining temperature, which means forms part of this patent application. This invention further claims a methodology of calibration to provide accurate temperature measurements (in the range of +/- 0.1 degree C).

BACKGROUND OF THE INVENTION

Devices to measure temperature in transported or stored goods are widely known. Inexpensive temperature sensing devices are generally designed to record only a single excursion outside a preset temperature window. More expensive temperature logging devices are typically bulkier and too costly for single use or disposable applications. A further limitation of prior art is the requirement to retrieve a tag from a shipping box to take a reading or download data from it.

There are many instances where it is desirable to determine and record the temperature at many points during the transportation or storage of a product or load. Electronic sensing and recording devices that can do this are available; they include thermistors or other temperature sensors, a clock, a battery, a memory in which temperature data are recorded, and some form of output mechanism (such as a plug-in port) whereby the recorded data can be read for interpretation by an interested party at a later time. These devices are large in size compared to the disposable tags, and significantly more expensive. They are generally reusable. In some cases, for example where the container's size is small relative to the size of the sensing and recording device or extreme temperatures that would affect battery performance are of interest, they require probes containing a temperature sensor that destroys the integrity of the container. Where the container is large enough to accommodate a sensing and recording device, the device must be removed from the container when it reaches its destination to allow it to be reused.

Passive RFID tags are in wide use for identifying and tracking all manner of packages and items. RFID technology uses electromagnetic or electrostatic coupling in the radio frequency (RF) range of the electromagnetic spectrum to identify uniquely an object of interest. RFID is increasingly supplementing or replacing bar coding for identification purposes and providing electronic packing slip functions in the shipping and logistics industry as it does not require direct contact or line-of-sight scanning.

A passive RFID system comprises an antenna and transceiver (usually combined as a reader) and a transponder (RFID tag). The antenna generates a RF signal that activates the RFID tag. The activated tag then transmits data back to the antenna. The data may be used to notify a logic controller to initiate an action, or stored for subsequent retrieved by an interested party.

In response to the size and cost issues, Petersen and Wilson (Environment Monitoring and Recording Tag and Reading System – U.S. Patent Pending 2002) have described an active or smart RFID Tag system for monitoring and recording environmental conditions including temperature, that is small in size, relatively inexpensive, and can transmit its data to a reader via wireless means. However it is sufficiently expensive in its manufacture that it could be uneconomical as a single use or disposable device for most applications, necessitating its removal from the container or package at its destination, for the purpose of later re-use. A further limitation is the adverse effect of decreasing temperature on the battery, making the device impractical for very cold applications (such as monitoring dry-ice packaged goods) without the addition of a temperature probe containing a thermistor, which destroys the integrity of the package, or the use of expensive low temperature battery technology.

SUMMARY OF THE INVENTION

The invention combines a low cost passive RFID tag (slave tag) with an active RFID master tag and a RF writer/reader in a system that senses and records temperature a preprogrammed intervals. The low cost of the slave tag makes it feasible to be used as a disposable temperature sensor.

A further implementation of this invention combines a low cost passive RFID tag (slave tag) with an RF writer/reader in a recording system, omitting the master tag.

The slave tag is inserted in a package or container whose internal temperature is of interest. The master tag polls the slave tag at pre-programmed intervals via RF signal, and the slave tag transmits data (such as its unique ID and/or manufacturer code) back to the master tag by RF signal. The master tag can then determine the temperature of the

environment into which the slave tag has been inserted by way of calculating the frequency shift caused by such ambient temperature from its nominal calibrated frequency (see below for method of calibration).

The master RFID tag comprises an integrated circuit with programmable or re-programmable procedure memory, battery, antenna, clock, high-stability oscillator such as piezo-electric, quartz or ceramic resonator, and volatile or non-volatile data memory. The master tag can be pre-programmed at the time of manufacture or can be programmed prior to use using the RF writer/reader. At programmed intervals, the temperature data calculated from the frequency shift during data transmission sessions by the slave tag are stored in the master tag's data memory. The stored temperature data can be downloaded via RF writer/reader by someone interested in the temperature to which the container contents have been exposed.

The slave tag comprises a procedure memory programmed with calibration data (if required, as described below) optional data such as ID, manufacturer codes, electronic packing slip information etc., Manchester-type phase encoder, oscillator whose frequency is temperature sensitive such as a tick oscillator, and a resonator such as an antenna coil, printed antenna, ceramic antenna, etc.

In a further aspect of the system, the temperature sensitive oscillator of the slave tag replaces a thermistor or other direct temperature sensing device as the means of determining the temperature, eliminating the need for a battery in the slave tag. This reduces the cost of manufacturing the slave tag and eliminates the problem of a battery's voltage being temperature sensitive. In principle, any ISO standard RFID tag can be used for this function, adding little or no additional cost to logistic systems already utilizing such RFID tags to track shipments.

In this system, temperature is measured by comparing the stable oscillator frequency of the master tag to the frequency of the slave tag's tick oscillator, a semi-conductor device whose frequency is predictably dependent on temperature. The master tag's antenna is calibrated to receive signals in the frequency range of interest, determined by the range of temperature to which the slave tag might be exposed and the range of frequencies that would result from such temperatures. The temperature at the slave tag would influence the tick count of its oscillator, which would be known to have a predictable change in tick frequency in response to changes in temperature.

$$Penc = Tf(temp)$$

Where ***Penc*** = period of Manchester encoder pulses; ***Tf*** = sigmoid type function; **temp** = temperature

The relationship between temperature and frequency would be calibrated prior to use and stored in the procedure memory of the master tag. Deviation of the returning RF signal's frequency from that of the stable oscillator in the master tag would be determined and compared to the frequency-temperature calibration data for the slave tag's oscillator. The resulting calculated temperature at the slave tag would then be recorded in the master tag's temperature data memory. At a later time, a party interested in the temperature to which the container was exposed could download the stored temperature data from the master tag using a RF or other type of reader.

In use, the slave tag is placed inside a container at the time of shipping or at the time of manufacture of such container. The master tag is placed outside the container in close proximity, such as attached to the container by adhesive or other means. The master tag is programmed to cause the slave tag to transmit data to it at intervals of interest to the user.

The master tag polls the slave tag by transmitting an RF signal that excites the slave tag's tick oscillator and provides energy to the device. The slave tag responds by transmitting an RF signal that can be detected by the master tag. Because of the sensitivity of the slave tag's tick oscillator to changes in temperature, its signal will deviate from the master tag's RF frequency according to a predictable relationship.

Calibration data for the slave tag's temperature-frequency relationship will be stored either in the slave tag's or master tag's memory, and the difference in frequency from the transmitted RF signal to the received RF signal will be applied to the calibration data to determine the temperature at the slave tag. This will be time stamped and recorded in the master tag's data memory.

To calibrate the slave tag's temperature-frequency relationship

$$Penc = Tf(temp)$$

Penc is determined under two or more specific temperatures $temp_1$..... $temp_n$. To achieve this, the slave tag could be inserted into a temperature insulated chamber containing a thermoelectric element (*effet Peltier*). The temperature could be changed rapidly and with precision, allowing $Penc_1$..... $Penc_n$ to be determined. The specific function can then be calculated for this tag sample and stored in the procedure memory of the slave tag from which it would be downloaded to the master tag or writer/reader to be used in temperature determination. This would obviate the necessity of uniquely pairing slave and master tags. The temperature-frequency function might equally be stored in the procedure memory of the master tag if specific master-slave pairs are to be used. From this function the temperature can be computed for any value of ***Penc***.

To provide very exact temperature measurements (+/- 0.1 degree C), each tag would be calibrated. However, in large scale implementation

calibration could be generalized to the design and components of a particular type of slave tag (such as a standard RFID tag produced by a particular manufacturer) and therefore avoid the requirement for individual calibration of each tag. In such cases, a generic calibration coefficient would be sufficient to provide temperature measurements in the +/- 1 degree C range, if not better.

As described by Petersen and Wilson (2002), the temperature data can be retrieved from the master tag by an interested party. The master tag can be single use or multiple use and may be reprogrammable. Petersen and Wilson (2002) describe various means by which this might be done. The slave tag can also be single use or reusable

In a variation of the invention, the master tag is omitted from the system and the passive RFID slave tag is inserted into a package or container. Each time the package passes through a RF reader at a loading station, unloading station, sorting station, warehouse or delivery point, as is currently in widespread use for tracking the movement of such packages, the temperature at the RFID tag at that time could also be determined and processed (stored, downloaded) by the reader. This would allow a central database to keep track of the time and internal temperature of the package at each waypoint in systems where such packages are already being scanned and tracked using barcodes and/or RFID tags.

In a further variation of the invention, the package ID, electronic packing slip, other logistics related information, manufacturer code (to facilitate "generic" calibration – see above) and temperature sensitive components could be combined in a single passive RFID tag, thereby eliminating the requirement for additional hardware to provide the benefit of temperature measurements, by utilizing RFID readers and passive RFID tags already incorporated into the logistics infrastructure of shipping and courier companies.

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G06K 7/10

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H4L LASS L20A
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GB 2297225 A **GB 2295749 A** **GB 2249001 A**
GB 2076259 A **EP 0563713 A2** **EP 0505906 A1**
WO 95/32616 A1

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UK CL (Edition O) **G1N NAHJA , H4L LACA LASS**
INT CL^6 **A61B 5/00**
On-Line - WPI

(54) **Identification tag with environmental sensing facility**

(57) A radio frequency identification tag 1 which is energised by a radio signal from a reader station 11 to transmit a code identifying the tag. The tag incorporates a sensor 7 responsive to an environmental parameter 8 to which the tag is exposed, and when the tag is energised by an adjacent reader the radio signal returned to the reader includes a code representing a measurement value corresponding to an output of the sensor. Thus the tag not only identifies the item to which it is attached, but also provides a measurement of the parameter to which the sensor is responsive. The measurement may be the instantaneous output of the sensor or a stored output, for example the maximum or minimum temperature to which the sensor has been exposed.

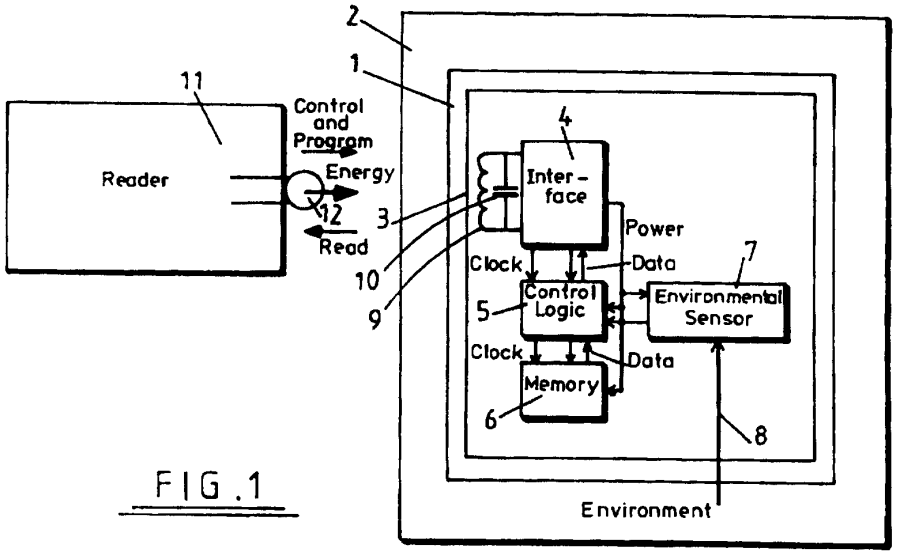

FIG.1

GB 2 308 947 A

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Page 313

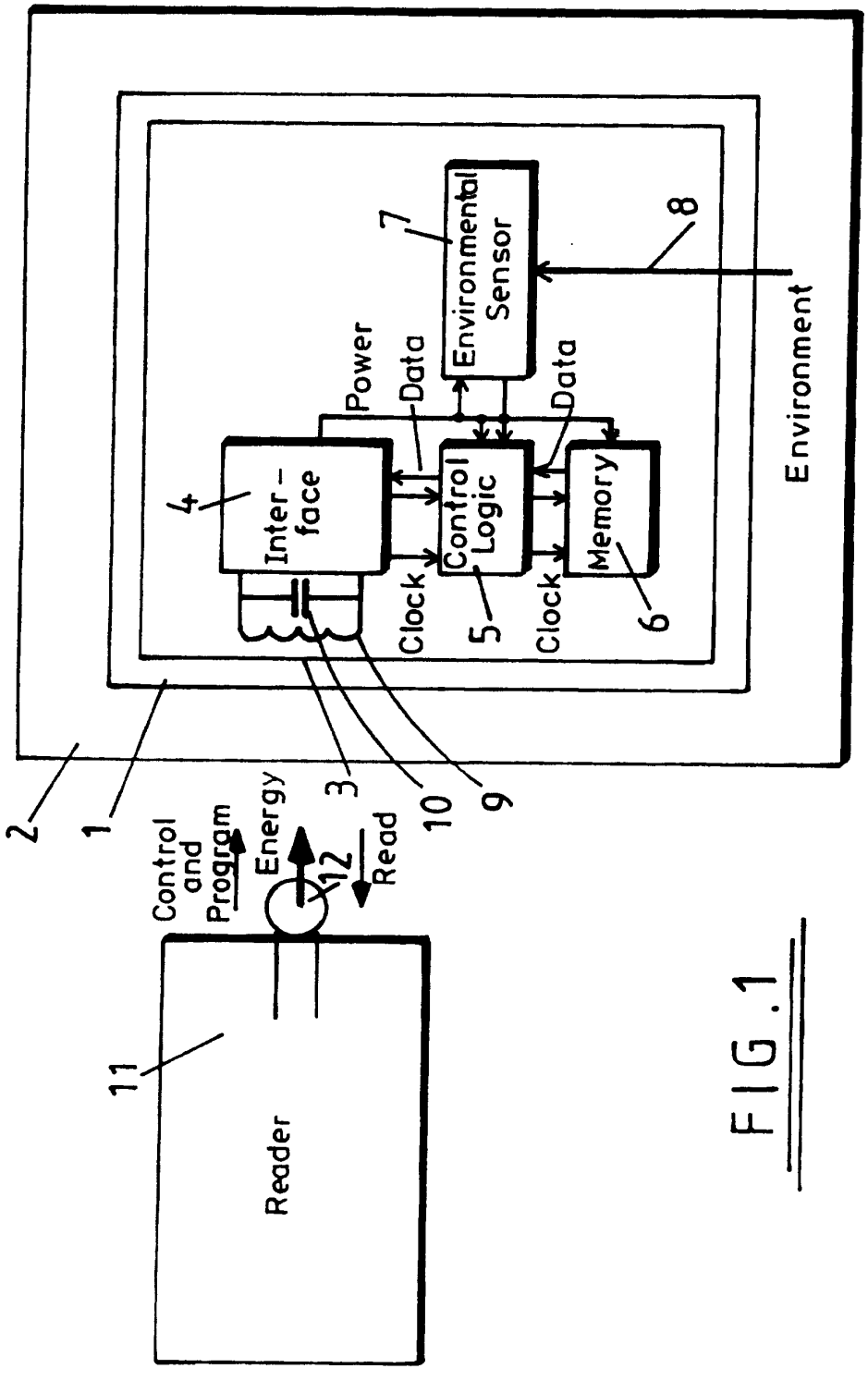
Environment
Environmental Sensor
7
8
Power
Data
Data
Inter – face
4
Control Logic
Memory
Clock
Clock
5
6
2
1
3
10
9
Control and Program
Energy
12
Read
11
Reader

FIG. 1

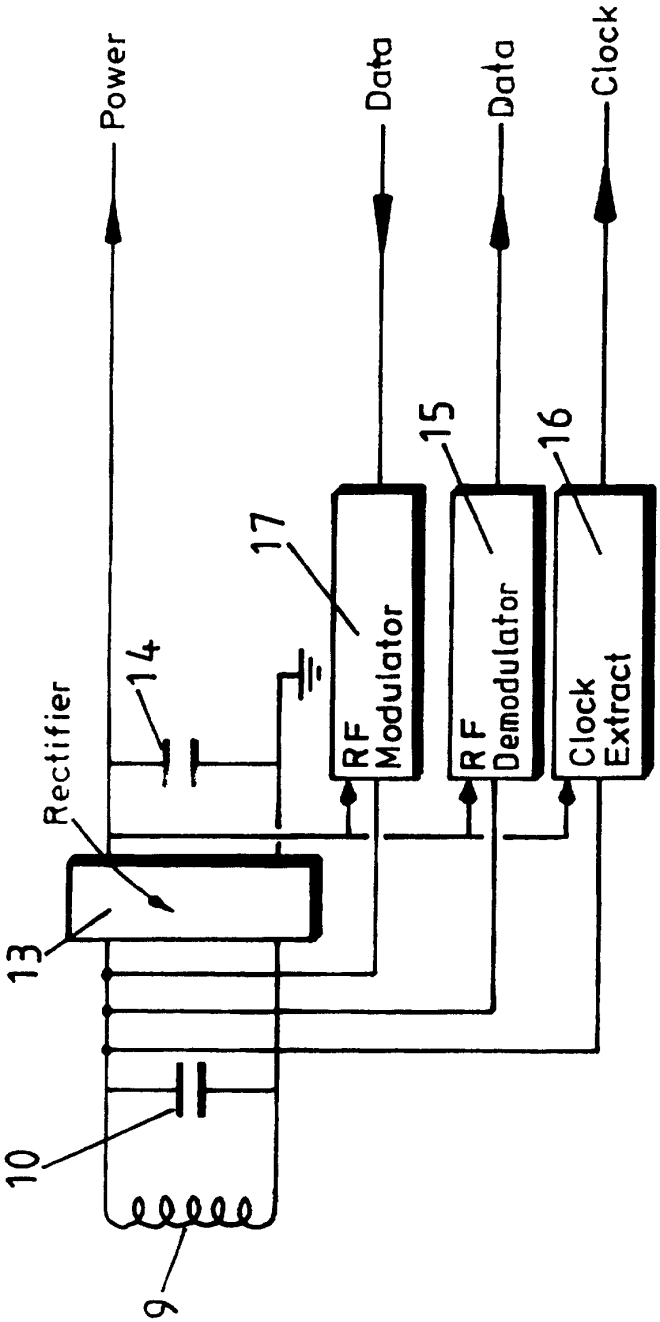
Power
Data
Data
Clock
15
16
17
14
RF Modulator
RF Demodulator
Clock Extract
Rectifier
13
10
9

FIG. 2

RADIO FREQUENCY IDENTIFICATION TAG

The present invention relates to radio frequency identification tags.

Radio frequency identification (RFID) tags (or transponders) are electronic devices which store identification codes and transmit the codes when interrogated by a radio frequency electromagnetic signal. A tag attached to an object, animal or person allows an ambiguous and convenient identification of that to which it is attached, and the tag may be used for identification purposes without requiring any action on the part of the person, animal or object carrying the tag to trigger the identification process. For example it is not necessary to present a card or label such as a bar code label to a reader. The tags do not incorporate an on-board power source but rather incorporate a power supply, generally a charge storage capacitor, that is energised by low power radio signals which are also used for the transmission of data in both directions between the tag and a reader intended for use with that tag.

Known tags are highly integrated devices that contain a small number of electronic components, usually sealed in a plastics case or glass capsule. A tag can be as small as a grain of rice or as large as a ice hockey puck. Regardless of their size, the characteristics of RFID tags can be summarised as follows:

1. Tags are generally designed for use with a dedicated electronic unit or "reader", although readers are now available which are self-programmable so as to be capable of communicating with a wide range of different tags. In all

cases the reader transmits a coded radio signal through a small antenna into the environment in which tags are to be detected.

2. Each tag incorporates its own antenna and when it is sufficiently close to a reader (generally within about two metres dependant upon the size of the tag) the tag is energised by the radio signal transmitted by the reader. When a tag is out of range of a reader, it remains inert.

3. The tag stores an identification code in a non-volatile memory and when energised generates a coded radio signal incorporating the stored code and transmits the radio signal through its antenna.

4. The reader detects signals transmitted by any adjacent tag, demodulates the coded data message incorporated in the signal received from the tag, verifies the accuracy of the information by using appropriate communications protocols, and then delivers the decoded information to an appropriate output, for example by transmitting a message to a computer for interpretation and action.

The known RFID tags offer significant advantages in performance when compared with other identification technologies such as bar codes. For example, with RFID tags, there is no line of sight requirement for reading or writing data; tags provided with programmable memories may be reprogrammed in-situ, using the same low power radio signals as are used during the reading process; if desired tags can be programmed with a permanent identification code; tags can be attached to, or buried

in, most non-metallic materials with no effect on performance; they are mechanically robust and are not affected by surface damage; they can be encapsulated so as to withstand chemical attack; they can withstand wide ranges of temperatures; error check coding can ensure very high reliability during the read and write processes; they can be read in all or most orientations assuming careful antenna design; and they cannot be easily replicated. As a result of these advantages, RFID tags are produced in large quantities by a number of suppliers. As an established technology benefiting from advances in the field of electronics which have resulted in rapidly reducing component costs, RFID tags are being used in an ever increasing number in an ever increasing range of applications. It has not previously been suggested however that RFID tags should be provided with capabilities over and above the basic capability of identifying the individual tags.

It is well known to incorporate sensors of various types into manufactured products. For example, temperature indicating sensors are used in the food distribution industry to indicate the instantaneous temperature of food products, and in some cases to indicate the temperature "history" of food products. It is known for example to incorporate temperature indicating devices in frozen foods which indicate it those foods have ever been allowed to thaw and then been refrozen.

It is an object of the present invention to enable the expansion of the market in which RFID tags can be used by building further capability into such tags.

According to the present invention, there is provided a radio frequency identification tag comprising a power supply, means responsive to a radio signal for energising the power supply, a memory circuit storing a tag identification code, and means energised by the power supply for transmitting from the tag a radio signal representing the tag identification code, wherein the tag further comprises a sensor responsive to an environmental parameter to which the tag is exposed, and means energised by the power supply for generating a sensor code representing the value of the parameter to which the sensor is responsive, the radio signal transmitted from the tag representing the tag identification code and the sensor code.

Thus the present invention proposes the combination of conventional RFID technology with a sensor to allow the remote reading of both the identity of an article to which the tag is attached and the value of a physical parameter to which the tag is exposed. Such parameters might include analog signals, for example temperature, flow rate, pressure, blood sugar levels and the like, or digital signals, for example the state (make or break) of switch contacts. The invention therefore allows remote, unpowered measurement of a wide variety of physical parameters, at a precise physical location, the source of the measurement being identified by the corresponding tag identification number. Sensors may generate an output representing the instantaneous value of the parameter to which they are responsive, but with relatively limited software and/or hardware development would be capable of more sophisticated functions, for example indicating when read whether or not the tag

has ever been exposed to an unacceptable condition, for example that the tag has been subjected to a temperature greater or less than a pre-set value.

Tags may be pre-programmed by for example burning in data into a read only memory, or may have non-volatile programmable memory. For example, data may be written to a programmable memory to adjust a programmed set-point. Reprogramming can be effected without it being necessary to have physical access to or even line of sight contact with the tag.

The tag may incorporate an interface coupled to a resonant circuit tuned to a frequency to which the tag is to be responsive. The interface may comprise a rectifier for converting an AC signal induced in the resonant circuit to a DC output voltage, and a charge storage device coupled to the output of the rectifier. The interface may comprise a clock circuit for generating a clock signal from signals induced in a coil in the resonant circuit, a demodulator for demodulating data from signals induced in the coil, and a modulator for modulating data derived from the sensor on the memory and a radio signal which is applied to the coil for transmission. A logic circuit may control reading data from the memory to the interface, writing data from the interface to the memory, and reading data from the sensor to the interface. All of the individual circuit components will be powered from the common power supply, data being transferred between components in accordance with a pre-programmed routine determined by the logic circuit.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic representation of an embodiment of the present invention; and

Figure 2 is a schematic representation of components incorporated in an interface of Figure 1.

Referring to the drawings, a tag 1 is shown within an area 2 which represents the environment to which the tag is exposed. The area 2 could be a physical structure, for example an article within which the tag is embedded, or simply an area of free space within which the tag is located. Incorporated within the tag is an integrated circuit 3 incorporating active circuit components in the form of an interface 4, control logic 5, a memory 6, and a sensor 7. The sensor is responsive to a parameter of the environment within which the tag is located, for example the temperature of that environment. The physical parameter to which the sensor 7 is exposed is represented by arrow 8.

The interface is coupled to the outside world by a coil 9 which forms a tuned resonant circuit with a capacitor 10. The resonant frequency of the circuit is selected to match the frequency of signals transmitted from a reader device 11 via an antenna 12. The reader device outputs a signal which serves two purposes, that is the transmission of energy to the tag assuming that the tag is within its normal operating range, and the transfer of data which both controls the responses of the tag and enables the memory of the tag to be appropriately programmed. The memory 6 is a ROM or EEPROM access to which is controlled by the logic circuit 5. The antenna

12 also serves to pick up radio signals transmitted from the coil 9, those radio signals being modulated with data which is to be read by the reader.

Figure 2 shows components of the interface 4 and supporting elements in greater detail. The alternating voltage appearing across the capacitor 10 is applied to a rectifier 13 the DC output of which is applied to a charge storing capacitor 14. The voltage across the capacitor serves as the power supply for all the active devices in the tag. RF signals detected by the coil 9 are demodulated by an RF demodulator 15, a clock signal is generated by a clock extract circuit 16 from the fundamental or modulated frequency of the signals transmitted from the reader, and an RF modulator 17 is provided to modulate an RF signal with data from the control logic circuit, the modulated signal being transmitted via the coil 9.

The system described above may use any of the existing transmission schemes currently employed for passive tags. Transmission frequencies can be of relatively high frequency, such as 2.45GHz or 915MHz, or of relatively low frequency such as the range 50kHz to 250kHz.

Similarly the modulation schemes for transmission of data to and from the tag may be any of those typically used in passive tags, for example Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK) or Phase Shift Keying (PSK).

Encoding of the data stream prior to modulation is typically performed using protocols such as NRZ (non-return to Zero), Manchester encoding or Coded Di-Phase. The later schemes help to prevent the development of DC offsets in the tag and

receiver circuits and also allow the recovery of a synchronisation clock. The recovered clock is usually essential to distinguish each bit reliably.

A reliable anti-contention protocol may be implemented to permit the detection and operation of several tags within one read volume.

The system components described above could be programmed to operate in a variety of different ways. For example, the reader could be programmed to periodically transmit an interrogation signal to which any in range tag would respond by transmitting back to the reader its characteristic identity code or other information. The reader would then respond to identification of the tag by transmitting an interrogation signal to read from the memory 6 the data representing the output of the sensor 7. The sensor output would then be received by the reader and associated with the respective tag code. The logic circuit could also be programmed to record for example the maximum and minimum temperatures to which the sensor 7 has been exposed and to transmit appropriate temperature indicating codes to the reader when interrogated.

The present invention has great potential as it is capable of application to the measurement of many different physical parameters in circumstances where it is very important to be able to accurately identify the source of a parameter measurement as well as the measurement value itself. For example, a pressure sensor could be used to simply measure a local pressure whose location is associated with a tag identification number. Pressure measurements in difficult or hazardous circumstances could then be achieved given that direct access to the sensors is not necessary. Measurement values

derived from the tags could be logged in association with the tag identities. Thus for example if a series of tags was attached along a length of underground pipe and each incorporated a temperature sensor, an inspector interested in local temperature readings would be able to walk above ground along the course of the pipe and read the temperature at every location of a tag and identify the position from which the sensed measurements originate by reference to the tag identification codes. It will be appreciated that similar applications arise where the parameter of interest is for example pressure or flow rate. Similarly, a simple pressure sensor could be used in an identification tag which would identify if a package within which the tag was positioned had ever been opened, assuming such opening would result in at least a short term pressure fluctuation. Such a system would have great value in food distribution, for example security seals for bottles or containers, and customs inspection, for example for bonded packages, given that large numbers of items could be tagged and scanned automatically with no line of sight or contact requirements at acceptable costs.

By incorporating appropriate anti-contention protocols, it would be possible to read multiple tags simultaneously and therefore it would not be a problem if more than one tag was within range of a reader at any one time. Each tag would in many circumstances only be responsive to a single physical parameter, but for some applications it would be appropriate to incorporate two or more sensors in each tag so that each sensor would be able to sense more than one parameter. Thus a tag might incorporate sensors responsive to say pressure and humidity, acceleration and

stress/strain, luminosity and magnetic field strength, chemical or gas concentrations or any other combination of physical conditions. A tag may also incorporate a low power non-volatile display to display user-defined information.

CLAIMS

1. A radio frequency identification tag comprising a power supply, means responsive to a radio signal for energising the power supply, a memory circuit storing a tag identification code, and means energised by the power supply for transmitting from the tag a radio signal representing the tag identification code, wherein the tag further comprises a sensor responsive to an environmental parameter to which the tag is exposed, and means energised by the power supply for generating a sensor code representing the parameter to which the sensor is responsive, the radio signal transmitted from the tag representing the tag identification code and the sensor code.

2. A radio frequency identification tag according to claim 1, wherein the radio frequency responsive means comprises an interface coupled to a resonant circuit tuned to a frequency to which the tag is to be responsive, the interface comprising a rectifier for converting an AC signal induced in the resonant circuit to a DC output voltage, and a charge storage device coupled to the output of the rectifier.

3. A radio frequency identification tag according to claim 2, wherein the interface comprises a clock circuit for generating a clock signal from signals induced in a coil of the resonant circuit, a demodulator for demodulating data

from signals induced in the coil, and a modulator for modulating data derived from the sensor and the memory on a radio signal which is applied to the coil for transmission.

4. A radio frequency identification tag according to claim 3, comprising a logic circuit which controls reading data from the memory to the interface, writing data from the interface to the memory, and reading data from the sensor to the interface.

5. A radio frequency identification tag substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

The Patent Office

13

Application No: GB 9600135.9 **Examiner:** Mr Jared Stokes
Claims searched: 1 to 5 **Date of search:** 27 February 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): G1N (NAHJA)
H4L (LASS, LACA)

Int Cl (Ed.6): A61B (5/00)

Other: On-Line - WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	GB 2 297 225 A	(Bio Medic) See whole document	1-5
X,E	GB 2 295 749 A	(Multilop) See page 6 paragraph 2	1,2 at least
X	GB 2 249 001 A	(Bio Medic) See page 2, "Summary of the invention"	1 at least
X	GB 2 076 259 A	(Rodrian) See abstract, figure 2 (labels 38,35,40)	1-3 at least
X	EP 0 563 713 A2	(Hughes) See whole document	1-5
X	EP 0 505 906 A1	(Goodyear) See abstract	1
X	WO 95/32616 A1	(Tetra) See whole document, especially abstract	1,2 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001
Filed as Large Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	3458379
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	16-JUN-2008
Filing Date:	08-APR-2005
Time Stamp:	08:37:25
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$ 180
RAM confirmation Number	7601
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement Letter	29343_1ThirdSuppIDS.pdf	159940 700da48f7806f958471cbf8d27181f5983ce0957	no	4
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Filed	US_IDS_Form__SB_08a.pdf	848606 f3669aacb71f64d95bfb8b17fdb14ab0d40ddafc	no	4
Warnings:					
Information:					
3	Foreign Reference	CA2387106.pdf	375361 cfe14a8beab07f5fa8f06110c1116bc8d32dbed2	no	10
Warnings:					
Information:					
4	Foreign Reference	GB2308947A.pdf	472894 80c79a6d24c570b5ad4b553a1a16137d1c6f4680	no	16
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Information:					
5	Fee Worksheet (PTO-06)	fee-info.pdf	8221 ea43f92912936c3c9fd4627423a779ed18f70be8	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1865022		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John P. Peeters		
Application No.:	10/530,901	Group Art Unit:	2612
Filing Date:	April 8, 2005	Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF		
Attorney Docket:	29343-00001		

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

May 7, 2008	Angie Moscowitz	
Date of Deposit		**Signature**

AMENDMENT AND REQUEST FOR RECONSIDERATION

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

Dear Madam:

Applicant submits this Amendment and Request for Reconsideration in response to the Office Action dated March 3, 2008. This response is timely because it is being filed within the three-month time period allowed for a response. Please amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion and adapted to be positioned on a surface;

a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor associated with a unique ID, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting ~~and receiving~~, through the use of said antenna, signals that correspond to said stimulus; ~~and~~

a multi-protocol wireless RFID reader ~~adapted to communicate through the use of multiple protocols~~ for communication with said RFID tag and sensor module, said RFID reader being ~~adapted to communicate~~ capable of communicating information over a wireless network through the use of multiple communication protocols; and

a database associated with said network, said database containing data or software associated with said ID.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Currently Amended) A system according to claim 2, wherein said ~~substitute~~ substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. (Original) A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Original) A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. (Currently Amended) A system according to claim 1, wherein responding to said stimulus includes sensing at least one electrical, chemical, biological, ~~and~~ or physical elements of said surface.

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Original) A system according to claim 1, wherein said surface is the skin surface of a person.

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Original) A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Original) A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. (Original) A system according to claim 1, wherein said at least one sensor is a glucose sensor.

16. (Original) A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. (Original) A system according to claim 1, wherein said at least one sensor is a radiation sensor.

18. (Original) A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Original) A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. (Cancelled)

22. (Original) A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. (Original) A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. (Original) A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. (Currently Amended) A human diagnostics system comprising:

a patch having ~~a radio frequency identification (RFID)~~ an RFID tag and sensor module, and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements;

a RFID reader communicative with said patch through the use of a network ~~and adapted~~ to analyze, receive, and transmit the signals from said patch through the use of multiple communication protocols; ~~and~~

a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and

said remote storage and data unit further having software which can be downloaded to said RFID reader for reading and interpreting said sensor.

26. (Original) A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. (Currently Amended) A system according to claim 25, wherein said predetermined elements include one or more electrical, chemical, biological, and physical ~~elements~~ element of a person.

28. (Original) A system according to claim 25, wherein said network is a wireless network that enables communication through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Original) A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFLD reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader

downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio-frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

REMARKS

Applicant would like to thank the Examiner for the Office Action of March 3, 2008. Applicant has reviewed the references cited in the Office Action and has amended the claims to more precisely recite the present invention. Please note that claim 25 has also been amended to address the §112 objection as well.

The two remaining independent claims after the cancellation of claim 35 are claims 1 and 25. Claim 1 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in light of Crowley and Lu et al. Claim 25 stands rejected under 35 U.S.C. §103(a) over Nelson, Jr. in view of Lu et al.

Claim 1 now recites:

> 1. A diagnostics system comprising:
>
> a flexible patch having an adhesive portion and adapted to be positioned on a surface;
>
> a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor associated with a unique ID, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting, through the use of said antenna, signals that correspond to said stimulus;
>
> a multi-protocol wireless RFID reader for communication with said RFID tag and sensor module, said RFID reader being capable of communicating information over a wireless network through the use of multiple communication protocols; and
>
> a database associated with said network, said database containing data or software associated with said ID.

Claim 25 now recites:

> 25. A human diagnostics system comprising:
>
> a patch having an RFID tag and sensor module, and being attachable to the surface of the skin and adapted to

> sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements;
>
> a RFID reader communicative with said patch through the use of a network to analyze, receive, and transmit the signals from said patch through the use of multiple communication protocols;
>
> a remote storage and data unit communicative with said RFID reader over said network, said remote storage and data unit analyzing and storing data from said patch and said RFID tag, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network; and
>
> said remote storage and data unit further having software which can be downloaded to said RFID reader for reading and interpreting said sensor.

None of the references, alone or in combination, disclose or make obvious the present invention's use of a database that includes software for reading a plurality of RFID sensors through multiple communication protocols. As stated in paragraph [0009] of the specification:

> Additionally, the RFID reader is adapted to read and analyze virtually any RFID tag and sensor module. As such, the RFID reader is adapted to retrieve the electronic identification of a tag and sensor module and download software that enables reading and analyses of the tag and sensor from a database.

The specification states further at paragraph [0076]:

> Since each RFID tag 10 contains its own electronic identification number 64, wireless device 2 can immediately recognize the type of sensor involved and perform the correct analysis. This is because a given modified cell phone can download the necessary software, data tables, etc. from a remote location via a wireless link and can instantly become a "smart" device for any given type of RFID sensor.

Finally, in paragraph [0093] of the specification:

> Using a low cost wireless device such as a cell phone 2 with RFID multi-protocol reader capability, complex drug interaction tests can be performed on-the-spot at a very low cost. This is possible by wireless access to cell phone towers 380, access to Internet 390 and to a remote storage/ data processing unit 400. In one embodiment remote storage/data processing unit 400 is embodied as a computer or electronic database. Accordingly through the use of computer 400 (hereinafter remote store/ data processing unit 400 shall be referred to as computer 400), a patient can either download data to computer 400 or upload into the cell phone the necessary information to conduct any given test by matching the ID of the RFID sensor with given software and data tables stored remotely on computer 400 via link 392.

The Crowley patent clearly shows that it is a simple wireless "logger" with no direct real-time second communication features (transceiver or radio) with a remote database to allow interactive instant two-way communication with a remote database for the sensor output.

The fact that Crowley is simple logger is clearly indicated by the following:

FIG. 1 shows that the reader device only has one radio (transceiver) which is meant to communicate from the reader to the temperature sensor as described in detail in the patent. Similarly FIG. 8 does not show any second communication to a remote database.

Col. 4 Lines 7-15 indicate that the temperatures "may be **later** recorded and/or downloaded to a computer database (e.g., for subsequent review and/or for patient record maintenance)."

Col. 8 Lines 39-49 describe the general configuration of the reader. While this section suggests that a second transmitter and receiver can be used it clearly indicates that it is a sub receiver of transceiver 8, which, as the patent shows, is the radio (transceiver) to communicate with the sensor.

Col. 10 Lines 32-40 indicate that "the reader 10 may include an input/output port (not shown) such that after a plurality of measurements are made (e.g., for a plurality of patients) such measurements may be **downloaded** into a database."

Claim 30 further confirms the above: "The system as recited in claim 26, further comprising: a data output port for **downloading** data form said hand-held probe to a data storage system."

Nelson, like Crowley, clearly describes a passive system, where information is downloaded from an index card or "data record" to a remote database in a second phase.

Col. 3 Lines 1-6 and FIGS. 1, 6, 7, 8, 9. Nelson describes a complex "index card" system with a detachable patch, a "carrier element" or substrate and a "data record" area (for manual input).

Col. 3 Lines 41-47 states that: "A code recipient record is **then** inputted into a data base in a manner such that the identification code can be used to access the record."

Col. 8 Lines 33-36 refer to "identification codes and code recipients are **to be** entered into and stored in a computer database."

Claim 1 further describes the two-tier passive "data record" system.

Lu does not disclose this approach to reading multiple communication protocols. In Lu, a CPU on board the reader performs a pulse width measurement:

> In the CPU 90, as illustrated by the "pulse-width measurement" box 100, the output of the comparator is first processed by measuring the pulse width. The pulse widths are measured in terms of the number of cycles of the driver signal. The CPU then determines the timer interval in the "protocol selection" box 102 by selecting the most likely protocol based on how much deviation there is from known ideal pulse width stored in the CPU 90.

Thus, in Lu there is no database connected to a network which has software which can read a plurality of RFID sensors through multiple communication protocols. Thus, the present invention as now claimed is neither disclosed nor made obvious in the combination of references.

Reconsideration and allowance are respectfully requested.

Respectfully Submitted,

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Dated: May 7, 2008
BLOOMFIELD 29343-1 903047v1

Electronic Acknowledgement Receipt

EFS ID:	3266618
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
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Attorney Docket Number:	29343-00001
Receipt Date:	07-MAY-2008
Filing Date:	08-APR-2005
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Application Type:	U.S. National Stage under 35 USC 371

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		29343_1Amendment.pdf	828952 61c3aefb52ddd986b9e188ba1352460544ced4a7	yes	16

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment - After Non-Final Rejection	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	16
Warnings:			
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	Total Files Size (in bytes):	828952	

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

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

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

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/530,901	04/08/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			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(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

AMENDMENT 05/07/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 60	Minus	** 64	= 0	X $25 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 8	Minus	***9	= 0	X $105 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	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".

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Legal Instrument Examiner:
/MONIQUE BRUNSON/

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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/530,901
Filing Date:	April 8, 2005
Applicant(s):	John P. Peeters
Group Art Unit:	2612
Examiner:	Jennifer Mehmood
Title:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF
Attorney Docket:	29343-00001

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

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Date of Deposit		**Signature**

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, the references listed on the enclosed Form PTO/SB/08A are submitted for consideration by the Examiner in the examination of the above-identified patent application.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form PTO/SB/08A, thereby indicating the Examiner's consideration of each of the references.

The submission of the references listed on the Form PTO/SB/08A is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

☐ (a) within three months of the filing date of the patent application, (b) within three months of the date of entry into the national stage as set forth in 37 C.F.R. § 1.491 of the international application, or (c) before the mailing date of a first Office Action on the merits.

☒ **after** (a), (b), or (c) above, but before the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution of the application, and is accompanied by one of:

- ☒ the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below).
- ☒ the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

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Copies Of The References

☐ Copies of the references (other than cited U.S. Patents and published U.S. Patent Applications) listed on the enclosed Form PTO/SB/08A are enclosed herewith. Attached to each reference not in the English language is a concise explanation of the relevance pursuant to 37 C.F.R. § 1.98(a)(3).

☐ A copy of the foreign search report is enclosed herewith.

☐ The references listed on the enclosed Form PTO/SB/08A were previously identified in the parent application(s) of the present application, and copies of the references were furnished at that time. Accordingly, additional copies of the references are not submitted herewith, so as not to burden the file with duplicate copies of references. The Examiner is respectfully requested to carefully review the references in accordance with the requirements set out in the Manual of Patent Examining Procedure. In accordance with 37 C.F.R. § 1.98(d), the details

of the parent application(s) relied upon for an earlier filing date under 35 U.S.C. § 120 in which copies of the references were previously furnished are set out below:

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				
3. 0 /				

☐ This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. If the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

Other Applications

☐ The Examiner's attention is directed to the following U.S. patent application(s):

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				

Certification

☐ The **undersigned attorney** hereby certifies that each item of information contained in the Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign patent application not more than three months prior to the filing of the Information Disclosure Statement.

☒ The **undersigned attorney** hereby certifies that no item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application or, to the knowledge of the attorney signing after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

Fees

☐ **No fee** is owed by the applicant(s).

☐ The Commissioner is hereby authorized to charge $_____ fee to Dickinson Wright PLLC's Dep. Acc't No. 04-1061.

☒ The fee is being paid concurrently with the submission of these documents via credit card.

Authorization To Charge Additional Fees

☒ If any additional fees are owed in connection with this communication, please charge Deposit Account No. 04-1061.

Respectfully submitted,

DICKINSON WRIGHT PLLC

Date: April 10, 2008

By:_____
Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant

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PTO/SB/08a (03-08)
Approved for use through 04/30/2008. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	10530901
Filing Date	2005-04-08
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Jennifer Mehmood
Attorney Docket Number	29343-00001

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6031454		2000-02-29	Lovejoy et al.	
	2	7109859		2006-09-19	Peeters	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10530901
	Filing Date	2005-04-08
	First Named Inventor	John P. Peeters
	Art Unit	2612
	Examiner Name	Jennifer Mehmood
	Attorney Docket Number	29343-00001

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

☐ None

SIGNATURE

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

Signature	/Robert L. Kelly/	Date (YYYY-MM-DD)	2008-04-10
Name/Print	Robert L. Kelly	Registration Number	31,843

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

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

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	10530901
Filing Date:	08-Apr-2005
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Filer:	Robert L. Kelly/Angie Moscowitz
Attorney Docket Number:	29343-00001
Filed as Large Entity	

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD ($)				**180**

Electronic Acknowledgement Receipt

EFS ID:	3133442
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Angie Moscowitz
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	10-APR-2008
Filing Date:	08-APR-2005
Time Stamp:	14:53:05
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	139
Deposit Account	041061
Authorized User	KELLY,ROBERT L.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement Letter	29343_1SuppDS.pdf	139516 b86b90a54ca132cdbf2c799fc8a4886552afb66d	no	4
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Filed	US_IDS_Form__SB_08a.pdf	844573 a7fbfbcbad8ef11e4efe3f1a383d433081b448e7	no	4
Warnings:					
Information:					
3	Fee Worksheet (PTO-06)	fee-info.pdf	8221 b2269aeba357a146d42fdcc620f031f2f61764e3	no	2
Warnings:					
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		Total Files Size (in bytes):	992310		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 03/03/2008

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

EXAMINER	
MEHMOOD, JENNIFER	
ART UNIT	**PAPER NUMBER**
2612	

MAIL DATE	DELIVERY MODE
03/03/2008	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	Jennifer A. Mehmood	2612	

-- 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 2008*.

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

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

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) *30-34 and 38-64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29 and 35-37* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *08 April 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)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/13/07; 4/8/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Election/Restrictions

1. Claims 30-34 and 38-64 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on January 16, 2008. Accordingly, this restriction is made final.

Claim Rejections - 35 USC § 112

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

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

3. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 25 recites the limitation "said RFID" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

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

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

6. Claims 1-4, 8-11, 13, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727) and further in view of and Crowley (US 7,142,114) and Lu et al. (US 6,172,609).

For claim 1, Nelson discloses a diagnostics system comprising: a flexible patch having an adhesive portion and adapted to be positioned on a surface (col 3, lns 5-10; col 4, lns 51-54; Fig. 1a, item 20; Fig. 2, items 24 and 26); a radio frequency identification (RFID) tag (Fig. 1a, item 22) and said patch and having an antenna (col 6, lns 40-46; Fig. 4), an RFID electronic chip (col 6, lns 8-21; Fig. 2, item 22), said RFID tag and responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and a wireless RFID reader adapted to communicate with said RFID tag, said RFID reader being adapted to communicate over a network (col 6, lns 40-55; col 8, lns 37-46; col 9, lns 1-5; Figs. 7a and 7b). Nelson, however, does not disclose a sensor module integrated with said patch. Crowley, on the other hand, discloses a sensor module integrated with a patch (col 7, lns 20-34; col 10, lns 10-15; Fig. 1, items 40 and 54). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to include a sensor module on a patch so that specific information of a patient, such as temperature, is obtained in order to make the most appropriate patient diagnosis. Nelson also does not disclose that a reader communicates through the use of multiple protocols with said RFID tag. Lu, however, discloses a reader which communicates through the use of multiple protocols with a RFID tag (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to communicate through the use of multiple protocols with a

RFID tag so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 2, Nelson discloses a substantial portion of said RFID tag is integrated onto a substrate disk (Fig. 2, item 24; col 4, lns 51-53). However, Nelson does not disclose a sensor. Furthermore, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above regarding the sensor disclosed by Crowley. It would have been obvious to include the sensor disclosed by Crowley integrated with the disk disclosed by Nelson so that a single medium includes both the sensor and the tag in order to decrease material costs by having two objects located on the same medium.

For claim 3, Nelson discloses said substrate disk includes a protective layer attached thereto (Fig. 2, items 24 and 26), said protective layer being in direct contact with the surface when said patch is positioned on the surface (col 4, lns 51-67; col 5, lns 25).

For claim 4, Nelson discloses said protective layer is formed of a semi-permeable material (col 4, lns 56-67; col 5, lns 1-8), but Nelson does not disclose that the layer is adapted to react to said stimulus from said surface. Crowley, however, discloses a sensor integrated with a layer that is adapted to react to said stimulus from a surface (i.e. body temperature of a human or animal; col 4, lns 32-67; col 5, lns 15-23). It would have been obvious to include the protective layer of Nelson adapted to react to said stimulus from a surface as disclosed by Crowley so that specific

characteristics of a human or animal are obtained to make the most appropriate diagnosis in a medical environment.

For claim 8, Nelson discloses a tag placed on a surface, but does not disclose a stimulus sensing of a surface. Crowley, however, discloses stimulus sensing includes sensing electrical, chemical, biological, and physical elements of said surface (col 1, lns 5-11). It would have been obvious to include stimulus sensing of a surface so that parameters of a patient's skin are measured in a non-intrusive manner (col 1, lns 49-58), as disclosed by Crowley.

For claim 9, Nelson discloses said RFID reader, but does not specifically disclose that the reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer. Crowley, discloses an RFID reader as a PDA (Fig. 5, item 10; col 7, lns 50-60). It would have been obvious to have the reader as disclosed by Nelson incorporated into a PDA, as disclosed by Crowley, so that the reader is mobile and will read several tags in multiple locations.

For claim 10, Nelson discloses said surface is the skin surface of a person (col 2, lns 60-65; col 4, lns 65-67; col 5, lns 1-8).

For claim 11, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above, regarding the sensor module. In addition, Nelson discloses said RFID tag further comprises a power unit adapted to stabilize voltage within said RFID tag (col 6, lns 26-48).

For claim 13, Nelson discloses an RFID tag, but does not disclose an RFID tag and sensor formed as an integrated circuit (IC). Crowley, however, discloses an RFID

tag and sensor formed as an integrated circuit (IC – col 5, lns 15-20; col 6, lns 46-51). It would have been obvious to include both an RFID tag and sensor formed as an IC so that a patient easily wears the RFID tag and sensor in one location on the patient's body.

For claim 19, Nelson discloses said patch is disposable (col 5 lns 26-32).

For claim 20, Nelson discloses said RFID tag further includes a power generation module that powers said RFID tag (col 6, lns 26-39). While Nelson discloses powering said RFID tag, Nelson does not disclose an RFID tag sensor. Crowley, on the other hand, discloses powering an RFID tag sensor (col 6, lns 5-14; col 8, lns 13-15). It would have been obvious to include a power source for a RFID tag sensor so that the sensor produces and stores readings of the sensor for future reference.

For claim 21, Nelson discloses said network includes a remote interrogator RFID reader (col 6, lns 7-21). However, Nelson discloses neither storage nor data processing adapted to remotely store and analyze data read. Crowley, however, does disclose storage and data processing that is remotely read by a reader (Fig. 1, items 8, 18, and 22; col 8, lns 34-42). It would have been obvious to include storage and data processing with the reader disclosed by Nelson so that the transponder maintains a relatively small size by transmitting raw data to the reader.

7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Ikefuji (US 5,774,062).

For claim 5, the claim is interpreted and rejected for the same reasons as stated in the rejection of claim 1 as stated above, regarding the sensor. In addition, Nelson discloses said RFID tag comprises: and a controller communicative with an interface, said controller (RFID interrogator – col 5, lns 42-67; col 10, lns 37-56) having a memory with a data table being adapted to analyze said data within said RFID tag (Fig. 7b, items 52; col 7, lns 35-45; col 8, lns 37-47). Nelson, however, does not include a sensor interface having an analog to digital converter coupled to at least one sensor. Ikefuji, on the other hand, discloses a sensor interface having an analog to digital converter coupled to at least one sensor (Fig. 1, item 18; Fig. 6, A/D; col 8, lns 10-15). It would have been obvious to include an analog digital converter coupled to the sensor of Crowley and interfaced with the controller of Nelson so that an abundant amount of information from the sensor is sent back to the interrogator/reader of Nelson via digital signals so that a diagnosis is made in a timely manner.

For claim 6, Nelson discloses said controller stores an ID number in a data table (col 5, lns 42-67; Fig. 1a, item 52; col 7, lns 35-45). Nelson, however, does not disclose a sensor. Crowley, on the other hand, discloses a sensor (col 7, lns 20-34; col 10, lns 10-15; Fig. 1, items 40 and 54). It would have been obvious to include a sensor ID number in the data table disclosed by Nelson in order to distinguish among several sensors that sense different types of characteristics of a patient.

For claim 7, Nelson discloses a tag communicative with said controller, but Nelson does not disclose a temperature sensor. Crowley, however, discloses a temperature sensor (col 1, lns 5-11). It would have been obvious to include a

temperature sensor integrated with the tag disclosed by Nelson so that a patient's temperature is measured in a non-intrusive manner.

8. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Valletta (US 6,970,105).

For claim 12, Nelson discloses a patch, but does not disclose a micro knife. Valletta, on the other hand, discloses a micro knife located on a patch adapted to dispense a substance when said patch is pressed on said surface, where said surface is the skin of the person (col 1, lns 43-49; col 3, lns 31-40; Fig. 2, items 13, 18, 29). While Valletta does not specifically disclose that the micro knife (syringe) is used to draw blood from the surface of the skin, the examiner takes official notice that it is well known that the syringe may used to draw blood from the surface of the skin as well as apply a therapy as disclosed by Valletta. Furthermore, it would have been obvious to draw blood from a patch worn by a patient in order to closely monitor blood characteristics of a patient thereby providing the most appropriate treatment.

For claim 16, Nelson does not disclose a cardiac sensor. Valletta, on the other hand, discloses a cardiac sensor (col 1, lns 47-50; col 3, lns 1-5). It would have been obvious to detect cardiac throbs via a patch worn by a patient in order to closely monitor the heart rate of a patient to determine exercise limitations of a patient.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Forcier et al. (US 7,061,381).

Nelson does not disclose a glucose sensor. Forcier discloses a glucose sensor (Fig. 9; col 11, lns 65-67; col 12, lns 1-10). It would have been obvious to modify the RFID tag of Nelson to include a glucose sensor disclosed by Forcier so that a patient is alerted to dangerous blood sugar levels.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Quinn et al. (US 2005/0101843).

Nelson does not disclose a radiation sensor. Quinn, however, discloses a radiation sensor (Fig. 1, items 20, 24; parag 0016). It would have been obvious to modify the RFID tag of Nelson to include a radiation sensor disclosed by Quinn so that a patient is alerted to dangerous levels of radiation.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609).
and further in view of Townsend et al. (US 6,529,127).

Nelson discloses an RFID tag, but does not disclose an RFID stress sensor. Townsend, however, discloses RF tag and sensor module includes at least one attachment point that enables attachment of the RF tag and sensor module to a structural stress, thereby forming a RF stress sensor (col 1, lns 25-47; col 2, lns 50-67; col 4, lns 8-27; Fig. 1, items 20a-20n). It would have been obvious to modify the RFID tag of Nelson to include a structural stress sensor disclosed by Townsend so that the integrity of a structure is maintained and confirmed as safe.

12. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609). and further in view of Ghazarian (US 7,034,683).

Nelson discloses a reader, but does not disclose that the reader includes a processor adapted to analyze and geolocate said patch through the use of GPS. Ghazarian, however, discloses a reader that includes a processor adapted to analyze and geolocate said patch through the use of GPS (Fig. 1A, items 32, 40, and GPS; col 10, lns 37-50; col 17, lns 49-55). It would have been obvious to incorporate a GPS receiver as disclosed by Ghazarian into the reader disclosed by Nelson so that a tag or patch's location is accounted for at all times, such as during inventory control, tracking of individuals, etc..

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Lye et al. (US 2004/0100376).

Nelson discloses an RFID tag, but does not disclose a RFID sensor module integrated into an immunoassay testing strip. Lye, however, discloses a RFID sensor module integrated into an immunoassay testing strip (Fig. 3, item 12; parags 0164 and 0165). It would have been obvious to include a RFID tag sensor module integrated into an immunoassay testing strip so that particular antigens are detected and communicated to a remote location for pharmaceutical purposes.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, Jr. (US 6,297,727), Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Valletta (US 6,970,105) and Lye et al. (US 2004/0100376).

Nelson discloses a patch with a substrate, but does not disclose said patch having a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area. Valetta discloses a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture data that flow through said testing area. While Valletta discloses capturing data that flow through said testing area, Valletta does not disclose that antigens flow through said testing area. Lye, however, discloses capturing data pertaining to antigens flowing through said testing area (parags. 0148, 0159, 0164, and 0165). It would have been obvious to modify the patch disclosed by Nelson with capturing data with an input port disclosed by Valletta, specifically focusing on capturing data pertaining to antigens disclosed by Lye so that data of a patient is captured and stored for future reference, such as data deviating from a predetermined range.

15. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and further in view of Lu et al. (US 6,172,609).

Crowley discloses a human diagnostics system comprising: a patch having a radio frequency identification (RFID) tag and sensor module (col 1, lns 6-11; col 6, lns 38-51), and being attachable to the surface of the skin and adapted to sense

predetermined elements through the skin and transmit signals corresponding to said predetermined elements (col 4, lns 36-50); a RFID reader communicative with said patch through the use of a network (col 10, lns 37-40) and adapted to analyze, receive, and transmit the signals from said patch (col 8, lns 34-41; Fig. 1, items 10, 18, and 22) through the use of multiple protocols; and a remote storage and data unit communicative with said RFID reader (Figs. 1 and 5, item 10), said remote storage and data unit analyzing and storing data from said patch and said RFID (col 7, ln 15), said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network (single reader for plurality of measurements/sensor tags downloaded to a database - col 10, lns 28-40). Crowley, however, does not disclose a RFID reader communicating to a tag through the use of multiple protocols. Lu, on the other hand, discloses a RFID reader communicating to a tag through the use of multiple protocols (col 1, lns 49-55; col 2, lns 37-47). It would have been obvious to communicate through the use of multiple protocols with a RFID tag so that a single reader is used to communicate with multiple tags, thereby providing an efficient system.

For claim 26, Crowley discloses a remote wireless device (Fig. 5, item 10) adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module (col 7, lns 21-37; col 8, lns 34-49).

For claim 27, Crowley discloses said predetermined elements include electrical, chemical, biological, and physical elements of a person (col 1, lns 5-11).

16. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and Lu et al. (US 6,172,609) and further in view of Zeps et al. (US 6,937,154).

For claim 28, Crowley discloses a wireless network, but does not disclose communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G. However, Zeps discloses communicating through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G (Fig. 1; col 9, lns 30-67; col 10, lns 33-42). It would have been obvious to communicate through the use of a communication protocol so that numerous equipment communicates with one another via a standardized communication channel.

For claim 29, Crowley discloses an RFID reader as a mobile, portable device, but does not disclose the RFID reader as a cellular telephone. Zeps, however, discloses the RFID reader as a cellular telephone (Fig. 1, items 31 and 34; col 3, lns 33-45). It would have been obvious to design the reader as a cellular telephone so that the reader is used for multiple purposes such as interrogating transponders and communicating with another during an emergency.

17. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114) and Townsend et al. (US 6,529,127) and further in view of Lu et al. (US 6,172,609).

For claim 35, Crowley discloses a diagnostics system comprising: a patch having an adhesive portion and adapted to be attached to a structure; a radio frequency identification (RFID) tag (Fig. 1, item 40; col 7, lns 20-30; col 9, lns 20-28) and sensor

module having an integrated temperature module (Fig. 1, item 54), said RFID tag and sensor module being integrated with said patch and having an antenna (Fig. 1, item 42; col 9, lns 22-30) and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and a wireless RFID reader communicative with said RFID tag and sensor module (col 7, lns 27-34; col 10, lns 10-19), said reader being adapted to communicate over a network (col 10, lns 35-40). Crowley discloses a patch disposed on a surface and not embedded within a structure. Townsend, however discloses a patch embedded within a structure (col 4, lns 8-15; Fig. 1, items 20a-20n). It would have been obvious to dispose a patch within a structure as opposed to on the surface of a structure in order to determine low cost health monitoring of a structure as disclosed by Townsend (col 3, lns 44-54). In addition, the claim is interpreted and rejected for the same reasons as stated in the rejection of claims 1 and 25 as stated above regarding Lu disclosing communications between a tag and a reader using multiple protocols.

For claim 36, Crowley discloses the stimulus of body temperature and not a defect in a structure. Townsend, on the other hand, discloses determining a defect in a structure (col 1, lns 11-26; col 3, lns 45-48). It would have been obvious to determine a defect in a structure in order to determine low cost health monitoring of a structure as disclosed by Townsend (col 3, lns 44-54).

18. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley (US 7,142,114), Townsend et al. (US 6,529,127) and Lu et al. (US 6,172,609) and further in view of Lake et al. (US 2001/0004237).

Crowley does not disclose that the stimulus is the presence of insects within a structure. Lake, however, discloses detecting the presence of insects within a structure (parags 0035 and 0036; Fig. 6, item 100, 20, and 22). It would have been obvious to determine the presence of insects within a structure in order to limit the amount of pesticide utilized to destroy insects since the location of insect infestation is known.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached on M-F from 8:00am to 4:30pm.

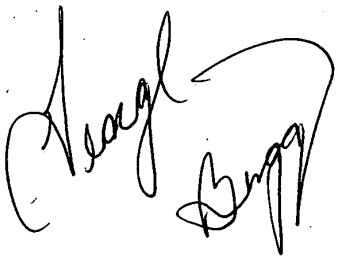
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. George Bugg, can be reached at (571) 272.2998. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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).

Jennifer A. Mehmood
February 21, 2008

George Bugg | Primary Examiner



PTO/SB/08a/b (08-03)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	~~Not Yet Assigned~~ 10/530,901
Filing Date	Concurrently Herewith
First Named Inventor	John P. Peeters
Art Unit	~~N/A~~ 2612
Examiner Name	~~Not Yet Assigned~~ Jennifer Mehmood
Attorney Docket Number	66355-0009

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JM/	AA	2,944,404	07/12/1960	Fritts	
	AB	3,050,948	08/28/1962	Jones	
	AC	4,315,599	02/16/1982	Biancardi	
	AD	4,506,510	03/26/1985	Tircot	
	AE	5,020,261	06/04/1991	Lishman	
	AF	5,351,437	10/04/1994	Lishman	
	AG	5,444,984	08/29/1995	Carson	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/JM/	BA	EP214766A1	08/08/1986	EPO		
/JM/	BB	DD272218A	04/10/1989	Germany		

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/JM/	CA	Sirringhaus, H.; Kawase, T.; Friend, R.H.; Shimoda, T.; Inbasekaran, M.; Wu, W.; Woo, E.P. High-Resolution Inkjet Printing of All-Polymer Transistor Circuits. Science, www.sciencemag.org, Vol 290, pp. 2123-2126. (December 15, 2000)	
	CB	Hausmann, Dennis; Becker, Jill; Wang, Shenglong; Gordon, Roy G. Rapid Vapor Deposition of Highly Conformal Silica Nanolaminates. Science, www.sciencemag.org, Volume 298, pp. 403-406 (October 11, 2002)	
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	CD	Donhauser, Z.J.; Mantooth, B.A.; Kelly, K.F.; Bumm, L.A.; Monnell, J.D.; Stapleton, J.J.; Price Jr., D.W.; Rawlett, A.M.; Allara, D.L.; Tour, J.M.; Weiss, P.S. Conductance Switching in Single Molecules Through Conformational Changes. Science, Volume 292, pp. 2303-2307, www.sciencemag.org (June 22, 2001)	
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Examiner Signature	/Jennifer Mehmood/	Date Considered	02/19/2008

PTO/SB/08a/b (08-03)
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Sheet 2 of 2

Complete if Known	
Application Number	Not Yet Assigned 10/530,901
Filing Date	Concurrently Herewith
First Named Inventor	John P. Peeters
Art Unit	~~N/A~~ 2612
Examiner Name	~~Not Yet Assigned~~ J. Mehmood
Attorney Docket Number	66355-0009

/JM/	CG	Wrolstad, Jay. Siemens' Cell-Network Service Tracks Assets, People. Wireless NewsFactor, www.wirelessnewsfactor.com/perl/printer/20997 (March 14, 2003)	
/JM/	CH	Merritt, Rick. From Sea to Shining Sea. Electronic Engineering Times, pp. 18-19, 24-25 (July 14, 2003)	
/JM/	CI	Wrolstad, Jay. Handheld Sniffs Out Potential Terrorist Threats. Wireless NewsFactor. www.wirelessnewsfactor.com/perl/story/21309.html (April 18, 2003)	

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Examiner Signature	/Jennifer Mehmood/	Date Considered	02/19/2008

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Sheet 1 of 1

Complete if Known	
Application Number	10/530,901
Filing Date	4/08/2005
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	~~Unknown~~ Jennifer Mehmood
Attorney Docket Number	29343-00001

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JM/		US- 3,253,588	05/31/1966	Vuilleumier et al.	
		US- 5,634,468	06/03/1997	Platt et al.	
		US- 6,285,899	09/04/2001	Ghaem et al.	
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Examiner Signature	/Jennifer Mehmood/	Date Considered	02/19/2008

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Notice of References Cited	Application/Control No. 10/530,901	Applicant(s)/Patent Under Reexamination PEETERS, JOHN P.	
	Examiner Jennifer A. Mehmood	Art Unit 2612	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0101843	05-2005	Quinn et al.	600/300
*	B	US-6,297,727	10-2001	Nelson, Jr., George N.	340/10.1
*	C	US-6,937,154	08-2005	Zeps et al.	340/573.1
*	D	US-7,142,114	11-2006	Crowley, Christopher T.	340/572.1
*	E	US-6,172,609	01-2001	Lu et al.	340/572.4
*	F	US-6,529,127	03-2003	Townsend et al.	340/505
*	G	US-2001/0004237	06-2001	Lake et al.	340/573.1
*	H	US-2004/0100376	05-2004	Lye et al.	340/539.12
*	I	US-5,774,062	06-1998	Ikefuji, Yoshihiro	340/10.4
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Page 384

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BIB DATA SHEET

CONFIRMATION NO. 9490

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/530,901	04/08/2005 RULE	455	2612	29343-00001

APPLICANTS
John P. Peeters, Bethesda, MD;

**** CONTINUING DATA ***************************
This application is a 371 of PCT/US05/02171 01/24/2005
which claims benefit of 60/539,419 01/27/2004

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
09/17/2006

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /JENNIFER MEHMOOD/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MD	23	64	9

ADDRESS

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970
UNITED STATES

TITLE

Diagnostic radio frequency identification sensors and applications thereof

FILING FEE RECEIVED	FEES: Authority has been given in Paper	☐ All Fees
1950	No._____ to charge/credit DEPOSIT ACCOUNT	☐ 1.16 Fees (Filing)
	No._____ for following:	☐ 1.17 Fees (Processing Ext. of time)
		☐ 1.18 Fees (Issue)
		☐ Other _____
		☐ Credit

BIB (Rev. 05/07).

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/530,901	PEETERS, JOHN P.
Examiner	**Art Unit**
Jennifer A. Mehmood	2612

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

Claim		Date
Final	Original	2/17/08
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Search Notes

Application/Control No.	Applicant(s)/Patent under Reexamination	
10/530,901	PEETERS, JOHN P.	
Examiner	**Art Unit**	
Jennifer A. Mehmood	2612	

SEARCHED			
Class	Subclass	Date	Examiner
340	572.1-572.9 573.1 573.2 539.12	2/19/2008	JM
600	306 300 309	2/19/2008	JM

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
East Search	2/19/2008	JM

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	145	340/572.1-572.9.ccls. and ((embed$4 within) near5 (transponder tag patch substrate) near5 (structure beam board truss))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:05
L2	107	340/572.1-572.9.ccls. and ((embed$4 within) near3 (transponder tag patch substrate) near5 (structure beam board truss joist stud rafter))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:09
L3	107	340/572.1-572.9.ccls. and ((embed$4 within) near3 (transponder tag patch substrate) near5 (structure beam board truss joist stud rafter))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:14
L4	28	3 and temperature	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:15
L5	78	340/572.1-572.9.ccls. and (structur$4 near4 integrity)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:17
L6	43	5 and temperature	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:17
L7	1	"6529127".pn. and temperature	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 09:25
L8	15	340/572.1-572.9.ccls. and ((detect$4 sens$4 monitor$4) near5 (termites insect bug))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 10:07

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L9	67	340/573.1,573.2.ccls. and ((detect$4 sens$4 monitor$4) near5 (termites insect bug))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/21 10:11
S1	40	("2944404"|"20020180605"|"2003 0187338"|"3050948"|"3253588"|" 4315599"|"4506510"|"5020261"|" 5351437"|"5444984"|"5634468"|" 6285899"|"6287252"|"6315719"|" 6428475"|"6615074"|"6686843"|" 7148803").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:35
S2	12	S1 and ((attach$4 appl$4 adher$4 adhear$4) near5 (body skin))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:37
S3	0	S2 and (RFID (radio near3 frequency near3 (ID identification)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:40
S4	89	340/572.8.ccls. and ((RFID (radio near3 frequency near3 (ID identification))) and ((attach$4 appl$4 adher$4 adhear$4) near5 (patient human body skin)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:42
S5	66	S4 and (sens$4 detect$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:43
S6	41	S4 and sensor	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:49
S7	16	peeters-john-p.in.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 11:53

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S8	151	340/572.1.ccls. and ((RFID (radio near3 frequency near3 (ID identification))) and ((attach$4 appl$4 adher$4 adhear$4) near5 (patient human body skin)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:05
S9	101	S8 and sens$4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:05
S10	58	340/539.12.ccls. and (RFID (radio near3 frequency near3 (ID identification)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:13
S11	3	"7109199".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:15
S12	3	"7106199".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:16
S13	1	"5736929".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:16
S14	1	"5973600".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:16
S15	1	"6040773".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:16
S16	1	"6232870".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:16
S17	1	"6255959".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:17
S18	1	"6294953".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:17
S19	1	"6297734".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:17
S20	1	"6712276".PN.	USPAT; USOCR	OR	ON	2008/02/19 12:17

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S21	272	340/572.7,572.1,572.8.ccls. and (((transponder RFID) (radio near3 frequency near3 (ID identification))) and ((attach$4 appl$4 adher$4 adhear$4) near5 (patient human body skin)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:18
S22	98	S21 and (flexible pliable)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:19
S23	141	S21 and sensor	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:47
S24	289	340/572.1-572.9.ccls. and (((transponder RFID) (radio near3 frequency near3 (ID identification))) and ((attach$4 appl$4 adher$4 adhear$4) near5 (patient human body skin)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:50
S25	102	S24 and (flexible pliable)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 12:51
S26	317	((reader interrogator interrogation) near15 (multiple vary$4 numerous several many) near5 (protocol))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 13:07
S27	282	((reader interrogator interrogation) near10 (multiple vary$4 numerous several many) near5 (protocol))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 13:08
S28	2	"6297727".pn.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 14:05

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S29	1	"6297727".pn. and (sens$4 detect$4)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 14:05
S30	6	(("20040225199") or ("20030004403") or ("20050009122")).PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/02/19 14:11
S31	0	"7142114".pn. and ((A/D) analog)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 15:26
S32	236	340/572.1-572.9.ccls. and ((sensor detector) near10 (analog A/D))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 15:29
S33	0	"6297727".pn. and sanitary	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 16:47
S34	1	"6297727".pn. and voltage	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 16:51
S35	17	340/572.1-572.9.ccls. and ((knife incision) near10 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 16:53
S36	0	600/306,300,309.ccls. and ((knife incision) near10 (tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 16:56

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S38	10	340/572.1-572.9.ccls. and ((microknife miniknife knife scalpal incision) near10 (patient human skin animal))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 17:05
S39	64	"300".clas. and (microknife $4knife (miniature near4 (knife scalpal)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 17:09
S40	116	340/572.1-572.9.ccls. and (microknife miniknife knife scalpal)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 17:13
S41	21	340/572.1-572.9.ccls. and ((microknife miniknife knife scalpal) near12 (substrate patch tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/19 17:15
S42	0	340/10.1.ccls. and ((microknife miniknife knife scalpal) near12 (substrate patch tag transponder))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 06:34
S43	11	340/10.1.ccls. and (microknife miniknife knife scalpal incision)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 06:34
S44	1	"7142114".pn. and (IC (integrated near3 chip))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 06:37
S45	50	340/572.1-572.9.ccls. and (capillary vein artery (vessel near3 blood))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 06:45

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S46	4	340/572.1-572.9.ccls. and ((protein carbohydrate antigen toxin enzyme) near12 blood)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:06
S47	406	"600".clas. and (RFID (radio near3 frequency near3 (ID identification)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:09
S48	174	S47 and ((sens$4 detect$4 monitor$4) near12 (glucose cardiac radiation))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:10
S49	90	S47 and ((sens$4 detect$4) near5 glucose)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:24
S50	7	340/572.7,572.1,572.8.ccls. and ((sens$4 detect$4) near5 glucose)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:31
S51	12	340/572.7,572.1,572.8.ccls. and ((sens$4 detect$4) near5 cardiac)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:37
S52	24	340/539.12.ccls. and ((sens$4 detect$4) near5 cardiac)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 07:41
S53	10	340/539.12.ccls. and ((sens$4 detect$4) near5 radiation)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 08:08

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S54	15	340/572.1-572.9.ccls. and (stress near4 (detector sensor))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 08:20
S55	2	"7142114".pn. and power$4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 13:55
S56	88	340/572.1-572.9.ccls. and ((reader interrogat$4) near10 GPS)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:13
S57	3	340/572.1-572.9.ccls. and immunoassay	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:33
S58	3	340/572.1-572.9.ccls. and (protein near25 antigen)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:34
S59	8	340/572.1-572.9.ccls. and antigen	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:34
S60	194	"600".clas. and ((test near3 strip) and (antigen immunossay))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:37
S61	19	S60 and (RFID (radio near3 frequency near3 (ID identification)))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 14:41

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S62	0	"7142114".pn. and network$4	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 15:28
S63	338	340/572.1-572.9.ccls. and (broadband 3G WLAN Wi-Fi)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 15:48
S64	1	"6937154".pn. and (cell$4 mobile phone)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 16:06
S65	0	"7142114".pn. and (cell$4 mobile phone)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 16:08
S66	2	"7142114".pn. and (antenna coil)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 16:20
S67	22	340/572.1-572.9.ccls. and ((thermal temperature heat) and (insects termite))	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/02/20 16:23

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/530,901	Confirmation No. 9490
Applicant	:	John P. Peeters	
Filed	:	April 8, 2005	
TC/A.U.	:	2612	
Examiner	:	Jennifer Mehmood	
Docket No.	:	29343-00001	
Titled	:	DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF	

I hereby certify that this correspondence is being electronically filed with the United States Patent & Trademark Office via the EFS-Web and a registered e-Filer certificate on:

January 16, 2008
Date of Deposit

Nicole M. Thurman
Nicole M. Thurman

RESPONSE TO RESTRICTION/ELECTION REQUIREMENT

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

Applicant submits this Response in reply to the Restriction/Election Office Action dated January 9, 2008 requiring an election of species. This response is timely because it is being filed within the time period set for a response.

REMARKS

The Examiner has required restriction to one of the following inventions, Group I (Claims 1-29 and 35-37), Group II (Claims 30-34 and 49-58), Group III (Claims 38-47, 63, and 64), Group IV (Claim 48), and Group V (Claims 59-62). Applicant hereby elects, without traverse, Group I (Claims 1-29 and 35-37)) and request withdrawal of Groups II, III, IV and V from consideration. Applicant hereby submits that all of the claims are clearly readable on the elected species.

Favorable consideration and allowance of this application is respectfully requested.

Applicant believes there are no fees due for this document, however, if any fees are due, the Patent Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 04-1061 in the name of Dickinson Wright PLLC.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

Robert L. Kelly (Reg. No. 31,843)
38525 Woodward Avenue, Suite 2000
Bloomfield Hills, MI 48304-5092
(248) 433-7200

Dated: January 16, 2008

BLOOMFIELD 29343-1 891346v1

Electronic Acknowledgement Receipt

EFS ID:	2725212
Application Number:	10530901
International Application Number:	
Confirmation Number:	9490
Title of Invention:	Diagnostic radio frequency identification sensors and applications thereof
First Named Inventor/Applicant Name:	John P. Peeters
Customer Number:	59582
Filer:	Robert L. Kelly/Nicole Thurman
Filer Authorized By:	Robert L. Kelly
Attorney Docket Number:	29343-00001
Receipt Date:	16-JAN-2008
Filing Date:	08-APR-2005
Time Stamp:	15:27:15
Application Type:	U.S. National Stage under 35 USC 371

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	Response to Election / Restriction Filed	Response.pdf	47560 5aa0feaa0643f3ba596eb5e440500f19392932ea	no	2

Warnings:	
Information:	

Total Files Size (in bytes):	47560

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,901	04/08/2005	John P. Peeters	29343-00001	9490

59582 7590 01/09/2008

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38525 WOODWARD AVENUE
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EXAMINER	
MEHMOOD, JENNIFER	

ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
01/09/2008	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.

Office Action Summary	Application No.	Applicant(s)	
	10/530,901	PEETERS, JOHN P.	
	Examiner	Art Unit	
	Jennifer A. Mehmood	2612	

-- 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 1 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 *13 August 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) *1-64* 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) _____ is/are objected to.

8)☒ Claim(s) *1-64* 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 _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-29 and 35-37 are drawn to a RFID system where a patch having an adhesive portion is positioned on a surface including an RFID tag and sensor module, classified in class 340, subclass 572.1.

   II. Claims 30-34 and 49-58 are drawn to a personal wireless communications device focusing on component structure of a RFID reader, classified in class 340, subclass 539.11.

   III. Claims 38-47, 63, and 64 are drawn to an immunoassay test strip for conducting diagnostic measurements classified in class 436, subclass 44.

   IV. Claim 48 is drawn to a method of manufacturing an RFID tag and sensor classified in class 270, subclass 52.02.

   V. Claims 59-62 are drawn to a lab-on-a-chip substrate for temperature detection diagnostics classified in class 600, subclass 549.

2. The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as diagnosing within a small area using an RFIG tag such as a cargo/storage space not requiring a personal wireless communication device for communication between two remote parties. See MPEP § 806.05(d).

4. Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as communicating between two remote parties not requiring an immunoassay test strip. See MPEP § 806.05(d).

5. Inventions III and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as for diagnosing allergic reactions to the skin not requiring manufacturing of an RFID tag and sensor. See MPEP § 806.05(d).

6. Inventions IV and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention IV has separate utility such as custom designing an RFID tag and sensor not requiring temperature detection. See MPEP § 806.05(d).

7. Inventions V and I are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention V has separate utility such as detecting air temperature not requiring attaching an RFID tag on an object. See MPEP § 806.05(d).

8. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required

because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

9. A telephone call/voice message was made to Robert L. Kelly on December 21, 2007 and December 27, 2007 to request an oral election to the above restriction requirement, but no response was received, therefore, an election was not made.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Mehmood whose telephone number is (571) 272.2976. The examiner can normally be reached 8:00-4:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Daniel Wu can be reached at (571) 272.2964. The fax phone number for the organization where this application or proceeding is assigned is (571) 273.8300 for regular and after final communications.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272.2600.

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).

Jennifer Mehmood
December 31, 2007

BENJAMIN C. LEE
PRIMARY EXAMINER

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/530,901	PEETERS, JOHN P.
Examiner	**Art Unit**
Jennifer A. Mehmood	2612

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

Claim		Date
Final	Original	12/31/07
	1	+
	2	√
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Claim		Date
Final	Original	12/12/2007
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PATENT & TRADEMARK OFFICE

IFW 2612

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/530,901

Filing Date: April 8, 2005

Applicant(s): John P. Peeters

Group Art Unit: 2612

Examiner: Unknown

Title: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Attorney Docket: 29343-00001

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendments
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, the references listed on the enclosed Form PTO/SB/08A are submitted for consideration by the Examiner in the examination of the above-identified patent application.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form PTO/SB/08A, thereby indicating the Examiner's consideration of each of the references.

Certificate of Mail Under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendments, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on **August 9, 2007** by the undersigned.

Susan K. Olson (~~Susan~~ K. Olson)

The submission of the references listed on the Form PTO/SB/08A is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

☒ (a) within three months of the filing date of the patent application, (b) within three months of the date of entry into the national stage as set forth in 37 C.F.R. § 1.491 of the international application, or (c) before the mailing date of a first Office Action on the merits.

☐ **after** (a), (b), or (c) above, but before the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution of the application, and is accompanied by one of:

- ☐ the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below).
- ☐ the fee set forth in 37 C.F.R. § 1.17(p) (see "Fees" below).

☐ **after** the mailing date of a final action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution but is filed on or before payment of the issue fee, and includes the Certification under 37 C.F.R. § 1.97(e) (see "Certification" below), and the fee set forth in 37 C.F.R. § 1.17(p).

Copies Of The References

☐ Copies of the references (other than cited U.S. Patents and published U.S. Patent Applications) listed on the enclosed Form PTO/SB/08A are enclosed herewith. Attached to each reference not in the English language is a concise explanation of the relevance pursuant to 37 C.F.R. § 1.98(a)(3).

☐ A copy of the foreign search report is enclosed herewith.

☐ The references listed on the enclosed Form PTO/SB/08A were previously identified in the parent application(s) of the present application, and copies of the references were furnished at that time. Accordingly, additional copies of the references are not submitted herewith, so as not to burden the file with duplicate copies of references. The Examiner

is respectfully requested to carefully review the references in accordance with the requirements set out in the Manual of Patent Examining Procedure. In accordance with 37 C.F.R. § 1.98(d), the details of the parent application(s) relied upon for an earlier filing date under 35 U.S.C. § 120 in which copies of the references were previously furnished are set out below:

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				
3. 0 /				

☐ This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. If the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

Other Applications

☐ The Examiner's attention is directed to the following U.S. patent application(s):

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1. 0 /				
2. 0 /				

Certification

☐ The **undersigned attorney** hereby certifies that each item of information contained in the Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign patent application not more than three months prior to the filing of the Information Disclosure Statement.

Abbott
Exhibit 1002
Page 410

☒ The **undersigned attorney** hereby certifies that no item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application or, to the knowledge of the attorney signing after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

Fees

☒ **No fee** is owed by the applicant(s).

☐ The Commissioner is hereby authorized to charge $_____ fee to Dickinson Wright PLLC's Dep. Acc't No. 04-1061.

Authorization To Charge Additional Fees

☒ If any additional fees are owed in connection with this communication, please charge Deposit Account No. 04-1061.

Respectfully submitted,

DICKINSON WRIGHT PLLC

Date: August 9, 2007

By:_____
Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant

Dickinson Wright PLLC
38525 Woodward Ave., Ste. 2000
Bloomfield Hills, MI 48304-5092
(248) 433-7578

BLOOMFIELD 29343-1 857626v1

Abbott
Exhibit 1002
Page 411

PTO/SB/08A (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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OIPE AUG 13 2007 PATENT & TRADEMARK OFFICE

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/530,901
Filing Date	4/08/2005
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	Unknown
Attorney Docket Number	29343-00001

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 3,253,588	05/31/1966	Vuilleumier et al.	
		US- 5,634,468	06/03/1997	Platt et al.	
		US- 6,285,899	09/04/2001	Ghaem et al.	
		US- 6,287,252	09/11/2001	Lugo	
		US- 6,315,719	11/13/2001	Rode et al.	
		US- 2002/0180605	07/16/2002	Ozguz et al.	
		US- 6,428,475	08/06/2002	Shen	
		US- 2003/0187338	04/18/2003	Say et al.	
		US- 6,615,074	09/02/2003	Mickle et al.	
		US- 6,686,843	02/03/2004	Felkowitz	
		US- 7,148,803	12/12/2006	Bandy	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 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, 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 (1-800-786-9199) 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

DATE: 05/18/2007

DICKINSON WRIGHT PLLC
38525 WOODWARD AVENUE
SUITE 2000
BLOOMFIELD HILLS, MI 48304-2970

To: Applicant of Serial Number 10530901
Filed on 08-APR-2005
(Art Unit 2612)

It is estimated that this application will receive an Office action in approximately 8 months. This is an estimate that is based on the current inventory level of applications filed in this art area and the current staffing levels in this Art Unit. The USPTO is dedicated to minimizing first action and total pendency, and we are targeting resources to help address backlogs in art areas with high new application filings. Thank you for your inquiry.

Customer Service Office in Technology Center: 2600

Phone Number: 571-272-2600
Central Fax Number: 571-273-8300

Applicant/Attorney Contact Information:

Phone Number: 248-594-0650
Fax Number:

TFW 2612

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John P. Peeters

Appl. No.: 10/530,901

Filed: April 8, 2005

Title: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Art Unit: 2612

Docket No.: 29343-00012

STATUS INQUIRY

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

Dear Sir:

In connection with the above-identified application, the last communications received from the Patent and Trademark Office was the Corrected Filing Receipt mailed January 4, 2007. Accordingly, because this application was filed over two years ago, Applicant hereby urgently requests the Patent Office to advise Applicant's undersigned attorney as to the status of the application.

Favorable and prompt consideration is respectfully requested.

Respectfully Submitted,

DICKINSON WRIGHT PLLC

Date: April 13, 2007 By: _____
Robert L. Kelly, Reg. No. 31,843

38525 Woodward Ave., Suite 2000
Bloomfield Hills, MI 48304-5092
(248) 433-7578

Abbott
Exhibit 1002
Page 414

CERTIFICATE OF MAILING

I hereby certify that the **STATUS INQUIRY** for United States Patent Application No. 10/530,901, is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on **April 13, 2007**.

Susan K. Olson

Susan K. Olson

Abbott
Exhibit 1002
Page 415

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DICKINSON WRIGHT PLLC

38525 WOODWARD AVENUE, SUITE 2000
BLOOMFIELD, MICHIGAN 48304
TELEPHONE: (248) 433-7200
FACSIMILE: (248) 433-7274
http://www.dickinsonwright.com

FACSIMILE TRANSMITTAL SHEET

To:	Art Unit 2612
Fax:	1-571-273-8300
Subject:	US Application No 10/530,901
Date:	02/01/2007 02:03:11 PM
Pages:	3 , including cover page
From:	Kelly, Robert L.
E-mail:	RKelly@dickinson-wright.com
Phone:	248-433-7578

If you have not received the total number of pages, please call the sender at the above phone number. ***Thank you.***

IMPORTANT - This message is intended solely to be used by the individual or entity to which it is addressed. It may contain information which is privileged, confidential and otherwise exempt by law from disclosure. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to its intended recipient, you are herewith notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us by telephone immediately and return this communication to us at the above address via the United States Postal Service. *Thank you.*

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PTO/SB/122 (01-06)
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CHANGE OF CORRESPONDENCE ADDRESS
Application

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

Application Number	10/530,901
Filing Date	4/08/2005
First Named Inventor	John P. Peeters
Art Unit	2612
Examiner Name	
Attorney Docket Number	29343-00001

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

☑ The address associated with Customer Number: 59582

OR

☐ Firm or Individual Name

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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" (RTO/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 31,843

☐ 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 Robert L. kelly

Date 2/01/2007 | Telephone 248-433-7578

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 1.33. 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.

Certificate of Transmission

I hereby certify that this Change of Correspondence Address form for U.S. Application No. 10/530,901 is being transmitted via facsimile No. **571-273-8300** to the Commissioner for Patents, on **February 1, 2007** by the undersigned.

Susan K. Olson (Susan K. Olson)

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
10/530,901	04/08/2005	2612	1950	29343-00001	23	64	9

CONFIRMATION NO. 9490

10291
RADER, FISHMAN & GRAUER PLLC
39533 WOODWARD AVENUE
SUITE 140
BLOOMFIELD HILLS, MI48304-0610

CORRECTED FILING RECEIPT

Date Mailed: 01/04/2007

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

John P. Peeters, Bethesda, MD;

Assignment For Published Patent Application

Altivera L.L.C.

Power of Attorney:
Robert Kelly--31843

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US05/02171 01/24/2005
which claims benefit of 60/539,419 01/27/2004

Foreign Applications

If Required, Foreign Filing License Granted: 09/17/2006

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US10/530,901**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

Diagnostic radio frequency identification sensors and applications thereof

Preliminary Class

340

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under

37 CFR 1.53(d). This license is not retroactive.

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

NOT GRANTED

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/530,901	04/08/2005	John P. Peeters	29343-00001

CONFIRMATION NO. 9490

10291
RADER, FISHMAN & GRAUER PLLC
39533 WOODWARD AVENUE
SUITE 140
BLOOMFIELD HILLS, MI48304-0610

Title: Diagnostic radio frequency identification sensors and applications thereof

Publication No. US-2006-0290496-A1
Publication Date: 12/28/2006

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 publically 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

OIPE IAP98
OCT 06 2006
PATENT & TRADEMARK OFFICE

TFW Receipt

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John P. Peeters

Serial No.: 10/530,901 Art Unit: 2618

OIPE IAP98
OCT 06 2006
PATENT & TRADEMARK OFFICE

Filed: April 8, 2005

Title: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Attorney Docket No.: 29343-00001

REQUEST FOR CORRECTED FILING RECEIPT

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

Dear Sir:

With respect to the above-identified patent application, Applicant respectfully requests a corrected Filing Receipt.

In the section entitled, **Assignment for Published Patent Application,** please delete "Gentag, Inc." and insert --Altivera L.L.C.--.

Respectfully submitted

DICKINSON WRIGHT PLLC

October 4, 2006
Date

Robert L. Kelly, Reg. No. 31,843
38505 Woodward Avenue, Suite 2000
Bloomfield Hills, Michigan 48304-5092
(248) 433-7578

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that this **Request for Corrected Filing Receipt** for U.S. Application No. 10/530,901 is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on **October 4, 2006** by:

Susan K. Olson (Susan K. Olson)

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

APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY.DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/530,901	04/08/2005	2618	1950	29343-00001	23	64	9

OIPE IAP98 OCT 06 2006 PATENT & TRADEMARK OFFICE

CONFIRMATION NO. 9490

FILING RECEIPT

OC000000020470861

10291
RADER, FISHMAN & GRAUER PLLC
39533 WOODWARD AVENUE
SUITE 140
BLOOMFIELD HILLS, MI 48304-0610

Date Mailed: 09/19/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

John P. Peeters, Bethesda, MD;

Assignment For Published Patent Application

Gentag, Inc. Altivera L.L.C.

RECEIVED DICKINSON WRIGHT PLLC

Power of Attorney:

Robert Kelly--31843

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US05/02171 01/24/2005 which claims benefit of 60/539,419 01/27/2004

Foreign Applications

If Required, Foreign Filing License Granted: 09/17/2006

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US10/530,901

Projected Publication Date: 12/28/2006

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

Diagnostic radio frequency identification sensors and applications thereof

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

under 37 CFR 5.13 or 5.14.

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

NOT GRANTED

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

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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
10/530,901	John P. Peeters	29343-00001

INTERNATIONAL APPLICATION NO.	
PCT/US05/02171	
I.A. FILING DATE	PRIORITY DATE
01/24/2005	01/27/2004

10291
RADER, FISHMAN & GRAUER PLLC
39533 WOODWARD AVENUE
SUITE 140
BLOOMFIELD HILLS, MI 48304-0610

CONFIRMATION NO. 9490

371 ACCEPTANCE LETTER

OC000000020470862

Date Mailed: 09/19/2006

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

04/08/2005	07/27/2006
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** *The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363).* Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 04/08/2005
- Copy of the International Search Report filed on 04/08/2005
- Copy of IPE Report filed on 04/08/2005
- Preliminary Amendments filed on 04/21/2006
- Information Disclosure Statements filed on 04/08/2005
- Oath or Declaration filed on 04/08/2005
- U.S. Basic National Fees filed on 04/08/2005

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

KAREN M WILLIAMS
Telephone: (703) 308-9140 EXT 213

PART 3 - OFFICE COPY

FORM PCT/DO/EO/903 (371 Acceptance Notice)

UNITED STATES NATIONAL STAGE SHEET (DO/EO)
Karen Williams, Paralegal

PUBLICATION NO. WO 05/074161

PUBLICATION DATE 11 AUG 05

U. S. APPL. NO. 10/553090

INTERNATIONAL APPL. US 05/02171

Application Filed By: 30 MOS

International Application ✓ Translation ___ Defective ___ Reason ___

WIPO Designated US Elected US IA Language ENGLISH

Copy of Search Report (ISR) ✓ Article 33 ✓ Article 19 ___

371 Filing fees ✓ paid ___ insufficient Pages ___

Total Claims 64 Chargeable 64 Independent 9 Multiple N

Total Drawing Sheets 23 Defective ___ Reason ___

Oath/Declaration needed ___ signed ✓ defective ___ Reason RULE 4.17

Small entity ✓ Large entity ___ Small entity statement ___

Biochemical Seq. Diskette ___ needed ___ damaged ___ entered ___ not entered ___

Biochemical Sequence listing ___ needed ___ statement ___ no statement ___

Copy of References Cited in ISR ___ IB/331 ___

Copy of IPER ✓ Annexes ___ entered ___ not entered ___ Reason ___

Preliminary Amendments 21 APR 06 entered ___ not entered Reason ___

Information Disclosure Statement ✓ Request for Immediate Examination ___

Substitute Specification ___ Assignment ___ Priority document ___

Power of Attorney ___ Data Sheet ✓ RO/101 ___ PCT Easy ___

Other papers STATUS 24 MAR 06; ADDRESS CHANGE 21 APR 06

35 USC Receipt of Request 08 APR 05
Date completion USC 371 Requirements 08 APR 05
Notice of Missing Requirements ___
Notice of Defective ___ Response ___ Translation ___ Declaration ___ Disk ___
Notice of Acceptance 17 SEP 06
Notice of Abandonment ___
Notice of Missing Sequence ___

PATENT APPLICATION SERIAL NO. _____

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

04/14/2005 GFREY1 00000061 180013 10530901

01 FC:2631 150.00 DA
02 FC:2633 100.00 DA
03 FC:2632 250.00 DA
04 FC:2615 1100.00 DA
05 FC:2614 600.00 DA

Adjustment date: 09/18/2006 KWILLIAM
04/14/2005 GFREY1 00000061 180013 10530901
02 FC:2633 100.00 CR
03 FC:2632 250.00 CR

09/18/2006 KWILLIAM 00000009 180013 10530901

01 FC:2641 50.00 DA
02 FC:2643 50.00 DA

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-267/60033

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

Application or Docket Number: 10/530901

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY TYPE ☐	RATE	FEE	OR	OTHER THAN SMALL ENTITY	RATE	FEE
U.S. NATIONAL STAGE FEES	64								
BASIC FEE	SMALL ENT. = $ 150	LARGE ENT. = $ 300		BASIC FEE	150	OR		BASIC FEE	
EXAMINATION FEE	Satisfies PCT Article 33(1)-(4) = $ 50 / $ 100	All other situations = $ 100 / $ 200		EXAM. FEE	50			EXAM. FEE	
SEARCH FEE	U.S. is ISA = $ 50 / $ 100 ALL other countries = $ 200 / $ 400	ALL other situations = $ 250 / $ 500		SEARCH FEE	50			SEARCH FEE	
FEE FOR EXTRA SPEC. PGS.	minus 100 =	/ 50 =		X $ 125 =				X $ 250 =	
TOTAL CHARGEABLE CLAIMS	64 minus 20 =	* 44		X $ 25 =	1100	OR		X $ 50 =	
INDEPENDENT CLAIMS	9 minus 3 =	* 6		X $ 100 =	600	OR		X $ 200 =	
MULTIPLE DEPENDENT CLAIM PRESENT	N ☐			+ $ 180 =		OR		+ $ 360 =	
* If the difference in column 1 is less than zero, enter "0" in column 2				TOTAL	1950	OR		TOTAL	

CLAIMS AS AMENDED - PART II

SMALL ENTITY OR OTHER THAN SMALL ENTITY

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDI-TIONAL FEE	OR	RATE	ADDI-TIONAL FEE
AMENDMENT A	Total	*	Minus	**	=	X $ 25 =		OR	X $ 50 =	
	Independent	*	Minus	***	=	X $ 100 =		OR	X $ 200 =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					+ $ 180 =		OR	+ $ 360 =	
						TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDI-TIONAL FEE	OR	RATE	ADDI-TIONAL FEE
AMENDMENT B	Total	*	Minus	**	=	X $ 25 =		OR	X $ 50 =	
	Independent	*	Minus	***	=	X $ 100 =		OR	X $ 200 =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					+ $ 180 =		OR	+ $ 360 =	
						TOTAL ADDIT. FEE		OR	TOTAL ADDIT. 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.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

(FOR USE WITH FORM PTO-875)

SERIAL NO. 10/530901

FILING DATE

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
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TOTAL IND.						
TOTAL DEP.						
TOTAL CLAIMS						

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
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98						
99						
100						
TOTAL IND.	9					
TOTAL DEP.	55					
TOTAL CLAIMS	64					

PTO - 1360 (REV. 11/04)

U.S. DEPARTMENT of COMMERCE
Patent and Trademark Office

IAP7 Rec'd PCT/PTO 21 APR 2006

OIPE IAP43 APR 21 2006 PATENT & TRADEMARK OFFICE

PCT

Attorney Docket No: 29343-00001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John P. Peeters

Application No: 10/530,901

Filing Date: April 8, 2005

Title: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Docket No.: 29343-00001 (previously 656200-060)

PRELIMINARY AMENDMENT

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

Dear Sirs:

Prior to examination of the above referenced application, please enter the following amendments:

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

Remarks begin on page **3** of this paper.

Abbott
Exhibit 1002
Page 433

IN THE SPECIFICATION

Please amend paragraph 1 of the application, beginning on page 1, line 5, as follows:

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to PCT Application No. PCT/US05/02171, filed January 24, 2005 which claims priority to U.S. Provisional Application 60/539,419, filed on January 27, 2004, which is incorporated herein by reference in its entirety.

Abbott
Exhibit 1002
Page 434

REMARKS

The above amendment conforms the specification to the domestic priority information as set forth in the Application Data Sheet. No new matter has been added.

Applicant does not anticipate any fees due with this amendment. However, the Commissioner is authorized to charge or refund any fee deficiency or excess to our Deposit Account No. 04-1061 in the name of Dickinson Wright PLLC.

Respectfully submitted,

DICKINSON WRIGHT, PLLC

April 18, 2006
Date

Robert L. Kelly, Reg. No. 31,843
Attorney for Applicant
38525 Woodward Avenue
Suite 2000
Bloomfield Hills, Michigan 48304-5092
(248) 433-7578

BLOOMFIELD 759537v1

656200-060

Abbott
Exhibit 1002
Page 435

OIPE IAP43 APR 21 2006 PATENT & TRADEMARK OFFICE

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
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.

CHANGE OF CORRESPONDENCE ADDRESS
Application

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

Application Number	10/530,901
Filing Date	4/08/2005
First Named Inventor	John Peeters
Art Unit	
Examiner Name	
Attorney Docket Number	29343-00001 (Previously 66355-0009)

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

☑ The address associated with Customer Number: 59582

OR

☐ Firm or Individual Name

Address

City | State | Zip

Country

Telephone | Email

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 31,843.

☐ 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 Robert L. Kelly

Date April 18, 2006 | Telephone (248) 433-7578

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 1.33. 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.

OIPE IAP43
APR 21 2006
PATENT & TRADEMARK OFFICE

PTO/SB/92 (09-04)
Approved for use through 07/31/2006. OMB 0561-0031
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Docket No. 29343-00001

Certificate of Mailing under 37 CFR 1.8

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P.O. Box 1450
Alexandria, VA 22313-1450

on April 18, 2006
Date

Susan K. Olson
Signature

Susan K. Olson
Typed or printed name of person signing Certificate

Registration Number, if applicable

(248) 433-7396
Telephone Number

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

1. Preliminary Amendment
2. Change of Correspondence Address

This collection of information is required by 37 CFR 1.8. 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 1.8 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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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875 Effective December 8, 2004

Application or Docket Number: 10/530,901

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	150.00		N/A	300.00
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	$250		N/A	$500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	$100		N/A	$200
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X$ 25 =		OR	X$50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X100 =			X200 =	
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

AMENDMENT A — 4/21/06

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 04	Minus	04	=	X$ 25 =		OR	X$50 =	
Independent (37 CFR 1.16(h))	* 9	Minus	*** 9	=	X100 =		OR	X200 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X$ 25 =		OR	X$50 =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X100 =		OR	X200 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
					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.

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DATE: March 24, 2006

PTO IDENTIFIER: **Application Number** 10/530,901
Patent Number

Inventor: John P. Peeters

MESSAGE TO: US Patent and Trademark Office

FAX NUMBER: (571) 273-8300

FROM: RADER, FISHMAN & GRAUER PLLC
Robert L. Kelly

PHONE: (248) 594-0600

Attorney Dkt. #: 66355-0009

PAGES (Including Cover Sheet): 3

CONTENTS:
Status Inquiry for application 10/530,901 (1 page)
Certificate of Transmission (1 page)

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PAGE 1/3 * RCVD AT 3/24/2006 11:36:52 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/44 * DNIS:2738300 * CSID:248 594 0610 * DURATION (mm-ss):01-00

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Dated: March 24, 2006 Signature: _____ (Victoria L. Wood)

Docket No.: 66355-0009
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
John P. Peeters

Application No.: 10/530,901 Confirmation No.: N/A

Filed: April 8, 2005 Art Unit: N/A

For: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF Examiner: Not Yet Assigned

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STATUS INQUIRY

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Alexandria, VA 22313-1450

Dear Sir:

It is respectfully requested that the attorney named below be advised of the status of the above-identified application. Please advise us of when we might expect to receive a Filing Receipt from the Patent and Trademark Office.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. 66355-0009 from which the undersigned is authorized to draw.

Dated: March 24, 2006

Respectfully submitted,

By_____
Robert L. Kelly
Registration No.: 31,843
RADER, FISHMAN & GRAUER PLLC
39533 Woodward Avenue
Suite 140
Bloomfield Hills, Michigan 48304
(248) 594-0600
Attorney for Applicant

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Application No. (if known): 10/530,901 Attorney Docket No.: 66355-0009

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Status Inquiry for application 10/530,901 (1 page)

PAGE 3/3 * RCVD AT 3/24/2006 11:36:52 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/44 * DNIS:2738300 * CSID:248 594 0610 * DURATION (mm-ss):01-00

PTO-1390 (Rev. 02-2005)
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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
66355-0009	10/530901

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/US05/02171	24 January 2005	27 January 2004

TITLE OF INVENTION: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

APPLICANT(S) FOR DO/EO/US: John P. Peeters

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [x] This is a **FIRST** submission of items concerning a submission under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a submission under 35 U.S.C. 371.
3. [ ] This is an express request to begin national examination procedures (35 U.S.C. 371 (f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [ ] The US has been elected (Article 31).
5. [x] A copy of the International Application as filed (35 U.S.C. 371 (c)(2))
   a. [x] is attached hereto (required only if not communicated by the International Bureau).
   b. [ ] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)).
   a. [ ] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [x] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [x] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. [ ] An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [x] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A preliminary amendment.
14. [x] An Application Data Sheet under 37 CFR 1.76.
15. [ ] A substitute specification.
16. [ ] A power of attorney and/or change of address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.2 and 37 CFR 1.821 - 1.825.
18. [ ] A second copy of the published International Application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [x] Other items or information: Return Receipt Postcard

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U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10753090 1	PCT/US05/02171	66355-0009

The following fees have been submitted	CALCULATIONS	PTO USE ONLY
21. [x] Basic national fee $300	$ 300.00	
22. [x] Examination fee		
If International preliminary examination report prepared by USPTO and all claims satisfy provisions of PCT Article 33(1)-(4) $100		
All other situations $200	$ 200.00	
23. [x] Search fee		
Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority $100		
International Search Report prepared and provided to the Office $400		
All other situations $500	$ 500.00	
TOTAL OF 21, 22 and 23 =	$ 1,000.00	
[ ] Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing or computer program listing filed in an electronic medium). The fee is **$250** for each additional 50 sheets of paper or fraction thereof.		

Total Sheets	Extra sheets	Number of each additional 50 or fraction thereof (round up to a whole number	RATE
- 100 =	/50 =		x **$250.00**

Surcharge of **$130.00** for furnishing the oath or declaration later than 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).					$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE			
Total claims	64 - 20 =	44	x	50.00	$ 2,200.00	
Independent claims	9 - 3 =	6	x	200.00	$ 1,200.00	
MULTIPLE DEPENDENT CLAIM(s) (if applicable)			+		$	
TOTAL OF ABOVE CALCULATIONS =					$ 4,400.00	
[x] Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by ½.					$ 2,200.00	
SUBTOTAL =					$ 2,200.00	
Processing fee of **$130.00** for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				+	$	
TOTAL NATIONAL FEE =					$ 2,200.00	
Fee for recording the enclosed assignment (37 CFR 1.21 (h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property				+	$	
TOTAL FEES ENCLOSED =					$ 2,200.00	
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a. [ ] A check in the amount of $ _____ to cover the above fees is enclosed.

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SEND ALL CORRESPONDENCE TO:

Robert L. Kelly
RADER, FISHMAN & GRAUER PLLC
39533 Woodward Avenue
Suite 140
Bloomfield Hills, Michigan 48304
(248) 594-0600
CUSTOMER NUMBER: 10291

SIGNATURE: _____

NAME: Robert L. Kelly

31,843
REGISTRATION NUMBER

10/530901
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FEE TRANSMITTAL
For FY 2005

[x] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 2,200.00

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John P. Peeters
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	66355-0009

METHOD OF PAYMENT (check all that apply)

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[x] Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
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	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 ($)	Fee Paid ($)
64 - 20 =	44	x	=

Multiple Dependent Claims: Fee ($) _____ Fee Paid ($) _____

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
9 - 3 =	6	x	=

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)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): 2631 Basic National Stage fee	150.00
2633 National Stage Examination Fee - all other ...	100.00
2632 National Stage Search Fee - all other situations	250.00
2615 National Stage claims - extra total (over twenty)	1,100.00
2614 National Stage claims - extra independent (over ...	600.00

SUBMITTED BY

Signature	Registration No. (Attorney/Agent)	31,843	Telephone	(248) 594-0600

Fee Transmittal

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Dated: April 8, 2005 Signature: Alexandra Dietrich (Alexandra Dietrich)

[illegible] 08 APR 2005

Application No. (if known): Not Yet Assigned | Attorney Docket No.: 66355-0009

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Fee Transmittal (1 page)
Application Data Sheet (2 pages)
Copy of the International Application including drawings (61 pages)
IDS (Citation) by Applicant (11 References)
Information Disclosure Statement (5 pages)
Transmittal Letter to the United States Designated-Elected Office (2 pages)
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23/PRTS 10/530901
JC13 Rec'd PCT/PTO 08 APR 2005

DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application 60/539,419, filed on January 27, 2004, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention generally relates to radio frequency identification (RFID) tags, and more specifically to a system having RFID tags that include diagnostic sensors, wherein the RFID tag and sensor are accessible by a wireless device such as a modified cell phone with a multi-protocol reader capability.

BACKGROUND

[0003] The conventional radio frequency identification (RFID) tag systems include an RFID tag that transmits data for reception by an RFID reader (also referred to as an interrogator). In a typical RFID system, individual objects (e.g., store merchandise) are equipped with a relatively small tag that contains a transponder. The transponder has a memory chip that is given a unique electronic product code. The RFID reader emits a signal activating the transponder within the tag through the use of a communication protocol. Accordingly, the RFID reader is capable of reading and writing data to the tag. Additionally, the RFID tag reader processes the data according to the RFID tag system application. Currently, there are passive and active type RFID tags. The passive type RFID tag does not contain an internal power source, but is powered by radio frequency signals received from the RFID reader. Alternatively, the active type RFID tag contains an internal power source that enables the active type RFID tag to possess greater transmission ranges and memory capacity. The use of a passive versus an active tag is dependent upon the particular application.

[0004] Accordingly, RFID tag systems have found use in a variety of applications. RFID tag system applications include animal identification, beer keg tracking, and automobile key-and-lock, anti-theft systems. Although the conventional RFID tag

systems have been used in a variety of applications, the conventional systems have several disadvantages.

[0005] A first disadvantage includes the inability of a RFID reader to communicate through the use of multiple protocols. In particular, the conventional RFID reader is capable of reading only those RFID tags that the RFID reader is programmed to read. That is, the RFID reader is adapted to communicate only through the use of a pre-programmed protocol. Consequently, the conventional RFID readers are incapable of automatically updating or changing protocols. Thus, the current RFID readers are unable to communicate with RFID tags having a comunication protocol that differs from the RFID reader pre-programmed protocol. A second disadvantage includes the inability to conveniently monitor objects containing the RFID tag from virtually any location. A third disadvantage of conventional RFID tag systems is the inability of wireless devices, such as cellular telephones and personal digital assitants (PDAs), to be used as RFID readers/interrogaters. The ability to interrogate RFID tags with conventional wireless devices would provide a convenient method of accessing and/or analyzing data obtained through the use of the RFID tag. Yet another disadvantage is that conventional RFID tag systems are incapable of cost effective, efficient and convenient monitoring of the physical, biological, and chemical characteristics of a person. For example, the conventional systems do not enable the detection of given biomarkers, pathogens, chemicals or other hazards, near or experienced by a person.

[0006] The embodiments described herein were developed in light of these and other disadvantages of known RFID tag systems.

BRIEF SUMMARY

[0007] This invention is directed to a system and method for low cost wireless diagnostics using modified radio frequency identification (RFID) tags that are combined with novel types of diagnostic sensors. A further aspect of this invention is that the diagnostic sensors can be read and analyzed on the spot by low cost wireless devices such as modified cell phones that incorporate multi-protocol RFID reader and communication standards such as Gen-2. The technology allows a modified cell phone to be used to directly identify external threats or to perform almost any type of diagnostic test on a single platform using low cost disposable passive RFID-sensors.

Abbott
Exhibit 1002
Page 447

The reader capabilities of a modified personal wireless device may also include other reader protocols such as Bluetooth, Zigbee or IEEE 1073 and read virtually any type of active or passive sensors, resulting in a new class of wireless readers that are truly universal and flexible to control virtually any application or provide a means for analyzing any type of sensor, including diagnostic sensors.

[0008] Accordingly, a diagnostics system is disclosed that includes a flexible patch having an adhesive portion that is adapted to be positioned on a surface. A radio frequency identification (RFID) tag and sensor module is integrated with the patch. The RFID tag and sensor module includes at least one antenna, an RFID electronic chip, and at least one sensor. The RFID tag may be either passive or active. Furthermore the technology described here does not need to be limited to RFID and may also be applied to other wireless interrogation protocols and chip technologies such as Bluetooth, Zigbee or other emerging technologies. For the sake of clarity RFID is used in this patent application but it is understood that RFID, Bluetooth, Zigbee or other similar technologies may be used interchangeably.

[0009] The RFID tag and sensor module responds to a stimulus by wirelessly transmitting and receiving, through the use of the antenna, signals that correspond to the stimulus. A wireless RFID reader is included that is adapted to communicate, through the use of multiple protocols, with the RFID tag and sensor module. Additionally, the RFID reader is adapted to read and analyze virtually any RFID tag and sensor module. As such, the RFID reader is adapted to retrieve the electronic identification of a tag and sensor module and download software that enables reading and analyses of the tag and sensor from a database. The RFID reader is also capable of communicating over a network through the use of multiple communication protocols. In one embodiment, the RFID reader is a cellular telephone. The diagnostics system may also include a remote storage/data access unit that remotely stores data transmitted and/or received by the RFID tag and sensor module and the RFID reader. A remote wireless device is also disclosed that enables access to the RFID tag and sensor module, the RFID reader, and the remote storage/data access unit from virtually any location.

[0010] Additionally, a method of transmitting and remotely analyzing data from a RFID tag and sensor module is disclosed. The method includes the step of activating the RFID tag and sensor module through the use of a wireless RFID reader. A second

Abbott
Exhibit 1002
Page 448

step includes receiving data from the RFID tag and sensor module, wherein the data includes RFID tag identification information. An additional step includes transmitting the received data to an external remote storage/data processing unit through the use of a network. Yet another step includes processing the data through the use of the remote storage/data processing unit. As indicated above, in addition to RFID technology, Bluetooth or similar technology may also be used as an alternative, whereby the cell phone is Bluetooth equipped and may power a remote RF diagnostic sensor that is Bluetooth compatible.

[0011] An immunoassay test strip for use in conducting diagnostic measurements is also disclosed. The immunoassay test strip includes a substrate and at least one test area located on the substrate for capturing antigens. Additionally, the immunoassay test strip includes a RFID tag and sensor module integrated with the substrate. The RFID tag and sensor module is adapted to sense and transmit signals that correspond to the antigens captured by the at least one test area.

[0012] Another method is disclosed for manufacturing a pathogen-specific RFID tag and sensor module. The method includes the steps of providing a substrate and printing conductive leads on the substrate, wherein the conductive leads define a sensor area. The method also includes printing a protective cap doped with a material that is sensitive to the enzymatic action within the sensor area. Furthermore, the step of printing an antenna on the substrate is included. Accordingly, the method includes the step of integrating an RFID tag and sensor module with the substrate.

[0013] An additional feature of this invention is that the wireless devices or the sensors can also be geolocated anywhere by a global positioning system (GPS) and/or non-GPS triangulation means and can be interrogated remotely through the use of the Internet or by any other wireless device that can access a cell phone reader, thereby combining electronic product code (EPC) and cellular telephone technologies into a single platform.

[0014] These and other objects, advantages and features will become readily apparent in view of the following detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS/ FIGURES

[0015] The accompanying drawings, which are incorporated herein and form a part of the specification, illustrate the present invention and, together with the description,

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further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention.

[0016] FIG. 1 depicts a block diagram of a modified cell phone serving as an radio frequency identification (RFID) reader with an RFID tag that is embedded in a disposable skin patch according to an embodiment of the present invention.

[0017] FIG. 2 depicts a block diagram of a disposable fully integrated skin patch having an RFID tag and sensor module that includes an electronic chip, sensors and an antenna according to an embodiment of the present invention.

[0018] FIG. 3A is a detailed illustration of the sensor shown in FIG. 2 including a chemical/physical barrier.

[0019] FIG. 3B is an alternative embodiment of the RFID tag and sensor module shown in FIG. 2.

[0020] FIG. 3C illustrates a disposable skin patch that is adapted to draw blood from a subject.

[0021] FIG. 4 is a system diagram of an RFID diagnostics system for monitoring glucose with a modified cellular telephone that is adapted to read the patch of FIG. 1.

[0022] FIG. 5 is a detailed block diagram of the RFID tag and sensor module that includes the electronic chip, the antenna and the sensor of FIG. 2.

[0023] FIG. 6 is yet another block diagram of a RFID tag and sensor module.

[0024] FIG. 7 depicts a system diagram of a modified cell phone that serves as a RFID reader for a disposable diagnostic flow-through RFID immunoassay strip.

[0025] FIG. 8 is a detailed illustration of the immunoassay strip shown in FIG. 7.

[0026] FIG. 9 is a detailed illustration of the sensor area of FIG. 8.

[0027] FIG. 10 depicts a method of producing a disease-specific disposable RFID wireless sensor.

[0028] FIG. 11 depicts a block diagram of an array of thin-film chemical sensors printed directly on an RFID substrate according to an embodiment of the present invention.

[0029] FIG. 12 depicts the integration of RFID technology with Lab-on-a-Chip (LOC) technology according to an embodiment of the present invention.

[0030] FIG. 13 depicts a modified LOC sensor combined with RFID technology that is read directly with a wireless device such as a cell phone.

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[0031] FIG. 14 depicts the integration of passive RFID technology with MEMS sensors according to an embodiment of the present invention.

[0032] FIG. 15 depicts a wine bottle that includes a cork with a RFID tag and sensor module therein.

[0033] FIG. 16 depicts a smart cheese sensor according to an embodiment of the present invention.

[0034] FIG. 17 depicts a generic low cost printable food-specific RFID sensor technology according to an embodiment of the present invention.

[0035] FIG. 18 depicts a RFID stress sensor according to an embodiment of the present invention.

[0036] FIGS. 19A and 19B illustrate the use of a RFID tag and sensor module for the detection of insect infestation within a structure.

[0037] FIG. 20 shows a drug interaction test performed in a urine sample with a disposable RFID immunoassay strip according to an embodiment of the present invention.

[0038] FIG. 21 shows a diagnostic passive RFID sensor network according to an embodiment of the present invention.

[0039] FIG. 22 shows an identification (ID) and software retrieval method that enables any RFID reader to read/interrogate any RFID tag.

[0040] FIG. 23 shows the integration of both passive and active sensor reader capabilities onto a single wireless chipset.

DETAILED DESCRIPTION

[0041] The technology described herein allows sensor technologies to be coupled to radio frequency identification (RFID) tags that provide both the power and the wireless interface for the sensor at very low cost. Another aspect of this invention is that common wireless devices such as cell phones can be modified to include the necessary logic and components to become RFID readers. The reader device can furthermore include a multi-protocol RFID reader capability, making it a universal reader for any RFID EPC tag or RFID-sensor tag, regardless of the manufacturer. This technology combination allows on the spot sophisticated processing of complex sensor data at a relatively low cost. The technology also allows RFID tags or sensor

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tags to be accessed by the Internet using the wireless reader device as a sensor communication tool. Identification retrieval and on the spot software download into the reader therefore becomes possible. Using this dual technology approach, almost any type of sensor can be combined with a RFID tag as described in this application. As will be discussed herein, the sensor is adapted to respond to virtually any stimulus and communicate information pertaining to the stimulus wirelessly. The underlying principles of the technology are described in more detail in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," that is incorporated herein by reference in its entirety.

[0042] FIG. 1 is a block diagram of a modified wireless device typically a cellular phone 2 that includes a microprocessor and the necessary logic to serve as a "power up" and read device for a passive RFID tag that is mounted directly inside a disposable patch 4. As it is made clear in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," any modified wireless device can be used. For example, in lieu of a modified cell phone an RFID reader can be used and may include the necessary data processing, remote access and wireless link capabilities present in devices such as a cell phone. Furthermore devices such as a modified wireless PDA, a modified wireless computer, a modified cordless phone, a modified beeper or even a modified wireless watch may also be combined with RFID technology and be used as readers. In addition, as indicated above, the principles described in this application may be extended to technologies other than RFID. For example a cell phone that is Bluetooth equipped may be used to communicate with and power a remote modified wireless Bluetooth chip that is combined with the diagnostic sensor technologies described here.

[0043] Ideally the RFID electronic chip technology is fully compatible with international RFID readers and tag standards making the technology completely universal and transparent in any country or for any class of RFID chip. At the present time these include Class 0, Class 0+, Class 1 and Gen-2 standards. Emerging RFID standards are referred to as Generation 2 or Gen-2 but other standards may emerge and be adopted in the future. It is one of the objectives of this technology to be compatible with as many standards as possible so that a modified cell phone or PDA

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can read any given RFID tag or RFID sensor tag anywhere in the world. A multi-protocol RFID reader can be used and be compressed on a single electronic chip or be directly incorporated into the core chipset of a cell phone or wireless device. For example, the multi-protocol reader technology can be included into a 3G electronic chip with the Bluetooth protocol so that any 3G device can read any RFID electronic product code (EPC) tag, RFID sensor tag or Bluetooth sensor chip transparently. The cell phone or personal wireless device has remote access capabilities integrated therein. Thus a cellular telephone user can dial up any remote database or the Internet to access data from the RFID tag. In addition to having these capabilities and having RFID reading capabilities, the device may have other Internet access protocols such as Bluetooth, Wi-Fi, Broadband, WLAN, 3G or other emerging technologies that may allow free or low cost Internet access. Using these technologies will be particularly beneficial to fully exploit the full potential of the present invention.

[0044] Patch 4 is typically attached to a subject (e.g., a person) but may also be attached to any location, device or object according to an embodiment of the present invention. In one embodiment, the stimulus may be temperature and the RFID tag and patch combination form a smart wireless temperature sensor. Accordingly, temperature can be directly measured remotely on a modified cell phone that can be used to process RFID data and warn a user of a wireless device about a temperature in a subject remotely. The patch is therefore a "smart" patch and the wireless device becomes a "smart" device in combination with the RFID-sensor. An example of an application is a worker or a firefighter who can self-monitor him or herself for heat stress and/or toxic fumes using a cell phone with RFID read capabilities. If the cell phone is Bluetooth equipped, in addition to doing sensor analyses, it may also send signals to both the firefighter directly into his or her ear but also remotely to a monitoring station. In addition as explained in US Patent 6,031,454, that is incorporated herein in its entirety real time precise geolocation of the firefighter is possible.

[0045] Another example of an application for this technology is remote monitoring of a fever in a child or patient using a dedicated cell phone or similar wireless device that can be used to call another cell phone and warn a parent or a nurse of a temperature build-up in a given patient. For example a parent can place smart skin patch 4 on the forehead of a sick child and leave a device 2 to monitor the child remotely while the

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child and the parent are at sleep. If the child develops a fever during the night that reaches a pre-set threshold device 4 will automatically warn the parent and the warning may be done in any remote location. In one embodiment the smart patch is used in hospitals and can remotely monitor a number of patients simultaneously. With the recent FDA mandate that drugs be labeled with RFID tags, both patients, drugs and in fact anything can be monitored in real time in "smart" hospitals. The readers in a hospital allow geolocation and therefore real time monitoring of the entire events in the hospital. Readers may also be directly connected to a network, thereby offering great flexibility in the infrastructures that are used. In one embodiment the temperature skin patch is a smart Band-Aid.

[0046] In another embodiment of the present invention the RFID tag and skin patch combination includes a plurality of sensors that can be combined for different diagnostic applications that can be measured directly on the surface of the skin, transdermally, in skin sweat, in blood drawn directly onto a disposable skin patch. In another embodiment the skin patch may also be used to measure external parameters such as physical, chemical or electrical parameters or a combination thereof on a patient. For example the RFID skin patch may be used to monitor the heart or be used to monitor external factors affecting the skin such as radiation.

[0047] FIG. 2 is a block diagram of a smart skin patch. As illustrated, patch 4 has an RFID tag and sensor module 11. RFID tag and sensor unit 11 combines an RFID tag with at least one sensor. Specifically, RFID tag and sensor module 11 includes an RFID electronic chip 10, a sensor 12, and at least one antenna 8. Typically the patch 4 is composed of a thin flexible support 5 that has an adhesive surface 7. Onto support 5 is mounted an antenna 8 typically composed of either a thin flexible metal film such as aluminum or material that is printed using doped inks or other flexible and highly conductive materials such as conductive polymers. The antenna may be printed on the external surface of the skin patch to avoid any possible skin contact or contamination.

[0048] Antenna 8 powers RFID electronic chip 10. In one embodiment RFID electronic chip 10 is passive. Alternatively, as recognized by one of ordinary skill, RFID electronic chip 10 may be active. In either case, RFID electronic chip 10 is typically located on a disk 6 that includes one or more sensors 12. RFID tag and sensor module 11 form an integrated unit on substrate disk 6. Disk 6 may be either a

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flexible substrate such as a plastic or a rigid disk that includes different types of semiconductor sensors. For example disk 6 may include a combination of an RFID tag and another low power sensor on a silicon substrate, whereby the RFID tag serves as power and wireless unit and the sensor serves as the sensing element. The term RFID tag refers to the combination of antenna 8 and RFID electronic chip 10. Power may be stored into the passive electronic chip by multiple cycles of external radio frequency (RF) energy. Using the combination of an RFID passive tag and energy storage capabilities complex sensors may be combined with RFID tags directly on a disposable skin patch. These sensors do not need any internal power, are disposable and can be geolocated. Typically the manufacturing cost will be less than $1, resulting in great savings, convenience and improved safety.

[0049] Typically disk 6 and sensing elements 12 are protected by at least one protective layer 20. Accordingly, when patch 4 is positioned on the skin, layer 20 makes direct contact with the surface of the skin. Layer 20 may be semi-permeable and may include specific chemistries that, in combination with the chemistries on each given sensor 12, aid in the detection of specific chemical or biological elements. For example protective layer 20 may filter certain proteins or cells and, at the same time, prime the chemistries for specific reactions on the sensor or sensors according to one embodiment.

[0050] In addition disk 6 may also include more complex sensors that optically detect changes in blood chemistries and may include one or more diodes combined with sensors (not shown). For example small Schottky or back bias diodes may be used. Additionally using advances in polymers and other thin film technologies complex low power sensor-reader combinations may be printed or produced at very low cost. More complex sensors that are built directly on the electronic chip or an add-on electronic chip may also be used in the smart skin patch.

[0051] The smart patch technology described here can therefore perform any number of different tests on a subject and be processed remotely by a wireless device such as a cell phone. The wireless device provides not only the power but also provides the means to analyze and process the sensor data on the spot. Therefore the processing requirements of the RFID tag and the sensing element are reduced, thereby reducing cost and power requirements and making the technology disposable. The wireless device can also provide step-by-step instructions to a user for each given type of

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sensor. Since the RFID tag provides a unique ID to the wireless device this ID identifies uniquely the type of sensor used. New classes of RFID sensors may also become part of the emerging international RFID standards and have unique sensor identifiers. The data tables 68 are also capable of storing the identification number of each sensor. Additionally, the data tables 68 that analyze any given sensor may be stored on the chip, inside the cell phone or remotely. Therefore any cell phone can analyze on the spot any type of RFID EPC tag or RFID sensor tag, regardless of the manufacturer and as explained more fully in this invention.

[0052] FIGS. 3A and 3B illustrate different types of elements that can be included on skin patch 4. FIG. 3A describes one type of sensor 12. In this case a sensor surface 34 is surrounded by conductive electrodes 28. Typically both are directly printed or deposited on a non-conductive surface 30. Methods for printing sensors are well known to those skilled in the art. As indicated above sensor surface 34 can be protected by another chemical layer or physical-chemical barrier 32 that can help filter or eliminate certain elements or refine chemical reactions that will occur on sensor area 34. Multiple layers of barrier or reactive surface 32 (not shown) can be used and can be layered one on top of the other serving as a method to separate different types of molecules and serving as reactive surfaces to absorb, eliminate or modify target molecules or reagents. Furthermore since disk 6 may be rigid, sensors and separating layers may include metals, surfaces with nanopores or any element comprising a simple or complex multilayer sensor.

[0053] In addition different types of sensors can be used including sensors serving as reference or calibration sensors. Since power is provided by the passive RFID tag, any type of sensor or sensor combination can be used on the skin patch to respond to stimuli such as any type of external chemical, electrical or physical changes that can occur on the surface of the skin. It is recognized that responding to stimuli includes any measuring, detecting, and/or reacting by the sensors.

[0054] Nevertheless, the orientation of disk 6 comprising the sensors may either face towards the skin or face away from it, depending on the given sensor application. In one embodiment the sensor may include a microelectronic circuit that can include for example at least one a diode or other optical means to do complex sensor analyses. Such sensors may be necessary for some applications of the technology where more simple sensing chemistries are not suitable. It will be appreciated that some of these

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sensors may be built directly into the RFID electronic chip itself. This includes for example a programmable temperature sensor but may also include sensors that measure motion or small electric pulses on the skin. In one embodiment the skin patch is a cardiac sensor. In another embodiment the skin patch measures an external hazard to the skin or subject, such as radiation. In yet another embodiment the RFID skin patch includes a plurality of diagnostic sensors.

[0055] FIG. 3B shows disk 6 as an entire integrated unit that comprises a coiled antenna 8, RFID electronic chip 10, and multiple sensor elements 12. The antenna can be mounted on one side of disk 6, while the sensors can be mounted on the other side. Using this approach and according to one embodiment, the integrated unit can be directly mounted onto a support 5 in a one step process.

[0056] FIG. 3C shows another embodiment of the present invention. In this case skin patch 4 also includes a hard surface 40 that includes one or several micro knives 44 meant to help draw a drop of blood into the sensor areas (not shown). Applications of this technology may include any diagnostic test where blood needs to be drawn. A disposable skin patch with RFID sensors that includes the micro knives would simply need to be pressed slightly on the skin to draw sufficient blood for an analysis causing minimal pain to the patient. The skin patch may even include a chemical to neutralize pain in the immediate area where blood is drawn. Once the patch is applied to the skin a read of the sensor is taken from wireless device 2. In one embodiment this wireless test using an RFID sensor is applied to blood glucose monitoring using a disposable RFID-skin patch and wireless device combination. If blood is drawn the sensor elements may include a filtering and separation mechanism (such as a surface with micro or nanopores). Furthermore in another embodiment the RFID sensing element may be separated from the blood drawing element and is reusable. The sensor element may then be more complex and may be included for example directly into a watch.

[0057] In addition non-invasive methods to measure glucose levels or other bodily chemistries may also be used and combined with RFID technologies. These include the use of diodes or other optical means that can detect optical-chemical changes that occur.

[0058] FIG. 4 shows how a skin patch 4 that includes RFID tag technologies, the proper sensor chemistries and a mechanical device as described in FIG. 3C can be

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used in case of diabetes self-monitoring and insulin self-regulation using a modified wireless device such as a modified cell phone 2. Data is obtained from a disposable skin patch and processed by the microprocessor of a cell phone. In one embodiment the cell phone can then control via RF a remote insulin pump 50 that can be implanted in a body. In lieu of using a separate glucose monitoring device, periodic glucose tests are done directly on a modified cell phone using disposable RFID-sensor skin patches. This way the patient does not need to use two devices and can check directly abnormal results with his/her doctor in case of need. In some cases the skin patch may be reusable using reversible reactions on the sensor surfaces. In one embodiment reversal occurs by micro heating the sensor area using power provided remotely by the wireless device. The implications of the invention shown in FIG. 4 is that any RFID or Bluetooth sensor can be read by a device like a modified cell phone that can also serve as a control system for other wireless technologies that are dependent on sensor values. Device 2 may also allow direct remote monitoring of a given patient for other functions, remote alerts and access to a physician's Office or medical center. For example the device may monitor cardiac function on the smart skin patch, patient temperature, position, etc.

[0059] FIG. 5 shows the basic elements of the RFID electronic chip 10. RFID electronic chip 10 is coupled to antenna 8 that may include separate send and receive elements (not shown). As discussed above, the combination of RFID electronic chip 10 and antenna 8 is referred to as an RFID tag. Antenna 8 may be printed directly on a polymer or plastic substrate. The principles and operation of the RFID tag having a sensor input is described in detail in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," which is incorporated herein by reference in its entirety. Additional reference is also made to Patent 6,720,866 B1.

[0060] Antenna 8 is connected to a power unit 60 with a voltage stabilization circuit, a controller 62, an identification unit 64 (which may be permanent or programmable), a memory unit 66, a sensor table 68, a thermistor or temperature module/sensor 70, and analog to digital converter 72 and an optional filter 74. Preferably, the temperature sensor 70 of the RFID electronic chip 10 is a very low power, highly accurate programmable unit that enables precise reference and calibration points for any application of RFID tag and sensor module 11. In addition, the electronic chip 10

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may include an energy storage unit (not shown) that stores energy for the power unit 60. This is important for sensors that exceed the available power to the passive chip. The device may be a Class 0 electronic chip as described in Patent 6,002,344, a Class 0+ chip, a Class 1 chip, a Gen-2 electronic chip or any other RFID or Bluetooth electronic chip that serves as a basic platform and is modified to include a built-in precise temperature unit, a voltage stabilization unit, an A/D converter and the ability to incorporate at least one or a plurality of sensors that are then incorporated into the devices described in this invention and form the basis for passive RFID-diagnostic sensors that can be directly read by common low cost wireless devices such as modified cell phones. Using the passive approach approximately 10 μwatts of power is available to the sensors from the RFID chip 10. Furthermore voltage can be precisely regulated in the range of 1-5 volts, providing adequate power to most diagnostic sensors.

[0061] The RFID electronic chip 10 is attached to one or multiple external sensors 12 that receive power and are controlled by units 60, 62, 72 and 74. Sensors 12 and part of the electronic circuitry may be composed of low cost doped inks or conductive polymers as described in U.S. Patent Application Serial No. 10/382,606, entitled "Method and Apparatus for Wide Area Surveillance of a Terrorist or Personal Threat," which is incorporated herein by reference in its entirety.

[0062] FIG. 6 illustrates another embodiment of RFID tag and sensor module 11, which includes RFID electronic chip 10, antenna 8, a substrate 55, conductive leads 28, and a sensor element 12. For a number of applications, particularly diagnostic applications, at least one reference element 14 is used. In some applications the reference element or the sensor may include at least one optional shield 16. In one embodiment the shield 16 is a light shield that covers a radiation sensitive film to be used for a low cost radiation RFID tag and sensor module 11 that may be included in a skin patch for a patient or may be used for Homeland Security or defense applications. In one embodiment both the RFID tag and elements 14 and 16 serve as radiation detectors. Several types of radiation sensitive polymers or other thin film materials may be used and be printed directly on the antenna substrate, creating a very low cost RFID passive radiation sensor. Since different types of radiation sensitive materials may be used, both qualitative and quantitative radiation sensors can be produced at extremely low cost. Additionally radiation sensing diodes may be

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included directly in chip 10, providing further low cost means to detect a radiation hazard.

[0063] In one embodiment sensor 12 is a chemical sensor. Therefore both low cost chemical and radiation detectors can be included on a low cost disposable substrate that includes a wireless RFID tag and power unit.

[0064] FIG. 7 shows the applications of another type of novel RFID-sensor technology combined with disposable flow-through assays to form a disposable wireless passive RFID immunoassay. Such assays can be included in disposable kits 90 where the power is provided remotely by the low cost wireless device 2 and the analyses are also performed on said device or remotely via wireless links.

[0065] FIG. 8 describes the technology of FIG. 7 in more detail. A flow-through immunoassay testing strip 90 includes a sample input port 92 and a substrate 94 that allows migration of the analyte on the assay by capillary forces. The assay includes one or multiple test areas 96 that are typically immobilized antibodies serving as a capture surface for specific antigens that flow through the test surface. Such tests are now commonly used to test for pregnancy, for the presence of specific proteins or toxins and for the detection of specific pathogens such as Streptococcus. Recently with the discovery of disease-specific biomarkers more complex tests are starting to become available. However using visual methods, such tests do not provide precise quantitative results and therefore is still generally limited to "yes" or "no" assays indicating simply the presence or absence of a given protein or bio-analyte. While tests have improved greatly to the extent that they have now been placed in the hands of the public the quantification of the presence or absence of given proteins remains a highly desirable goal. Such quantification can be now achieved by adding RFID or Bluetooth technology as shown in the present invention. An RFID electronic chip 10 is added onto disposable device 90 and includes conductive leads 28 that go either to antenna 8 or to sensor areas 34. In order to avoid shorting electrodes 28 may be embedded into plastic leads 98 that can also serve as channels for the analyte flowing across sensor area 34. Printing of leads and channels can be done using ink-jet technology or other similar means and is a low cost technology well known to those skilled in the art. Leads may also be laminated or molded directly into plastic substrates. Other low cost assembly or production methods may also be used.

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[0066] One of the test areas 96 may be a reference test area that measures the amount of moisture present on the surface or the presence or absence of given proteins or other analytes. In some applications the surface has to dry out before the results are read on the wireless device and this can be done automatically by using the reference strip or strips. In addition a window (not shown) may be used with a visual clue as to when the test is ready for analysis. For example if the test surface has to dry out then a simple color change may be used with a hygroscopic material that changes from red to blue depending on the level of moisture present on the RFID immunoassay strip.

[0067] Using this method many different channels and tests can be performed simultaneously on a single disposable test strip. Furthermore this technology can be applied to different types of assays such as lateral-flow, flow-through or solid-phase assays or any assay where an analyte is carried across a surface. The methods to fabricate the basic separation surface are well known to those skilled in the art and may include nitrocellulose or other similar materials.

[0068] FIG. 9 shows details of sensor area 34. Antibodies 100 are immobilized onto substrate 94 using printing or other standard deposition methods used for the fabrication of lateral-flow assays. As an analyte is carried across the test strip by capillary action, matching antigens 104 become attached to the antibodies. Such antigens could be proteins found in blood or urine, proteins found on surfaces of pathogens or they could be other biological molecules. The technology can be applied to any sensor situation with specific surface-to-surface interactions. In one embodiment this applies to proteins. In another embodiment to DNA or RNA. Hence disposable wireless RFID-sensor DNA assays that are read directly on a cell phone become possible with the technology described in the application.

[0069] In order to allow conductivity between the two electrodes present in the sensor area, in some applications another layer of antibodies 106 can be added which are specific to antigen 104. This technique is generally referred to as a "sandwich assay" and different methods exist to conduct such assays. In this case instead of having dyes attached to the antibodies, conductive molecules 108 are attached forming a conductive layer within sensor area 34. Conductive molecules can be conductive nanoparticles, conductive proteins, metal particles that are attached to the protein or latex or other beads that are conductive. As indicated above if DNA or RNA is used then the conductive molecules can be attached directly then the matching DNA or

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RNA strands. The release of the conductive molecules 108 may be timed such that the assay is a simple, one step process.

[0070] In some applications the strip may need washing and drying before the measurement are done. The state of the sensor can be assessed electronically by using one or more reference test areas where the sensor consists simply of a material that absorbs water and therefore allows for the saturation level and status of the entire test surface to be measured. Such measurements can be done remotely by the cell phone using sensor data tables that are either stored on the RFID chip, on the memory of the cell phone or by downloading the correct sensor data tables from a remote location on the Internet or a remote location available through the wireless networks. This method allow on the spot complex analyses to be performed.

[0071] Since the electrical conductivity of the surface area can be measured precisely quantitative results become possible on disposable wireless RFID electro-immunoassays. Furthermore the test area can become very small allowing for more tests to be done in a given area and therefore resulting in cost savings. In one embodiment the technology applies to high density DNA or RNA chips that are disposable.

[0072] In addition to the conductive methods described above, other methods may be used that rely on RFID or Bluetooth as the basic low cost communication and power platform for a disposable RFID immunoassay. For example optical means may be used to assess the presence and level of a given protein. This is possible because the precise position of deposition of given antibodies is known and can match an optical reader. A dual system may be used where the disposable substrate with the protein or DNA test is inserted into a reader (not shown) that comprises an RFID power and communication module that can be read directly with a device like a cell phone, PDA or computer in a doctors office.

[0073] Because it is low cost and is quantitative, the technology described in FIGS. 7-9 have broad market applications. In one embodiment it applies to Homeland Security, where instant checks can be performed by protective forces for example to confirm on-the-spot the presence or absence of a given pathogen. In one embodiment the technology is applied to food safety for the public. For instance using this technology trace elements can be detected in foods for people with certain allergies such as peanut allergies. In one embodiment the technology applies to medical self-

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tests for a given medical condition (e.g. a heart attack). In one embodiment the technology applies to screening for a given medical condition such as a pre-cancer condition.

[0074] The technology may also be miniaturized and be applied to micro or even to nanosensors with very small sensor areas with the power provided and relayed by a modified RFID or Bluetooth electronic chip to a remote wireless processing device such as a cell phone.

[0075] FIG. 10 shows the steps involved in the fabrication of disease-specific RFID wireless detection strips. Typically results from Genomics or Proteomics research 111 yield pre-disease or early disease specific biomarkers 112 associated with a given condition. Once these specific markers are identified, disease specific antibodies or surface receptors 113 can be isolated. These are then integrated into disease-specific RFID sensors 114 resulting in a final disease-specific self-contained testing kit 115.

[0076] Using the approach described in FIGS. 7-10 any specific disposable wireless RFID test strip can be produced. Since each RFID tag 10 contains its own electronic identification number 64, wireless device 2 can immediately recognize the type of sensor involved and perform the correct analysis. This is because a given modified cell phone can download the necessary software, data tables, etc. from a remote location via a wireless link and can instantly become a "smart" device for any given type of RFID sensor. Furthermore since many different types of tests can be performed at once on the same disposable wireless platform, cross validation and calibration is possible. Because of the remote data access and remote processing capabilities of the wireless reader, the technology described here allows for ubiquitous sensing and analyses for any type of RFID sensor using a single common wireless platform such as a modified cell phone. The RFID-sensors do not need to use a battery and are therefore very low cost. Furthermore for some applications such as remote temperature monitoring the sensor is fully reusable.

[0077] FIG. 11 shows the application of the technology for the measurement of a number of different gases simultaneously using a single disposable RFID-sensor chip. As part of the antenna substrate 55 an area 110 is composed of a plurality of different sensors 12 with conductive leads 28. Typically each sensor 12 is a different polymer or chemical that can react differently with chemicals present in the air. Because the sensors 12, the area 110 and the RFID electronic chip are on the same substrate,

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fabrication costs are very low and the entire unit comprising the area 110 including sensors 12 can be assembled in a single step.

[0078] Area 110 is typically exposed to the air to allow chemical reactions to take place. In one embodiment the sensor is enclosed in a sealed pouch (not shown) that can be opened at a given time by a user of the sensor to test a given environment.

[0079] This "nose" technology and applications thereof is described in more detail in pending patent application serial U.S. Patent Application Serial No. 10/382,606, entitled "Method and Apparatus for Wide Area Surveillance of a Terrorist or Personal Threat," which is incorporated herein by reference in its entirety.

[0080] FIG. 12 shows another embodiment of the present invention relating to Point-of-Care or diagnostic technologies. Specifically it combines lab-on-the-chip (or LOC) technologies with RFID-sensor technology as shown in 118. Lab-on-the chip technology is well described in the scientific literature and consists of multiple microfluidic channels 124 with either test, input or chemical wells 120. Reactions in wells 120 can be measured using RFID technology since conductive leads 28 from RFID electronic chip 10 can be linked directly to each of the test wells 120. An antenna can be printed or mounted in another layer of the electronic chip or directly on the back of the device. Furthermore the leads 28, the antenna and the electronic chip 10 can be embedded into the LOC chip, thereby preventing shorting of the electrodes or electronics. Since LOC allows complex sample separation and analyses, this technology allows LOC tests to be done independently of a complex or expensive reader. Rather a simple wireless device such as a cell phone or a PDA can be used. In one embodiment the cell phone also controls the separation and control of the microfluidics channels 124 for more complex LOC analyses. In one embodiment a LED and other electronic measuring or sensing devices are included in the LOC-RFID chip. Therefore this technology is disposable and allows complex tests that require separation and mixing to be placed directly into the hands of the public.

[0081] FIG. 13 shows how a LOC-RFID sensor unit 118 can be read directly from a wireless device such as a cell phone, thereby bypassing the need for a LOC reader. In the case of LOC type analyses the data may be complex and exceed the processing capabilities of the low cost wireless reader. In this case the analyses can be performed remotely for example on a remote computer that can be accessed directly via a wireless link. For example a centralized location may be provided with a direct dial in

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access that is available to user of the cell phone. Other communications systems may also be used. For example, as indicated above, a Bluetooth equipped cell phone, PDA or other device that is also RFID compatible may have a built-in means to directly access the Internet.

[0082] FIG. 14 shows the integration of Micro Electro Mechanical System (MEMS) sensors 140 with RFID technology. In one embodiment, an RFID electronic chip 10 with conductive leads 28 is combined directly with a MEMS sensor providing the power for the sensor. In one application MEMS sensor 140 includes a resonating surface 148. Antenna leads 8 are only partially shown and typically do not form a part of the sensor area. In this particular case, the leads 28 are exposed to the air and therefore the applications of the technology are more suitable for the detection of gases. However, a number of different MEMS sensor configurations are possible and only one is shown here. Because some MEMS sensors may require more power than what is typically available on an RFID passive chip, the electronic chip may be modified to step up the voltage and/or to store the necessary current required to read MEMS-type sensors. Alternatively the sensor may include a battery.

[0083] FIG. 15 shows the integration of the RFID-sensor passive diagnostic technology applied to foods. In this case the sensor unit 10 is included into a wine cork 150 for "smart wine" applications. In one embodiment, an RFID electronic chip with conductive leads 28 is mounted directly within the cork 150 while the antenna (not shown) is typically outside the bottle and may form a part of the wrapping at the top of the wine bottle. The entire unit is inserted into wine bottle 155. In another embodiment the entire unit with the antenna forms a part of the cork. If the chemistry of the wine changes, the cork will deteriorate because of changes in the acidity of the wine and this can be measured electronically externally with a wireless device such as a modified cell phone 2. Therefore prior to purchase by using a modified cell phone 2 the consumer can immediately spot a bad wine bottle from a good one. Such applications are particularly relevant for expensive wines that must age for quite a while and are subject to many changes in temperature, etc. In another embodiment, the RFID tag technology described herein can include a temperature module and a memory, the entire temperature storage profile of the wine can be recorded on the RFID passive tag and can be retrieved by the consumer on a cell phone prior to purchase. If, for example, the wine was not stored properly this will be known by the

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consumer. The temperature profile for the wines can be stored on the electronic chip by periodic "power up" cycles or can be stored remotely and retrieved directly from a remote database using the wireless device via a wireless link. Other power and storage means may also be used. Such applications are particularly relevant for "high end" wines.

[0084] FIG. 16 shows yet another embodiment of the present invention as applied to other food items and in this case "smart" cheeses. Cheeses, like wines, can turn bad without the knowledge of the consumer and prior to opening the package. In this case a cheese 170 includes an electronic RFID label that also includes a sensor pad 176 with at least two sensors 178 and 180. In FIG. 16 neither the antenna nor the RFID electronic chip are shown for the sake of simplicity. One sensor may be composed of a hygroscopic material to determine the moisture level of the cheese 170. The other may be a polymer that is sensitive or reactive to certain smells associated with the aging or degradation of the cheese 170 as a result of bacterial action. If the cheese 170 turns bad it is typically because the moisture level is incorrect or because it has become degraded by bacterial action. By using several sensors a precise assessment of the quality of the cheese can be assured remotely by the consumer prior to purchase using a cell phone 2 with RFID reader capability. The type of sensor ID is matched with data tables and processing instructions that can be downloaded directly into the cell phone. See U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," which is incorporated herein by reference in its entirety.

[0085] FIG. 17 shows a general printable passive RFID diagnostic food tag technology 202 that includes a sensor 204 that determines if the given food item has gone bad. The tag 202 is typically mounted in plastic and includes an RFID electronic chip 10 and an antenna 8 mounted on substrate 55. Also included are conductive leads 28. In one embodiment, all areas except sensor 204, limited by area 206, are laminated in plastic or the body of the storage unit (e.g. milk carton) to avoid shortage of the electrodes or conductive leads 28. Therefore, this sensor can be included directly into a liquid or a food surface with a high level of humidity.

[0086] A sensor cap 208 is deposited on sensor area 204. Sensor cap 208 contains a chemical that is specific to the food item and that becomes reactive only if the food turns bad. For example, the sensor tag can be included directly into meat packages on

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the surface of the meat itself. The RFID tag can contain all the information on the meat itself (price, date of packaging, etc.) but in this case the consumer will also be able to determine the occurrence of bacterial contamination. This is because sensor cap 208 can be made to be highly sensitive to enzymatic action by specific bacteria. If a given type of bacteria is present on the surface of the meat they will start preferentially degrading sensor cap 208. Sensor cap 208 is typically waterproof and contains a doping substance that will favor enzymatic degradation for each type of bacteria. This will allow exposure of the electrodes and will change the conductivity on the surface of sensor area 204.

[0087] The same principles can be applied to any situation with a specific chemical interaction. For example the technology can be mounted directly inside milk cartons. If milk has gone bad then its chemistry will change and the change of chemistry can be tailored to specifically react with sensor cap 208. It will be appreciated that many different sensors can be used with a single RFID chip, therefore allowing identification of specific types of bacteria. Furthermore, in another embodiment, the thickness of sensor cap 208 is varied in different sensors thereby allowing an assessment of the quantity of bacteria present. If more bacteria are present the sensor caps 208 will degrade faster and the thicker sensor caps 208 will degrade last. Therefore, this technology provides a general low cost solution for the food industry and combines electronic RFID tag labeling with very low cost sensing technology.

[0088] FIG. 18 shows a diagnostic application of RFID passive sensors applied to stresses. In this embodiment, an RFID-stress sensor 295 is provided that is composed of two distinct parts. The first one forms a power and communication unit 290 that includes an RFID tag and an antenna 8. Unit 290 is connected to a sensor 260 that includes attachment points 270, typically allowing a rigid mounting, stretchable leads 275 and a connection area 280. Typically, connection area 280 is an easy "plug in" type to allow the user to easily mount the sensor onto any type of surface. Both components form a stress sensor unit 295.

[0089] The technology works as follows. Stress sensor 295 is firmly attached by a user through the use of attachment points 270. Stress sensor 295 may be attached with skews or special glues to areas where possible structural stresses may occur and need to be measured remotely. Typically sensor 260 is composed of a thin film of a material such as a flexible metal strip that may be enclosed in a thin film of plastic

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(not shown). Any metals that are highly conductive and that can be stretched may be used such as aluminum, gold or copper. Area 290 is not attached and therefore is not subject to the stresses. Conductivity measurements are taken periodically via a remote wireless reader such as a cell phone and stored in memory or on a remote database. Low cost wireless devices such as modified cell phones or RFID tag readers may be mounted close to the sensors and are used to periodically monitor stresses. If stresses occur the sensor 260 will expand. Since the temperature reference is known, changes in the conductivity or resistance of the strip can be precisely measured. Because this technology is wireless and has no batteries, it is meant for long term monitoring in areas where visual access is difficult or not possible. This includes hidden structural beams in building, bridges, etc. but also any areas of high stresses (airplanes, homes, etc.). Stresses may also be monitored more dynamically with resonating MEMS structures or accelerometers as indicated in FIG. 14. A number of other methods may also be used such as compression measurement using piezoelectric materials, loss of conductivity in leads that break or snap as a result of stresses, etc. Broad market applications exist for the technology, for example insertion of a wireless RFID sensor in windows for "smart" home applications, etc.

[0090] FIGS. 19A and 19B show yet another application of the technology applied to an RFID-insect sensor such as a termite sensor. In FIG. 19 A the entire sensor unit is enclosed in a unit 310 that is highly attractive to termites such as a block of wood. Unit 310 can form a "plug" of a standard size that is inserted into structural wooden supports. The unit comprises an antenna 8, an RFID electronic chip 10 and leads that are shown in more detail in FIG. 19 B.

[0091] FIG. 19B shows the details of the technology in one embodiment. Conductive leads 28 are separated by a spacer 320 that is made of non-conductive material that is highly attractive to termites such as wood. If termites are present then spacer 320 will be eaten and the spacer separating electrodes or leads 28 will disappear. Electrodes 28 may be forced together by a spring (not shown). When the spacer has disappeared the electrodes short out and therefore it is known that termites are present. In case electrodes such as shown in FIG. 19B are used a mounting power unit similar to 290 (FIG. 18) may be used. Other simple conductive methods may be used for this type of sensor.

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[0092] Because this is a low cost wireless technology with no batteries, the technology can be used in hidden areas such as structural supports in houses, etc. The technology can be used to monitor remotely any type of insect damage, or may even be applied to pathogens such as bacteria using surface-specific materials that degrade only in the presence of certain enzymes.

[0093] FIG 20 shows the uses of the technology for drug interaction testing or for general medical self-testing for any given condition. In one embodiment after drug 360 is taken a disposable wireless RFID sensor strip 90 is placed in a urine sample 364. Such strips may be provided for free with given drugs where certain toxicities may occur as a result of combination with other drugs. Using a low cost wireless device such as a cell phone 2 with RFID multi-protocol reader capability, complex drug interaction tests can be performed on-the-spot at a very low cost. This is possible by wireless access to cell phone towers 380, access to Internet 390 and to a remote storage/ data processing unit 400. In one embodiment remote storage/ data processing unit 400 is embodied as a computer or electronic database. Accordingly through the use of computer 400 (hereinafter remote storage/ data processing unit 400 shall be referred to as computer 400), a patient can either download data to computer 400 or upload into the cell phone the necessary information to conduct any given test by matching the ID of the RFID sensor with given software and data tables stored remotely on computer 400 via link 392. In one embodiment computer 400 is a computer in a doctor's office. In another embodiment computer 400 is a drug interaction database of a pharmaceutical company. In yet another embodiment computer 400 is a computer containing reference tables for all types of RFID sensors. Since the RFID identifies each test uniquely a match of data, analyses protocols and/or software is assured. The principles described in this embodiment extend well beyond drug testing. By using disposable RFID test strips 90 with specific receptors to specific biomarkers, tests can be performed for any medical condition directly by a patient using a wireless device such as a modified cell phone. As biomarker discovery becomes more refined common wireless technologies can become used for self-diagnostics for almost anything using low cost wireless technologies such as cell phones. Such low cost diagnostic tests will be important in settings where sophisticated laboratory equipment is not available but where cell phone technology is available. The use of the technology described in this embodiment may be

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particularly relevant for less-developed countries where sophisticated laboratory equipment is not always available locally.

[0094] FIG. 21 shows the general applications of passive diagnostic RFID sensors to wireless sensor networks and wireless devices, wireless geolocation, the Internet, remote database access, remote data storage and remote data analyses. Specifically as described in this application a passive RFID diagnostic tag 10 can be used to identify any given hazard 460 in any given location. Wireless tag 10 can be activated by wireless device 2 via a wireless link 480. The microprocessor and RFID reader within wireless device 2 enable processing functions 500, which include reading, analysis and geolocation by a global positioning system (GPS) or a non-GPS means. The reading, analysis and geolocation by GPS or non-GPS means is described in US Patent 6,031,454 that is included herein by reference in its entirety. Wireless device 2 can communicate to a proximal cell phone tower or receiver 380 via wireless link 510 or indirectly by other existing or emerging wireless communication means such as Bluetooth. Cell phone tower 380 is linked to the Internet 390 or the wireless networks via soft or hard links 520 and to at least one remote computer 400 via soft or hard link 540. Remote computer 400 allows the functions 550, including the storage of RFID tables and associated software to analyze on the spot any given diagnostic RFID sensor tag 10. In addition using soft or hard links 630 any remote wireless device 600 may be used providing the functions 620 allowing remote access of any given RFID sensor tag via wireless device 2.

[0095] The implications of FIG. 21 are the following. Any wireless device 600 in any given geographical location can interrogate any given RFID-sensor 10 in another location. Sensor 10 may be a plurality of diagnostic sensors. For example a simple application is the following. Sensor 10 may be a temperature sensor located in a second home and include a smart sticky patch that is placed on a pipe. The owner of the home can check remotely the temperature in the home from any given location to determine for example if pipes are at risk of freezing. Two-way functionality is built into device 2. That is device 2 can be programmed to dial or send data remotely or be activated and queried at any time from any location.

[0096] FIG. 22 explains in more detail the functions in FIG. 21 and those described in this invention. Any RFID wireless reader can be used to read a compatible RFID passive sensor but a clear improvement is to use a multi-protocol reader (such as a

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Gen-2 enabled reader). A further improvement is to put the multi-protocol reader capability directly on a single chipset and most preferentially this chipset is the core electronic chip of a common wireless device such as a cell phone. It will be clear to those skilled in the art that the reader capability may also be integrated on a separate electronic chip that can be included in a computer as part of a plug-in smart card or even an RFID reader device connected to or built-in a Universal Serial Bus (or USB) port or similar convenient connection means. Such a device is most useful for example for a physician's office where the diagnostic functions of passive RFID diagnostic sensors described here can be fully exploited. In addition the devices described here may be compatible with Bluetooth, Zigbee or other emerging technologies, allowing further flexibility.

[0097] For consumer applications interrogation of any given RFID tag can be performed easily on a modified cell phone that includes either a special RFID read button or by pressing a series of existing keys on a keypad. Once a given tag is activated, the reader device can retrieve the ID number of the tag as shown by function 700. The reader may or may not initially recognize the tag as shown in FIG 708. If the new international standards are adopted for RFID sensor tags then such recognition will be standard and can be integrated with either the tag itself and/or a data table in the reader 2. If the ID of the sensor tag is recognized then the reader device may or may not have the necessary software and processing ability to analyze said sensor as shown in 716. If the software is available then the analysis can be completed immediately as shown in 746. However if the software is not available then the device must first obtain it from a given remote database 400 via function 720. This may be a centralized database for RFID tags or a diagnostics database that is accessed only by paying an access fee. Subsequently, the ID of the RFID sensor is matched to a given class of sensor (e.g. a glucose sensor) and the software and/or instructions for the analyses are downloaded into the reader 2 as shown in function 738. The device is then equipped to perform the analysis 746. Additional communication with computer 400 may occur if the analyses are complex (e.g. neural net or multivariate) and exceed the processing capabilities of the reader. Results are subsequently displayed on the cell phone or reader as shown in 758. Alternatively results may be displayed or stored remotely (e.g. in a doctor's office, etc.). The pathway described above is not limited to passive RFID diagnostic sensors. It can

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also include EPC tags, other RF tags or sensors such as Bluetooth and other wireless functions such as smart shopping or "smart wallet".

[0098] FIG. 23 shows the integration of the two types of sensor reader functions into a single wireless reader and a resulting new type of wireless chipset that can be included into any wireless reader. Starting with device 800 and as explained in patents 6,031,454 and Patent Application US 2004/0119591 A1 by the present inventor that are incorporated by reference in their entirety, a wireless device such as a cell phone may be modified to accommodate any number of sensors 816, including diagnostic sensors. These are typically "active" sensors since they are directly connected to the wireless device itself. An example of this is a cell phone that is also a person-specific asthma detector as described in Patent Application US 2004/0119591 A1. In addition to this capability, any wireless device 2 such as a cell phone may also be modified to interrogate remotely any active or passive wireless sensor 4 as described in this application. This capability most preferentially is a multi-protocol capability and includes emerging standards such as Gen-2, other future international standards for RFID and Bluetooth.

[0099] The cell phone may already have other multi-functionality integrated therein (such as Internet access). A widely adopted emerging standard is referred to as Third Generation or 3G functionality that is included directly into the chipset.

[00100] In this invention the ability to read any "plug-in" sensor and any remote wireless sensor are combined in 850 and results in a new multi-function chipset that allows any wireless device to read any sensor, whether a "plug-in" sensor or a remote wireless sensor. Most preferentially these capabilities are included into the core wireless electronic chip (such as the 3G chip), thereby extending the capabilities of the wireless device to read and analyze instantly any type of sensor, RFID tag, RFID-sensor tag or Bluetooth sensor, regardless of the manufacturer, location or nature of the sensor.

[00101] As described in the above embodiments, wireless passive RFID sensors can be used for many different types of diagnostic applications in the consumer markets, defense and Homeland Security, building security industry, medical diagnostics industry, food safety industry, and for home safety and other applications using a common wireless device such as a modified cell phone. This technology provides

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great convenience to consumers, to workers or to any person concerned with the detection of external threats or having special medical needs or concerns.

[00102] The diagnostic sensor technologies described here can also be adapted to networks and to national emergencies, where tagged items can be read remotely (thousands of feet), by employing special high power readers.

[00103] While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. It will be apparent to persons skilled in the relevant art that various changes in form and detail can be made therein without departing from the spirit and scope of the invention. Thus, the breadth and scope of the present invention should not be limited by any of the above-described embodiments, but should be defined only in accordance with the following claims and their equivalents.

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CLAIMS

WHAT IS CLAIMED IS:

1. A diagnostics system comprising:

a flexible patch having an adhesive portion and adapted to be positioned on a surface;

a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader adapted to communicate through the use of multiple protocols with said RFID tag and sensor module, said RFID reader being adapted to communicate over a network through the use of multiple communication protocols.

2. A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. A system according to claim 1, wherein said RFID tag and sensor module comprises:

a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

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7. A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. A system according to claim 1, wherein responding to said stimulus includes sensing electrical, chemical, biological, and physical elements of said surface.

9. A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. A system according to claim 1, wherein said surface is the skin surface of a person.

11. A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. A system according to claim 1, wherein said at least one sensor is a glucose sensor.

16. A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. A system according to claim 1, wherein said at least one sensor is a radiation sensor.

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18. A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. A system according to claim 1, wherein said patch is disposable.

20. A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. A system according to claim 1, wherein said network includes a remote storage and data processing unit adapted to remotely store and analyze data read by said RFID reader.

22. A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. A human diagnostics system comprising:

a patch having a radio frequency identification (RFID) tag and sensor module, and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements;

a RFID reader communicative with said patch through the use of a network and adapted to analyze, receive, and transmit the signals from said patch through the use of multiple protocols; and

a remote storage and data unit communicative with said RFID reader, said remote storage and data unit analyzing and storing data from said patch and said RFID, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network.

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26. A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. A system according to claim 25, wherein said predetermined elements include electrical, chemical, biological, and physical elements of a person.

28. A system according to claim 25, wherein said network is a wireless network that enables communication through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

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34. A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. A diagnostics system comprising:

a patch having an adhesive portion and adapted to be embedded within a structure;

a radio frequency identification (RFID) tag and sensor module having an integrated temperature module, said RFID tag and sensor module being integrated with said patch and having an antenna and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader communicative with said RFID tag and sensor module, said reader being adapted to communicate over a network through the use of multiple protocols.

36. A system according to claim 35, wherein said stimulus is a defect in said structure.

37. A system according to claim 35, wherein said stimulus is the presence of insects within said structure.

38. An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

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41. An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

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a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

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57. The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

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at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

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Page 482

ABSTRACT

An integrated passive wireless chip diagnostic sensor system is described that can be interrogated remotely with a wireless device such as a modified cell phone incorporating multi-protocol RFID reader capabilities (such as the emerging Gen-2 standard) or Bluetooth, providing universal easy to use, low cost and immediate quantitative analyses, geolocation and sensor networking capabilities to users of the technology. The present invention can be integrated into various diagnostic platforms and is applicable for use with low power sensors such as thin films, MEMS, electrochemical, thermal, resistive, nano or microfluidic sensor technologies. Applications of the present invention include on-the-spot medical and self-diagnostics on smart skin patches, Point of Care (POC) analyses, food diagnostics, pathogen detection, disease-specific wireless biomarker detection, remote structural stresses detection and sensor networks for industrial or Homeland Security using low cost wireless devices such as modified cell phones.

Abbott
Exhibit 1002
Page 483

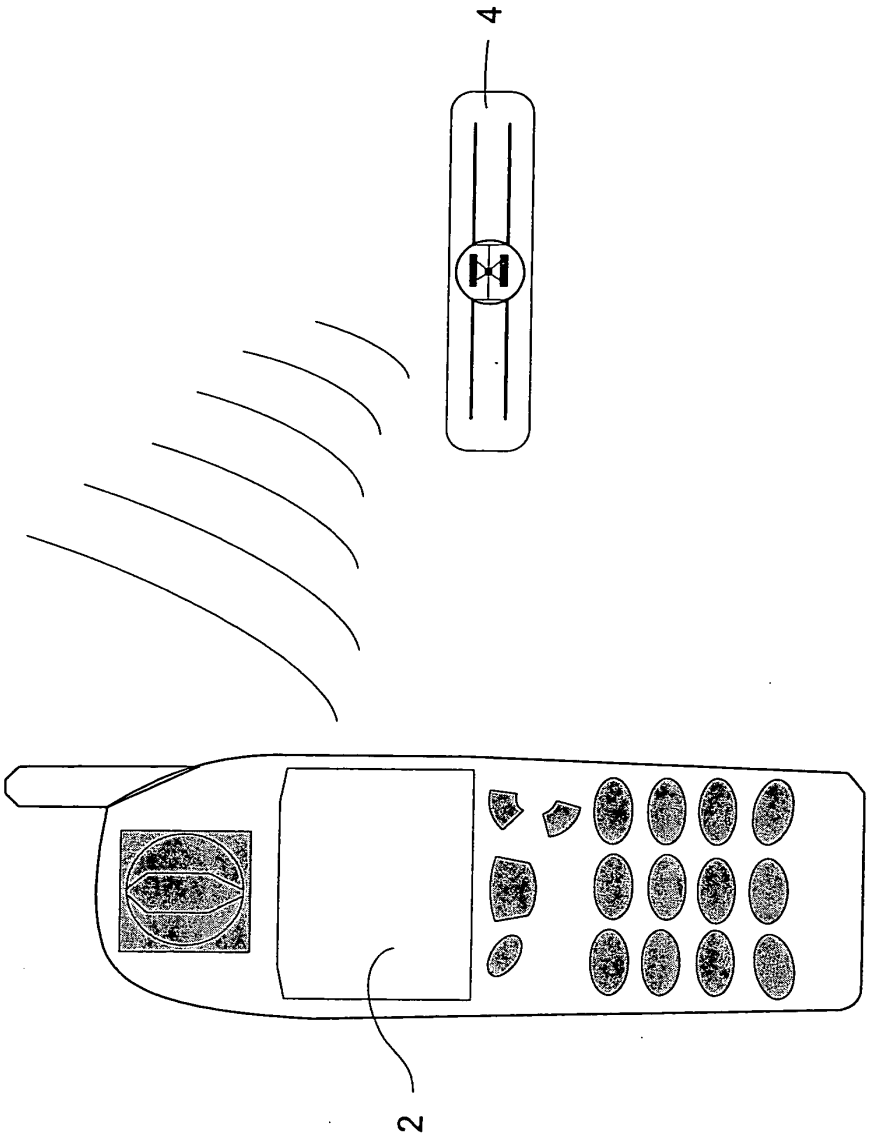


FIG. 1

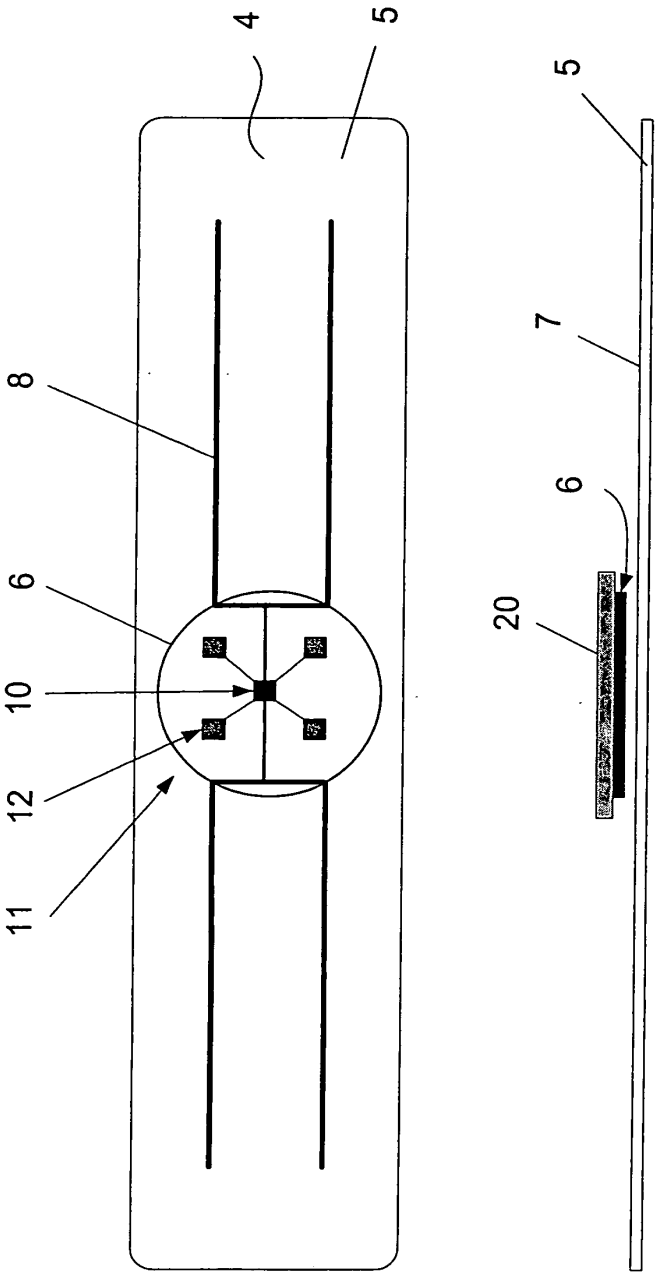


FIG. 2

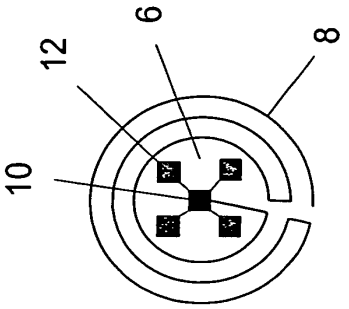


FIG. 3B

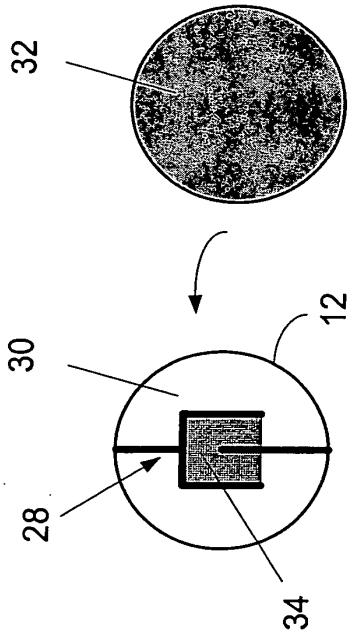


FIG. 3A

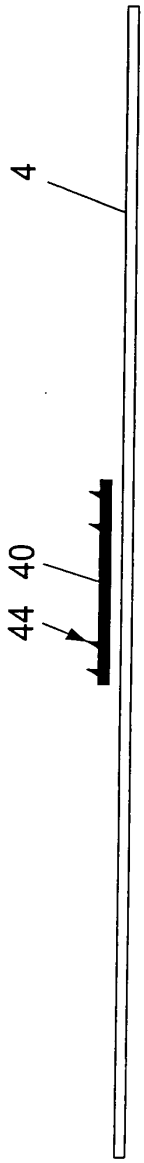


FIG. 3C

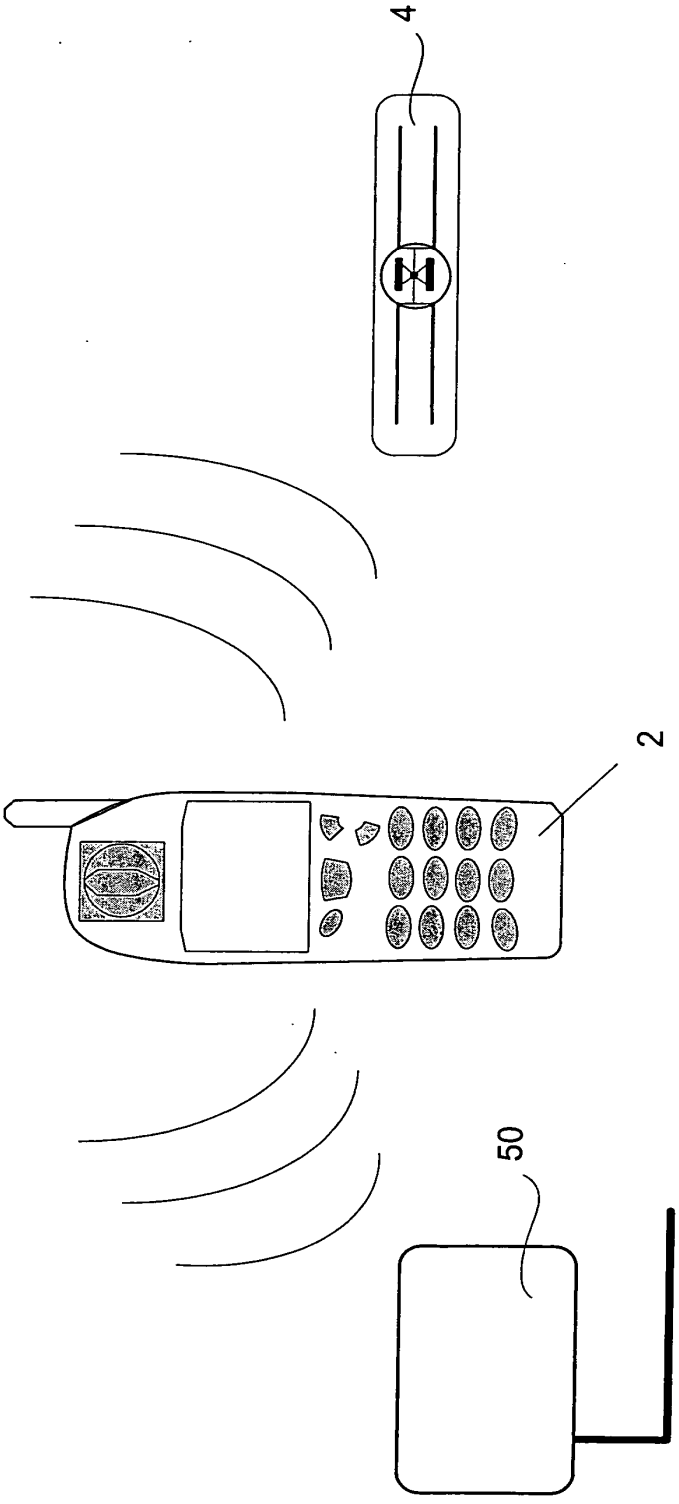


FIG. 4

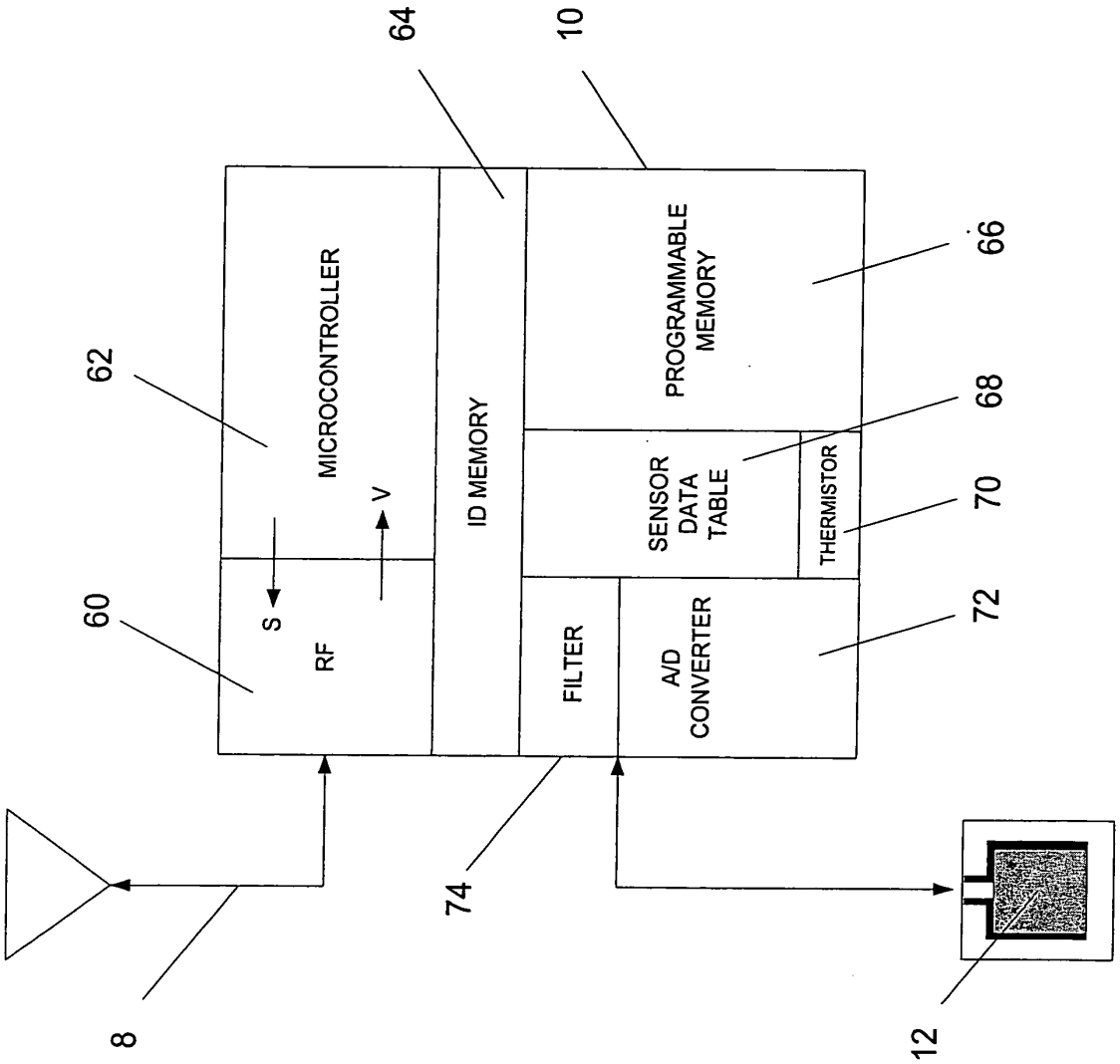

64
10
62
MICROCONTROLLER
ID MEMORY
PROGRAMMABLE MEMORY
66
68
SENSOR DATA TABLE
THERMISTOR
70
V
S
60
RF
FILTER
A/D CONVERTER
72
74
8
12

FIG. 5

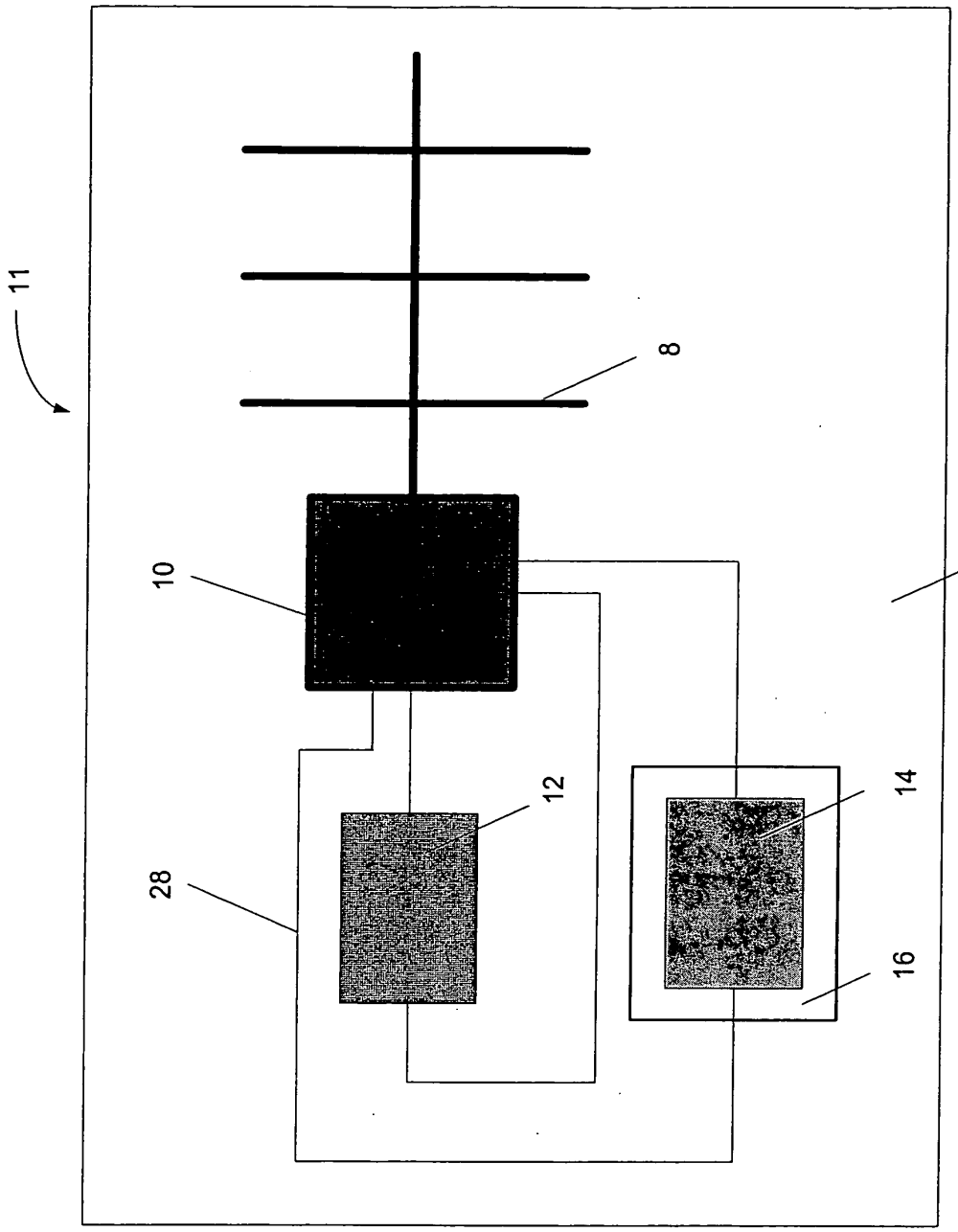
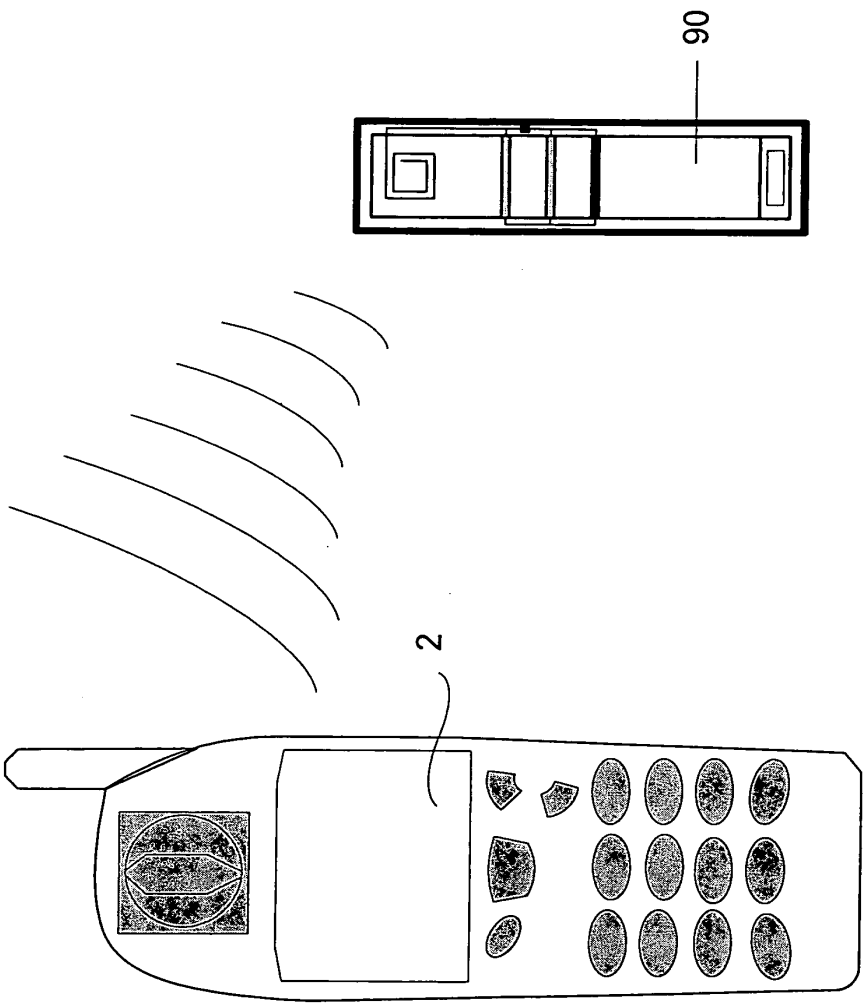


FIG. 6

FIG. 7



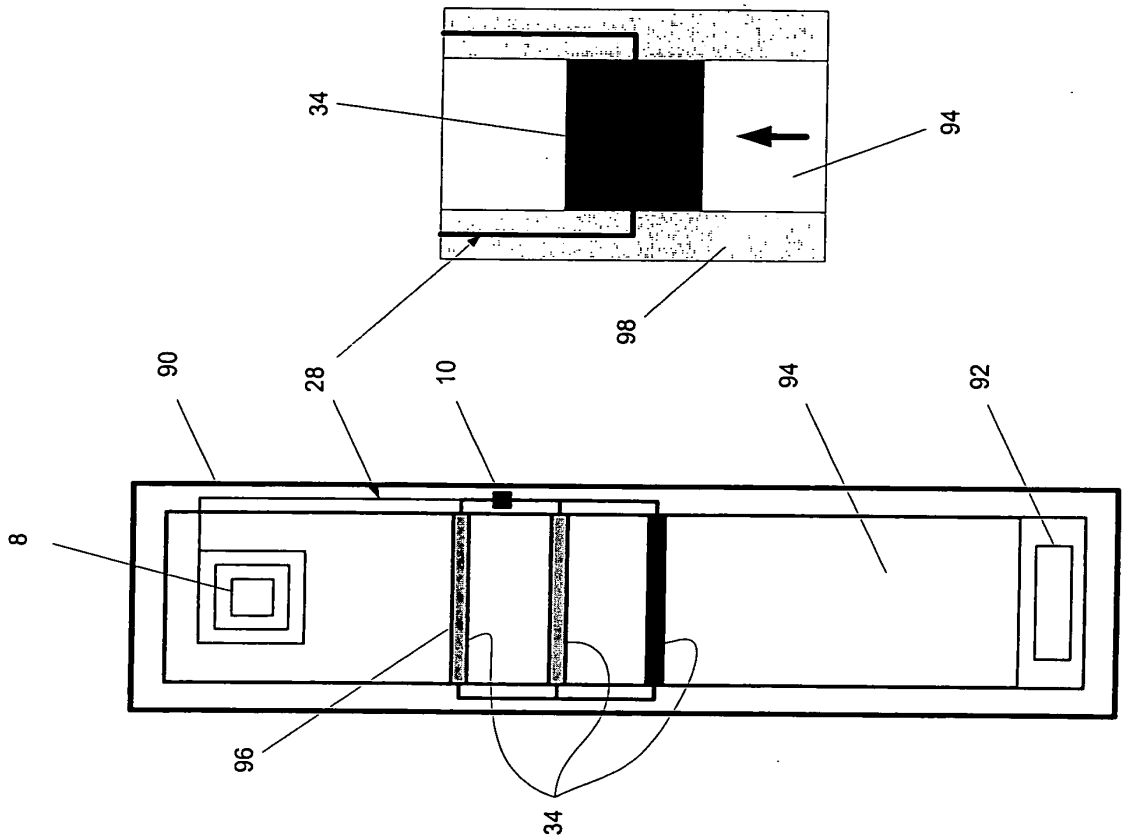


FIG. 8

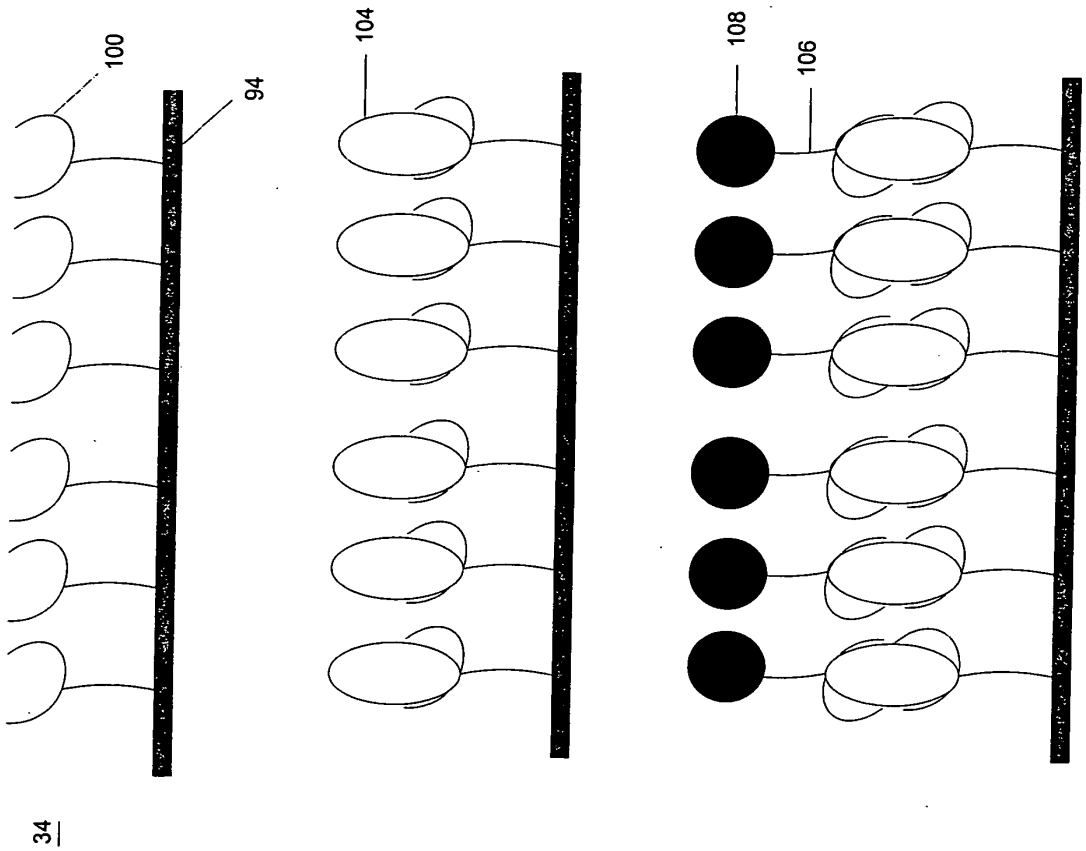


FIG. 9

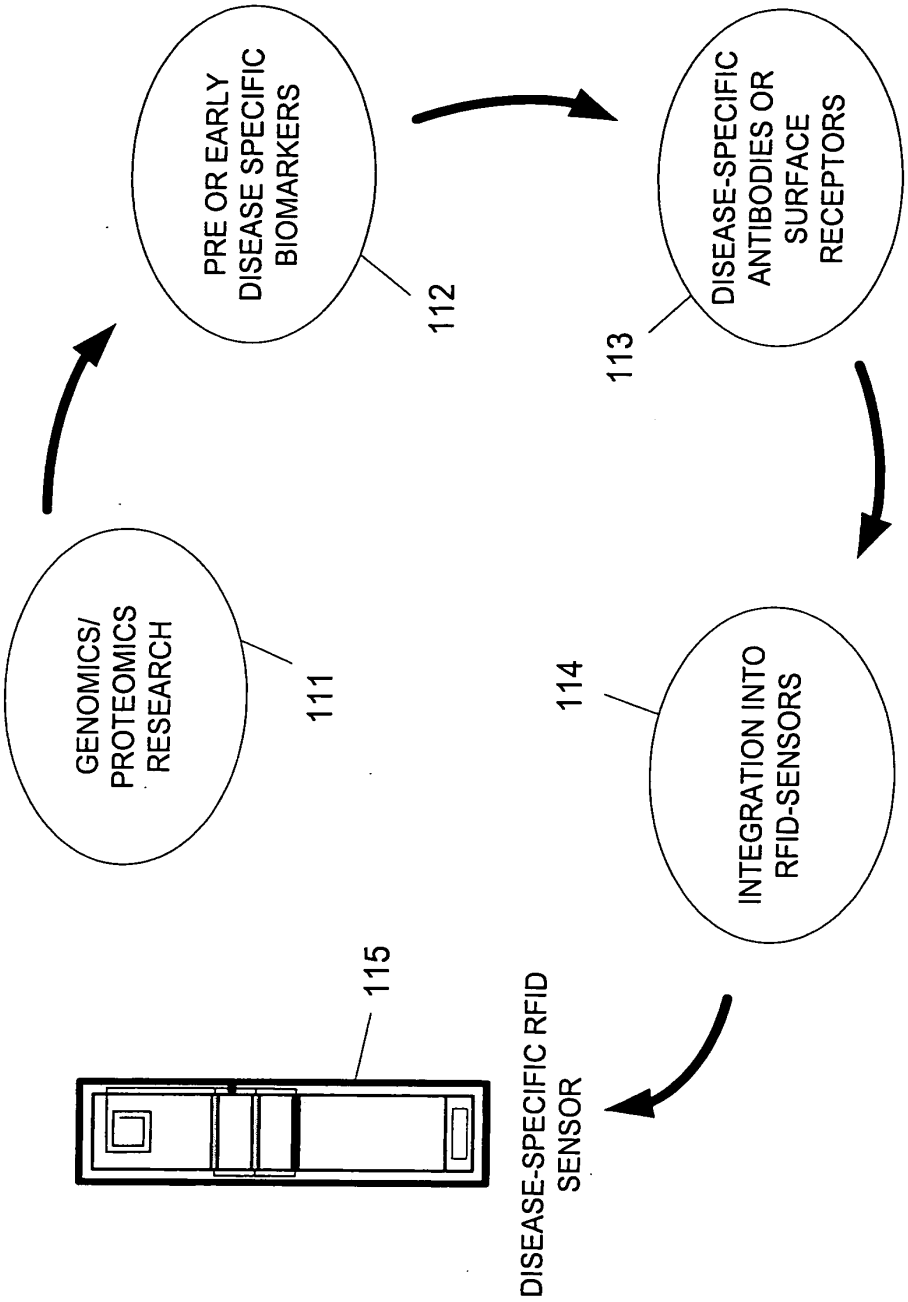

PRE OR EARLY DISEASE SPECIFIC BIOMARKERS
112
DISEASE-SPECIFIC ANTIBODIES OR SURFACE RECEPTORS
113
INTEGRATION INTO RFID-SENSORS
114
DISEASE-SPECIFIC RFID SENSOR
115
GENOMICS/ PROTEOMICS RESEARCH
111

FIG. 10

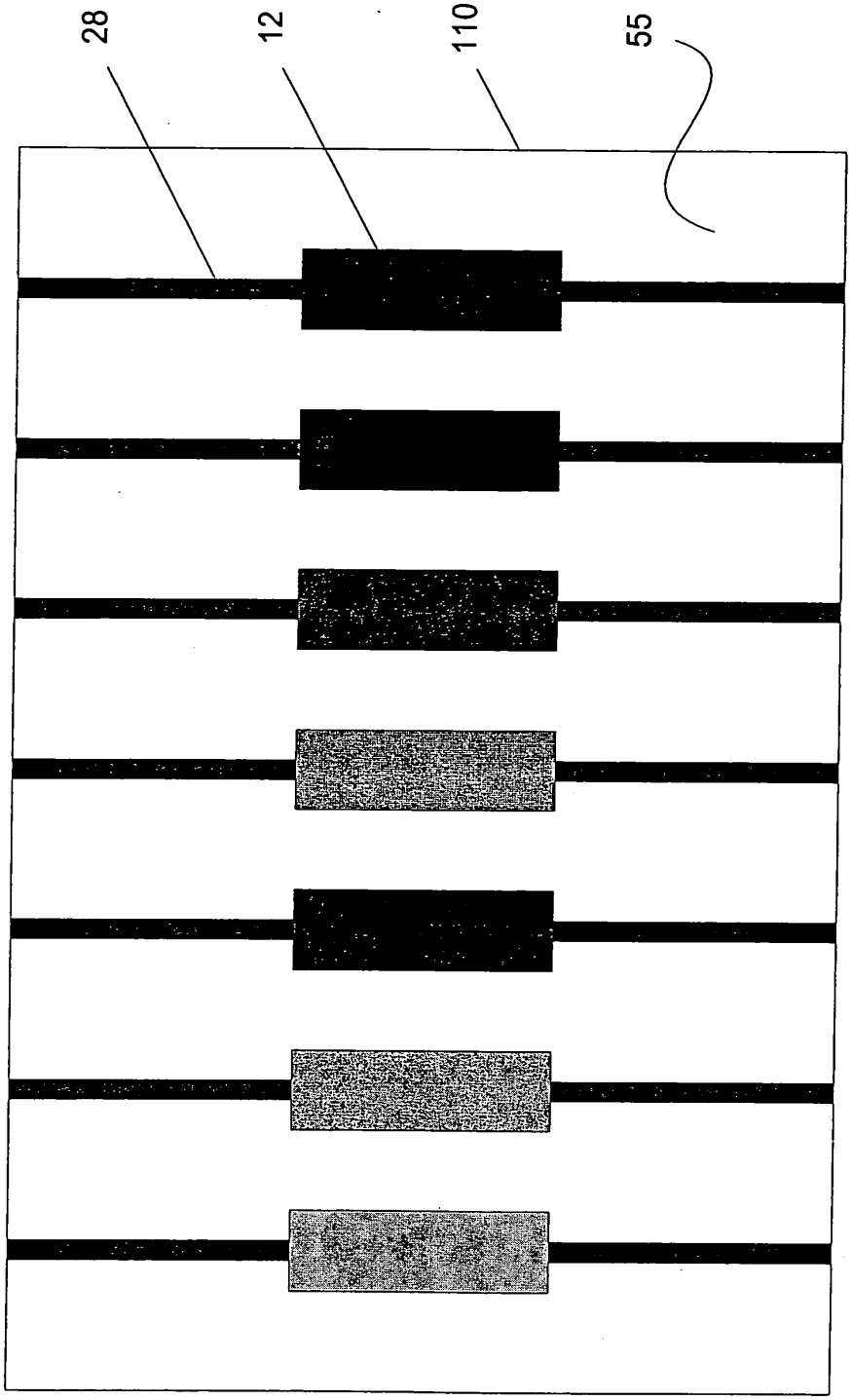


FIG. 11

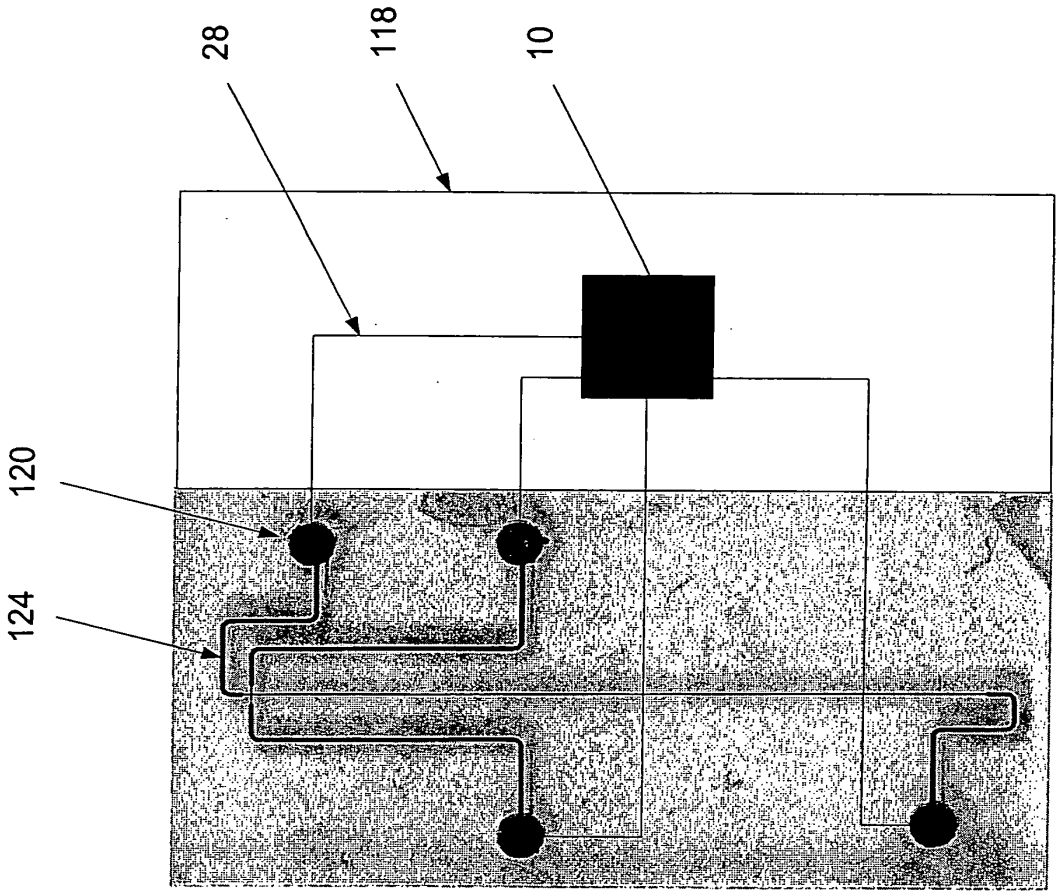


FIG. 12

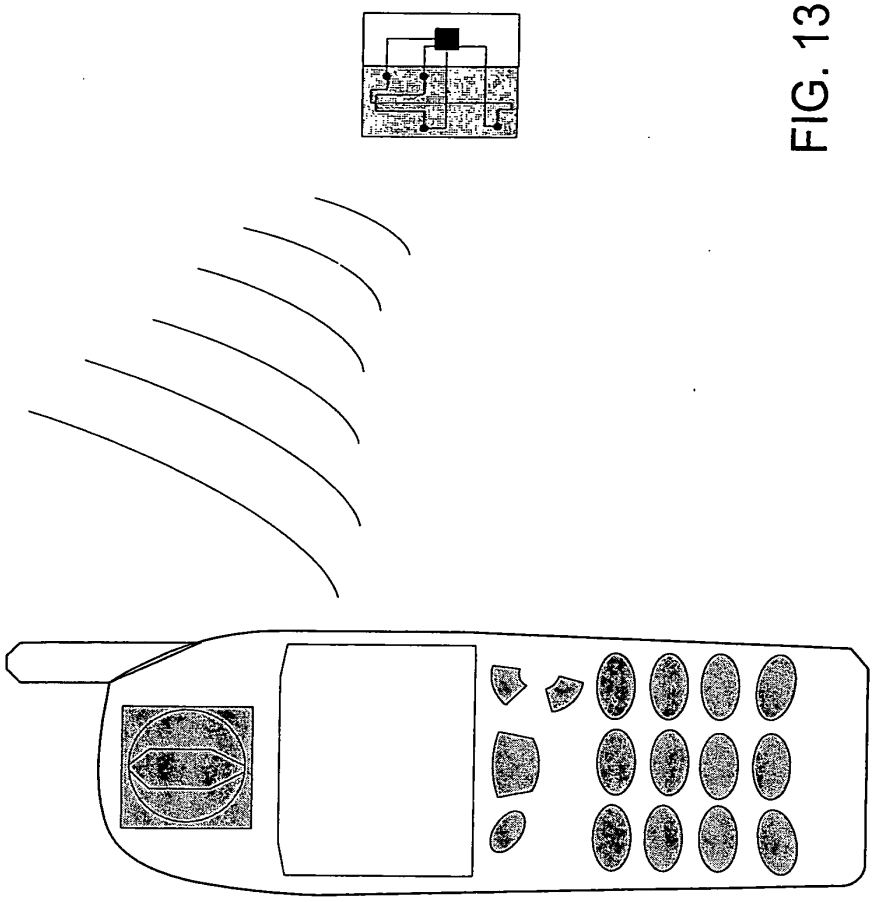


FIG. 13

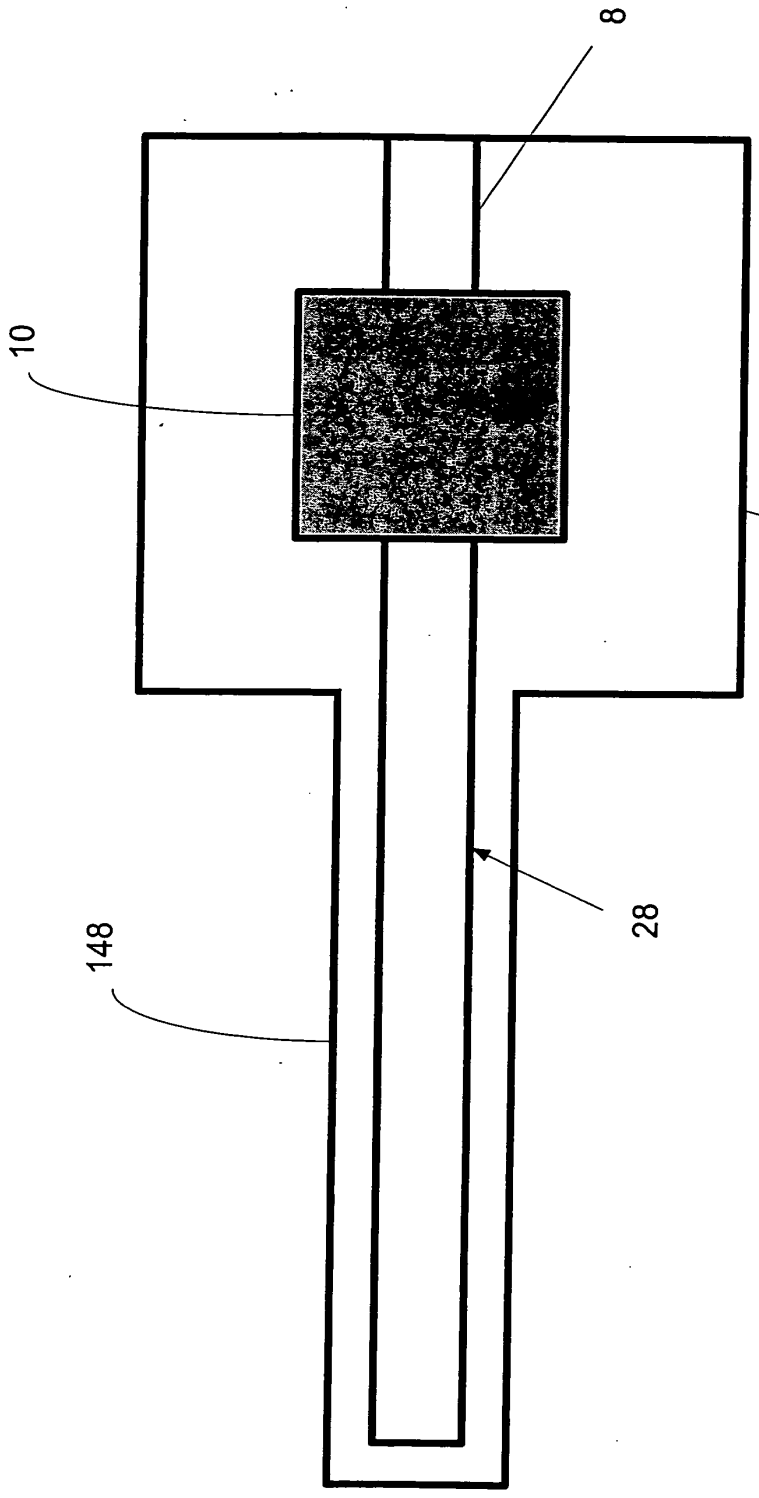


FIG. 14

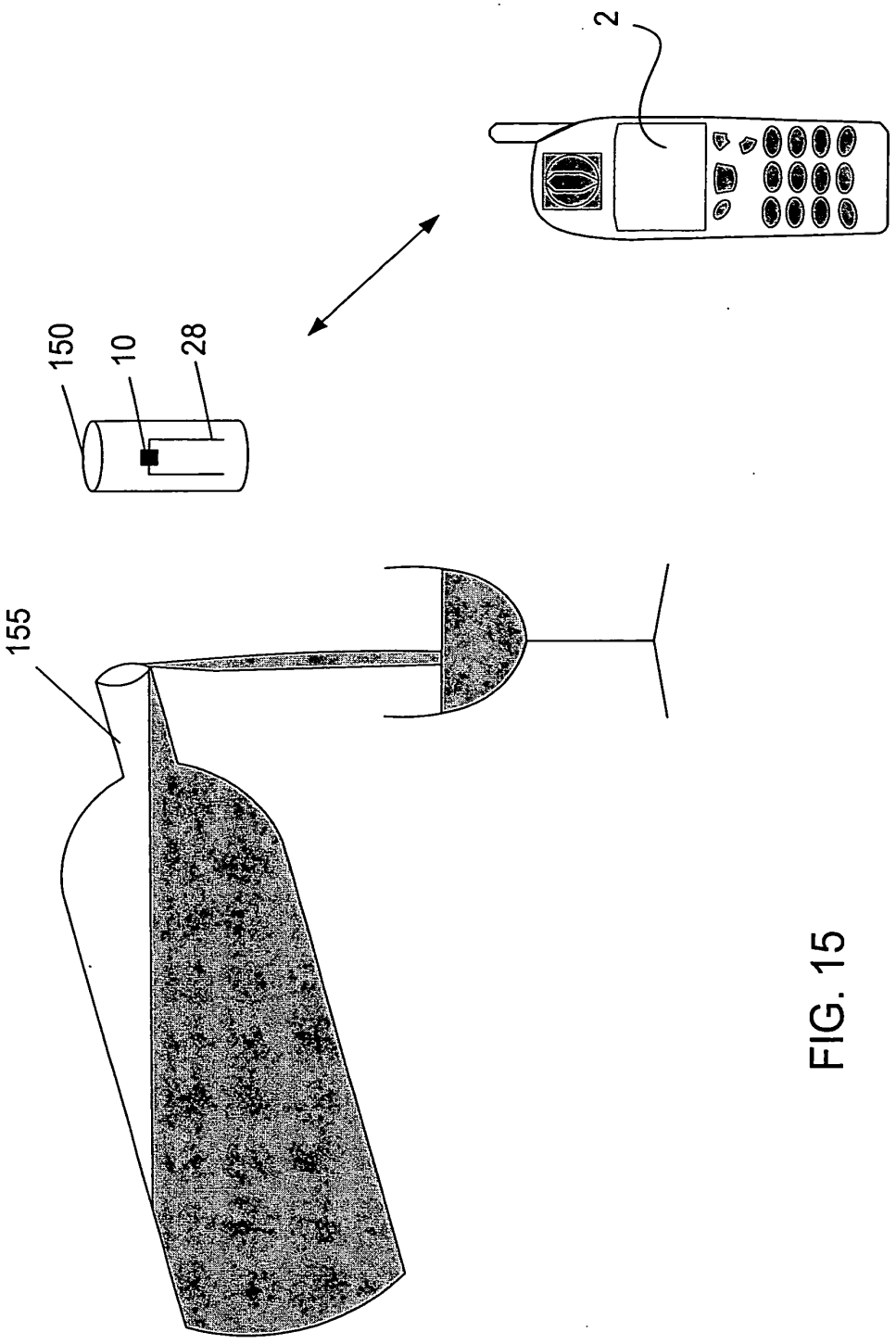


FIG. 15

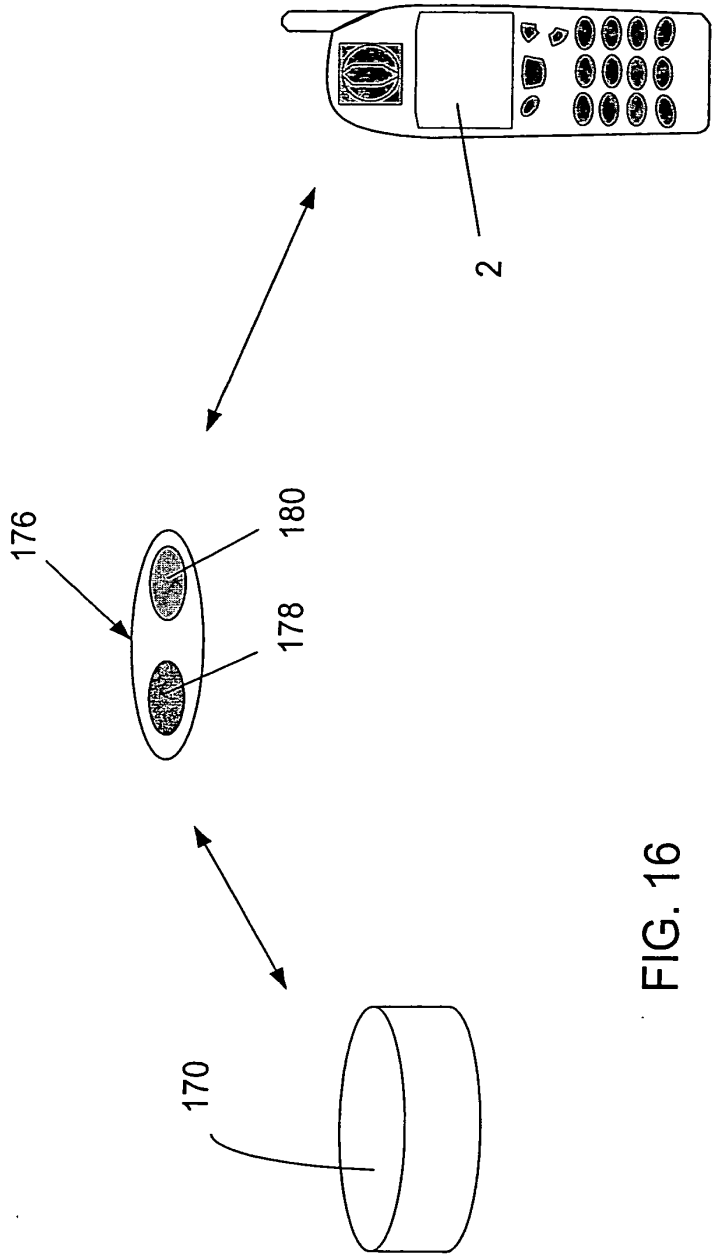


FIG. 16

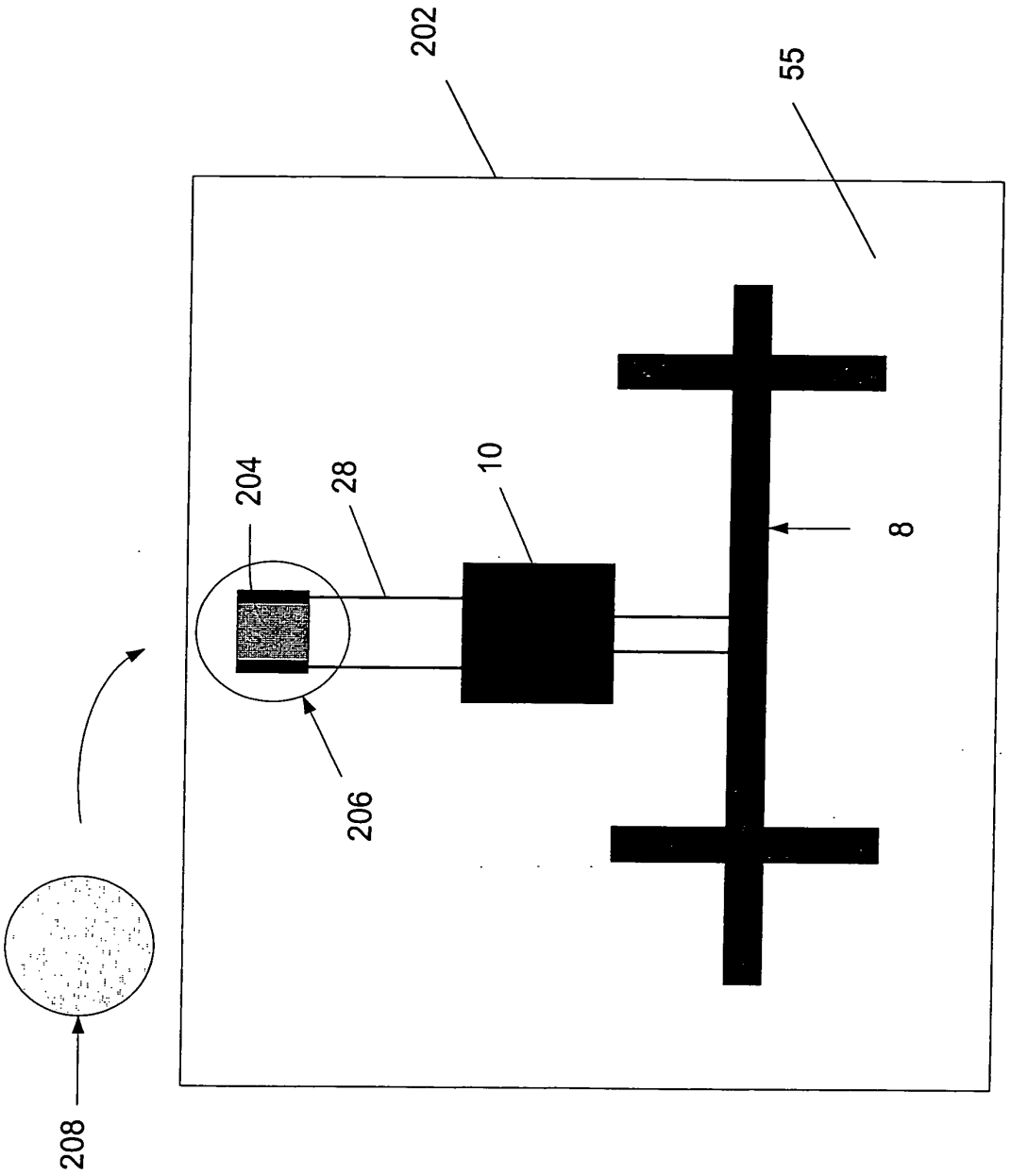


FIG. 17

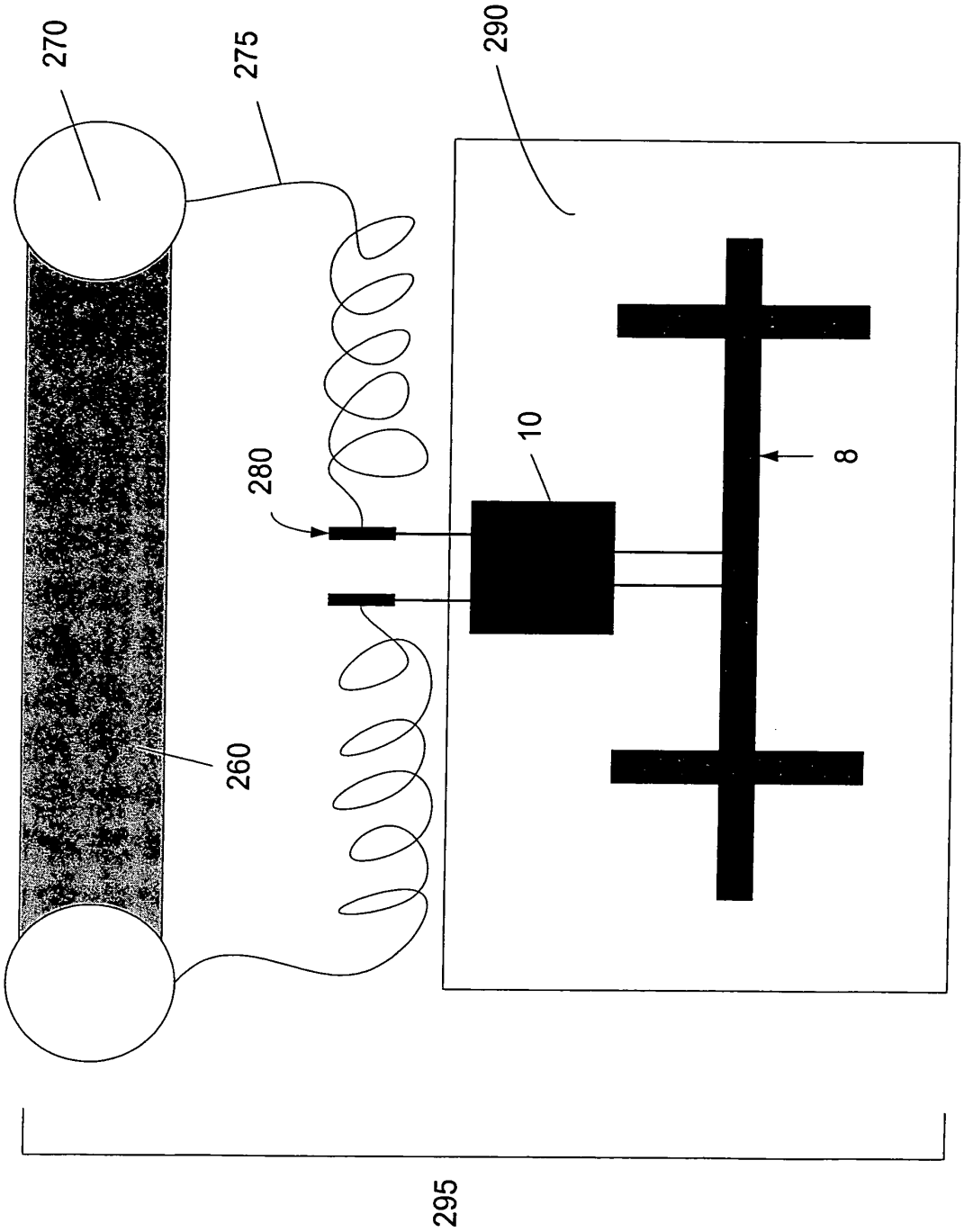


FIG. 18

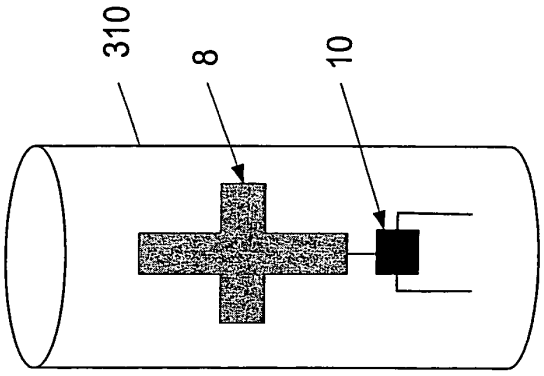


FIG. 19 A

FIG. 19 B

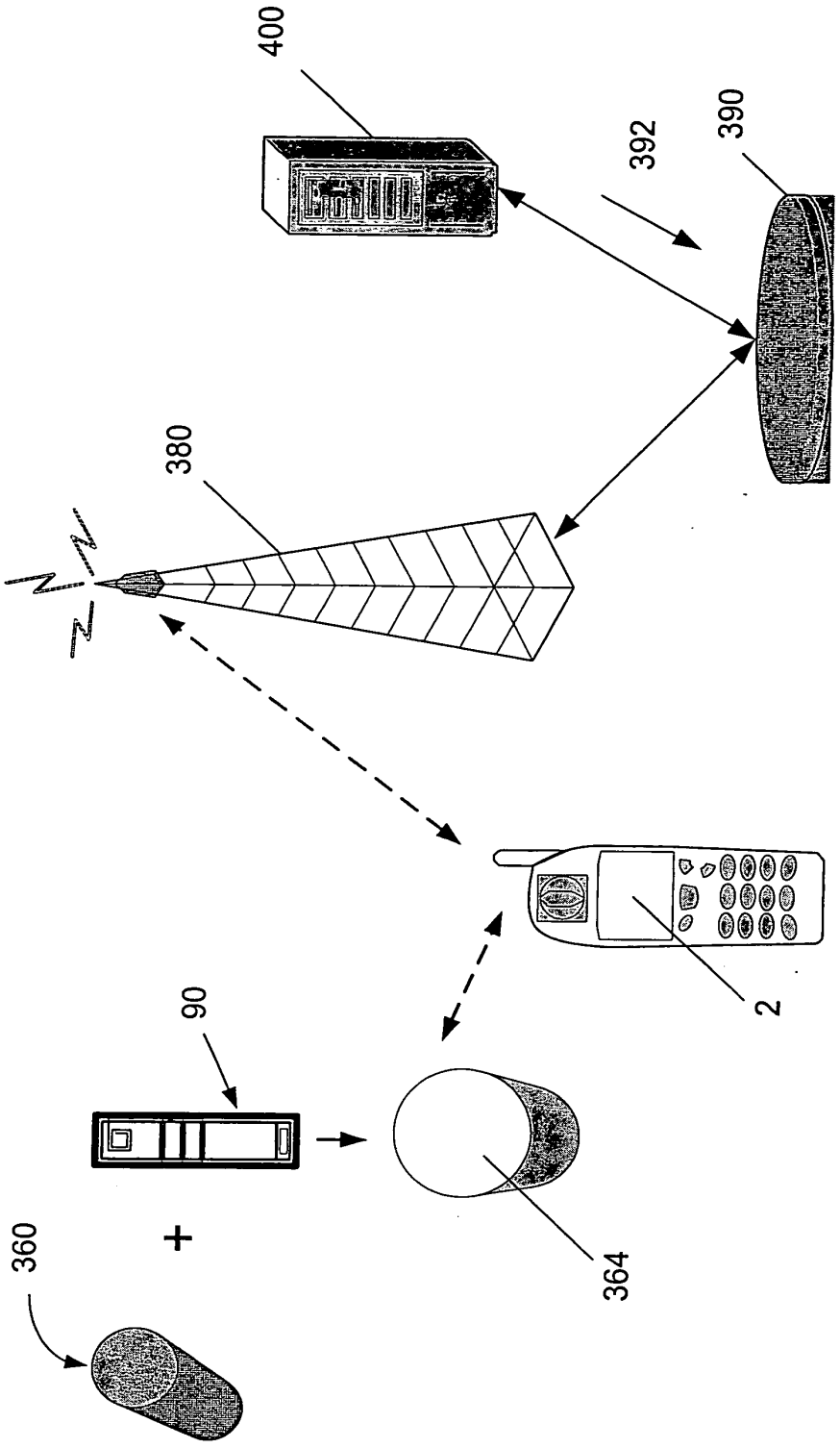


FIG. 20

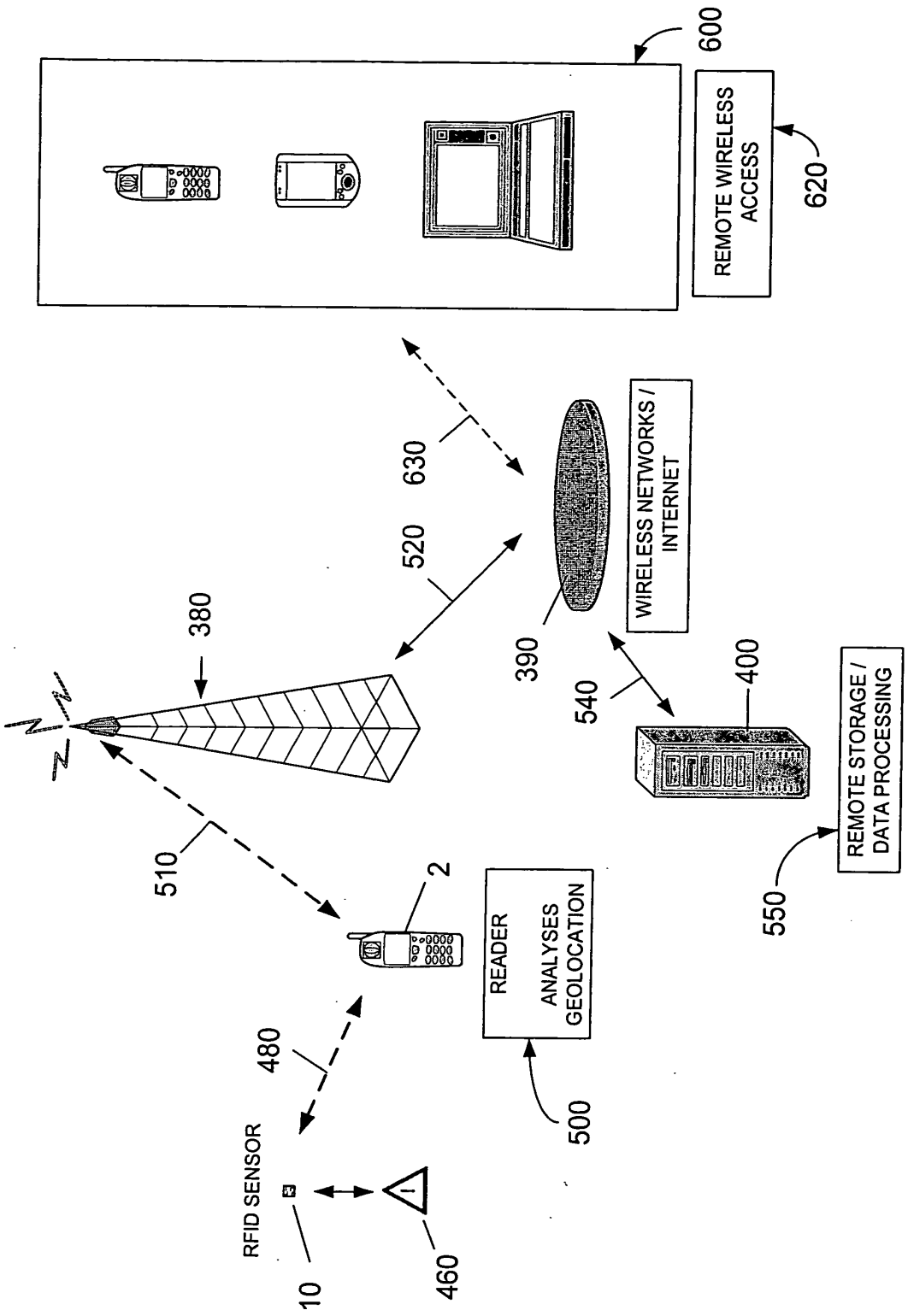

600
REMOTE WIRELESS ACCESS
620
630
520
380
390
WIRELESS NETWORKS / INTERNET
540
400
510
2
READER
ANALYSES
GEOLOCATION
REMOTE STORAGE / DATA PROCESSING
550
480
500
RFID SENSOR
10
460

FIG. 21

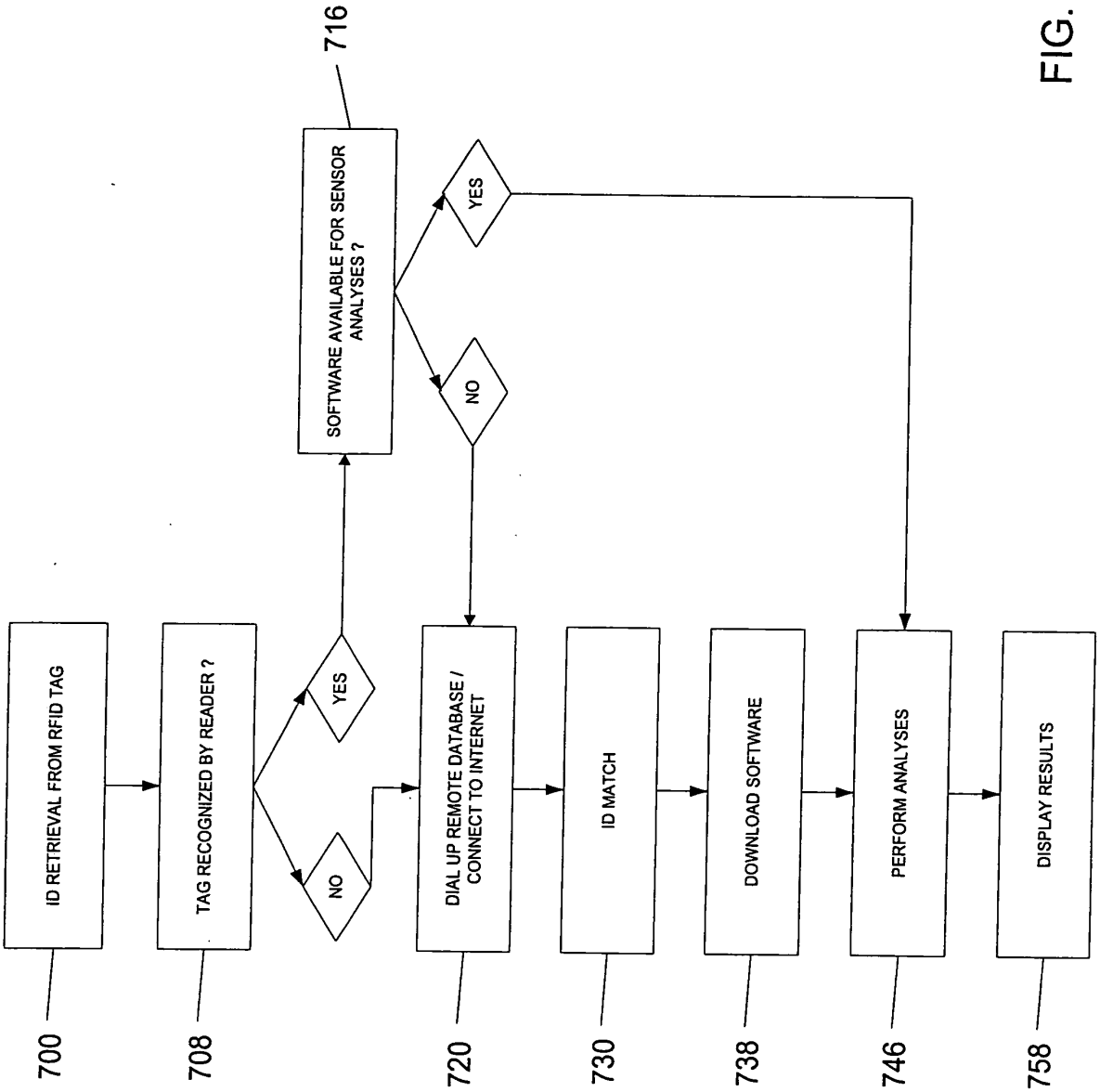

ID RETRIEVAL FROM RFID TAG
TAG RECOGNIZED BY READER ?
YES
NO
SOFTWARE AVAILABLE FOR SENSOR ANALYSES ?
YES
NO
DIAL UP REMOTE DATABASE / CONNECT TO INTERNET
ID MATCH
DOWNLOAD SOFTWARE
PERFORM ANALYSES
DISPLAY RESULTS
700
708
716
720
730
738
746
758

FIG. 22

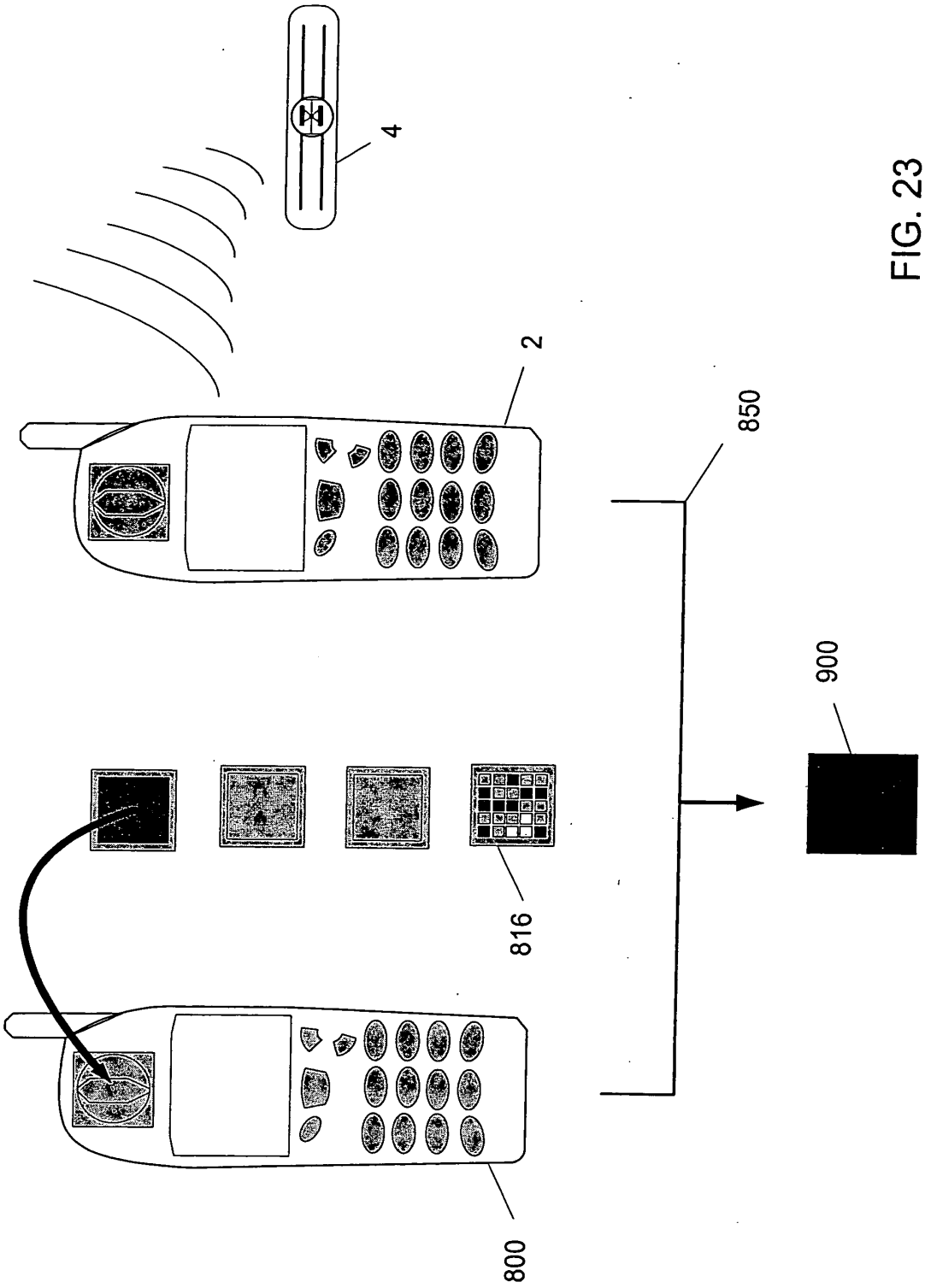


FIG. 23

10/530901

FILED UNDER 35 U.S.C. 371

U.S. **UTILITY** Patent Application

PATENT NUMBER and ISSUE DATE

APPLICATION NUMBER	FILING DATE	CLASS	SUBCLASS	GROUP ART UNIT	EXAMINER

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	Assistant Examiner	Total Claims	Print Claim for O.G

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02 FC:2633	100.00	DA
03 FC:2632	250.00	DA
04 FC:2615	1100.00	DA
05 FC:2614	600.00	DA

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-267/69033

10/530901
JC13 Rec'd PCT/PTO 08 APR 2005

PTO/SB/92 (09-04)
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Attorney Docket No.: 66355-0009

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Dated: April 8, 2005 Signature: alexandra Dietrich (Alexandra Dietrich)

Docket No.: 66355-0009
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
John P. Peeters

Application No.: Not Yet Assigned

Confirmation No.: N/A

Filed: Concurrently Herewith

Art Unit: N/A

For: DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

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Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement accompanies the new patent application submitted herewith.

A copy of each reference listed in foreign and other sections on the PTO/SB/08 is attached.

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any

patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 18-0013, under Order No. 66355-0009. A duplicate copy of this paper is enclosed.

Dated: April 8, 2005

Respectfully submitted,

By_____
Robert L. Kelly
Registration No.: 31,843
RADER, FISHMAN & GRAUER PLLC
39533 Woodward Avenue
Suite 140
Bloomfield Hills, Michigan 48304
(248) 594-0600
Attorney for Applicant

R0287700

Abbott
Exhibit 1002
Page 511

PTO/SB/08a/b (08-03)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John P. Peeters
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	66355-0009

	CG	Wrolstad, Jay. Siemens' Cell-Network Service Tracks Assets, People. Wireless NewsFactor, www.wirelessnewsfactor.com/perl/printer/20997 (March 14, 2003)	
	CH	Merritt, Rick. From Sea to Shining Sea. Electronic Engineering Times, pp. 18-19, 24-25 (July 14, 2003)	
	CI	Wrolstad, Jay. Handheld Sniffs Out Potential Terrorist Threats. Wireless NewsFactor. www.wirelessnewsfactor.com/perl/story/21309.html (April 18, 2003)	

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 2

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John P. Peeters
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	66355-0009

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AA	2,944,404	07/12/1960	Fritts	
	AB	3,050,948	08/28/1962	Jones	
	AC	4,315,599	02/16/1982	Biancardi	
	AD	4,506,510	03/26/1985	Tircot	
	AE	5,020,261	06/04/1991	Lishman	
	AF	5,351,437	10/04/1994	Lishman	
	AG	5,444,984	08/29/1995	Carson	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	BA	EP214766A1	08/08/1986	EPO		
	BB	DD272218A	04/10/1989	Germany		

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	CA	Sirringhaus, H.; Kawase, T.; Friend, R.H.; Shimoda, T.; Inbasekaran, M.; Wu, W.; Woo, E.P. High-Resolution Inkjet Printing of All-Polymer Transistor Circuits. Science, www.sciencemag.org, Vol 290, pp. 2123-2126. (December 15, 2000)	
	CB	Hausmann, Dennis; Becker, Jill; Wang, Shenglong; Gordon, Roy G. Rapid Vapor Deposition of Highly Conformal Silica Nanolaminates. Science, www.sciencemag.org, Volume 298, pp. 403-406 (October 11, 2002)	
	CC	Angelopoulos, M. Conducting Polymers in Microelectronics. IBM Journal of Research and Development, Vol. 45, Number 1. (2001) www.research.ibm.com/journal/rd/451/angelopoulos.mtml	
	CD	Donhauser, Z.J.; Mantooth, B.A.; Kelly, K.F.; Bumm, L.A.; Monnell, J.D.; Stapleton, J.J.; Price Jr., D.W.; Rawlett, A.M.; Allara, D.L.; Tour, J.M.; Weiss, P.S. Conductance Switching in Single Molecules Through Conformational Changes. Science, Volume 292, pp. 2303-2307, www.sciencemag.org (June 22, 2001)	
	CE	Zulicke, Ulrich. Ultrasmall Wires Get Excited. Science, Vol. 295, pp. 810-811, www.sciencemag.org (February 1, 2002)	
	CF	Cui, Yi; Wei, Qingqiao; Park, Hongkun; Lieber, Charles M. Nanowire Nanosensors for Highly Sensitive and Selective Detection of Biological and Chemical Species. Science, Vol. 293, pp. 1289-1292. (August 17, 2001)	

Examiner Signature		Date Considered	

WILL/ ★ P13 87-074115/11 ★EP -214-766-A

Roofing structure for plant protection - has roof panel with hollow to collect moisture and allow controlled drainage to plants

WILLIAMS I P 10.08.85-GB-020132

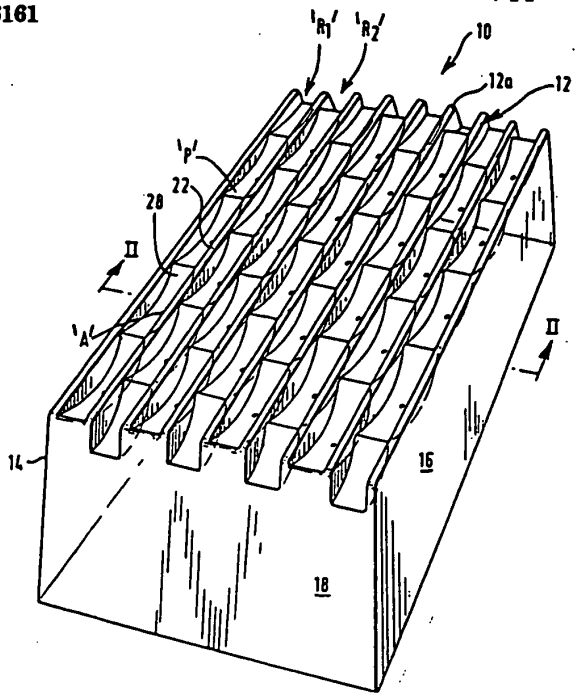
(18.03.87) A01g-09/14 A01g-13/04

08.08.86 as 306143 (980RW) (E) GB2128651 GB1580934 FR2485330 E(DE FR GB IT NL SE)

The plant cover roofing has a panel (12) formed to provide multiple individual pockets (P) each to collect poisture. Moisture transfer apertures (A) are provided in at least some of the pockets to allow moisture to pass through the panel in a controlled manner. The moisture is thus distributed evenly over the area beneath the roof panel.

The pockets can be arranged in multiple rows (R) in which pockets in one row are staggered out of registry with the pockets in the next adjacent row. The adjacent rows can be separated by an inverted channel shaped portion of the roof panel.

ADVANTAGE - Controlled flow of moisture. (9pp Dwg.No 1/2) G N87-056161



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(11) Publication number: **0 214 766**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 86305143.8

(22) Date of filing: 08.08.86

(51) Int. Cl.⁴: A 01 G 9/14
A 01 G 13/04

(30) Priority: 10.08.85 GB 8520132

(43) Date of publication of application:
18.03.87 Bulletin 87/12

(84) Designated Contracting States:
DE FR GB IT NL SE

(71) Applicant: Williams, Ivan Patrick
10 Hillside Ironbridge
Shropshire(GB)

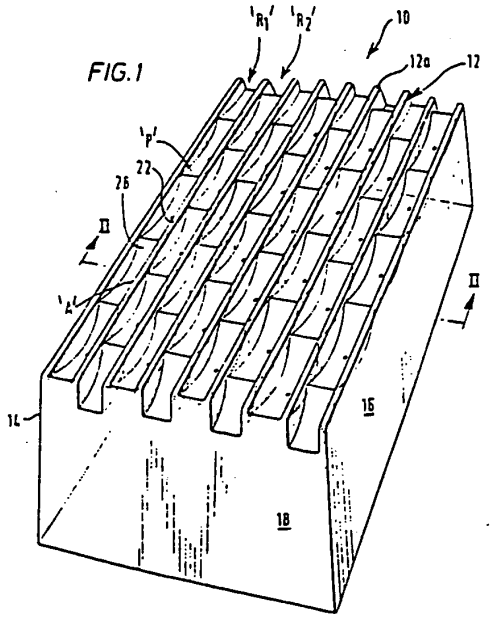
(72) Inventor: Williams, Ivan Patrick
10 Hillside Ironbridge
Shropshire(GB)

(74) Representative: Hepworth, John Malcolm
J.M. Hepworth & Co. 36 Regent Place
Rugby Warwickshire CV21 2PN(GB)

(54) Roofing structure for plant protection devices.

(57) A protection unit for plants and seeds comprises a roof panel (12), side walls (14, 16) and end walls (18, 20) extending downwardly from the roof panel thereby forming a hollow body, the roof panel being formed to provide a multiplicity of individual pockets (P) each to collect moisture. Each of the pockets has a base in which an aperture is formed, to permit moisture to pass through the roof panel in a controlled manner. The pockets are arranged in a plurality of rows (R) such as to ensure that moisture is distributed evenly over the area beneath the roof panel.

FIG. 1



EP 0 214 766 A1

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ROOFING STRUCTURE FOR PLANT PROTECTION DEVICES

This invention relates to a roofing structure for plant protection devices e.g. garden cloches.

Whereas the invention is particularly concerned with a garden cloche, the specific roofing structure may be used per se and supported above plants and/or seeds by some suitable means.

One aspect of the invention provides a roofing structure for a plant protection device which roofing structure comprises a panel formed to provide a multiplicity of individual pockets each to collect moisture and means provided in at least some of the pockets to permit moisture to pass through the panel in a controlled manner.

Another aspect of the invention provides a plant and/or seed protection unit which unit has a roof at least a portion of which is formed as defined in the immediately preceding paragraph.

The pockets collect moisture e.g. rain, water or artificially applied water and apertures provided in

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the base of the pockets allow for the controlled distribution of collected water to the area beneath the roofing structure.

The distribution of apertured pockets in the roofing structure according to the invention is such as to keep a degree of moisture distribution on the under-surface of the roofing structure which will provide, in the case of a cloche or other substantially closed unit, a humid atmosphere. The pocket apertures further provide ventilation in periods when the pockets do not contain moisture in order to reduce the risk of 'damping off' of plants.

An embodiment of the invention will now be described by way of example, with reference to the accompanying drawings in which:-

FIGURE 1 is a perspective view of a garden cloche incorporating a roofing structure according to the invention; and

FIGURE 2 is a cross-sectional view of the cloche taken along the line II-II in Figure 1.

Referring to Figures 1 and 2, there is shown a garden cloche 10 which is moulded e.g. by vacuum forming from a suitable plastics material e.g. polystyrene; p.v.c. so as to be self-supporting.

The cloche comprises a hollow body having a roof 12 from which depend integral, opposed side walls 14 and 16 and integral opposed end walls 18, 20 respectively whereas the hollow body of this embodiment is generally parallelapiped, other shapes e.g. cylindrical, frusto-conical are envisaged.

The roof 12 is formed with a multiplicity of similar pockets 'P' arranged in a series of parallel rows 'R'.

In the particular arrangement illustrated the pockets P of one row e.g. R' are staggered out of registry with the pockets P of the adjacent row e.g. R^2. The rows of pockets are separated one from the next by an inverted channel-shaped portion 22 of the roof. The channel-shaped portions are each defined by a top wall 12a forming a part of the uppermost surface of roof 12 and continuous flank walls 24, 26 extending the length of the roof and providing one side of each of the pockets in adjacent rows. Each pocket 'P' is thereby formed by a pair of flank walls 24, 26 of adjacent channel-shaped portions and a base 28 which is arcuate in the longitudinal direction of the cloche. At the lowermost location of the arcuate base 28 each pocket is formed with an aperture 'A'.

Each of the pockets 'P' is provided for the collection and temporary retention of moisture which is gravity fed through the base 28 of the pocket by an aperture 'A' provided at the lowermost location in the pocket base. It is envisaged that slots and/or a plurality of apertures may be provided. The specific arrangement of the aperture or apertures is unimportant except insofar as the function of providing a controlled means of escape of moisture from the pocket to the inside of the cloche is achieved.

In a modified construction, it is envisaged that the moisture collection pockets may be provided in substantially the whole surface area of the cloche which could therefore be of semi-cylindrical form in which case the roof also incorporates the side walls of the cloche. In such an arrangement the pockets may be formed by successive longitudinal folds of material. A cloche constructed in the modified form is not necessarily self-supporting and structural reinforcement e.g. rigid hoops may be required to maintain the structural rigidity of the cloche.

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It is also envisaged that the pockets may incorporate value means for more specifically controlling the distribution of moisture to the area beneath the cloche. For example, each pocket may be furnished with a control valve comprising a bung connected by a spigot passing through projection and connected at its opposite end to a bi-metallic strip. The bi-metallic strip controls opening and closing of the bung and is carried by a suitable structural element mounted internally of the cloche. A pair of spaced ducts passing one on either side of the bi-metallic stip may be provided to allow moisture to pass through the pocket such that moisture does not contact and thereby cool the strip.

It is further envisaged that a cloche assembly may comprise a height adjustable base frame, a flexible plastics sleeve and a cloche top which may take the form of the hollow body depicted in Figures 1 and 2. The plastics sleeve is fitted about the base frame in some suitable manner and upright legs of the frame are made adjustable e.g. telescopically to collapse or stretch the sleeve respectively. The cloche top sits atop the upright legs of the base frame. Thus the height of the cloche assembly may be adjustable to accommodate plants as they grow.

In any of the constructions described above it is envisaged that an inner screen may be provided within the cloche intermediate the roof and the ground which screen can be formed from plastics material or tightly stretched muslin to protect seedlings from droplets of water falling from the apertured pockets.

It is also envisaged that one for more receptacles e.g. a trough containing impure or saline water may be accommodated within a cloche or beneath a roofing structure according to the invention. Moisture from such receptacles will under appropriate conditions evaporate

condense on the underside of the roofing structure whereafter it is redistributed over the area covered by the roofing structure in the form of droplets of water substantially cleansed of the original impurities which are left remaining in the water trough or other receptacle utilised.

It will be appreciated that a roofing structure of the present invention when applied so as to form a part of a substantially closed housing functions to produce evaporation, condensation and thence redistribution of moisture back to plants or seeds contained within the closed housing thereby providing a "mini-tropical rain forest climate". The specific arrangement of the pockets allows for even distribution of moisture both directly from the pockets themselves and also from the condensate which collects on the underside of the pockets and other areas of the roof.

CLAIMS

1. A roofing structure for a plant protection device (10) which structure is characterised by a panel (12) formed to provide a multiplicity of individual pockets (P) each to collect moisture, moisture transfer means (A) being provided in at least some of the pockets to permit moisture to pass through the panel in a controlled manner so that it is distributed substantially evenly over the area beneath said roof panel.

2. A roofing structure according to claim 1, further characterised in that said transfer means comprises at least one aperture provided in each pocket.

3. A roofing structure according to claim 2, further characterised in that said pockets are arranged in a plurality of rows (R) in which the pockets in one row are staggered out of registry with the pockets in the next adjacent row.

4. A roofing structure according to claim 3, further characterised in that said rows of pockets are separated one from the next by an inverted channel-

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shaped portion of the said roof panel, each of said inverted channel shaped portions being defined by a top wall (12a) forming a part of the uppermost surface of said roof panel and continuous flank walls (24, 26) extending the length of said roof panel and providing one side of each of the pockets in adjacent rows.

5. A roofing structure according to claim 4, further characterised in that each pocket has an arcuate base, said aperture being formed in the lowermost location of said arcuate base.

6. A protection unit for plants and seeds which unit is characterised by a roof panel at least a portion of which is formed as claimed in claim 1.

7. A protection unit according to claim 6, characterised in that said roof panel is height adjustable.

8. A protection unit for plants and seeds which unit comprises a roof panel (12), side walls (14, 16) and end walls (18, 20) extending downwardly from said roof panel thereby forming a hollow body, characterised in that said roof panel is formed to provide a multiplicity of individual pockets (P) each to collect moisture, each pocket having a base in which an aperture is formed to permit moisture to pass through said roof panel in a controlled manner and in that said pockets are arranged in a plurality of rows (R) in which the pockets in one row are staggered out of registry with the pockets in the next adjacent row whereby, in use, moisture is distributed evenly over the area beneath the roof panel.

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FIG.1

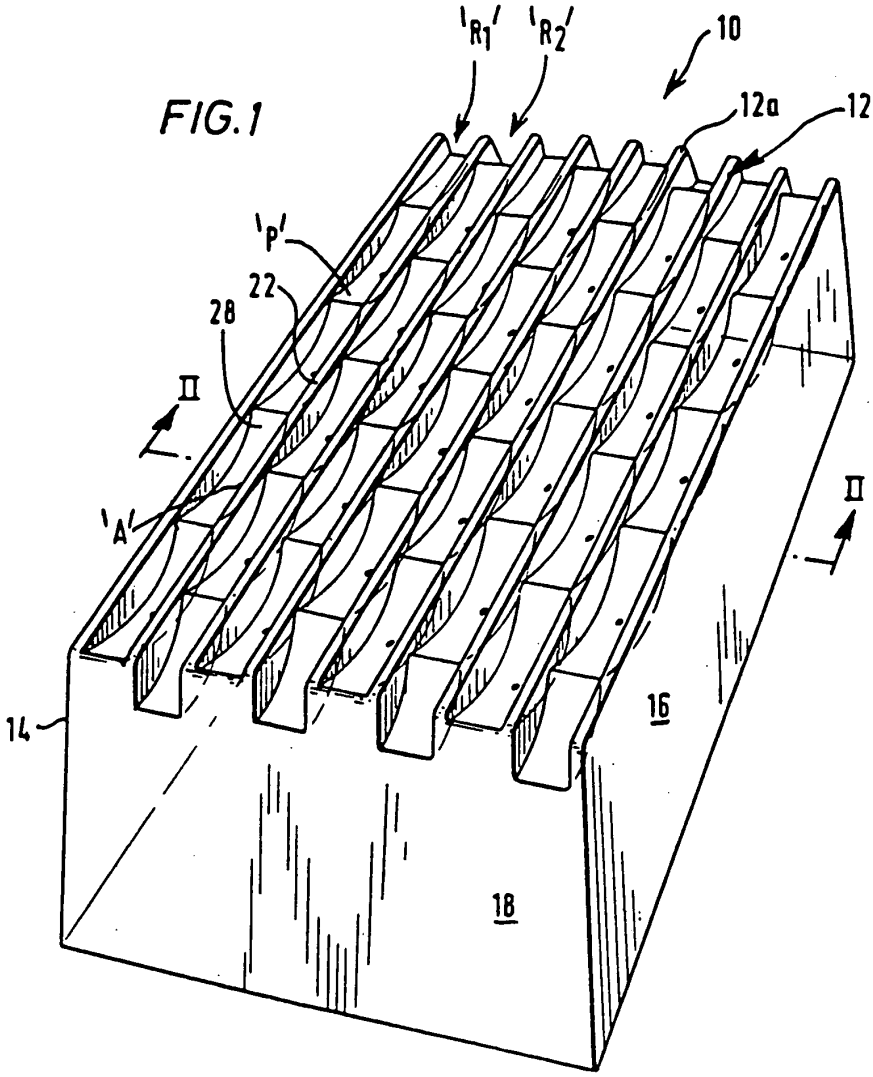
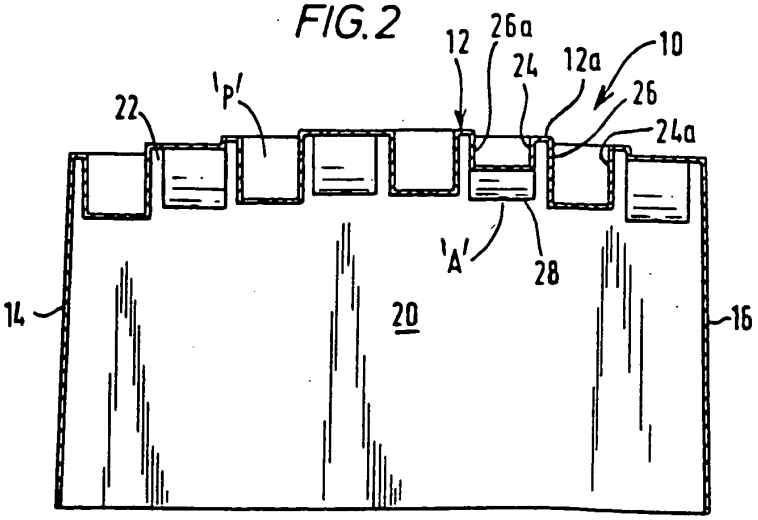


FIG.2



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European Patent Office

EUROPEAN SEARCH REPORT

0214766
Application number

EP 86 30 6143

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl 4)
Y	GB-A-2 128 651 (VASBENTER) * Page 1, lines 96-108; page 2, lines 16-32; figures 1,3 *	1-8	A 01 G 9/14 A 01 G 13/04
Y	GB-A-1 580 934 (SALT) * Whole document *	1-8	
A	FR-A-2 485 330 (LEFEBVRE) * Page 2, lines 41-68; figures 1-4 *	1-3,5, 6,8	

TECHNICAL FIELDS SEARCHED (Int Cl 4)

A 01 G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-11-1986	HERYGERS J.J.

CATEGORY OF CITED DOCUMENTS

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JENA ★ P13 90-076189/11 ★DD-272-218-A

Control probe for open air irrigation plant - simultaneously records actual ground humidity, air and ground temps. to attain optimum growing conditions

VEB JENA GLASWERK 24.05.88-DD-315977

S03 T06 X25 (04.10.89) A01g-25/16

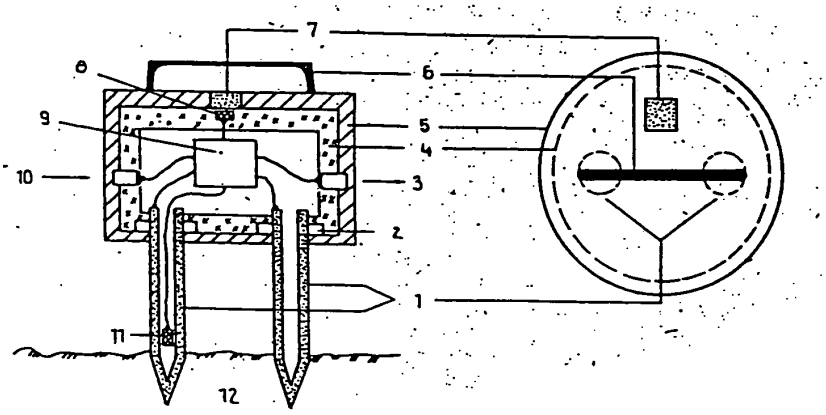
24.05.88 as 315977 (1686BD)

The probe consists of a hermetically closed cylindrical capsule surrounded by external insulation. Two metallic hollow cylinders (1) with pointed ends are embedded in the underside of the probe to serve as electrodes for the measurement of the dispersion resistance using a DC pulse. An electronic block is arranged inside the capsule and a bracket (6) is fitted on the top side for inserting the probe by hand in the soil being investigated. A contact surface (7) is embedded on the top side for receiving the air temp. which is connected to a measuring thyristor (8). A second thyristor (11) for measuring the soil temp. is positioned in one of the cylinders (1) at the tip.

The current supply and the signalling takes place across a single cable conenction with a central control part, which simultaneously operates l.v. magnetic valve for the water supply.

USE/ADVANTAGE Control of irrigation sprinkling using as parameters actual measurements of soil humidity, temp. and air temp. Establishes amount of artificial rain required to give optimum growing conditions with different climatic conditions. Reliable and increases average crop bearing per unit area. (Dwg.No.1)

N90-058512



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4(51) A 01 G 25/16

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(71) VEB JENAer GLASWERK, Otto-Schott-Straße 13, Jena, 6900, DD
(72) Wagner, Thomas, Dipl.-Phys., DD

(54) Sonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien

(55) Sonde, Meßparameter, Beregnungsanlage, Bodenfeuchtigkeit, Lufttemperatur, Bodentemperatur, Isolierung, Metallzylinder, Ausbreitungswiderstand, Gleichstromimpuls, Meßthyristor, Elektronikblock, Kontaktfläche, Kabelverbindung, Niederspannungsmagnetventil

(57) Die Erfindung betrifft eine Sonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien durch die gleichzeitige Registrierung der aktuellen Bodenfeuchtigkeit, der Lufttemperatur und der Bodentemperatur. Damit kann zuverlässig eine durch diese Meßparameter festgelegte künstliche Beregnung von Bodenkulturen zur Erzielung optimaler Wachstumsbedingungen unter den verschiedenartigsten klimatischen Einflüssen zur Steigerung der durchschnittlichen Flächenerträge erfolgen. Erfindungsgemäß besteht die Sonde aus einer hermetisch geschlossenen Kapsel zylindrischer Bauform, die von einer äußeren Isolierung umgeben ist. Auf der Unterseite befinden sich zwei eingelassene Metallzylinder, die im Innern hohl sind und am unteren Ende spitz auslaufen. Sie stellen die Elektroden für die Messung des Ausbreitungswiderstandes mit Hilfe eines Gleichstromimpulses dar. Im Innern der Kapsel befindet sich ein Elektronikblock. Auf der Oberseite ist ein Tragebügel zum Einstechen der Sonde von Hand in den zu untersuchenden Boden angebracht. Ebenso ist eine Kontaktfläche zur Aufnahme der Lufttemperatur in die Oberseite eingelassen, die mit einem Meßthyristor fest verbunden ist. Ein zweiter Meßthyristor für die Aufnahme der Bodentemperatur sitzt im Innern eines der Metallzylinder unmittelbar an der Spitze. Die Stromversorgung und die Signalmeldung geschieht über eine einfache Kabelverbindung mit einem zentralen Steuerteil, das zugleich ein Niederspannungsmagnetventil zur Wasserzufuhr betätigt. Fig. 1

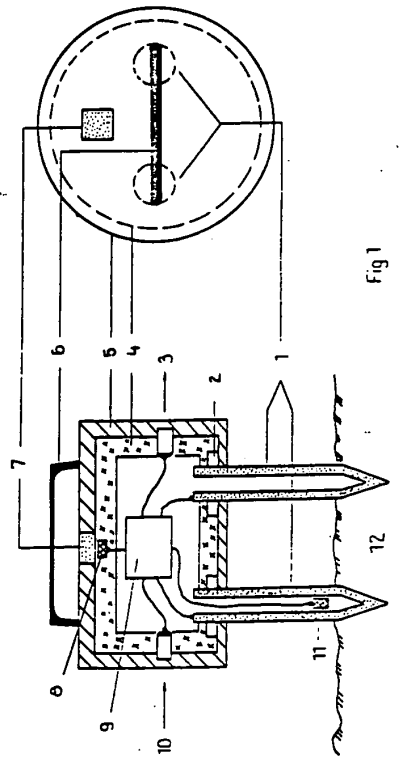

Fig 1

ISSN 0433-6461

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Patentanspruch

Sonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien durch die gleichzeitige Registrierung der aktuellen Bodenfeuchtigkeit, der Lufttemperatur und der Bodentemperatur dadurch gekennzeichnet,

- daß eine hermetisch geschlossene Kapsel zylindrischer Bauform, die von einer äußeren elektrischen und klimatischen Isolierung (5) umgeben ist, zwei vom Mittelpunkt auf dessen seitlicher Verlängerung links und rechts abgesetzt in die Unterseite der Kapsel eingelassene Metallzylinder (1) besitzt, die im Innern hohl ausgebildet sind und am unteren Ende spitz auslaufen, wobei diese Metallzylinder Elektroden für die Messung des Ausbreitungswiderstandes eines Gleichstromimpulses rechteckiger Form in einem zu untersuchenden Boden (12) als Maß für dessen Feuchtigkeitsgehalt bilden,
- daß das Innere der Kapsel mit einer Wärmeisolierung (4) ausgekleidet ist, die lediglich von zwei seitlich gegenüberliegenden Anschlußbuchsen für einen Kabeleingang (10) und einen Kabelausgang (3) für einen Elektronikblock (9) und von dem oberen Ende der Metallzylinder (1) durchbrochen ist,
- daß sich auf der Oberseite der Sonde ein Tragebügel (6) zum Eindrücken der Spitzen der Metallzylinder (1) in den zu untersuchenden Boden (12) durch senkrechten Druck von Hand mit Hilfe dieses Bügels befindet, so daß die Sonde dadurch zugleich einen sicheren Halt beim Einstechen in den zu untersuchenden Boden (12) und den für die zuverlässige Arbeitsweise benötigten fixierten Abstand zum Boden (12) bekommt,
- daß auf der Oberseite der Sonde, vom Tragebügel (6) seitlich abgesetzt, bündig mit der Oberfläche ein gut wärmeleitender Körper (7) eingelassen ist, an dessen Unterseite direkt ein Meßthyristor (8) zur Aufnahme der Lufttemperatur befestigt ist,
- daß sich im Innern der Metallzylinder (1) in der Nähe der Spitze ein zweiter Meßthyristor (11) zur Aufnahme der Bodentemperatur durch den direkten Kontakt des Metallzylinders (1) mit dem zu untersuchenden Boden (12) befindet.

"Hierzu 1 Blatt Zeichnung"

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Titel der Erfindung

Sonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien

Anwendungsgebiet der Erfindung

Die Erfindung dient als Sonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien durch die gleichzeitige Registrierung der aktuellen Bodenfeuchtigkeit, der Lufttemperatur und der Bodentemperatur. Damit kann zuverlässig eine durch diese Meßparameter festgelegte künstliche Beregnung von Bodenkulturen im Freien erfolgen zur Erzielung optimaler Wachstumsbedingungen unter den verschiedenartigsten äußeren klimatischen Einflüssen für eine Steigerung der durchschnittlichen Flächenerträge.

Die Erfindung kann auf allen technischen Gebieten angewendet werden, wo eine Steuerung des Feuchtigkeitsgehaltes eines Mediums im laufenden Produktionsprozeß im Freien notwendig ist. Ein günstiger Anwendungsfall ist die automatische Steuerung von Beregnungsanlagen auf einem abgegrenzten Territorium im Freien, wobei der Wasseraustritt aus den Verteileröffnungen der Beregnungsleitung unterschiedlich gemäß dem jeweiligen Erfordernis diskontinuierlich über die gesamte Beregnungsfläche verändert wird, so daß der Beregnungsfläche örtlich und zeitlich unterschiedliche Wassermengen zugeführt werden können.

Charakteristik des bekannten Standes der Technik

Zur Steuerung von Beregnungsanlagen werden entweder sehr komplexe Meßsysteme mit speziell dafür ausgebildeten Meßwertaufnehmern benutzt (z.B. DD-WP 248951, DD-WP 223051) oder derart triviale mechanische Systeme, daß sie für solch einen komplizierten Einsatz im Freien, bei dem sie allen möglichen äußeren klimatischen Einflüssen und sonstigen schadhaften Umweltfaktoren ununterbrochen ausgesetzt sind, nicht genügend geeignet sind (z.B. DE-OS 3412739, DE-OS 3428097, DD-WP 243843).
Den Meßsonden fehlt dabei die unkomplizierte Handhabung und Austauschbarkeit. Sie sind auch nicht zu einem ganzen Meßfeld aufreihbar und sind nicht völlig netzunabhängig zu betreiben.

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Die Erfüllung all dieser Bedingungen ist aber für eine zuverlässige Arbeitsweise und die optimale Anpassung an die tagtäglichen Problemstellungen unabdingbar.

Ziel der Erfindung

Das Ziel der Erfindung ist die Schaffung einer Meßsonde zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien. Dabei sollen gleichzeitig die Bodenfeuchtigkeit, die Bodentemperatur und die Lufttemperatur gemessen werden zur zentralen Meldung an eine Steuergruppe, die die Wasserzufuhr elektrisch beeinflußt. Die dafür eingesetzte Meßsonde muß eine hermetisch geschlossene Bauform besitzen und eine einfache Handhabung gestatten. Dabei soll der Material- und Kosteneinsatz sehr gering sein und die Meßsonde muß die Meldung der Signale über große Entfernungen unkompliziert über ein gewöhnliches Netzkabel erlauben.

Darlegung des Wesens der Erfindung

Der Erfindung liegt die Aufgabe zugrunde, eine Meßsonde zur automatischen Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien so zu gestalten, daß zuverlässig und über lange Zeiträume netzunabhängig die Bodenfeuchtigkeit über die Messung des Ausbreitungswiderstandes eines Gleichstromimpulses rechteckiger Form im zu untersuchenden Boden, die Bodentemperatur selber und die Lufttemperatur gleichzeitig gemessen werden können. Dabei soll die Verwendung mechanisch oder elektrisch-mechanisch bewegter Teile vollständig vermieden werden, um den klimatischen Einflüssen und Umweltbelastungen am besten gerecht zu werden. Sie soll weiterhin eine geringe Stromaufnahme aufweisen, um einen netzunabhängigen Betrieb durch eine eigene Stromversorgung über eine Zeitperiode zu ermöglichen.

Die Aufgabe wird erfindungsgemäß dadurch gelöst, daß bei einer Meßsonde zur Aufnahme der Meßparameter zur Steuerung von Beregnungsanlagen folgende Merkmale auftreten:

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1. Eine hermetisch geschlossene Kapsel zylindrischer Bauform, die von einer äußeren elektrischen und klimatischen Isolierung umgeben ist, besitzt zwei vom Mittelpunkt auf dessen seitlicher Verlängerung links und rechts abgesetzt in deren Boden eingelassene Metallzylinder, die im Innern hohl ausgebildet sind und am unteren Ende spitz auslaufen. Sie stellen die Elektroden für die Messung des Ausbreitungswiderstandes des Gleichstromimpulses rechteckiger Form in dem zu untersuchenden Boden als Maß für den Feuchtigkeitsgehalt dar.

2. Das Innere der Kapsel ist mit einer Wärmeisolierung ausgekleidet, die lediglich von zwei seitlich gegenüberliegenden Anschlußbuchsen für einen Kabeleingang und einen Kabelausgang für einen Elektronikblock durchbrochen ist und dem oberen offenen Ende der Metallzylinder.

3. Auf der Oberseite der Meßsonde befindet sich ein Tragebügel zum Eindrücken der Spitzen der Metallzylinder in den zu untersuchenden Boden durch senkrechten Druck von Hand mit Hilfe des Griffes, so daß die Meßsonde dadurch zugleich einen sicheren Halt beim Einstechen in den zu untersuchenden Boden bekommt und den für die zuverlässige Arbeitsweise benötigten fixierten Abstand zum Boden.

4. Auf der Oberseite der Meßsonde, von dem Tragebügel seitlich abgesetzt, befindet sich bündig in der Oberfläche eingelassen ein gut wärmeleitender Körper, an dessen Unterseite direkt ein Meßthyristor zur Aufnahme der Lufttemperatur befestigt ist.

5. Im Innern einer der Metallzylinder befindet sich in der Nähe der Spitze ein zweiter Meßthyristor zur Aufnahme der Bodentemperatur durch den direkten Kontakt des unteren Teiles des Metallzylinders mit dem zu untersuchenden Boden beim Einstekken der Meßsonde.

Bei der Verwendung von korrosionsfestem und witterungsbeständigem Material für die Kapsel, z.B. PTFE für die Oberfläche und Reinaluminium für die Meßelektroden ist eine zuverlässige Ar-

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beitsweise unabhängig von äußeren klimatischen Einflüssen gewährleistet. Untereinander sind die einzelnen Meßsonden mit einem gewöhnlichen Kabel verbunden, über das auch die Einspeisung der netzunabhängigen Stromversorgung erfolgt.

Ausführungsbeispiel

Die Erfindung wird anhand der Fig. 1 beschrieben, die eine Zeichnung vom schematischen Aufbau einer Meßsonde im Querschnitt und in der Aufsicht zur Erfassung von Meßparametern zur Steuerung von Beregnungsanlagen im Freien darstellt.

Eine hermetisch geschlossene Kapsel zylindrischer Bauform, die aus einem Schutzgehäuse 5 gebildet wird, welches im Innern mit einer Wärmeisolierung 4 ausgekleidet ist, enthält auf der Unterseite zwei vom Mittelpunkt seitlich links und rechts abgesetzte kreisförmige Durchbrüche mit einer Isolierung 2, die verhindert, daß auf diesem Weg äußere Klimaeinflüsse in das Innere der Kapsel gelangen. In diesen Durchbrüchen sind zwei Metallzylinder 1 eingelassen, deren unteres Ende spitz ausläuft und die im Innern hohl ausgebildet sind. In einem dieser Metallzylinder 1 befindet sich im Innern nahe der Spitze ein Meßthyristor für Bodentemperatur 11. Auf der Oberseite der Kapsel befindet sich ein Tragebügel 6. Davon seitlich nach hinten abgesetzt ist in die Oberfläche des Schutzgehäuses 5 eine rechteckige Öffnung als Kontaktfläche 7 eingelassen, die mit einem sehr gut wärmeleitfähigen Material ausgefüllt ist. Auf der Unterseite der Kontaktfläche 7, die bis zum Beginn der Wärmeisolierung 4 reicht, ist direkt ein Meßthyristor für Lufttemperatur 8 befestigt. Im Innern der Meßsonde befindet sich ein Elektronikblock 9, der die zur Aufnahme der Meßparameter benötigte elektronische Schaltung trägt. Der Elektronikblock 9 ist mit dem Metallzylinder 1, dem Meßthyristor für Bodentemperatur 11 und dem Meßthyristor für Lufttemperatur 8 verbunden. Weiterhin ist eine Eingangsbuchse 10 und eine Ausgangsbuchse 3 an den Elektronikblock 9 angeschlossen. Die Meßsonde selbst befindet sich mit den Metallzylindern 1 in einem zu untersuchenden Boden 12.

Durch den Anschluß eines gewöhnlichen Netzkabels an die Eingangsbuchse 10 ist die Meßsonde betriebsbereit, da das Kabel direkt

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zur eigenständigen Stromversorgung mit einem batteriegespeisten Steuerteil führt. Mit Hilfe des Tragebügels 6 wird durch senkrechten Druck von Hand die Meßsonde mit den Spitzen der Metallzylinder 1 in den zu untersuchenden Boden an der gewünschten Stelle eingestochen, bis diese dadurch einen einwandfreien Stand besitzt, denn die Eindringtiefe der Metallzylinder 1 ist absolut unkritisch. Der Abstand der Metallzylinder 1, die als Meßelektroden zur Einspeisung eines Gleichstromimpulses rechteckiger Form über ihre Oberfläche dienen, legt dabei fest, welcher Bodenabschnitt als Ausbreitungswiderstand des Gleichstromimpulses gemessen wird. Und dieser Abstand wird nur durch die Meßsonde vorgegeben. Beginnt nun der zu untersuchende Boden 12 langsam auszutrocknen, in dem die Meßsonde steckt, so steigt zwangsläufig durch den sinkenden Feuchtigkeitsgehalt der Ausbreitungswiderstand und der Gleichstromimpuls wird stärker geschwächt, als vorher zwischen den Metallzylindern 1. Dieses Meßsignal gelangt damit unmittelbar zum Elektronikblock 9. Hat dabei jedoch der Meßthyristor für Bodentemperatur 11, der im Innern von einem der Metallzylinder 1 steckt, der selber aus gut wärmeleitendem Material (z.B. Aluminium) besteht, über diesen Wärme- und Bodenkontakt der Spitze noch nicht einen vorgegebenen oberen Grenzwert für eine bestimmte Höhe der Bodentemperatur erreicht, welches ebenfalls als Meßsignal auf den Elektronikblock 9 gelangt, so tritt noch keine Meldung zum zentralen Steuerteil über die Eingangsbuchse 10 ein. Das Gleiche gilt für den Meßthyristor für Lufttemperatur 8, welcher durch die direkte Wärmebrücke zur Kontaktfläche 7 nach außen die Lufttemperatur als Erwärmung dieser Fläche 7 z.B. durch die Sonneneinstrahlung in einer gewissen Höhe über dem zu untersuchenden Boden 12 aufnimmt. Erst wenn beide Meßthyristoren 11 und 8 durch die einsetzende Erwärmung ihren vorgegebenen oberen Temperaturgrenzwert überschritten haben und somit zünden und der Ausbreitungswiderstand sich ebenfalls außerhalb eines oberen Grenzwertes befindet, gibt der Elektronikblock 9 über die Eingangsbuchse 10 über das Netzkabel ein Signal an die zentrale Steuergruppe zum Öffnen einer elektrisch betätigten Wasserzufuhr (z.B. über Niederspannungsmagnetventile). Die nun einsetzende Beregnung

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hält solange an, bis einer der drei Meßparameter: Ausbreitungswiderstand, Bodentemperatur und Lufttemperatur wieder ihren vorgebenen oberen Grenzwert unterschritten hat. So kann z.B. durch plötzliche Abkühlung (Wind, einsetzender Sprühregen usw.) der Kontaktfläche 7 die vorgegebene Zündtemperatur nicht mehr aufrecht erhalten werden und der Meßthyristor für Lufttemperatur 8 verlischt. Dieses gilt auch analog für den Meßthyristor für Bodentemperatur 11. Damit wird verhindert, daß die Beregnung nur nach einseitigen Gesichtspunkten erfolgt. Bleiben jedoch die vorgegebenen Grenzwerte für die Luft- und Bodentemperatur erhalten, so wird die Beregnung solange fortgesetzt, bis sich der Ausbreitungswiderstand des zu untersuchenden Bodens 12 soweit wieder verringert hat, daß er unterhalb eines vorgegebenen Wertes liegt und damit der Boden wieder den gewünschten Feuchtigkeitsgehalt besitzt.

An die Ausgangsbuchse 3 kann dann über eine große Entfernung die nächste Meßsonde angeschlossen werden, da diese beliebig aufreihbar sind. Die Stromversorgung für die nächste Meßsonde erfolgt ebenfalls über diesen Anschluß 3, ebenso die bei Bedarf entstehende Rückmeldung an die zentrale Steuergruppe zur Öffnung der Wasserzufuhr. Werden an jede Meßsonde sogar separate elektrische Betätigungseinrichtungen für die Wasserzufuhr angeschlossen, kann sogar ein abgegrenztes Territorium verschiedenartig beregnet werden.

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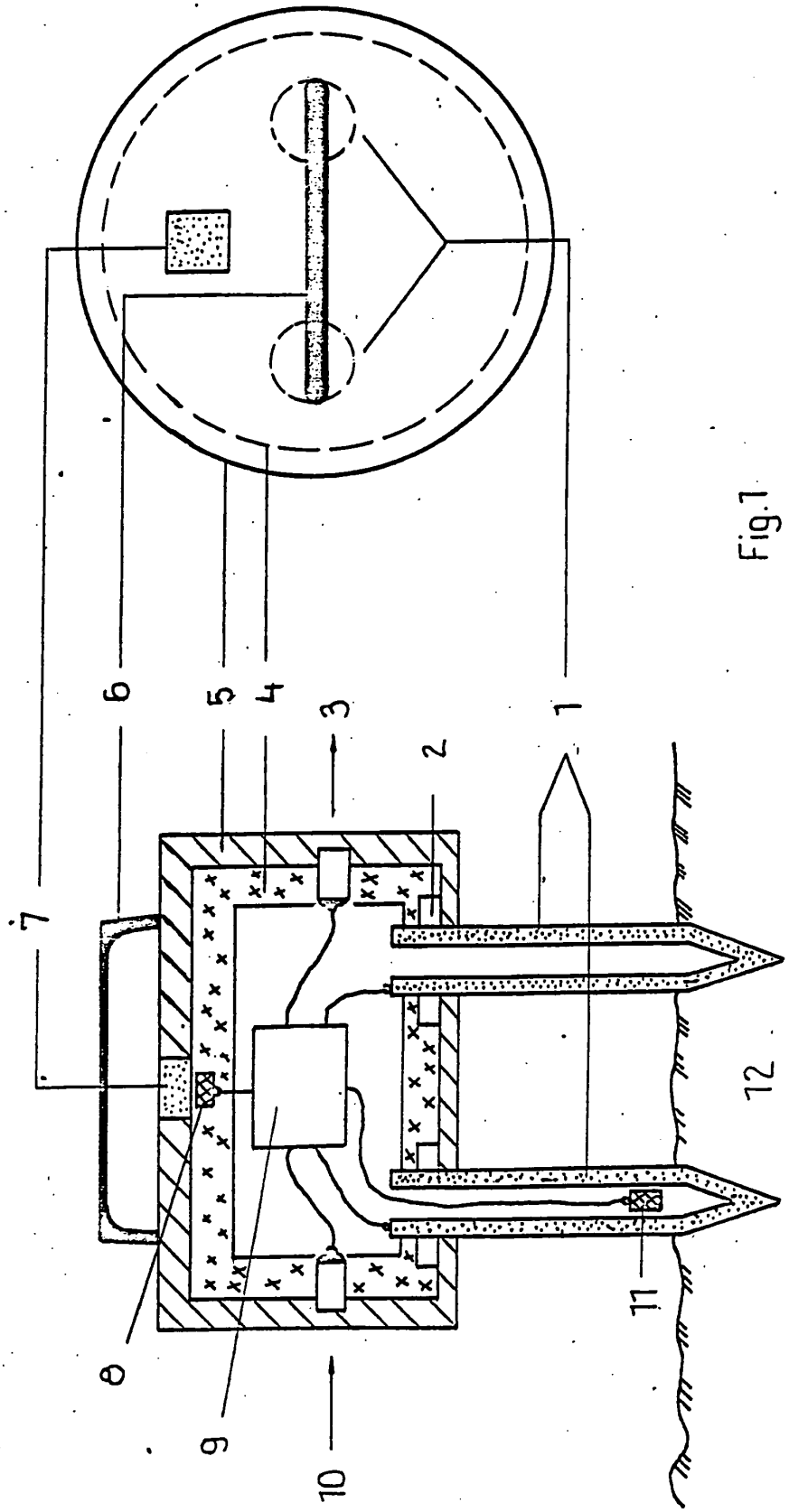

Fig.1

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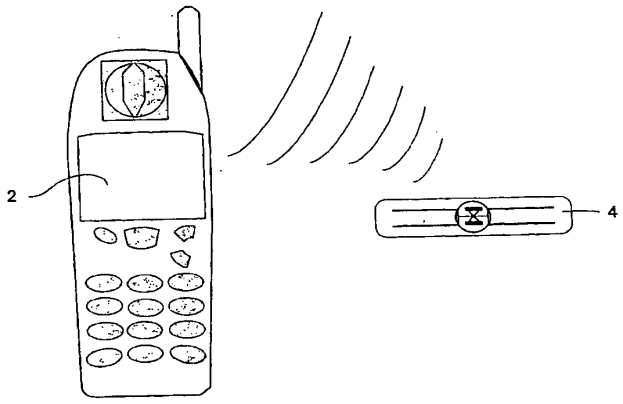

(57) Abstract: An integrated passive wireless chip diagnostic sensor system (4) is described that can be interrogated remotely with a wireless device (2) such as a modified cell phone incorporating multi-protocol RFID reader capabilities (such as the emerging Gen-2 standard) or Bluetooth, providing universal easy to use, low cost and immediate quantitative analyses, geolocation and sensor networking capabilities to users of the technology. The present invention can be integrated into various diagnostic platforms and is applicable for use with low power sensors such as thin films, MEMS, electrochemical, thermal., resistive, nano or microfluidic sensor technologies. Applications of the present invention include on-the-spot medical and selfdiagnostics on smart skin patches, Point of Care (POC) analyses, food diagnostics, pathogen detection, disease-specific wireless biomarker detection, remote structural stresses detection and sensor networks for industrial or Homeland Security using low cost wireless devices such as modified cell phones.

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DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application 60/539,419, filed on January 27, 2004, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention generally relates to radio frequency identification (RFID) tags, and more specifically to a system having RFID tags that include diagnostic sensors, wherein the RFID tag and sensor are accessible by a wireless device such as a modified cell phone with a multi-protocol reader capability.

BACKGROUND

[0003] The conventional radio frequency identification (RFID) tag systems include an RFID tag that transmits data for reception by an RFID reader (also referred to as an interrogator). In a typical RFID system, individual objects (e.g., store merchandise) are equipped with a relatively small tag that contains a transponder. The transponder has a memory chip that is given a unique electronic product code. The RFID reader emits a signal activating the transponder within the tag through the use of a communication protocol. Accordingly, the RFID reader is capable of reading and writing data to the tag. Additionally, the RFID tag reader processes the data according to the RFID tag system application. Currently, there are passive and active type RFID tags. The passive type RFID tag does not contain an internal power source, but is powered by radio frequency signals received from the RFID reader. Alternatively, the active type RFID tag contains an internal power source that enables the active type RFID tag to possess greater transmission ranges and memory capacity. The use of a passive versus an active tag is dependent upon the particular application.

[0004] Accordingly, RFID tag systems have found use in a variety of applications. RFID tag system applications include animal identification, beer keg tracking, and automobile key-and-lock, anti-theft systems. Although the conventional RFID tag

systems have been used in a variety of applications, the conventional systems have several disadvantages.

[0005] A first disadvantage includes the inability of a RFID reader to communicate through the use of multiple protocols. In particular, the conventional RFID reader is capable of reading only those RFID tags that the RFID reader is programmed to read. That is, the RFID reader is adapted to communicate only through the use of a pre-programmed protocol. Consequently, the conventional RFID readers are incapable of automatically updating or changing protocols. Thus, the current RFID readers are unable to communicate with RFID tags having a comunication protocol that differs from the RFID reader pre-programmed protocol. A second disadvantage includes the inability to conveniently monitor objects containing the RFID tag from virtually any location. A third disadvantage of conventional RFID tag systems is the inability of wireless devices, such as cellular telephones and personal digital assitants (PDAs), to be used as RFID readers/interrogaters. The ability to interrogate RFID tags with conventional wireless devices would provide a convenient method of accessing and/or analyzing data obtained through the use of the RFID tag. Yet another disadvantage is that conventional RFID tag systems are incapable of cost effective, efficient and convenient monitoring of the physical, biological, and chemical characteristics of a person. For example, the conventional systems do not enable the detection of given biomarkers, pathogens, chemicals or other hazards, near or experienced by a person.

[0006] The embodiments described herein were developed in light of these and other disadvantages of known RFID tag systems.

BRIEF SUMMARY

[0007] This invention is directed to a system and method for low cost wireless diagnostics using modified radio frequency identification (RFID) tags that are combined with novel types of diagnostic sensors. A further aspect of this invention is that the diagnostic sensors can be read and analyzed on the spot by low cost wireless devices such as modified cell phones that incorporate multi-protocol RFID reader and communication standards such as Gen-2. The technology allows a modified cell phone to be used to directly identify external threats or to perform almost any type of diagnostic test on a single platform using low cost disposable passive RFID-sensors.

The reader capabilities of a modified personal wireless device may also include other reader protocols such as Bluetooth, Zigbee or IEEE 1073 and read virtually any type of active or passive sensors, resulting in a new class of wireless readers that are truly universal and flexible to control virtually any application or provide a means for analyzing any type of sensor, including diagnostic sensors.

[0008] Accordingly, a diagnostics system is disclosed that includes a flexible patch having an adhesive portion that is adapted to be positioned on a surface. A radio frequency identification (RFID) tag and sensor module is integrated with the patch. The RFID tag and sensor module includes at least one antenna, an RFID electronic chip, and at least one sensor. The RFID tag may be either passive or active. Furthermore the technology described here does not need to be limited to RFID and may also be applied to other wireless interrogation protocols and chip technologies such as Bluetooth, Zigbee or other emerging technologies. For the sake of clarity RFID is used in this patent application but it is understood that RFID, Bluetooth, Zigbee or other similar technologies may be used interchangeably.

[0009] The RFID tag and sensor module responds to a stimulus by wirelessly transmitting and receiving, through the use of the antenna, signals that correspond to the stimulus. A wireless RFID reader is included that is adapted to communicate, through the use of multiple protocols, with the RFID tag and sensor module. Additionally, the RFID reader is adapted to read and analyze virtually any RFID tag and sensor module. As such, the RFID reader is adapted to retrieve the electronic identification of a tag and sensor module and download software that enables reading and analyses of the tag and sensor from a database. The RFID reader is also capable of communicating over a network through the use of multiple communication protocols. In one embodiment, the RFID reader is a cellular telephone. The diagnostics system may also include a remote storage/data access unit that remotely stores data transmitted and/or received by the RFID tag and sensor module and the RFID reader. A remote wireless device is also disclosed that enables access to the RFID tag and sensor module, the RFID reader, and the remote storage/data access unit from virtually any location.

[0010] Additionally, a method of transmitting and remotely analyzing data from a RFID tag and sensor module is disclosed. The method includes the step of activating the RFID tag and sensor module through the use of a wireless RFID reader. A second

step includes receiving data from the RFID tag and sensor module, wherein the data includes RFID tag identification information. An additional step includes transmitting the received data to an external remote storage/data processing unit through the use of a network. Yet another step includes processing the data through the use of the remote storage/data processing unit. As indicated above, in addition to RFID technology, Bluetooth or similar technology may also be used as an alternative, whereby the cell phone is Bluetooth equipped and may power a remote RF diagnostic sensor that is Bluetooth compatible.

[0011] An immunoassay test strip for use in conducting diagnostic measurements is also disclosed. The immunoassay test strip includes a substrate and at least one test area located on the substrate for capturing antigens. Additionally, the immunoassay test strip includes a RFID tag and sensor module integrated with the substrate. The RFID tag and sensor module is adapted to sense and transmit signals that correspond to the antigens captured by the at least one test area.

[0012] Another method is disclosed for manufacturing a pathogen-specific RFID tag and sensor module. The method includes the steps of providing a substrate and printing conductive leads on the substrate, wherein the conductive leads define a sensor area. The method also includes printing a protective cap doped with a material that is sensitive to the enzymatic action within the sensor area. Furthermore, the step of printing an antenna on the substrate is included. Accordingly, the method includes the step of integrating an RFID tag and sensor module with the substrate.

[0013] An additional feature of this invention is that the wireless devices or the sensors can also be geolocated anywhere by a global positioning system (GPS) and/or non-GPS triangulation means and can be interrogated remotely through the use of the Internet or by any other wireless device that can access a cell phone reader, thereby combining electronic product code (EPC) and cellular telephone technologies into a single platform.

[0014] These and other objects, advantages and features will become readily apparent in view of the following detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS/ FIGURES

[0015] The accompanying drawings, which are incorporated herein and form a part of the specification, illustrate the present invention and, together with the description,

further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention.

[0016] FIG. 1 depicts a block diagram of a modified cell phone serving as an radio frequency identification (RFID) reader with an RFID tag that is embedded in a disposable skin patch according to an embodiment of the present invention.

[0017] FIG. 2 depicts a block diagram of a disposable fully integrated skin patch having an RFID tag and sensor module that includes an electronic chip, sensors and an antenna according to an embodiment of the present invention.

[0018] FIG. 3A is a detailed illustration of the sensor shown in FIG. 2 including a chemical/physical barrier.

[0019] FIG. 3B is an alternative embodiment of the RFID tag and sensor module shown in FIG. 2.

[0020] FIG. 3C illustrates a disposable skin patch that is adapted to draw blood from a subject.

[0021] FIG. 4 is a system diagram of an RFID diagnostics system for monitoring glucose with a modified cellular telephone that is adapted to read the patch of FIG. 1.

[0022] FIG. 5 is a detailed block diagram of the RFID tag and sensor module that includes the electronic chip, the antenna and the sensor of FIG. 2.

[0023] FIG. 6 is yet another block diagram of a RFID tag and sensor module.

[0024] FIG. 7 depicts a system diagram of a modified cell phone that serves as a RFID reader for a disposable diagnostic flow-through RFID immunoassay strip.

[0025] FIG. 8 is a detailed illustration of the immunoassay strip shown in FIG. 7.

[0026] FIG. 9 is a detailed illustration of the sensor area of FIG. 8.

[0027] FIG. 10 depicts a method of producing a disease-specific disposable RFID wireless sensor.

[0028] FIG. 11 depicts a block diagram of an array of thin-film chemical sensors printed directly on an RFID substrate according to an embodiment of the present invention.

[0029] FIG. 12 depicts the integration of RFID technology with Lab-on-a-Chip (LOC) technology according to an embodiment of the present invention.

[0030] FIG. 13 depicts a modified LOC sensor combined with RFID technology that is read directly with a wireless device such as a cell phone.

[0031] FIG. 14 depicts the integration of passive RFID technology with MEMS sensors according to an embodiment of the present invention.

[0032] FIG. 15 depicts a wine bottle that includes a cork with a RFID tag and sensor module therein.

[0033] FIG. 16 depicts a smart cheese sensor according to an embodiment of the present invention.

[0034] FIG. 17 depicts a generic low cost printable food-specific RFID sensor technology according to an embodiment of the present invention.

[0035] FIG. 18 depicts a RFID stress sensor according to an embodiment of the present invention.

[0036] FIGS. 19A and 19B illustrate the use of a RFID tag and sensor module for the detection of insect infestation within a structure.

[0037] FIG. 20 shows a drug interaction test performed in a urine sample with a disposable RFID immunoassay strip according to an embodiment of the present invention.

[0038] FIG. 21 shows a diagnostic passive RFID sensor network according to an embodiment of the present invention.

[0039] FIG. 22 shows an identification (ID) and software retrieval method that enables any RFID reader to read/interrogate any RFID tag.

[0040] FIG. 23 shows the integration of both passive and active sensor reader capabilities onto a single wireless chipset.

DETAILED DESCRIPTION

[0041] The technology described herein allows sensor technologies to be coupled to radio frequency identification (RFID) tags that provide both the power and the wireless interface for the sensor at very low cost. Another aspect of this invention is that common wireless devices such as cell phones can be modified to include the necessary logic and components to become RFID readers. The reader device can furthermore include a multi-protocol RFID reader capability, making it a universal reader for any RFID EPC tag or RFID-sensor tag, regardless of the manufacturer. This technology combination allows on the spot sophisticated processing of complex sensor data at a relatively low cost. The technology also allows RFID tags or sensor

tags to be accessed by the Internet using the wireless reader device as a sensor communication tool. Identification retrieval and on the spot software download into the reader therefore becomes possible. Using this dual technology approach, almost any type of sensor can be combined with a RFID tag as described in this application. As will be discussed herein, the sensor is adapted to respond to virtually any stimulus and communicate information pertaining to the stimulus wirelessly. The underlying principles of the technology are described in more detail in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," that is incorporated herein by reference in its entirety.

[0042] FIG. 1 is a block diagram of a modified wireless device typically a cellular phone 2 that includes a microprocessor and the necessary logic to serve as a "power up" and read device for a passive RFID tag that is mounted directly inside a disposable patch 4. As it is made clear in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," any modified wireless device can be used. For example, in lieu of a modified cell phone an RFID reader can be used and may include the necessary data processing, remote access and wireless link capabilities present in devices such as a cell phone. Furthermore devices such as a modified wireless PDA, a modified wireless computer, a modified cordless phone, a modified beeper or even a modified wireless watch may also be combined with RFID technology and be used as readers. In addition, as indicated above, the principles described in this application may be extended to technologies other than RFID. For example a cell phone that is Bluetooth equipped may be used to communicate with and power a remote modified wireless Bluetooth chip that is combined with the diagnostic sensor technologies described here.

[0043] Ideally the RFID electronic chip technology is fully compatible with international RFID readers and tag standards making the technology completely universal and transparent in any country or for any class of RFID chip. At the present time these include Class 0, Class 0+, Class 1 and Gen-2 standards. Emerging RFID standards are referred to as Generation 2 or Gen-2 but other standards may emerge and be adopted in the future. It is one of the objectives of this technology to be compatible with as many standards as possible so that a modified cell phone or PDA

can read any given RFID tag or RFID sensor tag anywhere in the world. A multi-protocol RFID reader can be used and be compressed on a single electronic chip or be directly incorporated into the core chipset of a cell phone or wireless device. For example, the multi-protocol reader technology can be included into a 3G electronic chip with the Bluetooth protocol so that any 3G device can read any RFID electronic product code (EPC) tag, RFID sensor tag or Bluetooth sensor chip transparently. The cell phone or personal wireless device has remote access capabilities integrated therein. Thus a cellular telephone user can dial up any remote database or the Internet to access data from the RFID tag. In addition to having these capabilities and having RFID reading capabilities, the device may have other Internet access protocols such as Bluetooth, Wi-Fi, Broadband, WLAN, 3G or other emerging technologies that may allow free or low cost Internet access. Using these technologies will be particularly beneficial to fully exploit the full potential of the present invention.

[0044] Patch 4 is typically attached to a subject (e.g., a person) but may also be attached to any location, device or object according to an embodiment of the present invention. In one embodiment, the stimulus may be temperature and the RFID tag and patch combination form a smart wireless temperature sensor. Accordingly, temperature can be directly measured remotely on a modified cell phone that can be used to process RFID data and warn a user of a wireless device about a temperature in a subject remotely. The patch is therefore a "smart" patch and the wireless device becomes a "smart" device in combination with the RFID-sensor. An example of an application is a worker or a firefighter who can self-monitor him or herself for heat stress and/or toxic fumes using a cell phone with RFID read capabilities. If the cell phone is Bluetooth equipped, in addition to doing sensor analyses, it may also send signals to both the firefighter directly into his or her ear but also remotely to a monitoring station. In addition as explained in US Patent 6,031,454, that is incorporated herein in its entirety real time precise geolocation of the firefighter is possible.

[0045] Another example of an application for this technology is remote monitoring of a fever in a child or patient using a dedicated cell phone or similar wireless device that can be used to call another cell phone and warn a parent or a nurse of a temperature build-up in a given patient. For example a parent can place smart skin patch 4 on the forehead of a sick child and leave a device 2 to monitor the child remotely while the

child and the parent are at sleep. If the child develops a fever during the night that reaches a pre-set threshold device 4 will automatically warn the parent and the warning may be done in any remote location. In one embodiment the smart patch is used in hospitals and can remotely monitor a number of patients simultaneously. With the recent FDA mandate that drugs be labeled with RFID tags, both patients, drugs and in fact anything can be monitored in real time in "smart" hospitals. The readers in a hospital allow geolocation and therefore real time monitoring of the entire events in the hospital. Readers may also be directly connected to a network, thereby offering great flexibility in the infrastructures that are used. In one embodiment the temperature skin patch is a smart Band-Aid.

[0046] In another embodiment of the present invention the RFID tag and skin patch combination includes a plurality of sensors that can be combined for different diagnostic applications that can be measured directly on the surface of the skin, transdermally, in skin sweat, in blood drawn directly onto a disposable skin patch. In another embodiment the skin patch may also be used to measure external parameters such as physical, chemical or electrical parameters or a combination thereof on a patient. For example the RFID skin patch may be used to monitor the heart or be used to monitor external factors affecting the skin such as radiation.

[0047] FIG. 2 is a block diagram of a smart skin patch. As illustrated, patch 4 has an RFID tag and sensor module 11. RFID tag and sensor unit 11 combines an RFID tag with at least one sensor. Specifically, RFID tag and sensor module 11 includes an RFID electronic chip 10, a sensor 12, and at least one antenna 8. Typically the patch 4 is composed of a thin flexible support 5 that has an adhesive surface 7. Onto support 5 is mounted an antenna 8 typically composed of either a thin flexible metal film such as aluminum or material that is printed using doped inks or other flexible and highly conductive materials such as conductive polymers. The antenna may be printed on the external surface of the skin patch to avoid any possible skin contact or contamination.

[0048] Antenna 8 powers RFID electronic chip 10. In one embodiment RFID electronic chip 10 is passive. Alternatively, as recognized by one of ordinary skill, RFID electronic chip 10 may be active. In either case, RFID electronic chip 10 is typically located on a disk 6 that includes one or more sensors 12. RFID tag and sensor module 11 form an integrated unit on substrate disk 6. Disk 6 may be either a

flexible substrate such as a plastic or a rigid disk that includes different types of semiconductor sensors. For example disk 6 may include a combination of an RFID tag and another low power sensor on a silicon substrate, whereby the RFID tag serves as power and wireless unit and the sensor serves as the sensing element. The term RFID tag refers to the combination of antenna 8 and RFID electronic chip 10. Power may be stored into the passive electronic chip by multiple cycles of external radio frequency (RF) energy. Using the combination of an RFID passive tag and energy storage capabilities complex sensors may be combined with RFID tags directly on a disposable skin patch. These sensors do not need any internal power, are disposable and can be geolocated. Typically the manufacturing cost will be less than $1, resulting in great savings, convenience and improved safety.

[0049] Typically disk 6 and sensing elements 12 are protected by at least one protective layer 20. Accordingly, when patch 4 is positioned on the skin, layer 20 makes direct contact with the surface of the skin. Layer 20 may be semi-permeable and may include specific chemistries that, in combination with the chemistries on each given sensor 12, aid in the detection of specific chemical or biological elements. For example protective layer 20 may filter certain proteins or cells and, at the same time, prime the chemistries for specific reactions on the sensor or sensors according to one embodiment.

[0050] In addition disk 6 may also include more complex sensors that optically detect changes in blood chemistries and may include one or more diodes combined with sensors (not shown). For example small Schottky or back bias diodes may be used. Additionally using advances in polymers and other thin film technologies complex low power sensor-reader combinations may be printed or produced at very low cost. More complex sensors that are built directly on the electronic chip or an add-on electronic chip may also be used in the smart skin patch.

[0051] The smart patch technology described here can therefore perform any number of different tests on a subject and be processed remotely by a wireless device such as a cell phone. The wireless device provides not only the power but also provides the means to analyze and process the sensor data on the spot. Therefore the processing requirements of the RFID tag and the sensing element are reduced, thereby reducing cost and power requirements and making the technology disposable. The wireless device can also provide step-by-step instructions to a user for each given type of

sensor. Since the RFID tag provides a unique ID to the wireless device this ID identifies uniquely the type of sensor used. New classes of RFID sensors may also become part of the emerging international RFID standards and have unique sensor identifiers. The data tables 68 are also capable of storing the identification number of each sensor. Additionally, the data tables 68 that analyze any given sensor may be stored on the chip, inside the cell phone or remotely. Therefore any cell phone can analyze on the spot any type of RFID EPC tag or RFID sensor tag, regardless of the manufacturer and as explained more fully in this invention.

[0052] FIGS. 3A and 3B illustrate different types of elements that can be included on skin patch 4. FIG. 3A describes one type of sensor 12. In this case a sensor surface 34 is surrounded by conductive electrodes 28. Typically both are directly printed or deposited on a non-conductive surface 30. Methods for printing sensors are well known to those skilled in the art. As indicated above sensor surface 34 can be protected by another chemical layer or physical-chemical barrier 32 that can help filter or eliminate certain elements or refine chemical reactions that will occur on sensor area 34. Multiple layers of barrier or reactive surface 32 (not shown) can be used and can be layered one on top of the other serving as a method to separate different types of molecules and serving as reactive surfaces to absorb, eliminate or modify target molecules or reagents. Furthermore since disk 6 may be rigid, sensors and separating layers may include metals, surfaces with nanopores or any element comprising a simple or complex multilayer sensor.

[0053] In addition different types of sensors can be used including sensors serving as reference or calibration sensors. Since power is provided by the passive RFID tag, any type of sensor or sensor combination can be used on the skin patch to respond to stimuli such as any type of external chemical, electrical or physical changes that can occur on the surface of the skin. It is recognized that responding to stimuli includes any measuring, detecting, and/or reacting by the sensors.

[0054] Nevertheless, the orientation of disk 6 comprising the sensors may either face towards the skin or face away from it, depending on the given sensor application. In one embodiment the sensor may include a microelectronic circuit that can include for example at least one a diode or other optical means to do complex sensor analyses. Such sensors may be necessary for some applications of the technology where more simple sensing chemistries are not suitable. It will be appreciated that some of these

sensors may be built directly into the RFID electronic chip itself. This includes for example a programmable temperature sensor but may also include sensors that measure motion or small electric pulses on the skin. In one embodiment the skin patch is a cardiac sensor. In another embodiment the skin patch measures an external hazard to the skin or subject, such as radiation. In yet another embodiment the RFID skin patch includes a plurality of diagnostic sensors.

[0055] FIG. 3B shows disk 6 as an entire integrated unit that comprises a coiled antenna 8, RFID electronic chip 10, and multiple sensor elements 12. The antenna can be mounted on one side of disk 6, while the sensors can be mounted on the other side. Using this approach and according to one embodiment, the integrated unit can be directly mounted onto a support 5 in a one step process.

[0056] FIG. 3C shows another embodiment of the present invention. In this case skin patch 4 also includes a hard surface 40 that includes one or several micro knives 44 meant to help draw a drop of blood into the sensor areas (not shown). Applications of this technology may include any diagnostic test where blood needs to be drawn. A disposable skin patch with RFID sensors that includes the micro knives would simply need to be pressed slightly on the skin to draw sufficient blood for an analysis causing minimal pain to the patient. The skin patch may even include a chemical to neutralize pain in the immediate area where blood is drawn. Once the patch is applied to the skin a read of the sensor is taken from wireless device 2. In one embodiment this wireless test using an RFID sensor is applied to blood glucose monitoring using a disposable RFID-skin patch and wireless device combination. If blood is drawn the sensor elements may include a filtering and separation mechanism (such as a surface with micro or nanopores). Furthermore in another embodiment the RFID sensing element may be separated from the blood drawing element and is reusable. The sensor element may then be more complex and may be included for example directly into a watch.

[0057] In addition non-invasive methods to measure glucose levels or other bodily chemistries may also be used and combined with RFID technologies. These include the use of diodes or other optical means that can detect optical-chemical changes that occur.

[0058] FIG. 4 shows how a skin patch 4 that includes RFID tag technologies, the proper sensor chemistries and a mechanical device as described in FIG. 3C can be

used in case of diabetes self-monitoring and insulin self-regulation using a modified wireless device such as a modified cell phone 2. Data is obtained from a disposable skin patch and processed by the microprocessor of a cell phone. In one embodiment the cell phone can then control via RF a remote insulin pump 50 that can be implanted in a body. In lieu of using a separate glucose monitoring device, periodic glucose tests are done directly on a modified cell phone using disposable RFID-sensor skin patches. This way the patient does not need to use two devices and can check directly abnormal results with his/her doctor in case of need. In some cases the skin patch may be reusable using reversible reactions on the sensor surfaces. In one embodiment reversal occurs by micro heating the sensor area using power provided remotely by the wireless device. The implications of the invention shown in FIG. 4 is that any RFID or Bluetooth sensor can be read by a device like a modified cell phone that can also serve as a control system for other wireless technologies that are dependent on sensor values. Device 2 may also allow direct remote monitoring of a given patient for other functions, remote alerts and access to a physician's Office or medical center. For example the device may monitor cardiac function on the smart skin patch, patient temperature, position, etc.

[0059] FIG. 5 shows the basic elements of the RFID electronic chip 10. RFID electronic chip 10 is coupled to antenna 8 that may include separate send and receive elements (not shown). As discussed above, the combination of RFID electronic chip 10 and antenna 8 is referred to as an RFID tag. Antenna 8 may be printed directly on a polymer or plastic substrate. The principles and operation of the RFID tag having a sensor input is described in detail in U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," which is incorporated herein by reference in its entirety. Additional reference is also made to Patent 6,720,866 B1.

[0060] Antenna 8 is connected to a power unit 60 with a voltage stabilization circuit, a controller 62, an identification unit 64 (which may be permanent or programmable), a memory unit 66, a sensor table 68, a thermistor or temperature module/sensor 70, and analog to digital converter 72 and an optional filter 74. Preferably, the temperature sensor 70 of the RFID electronic chip 10 is a very low power, highly accurate programmable unit that enables precise reference and calibration points for any application of RFID tag and sensor module 11. In addition, the electronic chip 10

may include an energy storage unit (not shown) that stores energy for the power unit 60. This is important for sensors that exceed the available power to the passive chip. The device may be a Class 0 electronic chip as described in Patent 6,002,344, a Class 0+ chip, a Class 1 chip, a Gen-2 electronic chip or any other RFID or Bluetooth electronic chip that serves as a basic platform and is modified to include a built-in precise temperature unit, a voltage stabilization unit, an A/D converter and the ability to incorporate at least one or a plurality of sensors that are then incorporated into the devices described in this invention and form the basis for passive RFID-diagnostic sensors that can be directly read by common low cost wireless devices such as modified cell phones. Using the passive approach approximately 10 μwatts of power is available to the sensors from the RFID chip 10. Furthermore voltage can be precisely regulated in the range of 1-5 volts, providing adequate power to most diagnostic sensors.

[0061] The RFID electronic chip 10 is attached to one or multiple external sensors 12 that receive power and are controlled by units 60, 62, 72 and 74. Sensors 12 and part of the electronic circuitry may be composed of low cost doped inks or conductive polymers as described in U.S. Patent Application Serial No. 10/382,606, entitled "Method and Apparatus for Wide Area Surveillance of a Terrorist or Personal Threat," which is incorporated herein by reference in its entirety.

[0062] FIG. 6 illustrates another embodiment of RFID tag and sensor module 11, which includes RFID electronic chip 10, antenna 8, a substrate 55, conductive leads 28, and a sensor element 12. For a number of applications, particularly diagnostic applications, at least one reference element 14 is used. In some applications the reference element or the sensor may include at least one optional shield 16. In one embodiment the shield 16 is a light shield that covers a radiation sensitive film to be used for a low cost radiation RFID tag and sensor module 11 that may be included in a skin patch for a patient or may be used for Homeland Security or defense applications. In one embodiment both the RFID tag and elements 14 and 16 serve as radiation detectors. Several types of radiation sensitive polymers or other thin film materials may be used and be printed directly on the antenna substrate, creating a very low cost RFID passive radiation sensor. Since different types of radiation sensitive materials may be used, both qualitative and quantitative radiation sensors can be produced at extremely low cost. Additionally radiation sensing diodes may be

included directly in chip 10, providing further low cost means to detect a radiation hazard.

[0063] In one embodiment sensor 12 is a chemical sensor. Therefore both low cost chemical and radiation detectors can be included on a low cost disposable substrate that includes a wireless RFID tag and power unit.

[0064] FIG. 7 shows the applications of another type of novel RFID-sensor technology combined with disposable flow-through assays to form a disposable wireless passive RFID immunoassay. Such assays can be included in disposable kits 90 where the power is provided remotely by the low cost wireless device 2 and the analyses are also performed on said device or remotely via wireless links.

[0065] FIG. 8 describes the technology of FIG. 7 in more detail. A flow-through immunoassay testing strip 90 includes a sample input port 92 and a substrate 94 that allows migration of the analyte on the assay by capillary forces. The assay includes one or multiple test areas 96 that are typically immobilized antibodies serving as a capture surface for specific antigens that flow through the test surface. Such tests are now commonly used to test for pregnancy, for the presence of specific proteins or toxins and for the detection of specific pathogens such as Streptococcus. Recently with the discovery of disease-specific biomarkers more complex tests are starting to become available. However using visual methods, such tests do not provide precise quantitative results and therefore is still generally limited to "yes" or "no" assays indicating simply the presence or absence of a given protein or bio-analyte. While tests have improved greatly to the extent that they have now been placed in the hands of the public the quantification of the presence or absence of given proteins remains a highly desirable goal. Such quantification can be now achieved by adding RFID or Bluetooth technology as shown in the present invention. An RFID electronic chip 10 is added onto disposable device 90 and includes conductive leads 28 that go either to antenna 8 or to sensor areas 34. In order to avoid shorting electrodes 28 may be embedded into plastic leads 98 that can also serve as channels for the analyte flowing across sensor area 34. Printing of leads and channels can be done using ink-jet technology or other similar means and is a low cost technology well known to those skilled in the art. Leads may also be laminated or molded directly into plastic substrates. Other low cost assembly or production methods may also be used.

[0066] One of the test areas 96 may be a reference test area that measures the amount of moisture present on the surface or the presence or absence of given proteins or other analytes. In some applications the surface has to dry out before the results are read on the wireless device and this can be done automatically by using the reference strip or strips. In addition a window (not shown) may be used with a visual clue as to when the test is ready for analysis. For example if the test surface has to dry out then a simple color change may be used with a hygroscopic material that changes from red to blue depending on the level of moisture present on the RFID immunoassay strip.

[0067] Using this method many different channels and tests can be performed simultaneously on a single disposable test strip. Furthermore this technology can be applied to different types of assays such as lateral-flow, flow-through or solid-phase assays or any assay where an analyte is carried across a surface. The methods to fabricate the basic separation surface are well known to those skilled in the art and may include nitrocellulose or other similar materials.

[0068] FIG. 9 shows details of sensor area 34. Antibodies 100 are immobilized onto substrate 94 using printing or other standard deposition methods used for the fabrication of lateral-flow assays. As an analyte is carried across the test strip by capillary action, matching antigens 104 become attached to the antibodies. Such antigens could be proteins found in blood or urine, proteins found on surfaces of pathogens or they could be other biological molecules. The technology can be applied to any sensor situation with specific surface-to-surface interactions. In one embodiment this applies to proteins. In another embodiment to DNA or RNA. Hence disposable wireless RFID-sensor DNA assays that are read directly on a cell phone become possible with the technology described in the application.

[0069] In order to allow conductivity between the two electrodes present in the sensor area, in some applications another layer of antibodies 106 can be added which are specific to antigen 104. This technique is generally referred to as a "sandwich assay" and different methods exist to conduct such assays. In this case instead of having dyes attached to the antibodies, conductive molecules 108 are attached forming a conductive layer within sensor area 34. Conductive molecules can be conductive nanoparticles, conductive proteins, metal particles that are attached to the protein or latex or other beads that are conductive. As indicated above if DNA or RNA is used then the conductive molecules can be attached directly then the matching DNA or

RNA strands. The release of the conductive molecules 108 may be timed such that the assay is a simple, one step process.

[0070] In some applications the strip may need washing and drying before the measurement are done. The state of the sensor can be assessed electronically by using one or more reference test areas where the sensor consists simply of a material that absorbs water and therefore allows for the saturation level and status of the entire test surface to be measured. Such measurements can be done remotely by the cell phone using sensor data tables that are either stored on the RFID chip, on the memory of the cell phone or by downloading the correct sensor data tables from a remote location on the Internet or a remote location available through the wireless networks. This method allow on the spot complex analyses to be performed.

[0071] Since the electrical conductivity of the surface area can be measured precisely quantitative results become possible on disposable wireless RFID electro-immunoassays. Furthermore the test area can become very small allowing for more tests to be done in a given area and therefore resulting in cost savings. In one embodiment the technology applies to high density DNA or RNA chips that are disposable.

[0072] In addition to the conductive methods described above, other methods may be used that rely on RFID or Bluetooth as the basic low cost communication and power platform for a disposable RFID immunoassay. For example optical means may be used to assess the presence and level of a given protein. This is possible because the precise position of deposition of given antibodies is known and can match an optical reader. A dual system may be used where the disposable substrate with the protein or DNA test is inserted into a reader (not shown) that comprises an RFID power and communication module that can be read directly with a device like a cell phone, PDA or computer in a doctors office.

[0073] Because it is low cost and is quantitative, the technology described in FIGS. 7-9 have broad market applications. In one embodiment it applies to Homeland Security, where instant checks can be performed by protective forces for example to confirm on-the-spot the presence or absence of a given pathogen. In one embodiment the technology is applied to food safety for the public. For instance using this technology trace elements can be detected in foods for people with certain allergies such as peanut allergies. In one embodiment the technology applies to medical self-

tests for a given medical condition (e.g. a heart attack). In one embodiment the technology applies to screening for a given medical condition such as a pre-cancer condition.

[0074] The technology may also be miniaturized and be applied to micro or even to nanosensors with very small sensor areas with the power provided and relayed by a modified RFID or Bluetooth electronic chip to a remote wireless processing device such as a cell phone.

[0075] FIG. 10 shows the steps involved in the fabrication of disease-specific RFID wireless detection strips. Typically results from Genomics or Proteomics research 111 yield pre-disease or early disease specific biomarkers 112 associated with a given condition. Once these specific markers are identified, disease specific antibodies or surface receptors 113 can be isolated. These are then integrated into disease-specific RFID sensors 114 resulting in a final disease-specific self-contained testing kit 115.

[0076] Using the approach described in FIGS. 7-10 any specific disposable wireless RFID test strip can be produced. Since each RFID tag 10 contains its own electronic identification number 64, wireless device 2 can immediately recognize the type of sensor involved and perform the correct analysis. This is because a given modified cell phone can download the necessary software, data tables, etc. from a remote location via a wireless link and can instantly become a "smart" device for any given type of RFID sensor. Furthermore since many different types of tests can be performed at once on the same disposable wireless platform, cross validation and calibration is possible. Because of the remote data access and remote processing capabilities of the wireless reader, the technology described here allows for ubiquitous sensing and analyses for any type of RFID sensor using a single common wireless platform such as a modified cell phone. The RFID-sensors do not need to use a battery and are therefore very low cost. Furthermore for some applications such as remote temperature monitoring the sensor is fully reusable.

[0077] FIG. 11 shows the application of the technology for the measurement of a number of different gases simultaneously using a single disposable RFID-sensor chip. As part of the antenna substrate 55 an area 110 is composed of a plurality of different sensors 12 with conductive leads 28. Typically each sensor 12 is a different polymer or chemical that can react differently with chemicals present in the air. Because the sensors 12, the area 110 and the RFID electronic chip are on the same substrate,

fabrication costs are very low and the entire unit comprising the area 110 including sensors 12 can be assembled in a single step.

[0078] Area 110 is typically exposed to the air to allow chemical reactions to take place. In one embodiment the sensor is enclosed in a sealed pouch (not shown) that can be opened at a given time by a user of the sensor to test a given environment.

[0079] This "nose" technology and applications thereof is described in more detail in pending patent application serial U.S. Patent Application Serial No. 10/382,606, entitled "Method and Apparatus for Wide Area Surveillance of a Terrorist or Personal Threat," which is incorporated herein by reference in its entirety.

[0080] FIG. 12 shows another embodiment of the present invention relating to Point-of-Care or diagnostic technologies. Specifically it combines lab-on-the-chip (or LOC) technologies with RFID-sensor technology as shown in 118. Lab-on-the chip technology is well described in the scientific literature and consists of multiple microfluidic channels 124 with either test, input or chemical wells 120. Reactions in wells 120 can be measured using RFID technology since conductive leads 28 from RFID electronic chip 10 can be linked directly to each of the test wells 120. An antenna can be printed or mounted in another layer of the electronic chip or directly on the back of the device. Furthermore the leads 28, the antenna and the electronic chip 10 can be embedded into the LOC chip, thereby preventing shorting of the electrodes or electronics. Since LOC allows complex sample separation and analyses, this technology allows LOC tests to be done independently of a complex or expensive reader. Rather a simple wireless device such as a cell phone or a PDA can be used. In one embodiment the cell phone also controls the separation and control of the microfluidics channels 124 for more complex LOC analyses. In one embodiment a LED and other electronic measuring or sensing devices are included in the LOC-RFID chip. Therefore this technology is disposable and allows complex tests that require separation and mixing to be placed directly into the hands of the public.

[0081] FIG. 13 shows how a LOC-RFID sensor unit 118 can be read directly from a wireless device such as a cell phone, thereby bypassing the need for a LOC reader. In the case of LOC type analyses the data may be complex and exceed the processing capabilities of the low cost wireless reader. In this case the analyses can be performed remotely for example on a remote computer that can be accessed directly via a wireless link. For example a centralized location may be provided with a direct dial in

access that is available to user of the cell phone. Other communications systems may also be used. For example, as indicated above, a Bluetooth equipped cell phone, PDA or other device that is also RFID compatible may have a built-in means to directly access the Internet.

[0082] FIG. 14 shows the integration of Micro Electro Mechanical System (MEMS) sensors 140 with RFID technology. In one embodiment, an RFID electronic chip 10 with conductive leads 28 is combined directly with a MEMS sensor providing the power for the sensor. In one application MEMS sensor 140 includes a resonating surface 148. Antenna leads 8 are only partially shown and typically do not form a part of the sensor area. In this particular case, the leads 28 are exposed to the air and therefore the applications of the technology are more suitable for the detection of gases. However, a number of different MEMS sensor configurations are possible and only one is shown here. Because some MEMS sensors may require more power than what is typically available on an RFID passive chip, the electronic chip may be modified to step up the voltage and/or to store the necessary current required to read MEMS-type sensors. Alternatively the sensor may include a battery.

[0083] FIG. 15 shows the integration of the RFID-sensor passive diagnostic technology applied to foods. In this case the sensor unit 10 is included into a wine cork 150 for "smart wine" applications. In one embodiment, an RFID electronic chip with conductive leads 28 is mounted directly within the cork 150 while the antenna (not shown) is typically outside the bottle and may form a part of the wrapping at the top of the wine bottle. The entire unit is inserted into wine bottle 155. In another embodiment the entire unit with the antenna forms a part of the cork. If the chemistry of the wine changes, the cork will deteriorate because of changes in the acidity of the wine and this can be measured electronically externally with a wireless device such as a modified cell phone 2. Therefore prior to purchase by using a modified cell phone 2 the consumer can immediately spot a bad wine bottle from a good one. Such applications are particularly relevant for expensive wines that must age for quite a while and are subject to many changes in temperature, etc. In another embodiment, the RFID tag technology described herein can include a temperature module and a memory, the entire temperature storage profile of the wine can be recorded on the RFID passive tag and can be retrieved by the consumer on a cell phone prior to purchase. If, for example, the wine was not stored properly this will be known by the

consumer. The temperature profile for the wines can be stored on the electronic chip by periodic "power up" cycles or can be stored remotely and retrieved directly from a remote database using the wireless device via a wireless link. Other power and storage means may also be used. Such applications are particularly relevant for "high end" wines.

[0084] FIG. 16 shows yet another embodiment of the present invention as applied to other food items and in this case "smart" cheeses. Cheeses, like wines, can turn bad without the knowledge of the consumer and prior to opening the package. In this case a cheese 170 includes an electronic RFID label that also includes a sensor pad 176 with at least two sensors 178 and 180. In FIG. 16 neither the antenna nor the RFID electronic chip are shown for the sake of simplicity. One sensor may be composed of a hygroscopic material to determine the moisture level of the cheese 170. The other may be a polymer that is sensitive or reactive to certain smells associated with the aging or degradation of the cheese 170 as a result of bacterial action. If the cheese 170 turns bad it is typically because the moisture level is incorrect or because it has become degraded by bacterial action. By using several sensors a precise assessment of the quality of the cheese can be assured remotely by the consumer prior to purchase using a cell phone 2 with RFID reader capability. The type of sensor ID is matched with data tables and processing instructions that can be downloaded directly into the cell phone. See U.S. Patent Application Ser No. 10/761,362, filed January 22, 2004, entitled, "Radio Frequency Identification Based (RFID) Sensor Networks," which is incorporated herein by reference in its entirety.

[0085] FIG. 17 shows a general printable passive RFID diagnostic food tag technology 202 that includes a sensor 204 that determines if the given food item has gone bad. The tag 202 is typically mounted in plastic and includes an RFID electronic chip 10 and an antenna 8 mounted on substrate 55. Also included are conductive leads 28. In one embodiment, all areas except sensor 204, limited by area 206, are laminated in plastic or the body of the storage unit (e.g. milk carton) to avoid shortage of the electrodes or conductive leads 28. Therefore, this sensor can be included directly into a liquid or a food surface with a high level of humidity.

[0086] A sensor cap 208 is deposited on sensor area 204. Sensor cap 208 contains a chemical that is specific to the food item and that becomes reactive only if the food turns bad. For example, the sensor tag can be included directly into meat packages on

the surface of the meat itself. The RFID tag can contain all the information on the meat itself (price, date of packaging, etc.) but in this case the consumer will also be able to determine the occurrence of bacterial contamination. This is because sensor cap 208 can be made to be highly sensitive to enzymatic action by specific bacteria. If a given type of bacteria is present on the surface of the meat they will start preferentially degrading sensor cap 208. Sensor cap 208 is typically waterproof and contains a doping substance that will favor enzymatic degradation for each type of bacteria. This will allow exposure of the electrodes and will change the conductivity on the surface of sensor area 204.

[0087] The same principles can be applied to any situation with a specific chemical interaction. For example the technology can be mounted directly inside milk cartons. If milk has gone bad then its chemistry will change and the change of chemistry can be tailored to specifically react with sensor cap 208. It will be appreciated that many different sensors can be used with a single RFID chip, therefore allowing identification of specific types of bacteria. Furthermore, in another embodiment, the thickness of sensor cap 208 is varied in different sensors thereby allowing an assessment of the quantity of bacteria present. If more bacteria are present the sensor caps 208 will degrade faster and the thicker sensor caps 208 will degrade last. Therefore, this technology provides a general low cost solution for the food industry and combines electronic RFID tag labeling with very low cost sensing technology.

[0088] FIG. 18 shows a diagnostic application of RFID passive sensors applied to stresses. In this embodiment, an RFID-stress sensor 295 is provided that is composed of two distinct parts. The first one forms a power and communication unit 290 that includes an RFID tag and an antenna 8. Unit 290 is connected to a sensor 260 that includes attachment points 270, typically allowing a rigid mounting, stretchable leads 275 and a connection area 280. Typically, connection area 280 is an easy "plug in" type to allow the user to easily mount the sensor onto any type of surface. Both components form a stress sensor unit 295.

[0089] The technology works as follows. Stress sensor 295 is firmly attached by a user through the use of attachment points 270. Stress sensor 295 may be attached with skews or special glues to areas where possible structural stresses may occur and need to be measured remotely. Typically sensor 260 is composed of a thin film of a material such as a flexible metal strip that may be enclosed in a thin film of plastic

(not shown). Any metals that are highly conductive and that can be stretched may be used such as aluminum, gold or copper. Area 290 is not attached and therefore is not subject to the stresses. Conductivity measurements are taken periodically via a remote wireless reader such as a cell phone and stored in memory or on a remote database. Low cost wireless devices such as modified cell phones or RFID tag readers may be mounted close to the sensors and are used to periodically monitor stresses. If stresses occur the sensor 260 will expand. Since the temperature reference is known, changes in the conductivity or resistance of the strip can be precisely measured. Because this technology is wireless and has no batteries, it is meant for long term monitoring in areas where visual access is difficult or not possible. This includes hidden structural beams in building, bridges, etc. but also any areas of high stresses (airplanes, homes, etc.). Stresses may also be monitored more dynamically with resonating MEMS structures or accelerometers as indicated in FIG. 14. A number of other methods may also be used such as compression measurement using piezoelectric materials, loss of conductivity in leads that break or snap as a result of stresses, etc. Broad market applications exist for the technology, for example insertion of a wireless RFID sensor in windows for "smart" home applications, etc.

[0090] FIGS. 19A and 19B show yet another application of the technology applied to an RFID-insect sensor such as a termite sensor. In FIG. 19 A the entire sensor unit is enclosed in a unit 310 that is highly attractive to termites such as a block of wood. Unit 310 can form a "plug" of a standard size that is inserted into structural wooden supports. The unit comprises an antenna 8, an RFID electronic chip 10 and leads that are shown in more detail in FIG. 19 B.

[0091] FIG. 19B shows the details of the technology in one embodiment. Conductive leads 28 are separated by a spacer 320 that is made of non-conductive material that is highly attractive to termites such as wood. If termites are present then spacer 320 will be eaten and the spacer separating electrodes or leads 28 will disappear. Electrodes 28 may be forced together by a spring (not shown). When the spacer has disappeared the electrodes short out and therefore it is known that termites are present. In case electrodes such as shown in FIG. 19B are used a mounting power unit similar to 290 (FIG. 18) may be used. Other simple conductive methods may be used for this type of sensor.

[0092] Because this is a low cost wireless technology with no batteries, the technology can be used in hidden areas such as structural supports in houses, etc. The technology can be used to monitor remotely any type of insect damage, or may even be applied to pathogens such as bacteria using surface-specific materials that degrade only in the presence of certain enzymes.

[0093] FIG 20 shows the uses of the technology for drug interaction testing or for general medical self-testing for any given condition. In one embodiment after drug 360 is taken a disposable wireless RFID sensor strip 90 is placed in a urine sample 364. Such strips may be provided for free with given drugs where certain toxicities may occur as a result of combination with other drugs. Using a low cost wireless device such as a cell phone 2 with RFID multi-protocol reader capability, complex drug interaction tests can be performed on-the-spot at a very low cost. This is possible by wireless access to cell phone towers 380, access to Internet 390 and to a remote storage/ data processing unit 400. In one embodiment remote storage/ data processing unit 400 is embodied as a computer or electronic database. Accordingly through the use of computer 400 (hereinafter remote storage/ data processing unit 400 shall be referred to as computer 400), a patient can either download data to computer 400 or upload into the cell phone the necessary information to conduct any given test by matching the ID of the RFID sensor with given software and data tables stored remotely on computer 400 via link 392. In one embodiment computer 400 is a computer in a doctor's office. In another embodiment computer 400 is a drug interaction database of a pharmaceutical company. In yet another embodiment computer 400 is a computer containing reference tables for all types of RFID sensors. Since the RFID identifies each test uniquely a match of data, analyses protocols and/or software is assured. The principles described in this embodiment extend well beyond drug testing. By using disposable RFID test strips 90 with specific receptors to specific biomarkers, tests can be performed for any medical condition directly by a patient using a wireless device such as a modified cell phone. As biomarker discovery becomes more refined common wireless technologies can become used for self-diagnostics for almost anything using low cost wireless technologies such as cell phones. Such low cost diagnostic tests will be important in settings where sophisticated laboratory equipment is not available but where cell phone technology is available. The use of the technology described in this embodiment may be

particularly relevant for less-developed countries where sophisticated laboratory equipment is not always available locally.

[0094] FIG. 21 shows the general applications of passive diagnostic RFID sensors to wireless sensor networks and wireless devices, wireless geolocation, the Internet, remote database access, remote data storage and remote data analyses. Specifically as described in this application a passive RFID diagnostic tag 10 can be used to identify any given hazard 460 in any given location. Wireless tag 10 can be activated by wireless device 2 via a wireless link 480. The microprocessor and RFID reader within wireless device 2 enable processing functions 500, which include reading, analysis and geolocation by a global positioning system (GPS) or a non-GPS means. The reading, analysis and geolocation by GPS or non-GPS means is described in US Patent 6,031,454 that is included herein by reference in its entirety. Wireless device 2 can communicate to a proximal cell phone tower or receiver 380 via wireless link 510 or indirectly by other existing or emerging wireless communication means such as Bluetooth. Cell phone tower 380 is linked to the Internet 390 or the wireless networks via soft or hard links 520 and to at least one remote computer 400 via soft or hard link 540. Remote computer 400 allows the functions 550, including the storage of RFID tables and associated software to analyze on the spot any given diagnostic RFID sensor tag 10. In addition using soft or hard links 630 any remote wireless device 600 may be used providing the functions 620 allowing remote access of any given RFID sensor tag via wireless device 2.

[0095] The implications of FIG. 21 are the following. Any wireless device 600 in any given geographical location can interrogate any given RFID-sensor 10 in another location. Sensor 10 may be a plurality of diagnostic sensors. For example a simple application is the following. Sensor 10 may be a temperature sensor located in a second home and include a smart sticky patch that is placed on a pipe. The owner of the home can check remotely the temperature in the home from any given location to determine for example if pipes are at risk of freezing. Two-way functionality is built into device 2. That is device 2 can be programmed to dial or send data remotely or be activated and queried at any time from any location.

[0096] FIG. 22 explains in more detail the functions in FIG. 21 and those described in this invention. Any RFID wireless reader can be used to read a compatible RFID passive sensor but a clear improvement is to use a multi-protocol reader (such as a

Gen-2 enabled reader). A further improvement is to put the multi-protocol reader capability directly on a single chipset and most preferentially this chipset is the core electronic chip of a common wireless device such as a cell phone. It will be clear to those skilled in the art that the reader capability may also be integrated on a separate electronic chip that can be included in a computer as part of a plug-in smart card or even an RFID reader device connected to or built-in a Universal Serial Bus (or USB) port or similar convenient connection means. Such a device is most useful for example for a physician's office where the diagnostic functions of passive RFID diagnostic sensors described here can be fully exploited. In addition the devices described here may be compatible with Bluetooth, Zigbee or other emerging technologies, allowing further flexibility.

[0097] For consumer applications interrogation of any given RFID tag can be performed easily on a modified cell phone that includes either a special RFID read button or by pressing a series of existing keys on a keypad. Once a given tag is activated, the reader device can retrieve the ID number of the tag as shown by function 700. The reader may or may not initially recognize the tag as shown in FIG 708. If the new international standards are adopted for RFID sensor tags then such recognition will be standard and can be integrated with either the tag itself and/or a data table in the reader 2. If the ID of the sensor tag is recognized then the reader device may or may not have the necessary software and processing ability to analyze said sensor as shown in 716. If the software is available then the analysis can be completed immediately as shown in 746. However if the software is not available then the device must first obtain it from a given remote database 400 via function 720. This may be a centralized database for RFID tags or a diagnostics database that is accessed only by paying an access fee. Subsequently, the ID of the RFID sensor is matched to a given class of sensor (e.g. a glucose sensor) and the software and/or instructions for the analyses are downloaded into the reader 2 as shown in function 738. The device is then equipped to perform the analysis 746. Additional communication with computer 400 may occur if the analyses are complex (e.g. neural net or multivariate) and exceed the processing capabilities of the reader. Results are subsequently displayed on the cell phone or reader as shown in 758. Alternatively results may be displayed or stored remotely (e.g. in a doctor's office, etc.). The pathway described above is not limited to passive RFID diagnostic sensors. It can

also include EPC tags, other RF tags or sensors such as Bluetooth and other wireless functions such as smart shopping or "smart wallet".

[0098] FIG. 23 shows the integration of the two types of sensor reader functions into a single wireless reader and a resulting new type of wireless chipset that can be included into any wireless reader. Starting with device 800 and as explained in patents 6,031,454 and Patent Application US 2004/0119591 A1 by the present inventor that are incorporated by reference in their entirety, a wireless device such as a cell phone may be modified to accommodate any number of sensors 816, including diagnostic sensors. These are typically "active" sensors since they are directly connected to the wireless device itself. An example of this is a cell phone that is also a person-specific asthma detector as described in Patent Application US 2004/0119591 A1. In addition to this capability, any wireless device 2 such as a cell phone may also be modified to interrogate remotely any active or passive wireless sensor 4 as described in this application. This capability most preferentially is a multi-protocol capability and includes emerging standards such as Gen-2, other future international standards for RFID and Bluetooth.

[0099] The cell phone may already have other multi-functionality integrated therein (such as Internet access). A widely adopted emerging standard is referred to as Third Generation or 3G functionality that is included directly into the chipset.

[00100] In this invention the ability to read any "plug-in" sensor and any remote wireless sensor are combined in 850 and results in a new multi-function chipset that allows any wireless device to read any sensor, whether a "plug-in" sensor or a remote wireless sensor. Most preferentially these capabilities are included into the core wireless electronic chip (such as the 3G chip), thereby extending the capabilities of the wireless device to read and analyze instantly any type of sensor, RFID tag, RFID-sensor tag or Bluetooth sensor, regardless of the manufacturer, location or nature of the sensor.

[00101] As described in the above embodiments, wireless passive RFID sensors can be used for many different types of diagnostic applications in the consumer markets, defense and Homeland Security, building security industry, medical diagnostics industry, food safety industry, and for home safety and other applications using a common wireless device such as a modified cell phone. This technology provides

great convenience to consumers, to workers or to any person concerned with the detection of external threats or having special medical needs or concerns.

[00102] The diagnostic sensor technologies described here can also be adapted to networks and to national emergencies, where tagged items can be read remotely (thousands of feet), by employing special high power readers.

[00103] While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. It will be apparent to persons skilled in the relevant art that various changes in form and detail can be made therein without departing from the spirit and scope of the invention. Thus, the breadth and scope of the present invention should not be limited by any of the above-described embodiments, but should be defined only in accordance with the following claims and their equivalents.

CLAIMS

WHAT IS CLAIMED IS:

1. A diagnostics system comprising:

a flexible patch having an adhesive portion and adapted to be positioned on a surface;

a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader adapted to communicate through the use of multiple protocols with said RFID tag and sensor module, said RFID reader being adapted to communicate over a network through the use of multiple communication protocols.

2. A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. A system according to claim 1, wherein said RFID tag and sensor module comprises:

a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. A system according to claim 1, wherein responding to said stimulus includes sensing electrical, chemical, biological, and physical elements of said surface.

9. A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. A system according to claim 1, wherein said surface is the skin surface of a person.

11. A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. A system according to claim 1, wherein said at least one sensor is a glucose sensor.

16. A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. A system according to claim 1, wherein said at least one sensor is a radiation sensor.

18. A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. A system according to claim 1, wherein said patch is disposable.

20. A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. A system according to claim 1, wherein said network includes a remote storage and data processing unit adapted to remotely store and analyze data read by said RFID reader.

22. A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. A human diagnostics system comprising:

a patch having a radio frequency identification (RFID) tag and sensor module, and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements;

a RFID reader communicative with said patch through the use of a network and adapted to analyze, receive, and transmit the signals from said patch through the use of multiple protocols; and

a remote storage and data unit communicative with said RFID reader, said remote storage and data unit analyzing and storing data from said patch and said RFID, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network.

26. A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. A system according to claim 25, wherein said predetermined elements include electrical, chemical, biological, and physical elements of a person.

28. A system according to claim 25, wherein said network is a wireless network that enables communication through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. A diagnostics system comprising:

a patch having an adhesive portion and adapted to be embedded within a structure;

a radio frequency identification (RFID) tag and sensor module having an integrated temperature module, said RFID tag and sensor module being integrated with said patch and having an antenna and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader communicative with said RFID tag and sensor module, said reader being adapted to communicate over a network through the use of multiple protocols.

36. A system according to claim 35, wherein said stimulus is a defect in said structure.

37. A system according to claim 35, wherein said stimulus is the presence of insects within said structure.

38. An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

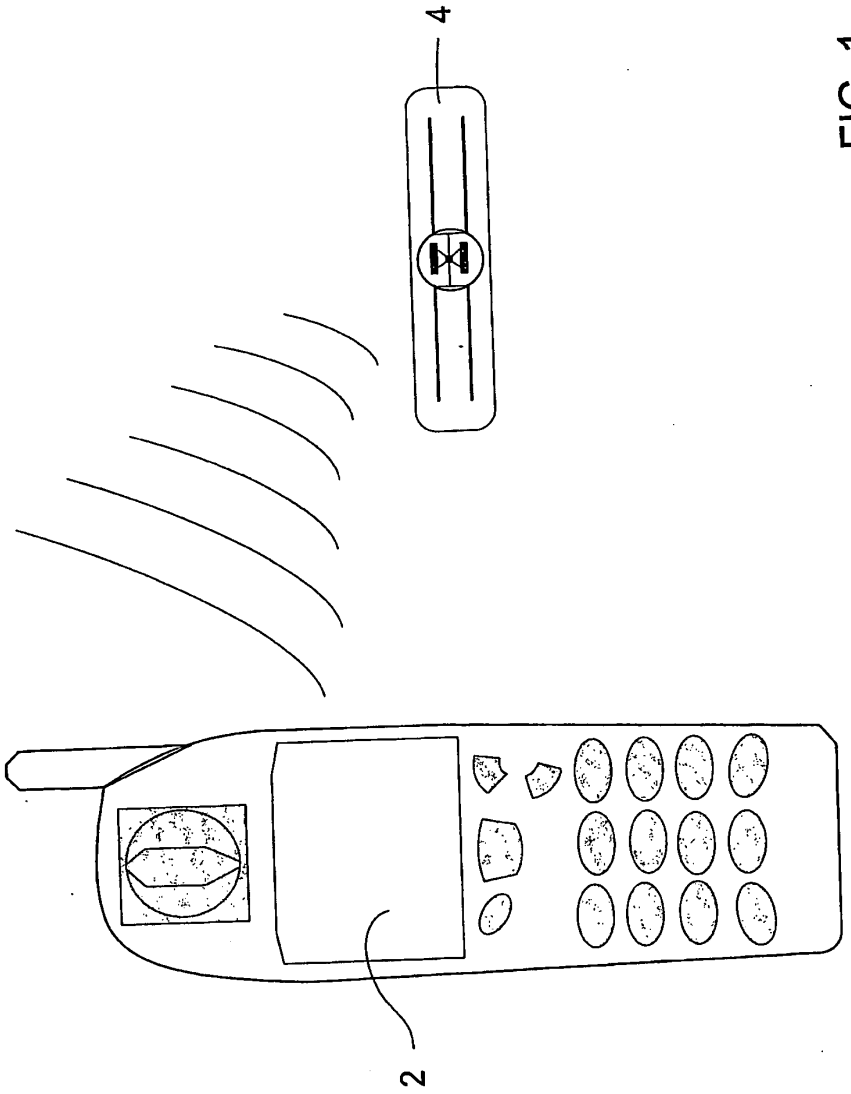


FIG. 1

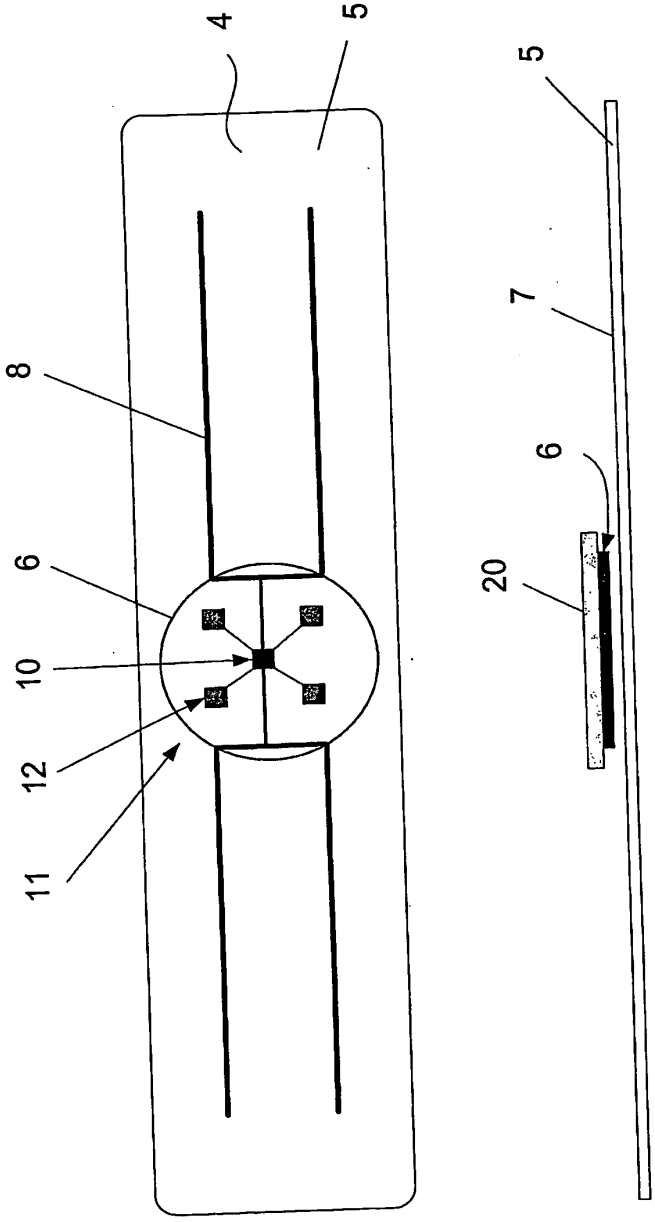


FIG. 2

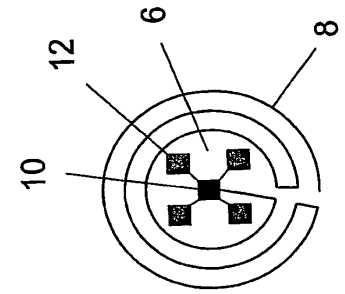


FIG. 3B

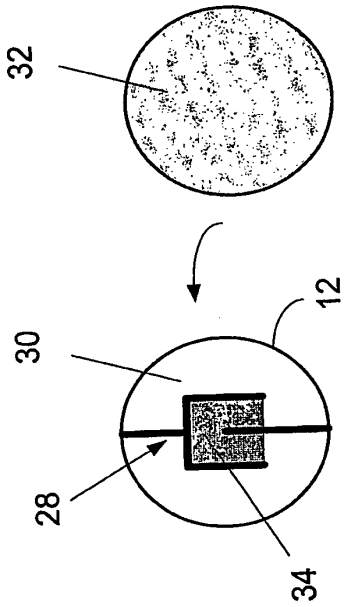


FIG. 3A

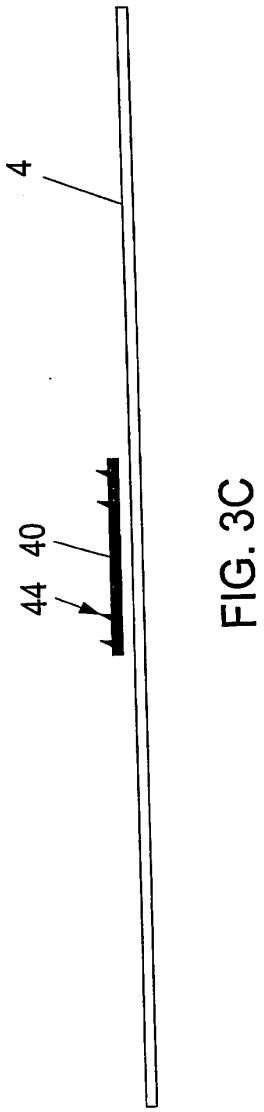


FIG. 3C

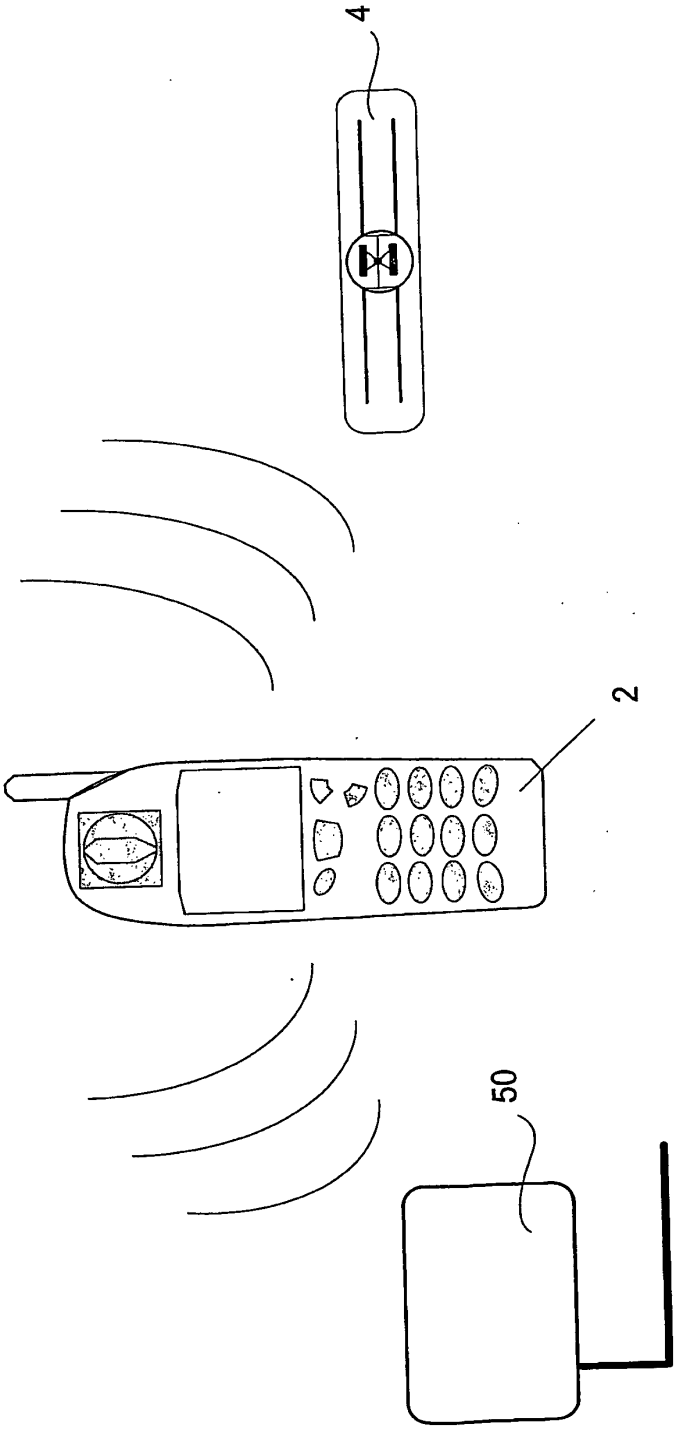


FIG. 4

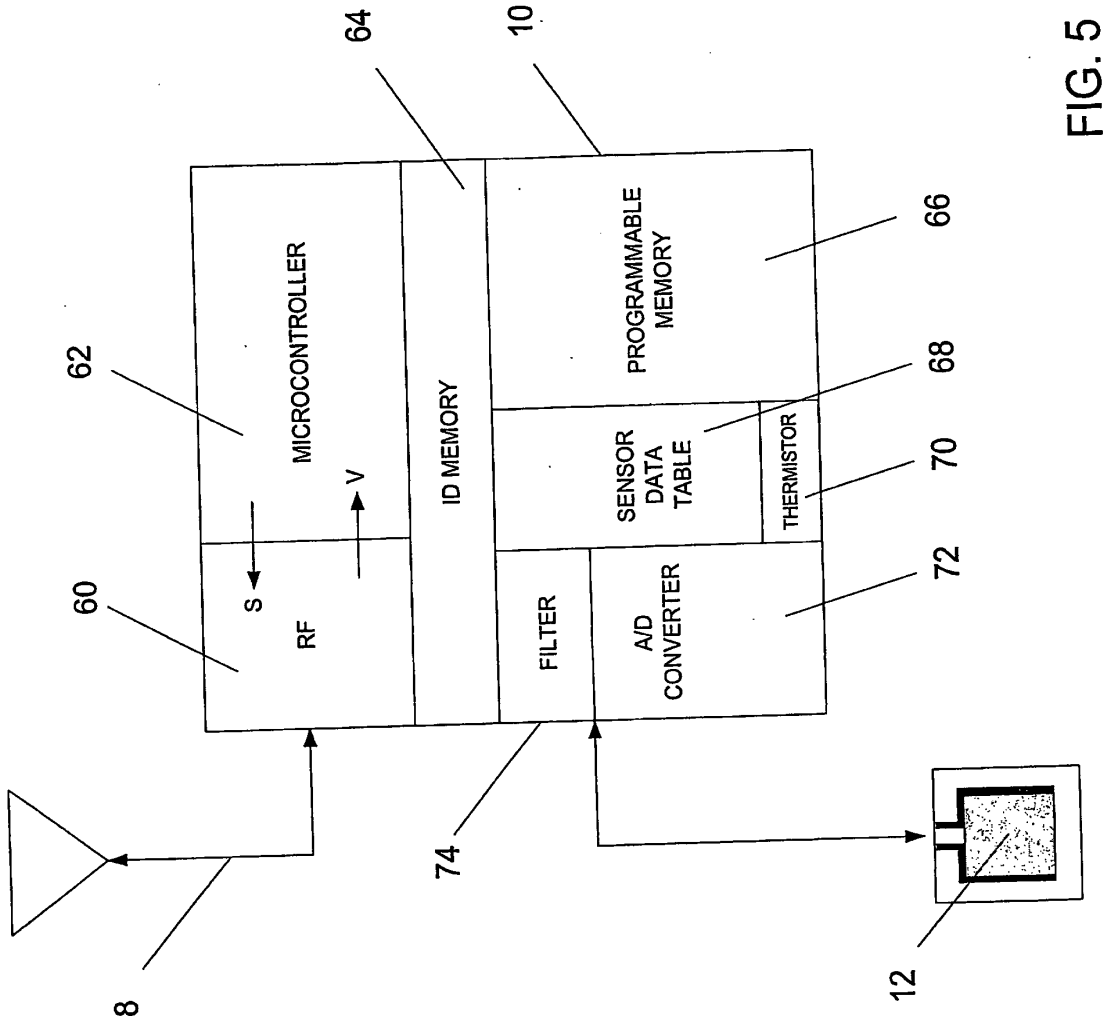

64
10
MICROCONTROLLER
ID MEMORY
PROGRAMMABLE MEMORY
66
62
68
SENSOR DATA TABLE
THERMISTOR
70
V
S
RF
60
FILTER
A/D CONVERTER
72
74
8
12

FIG. 5

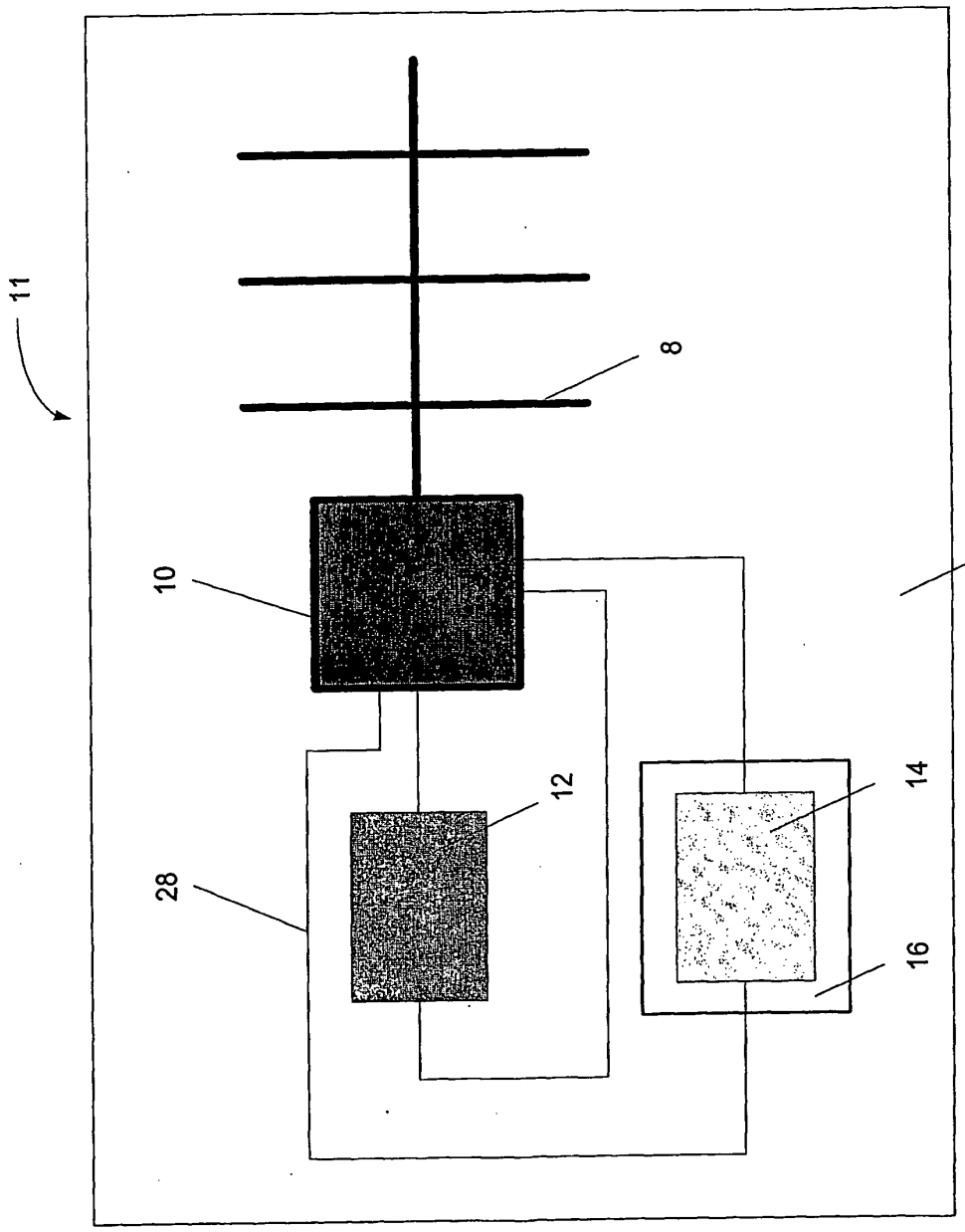
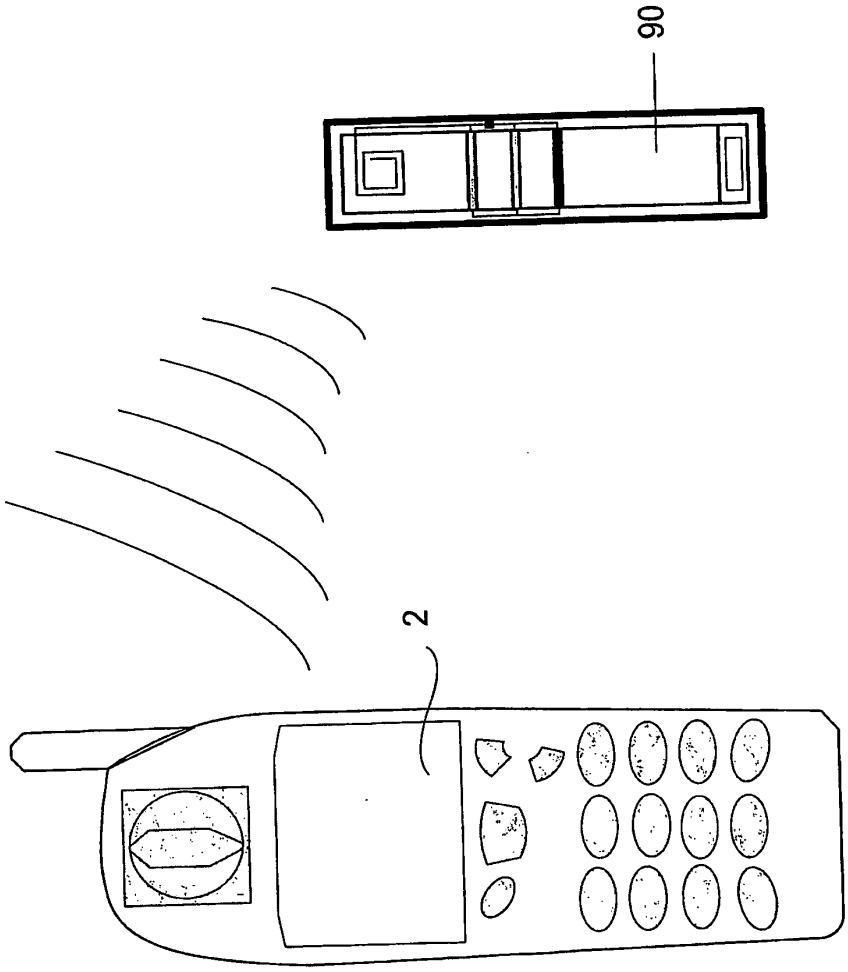


FIG. 6

FIG. 7



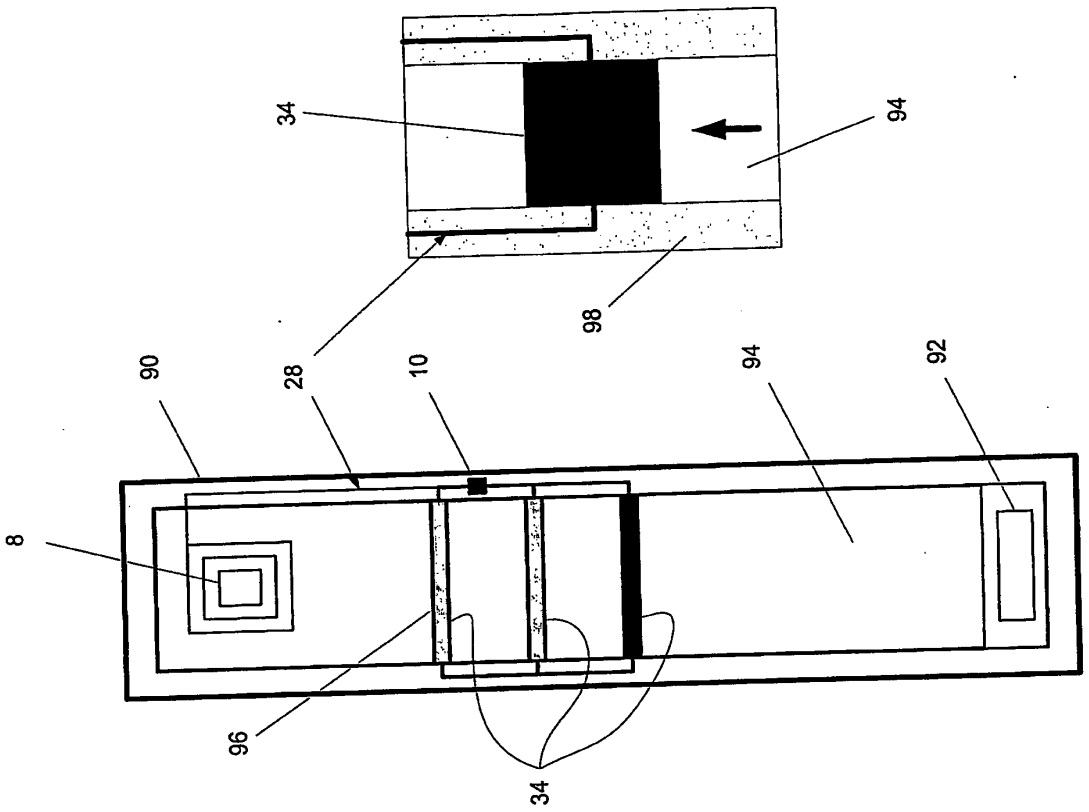


FIG. 8

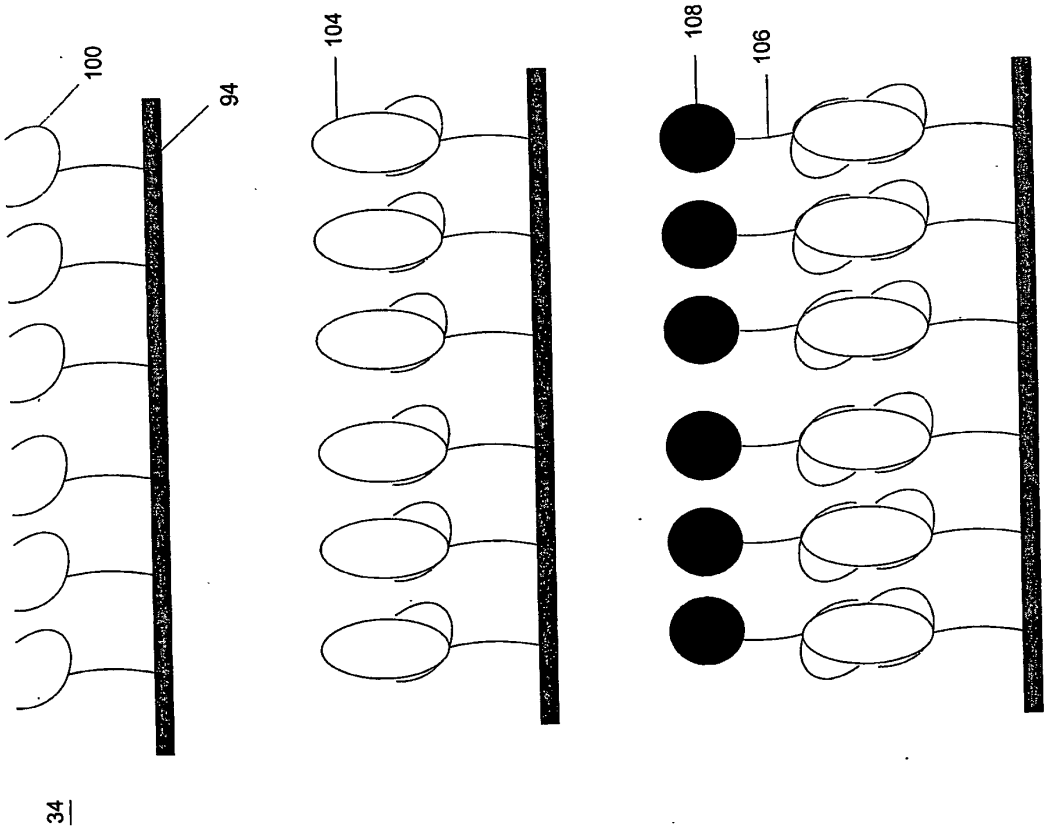


FIG. 9

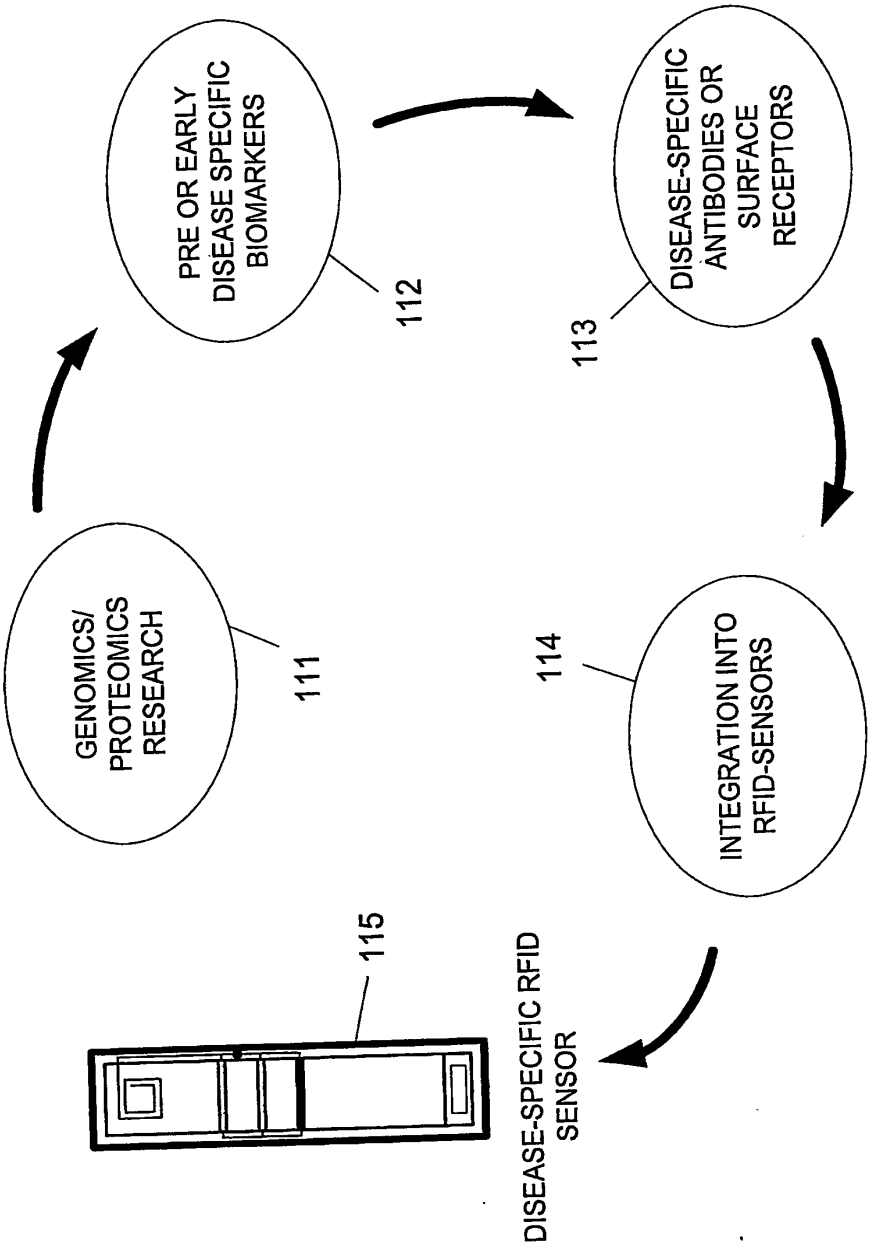

GENOMICS/
PROTEOMICS
RESEARCH
111
PRE OR EARLY
DISEASE SPECIFIC
BIOMARKERS
112
DISEASE-SPECIFIC
ANTIBODIES OR
SURFACE
RECEPTORS
113
INTEGRATION INTO
RFID-SENSORS
114
DISEASE-SPECIFIC RFID
SENSOR
115

FIG. 10

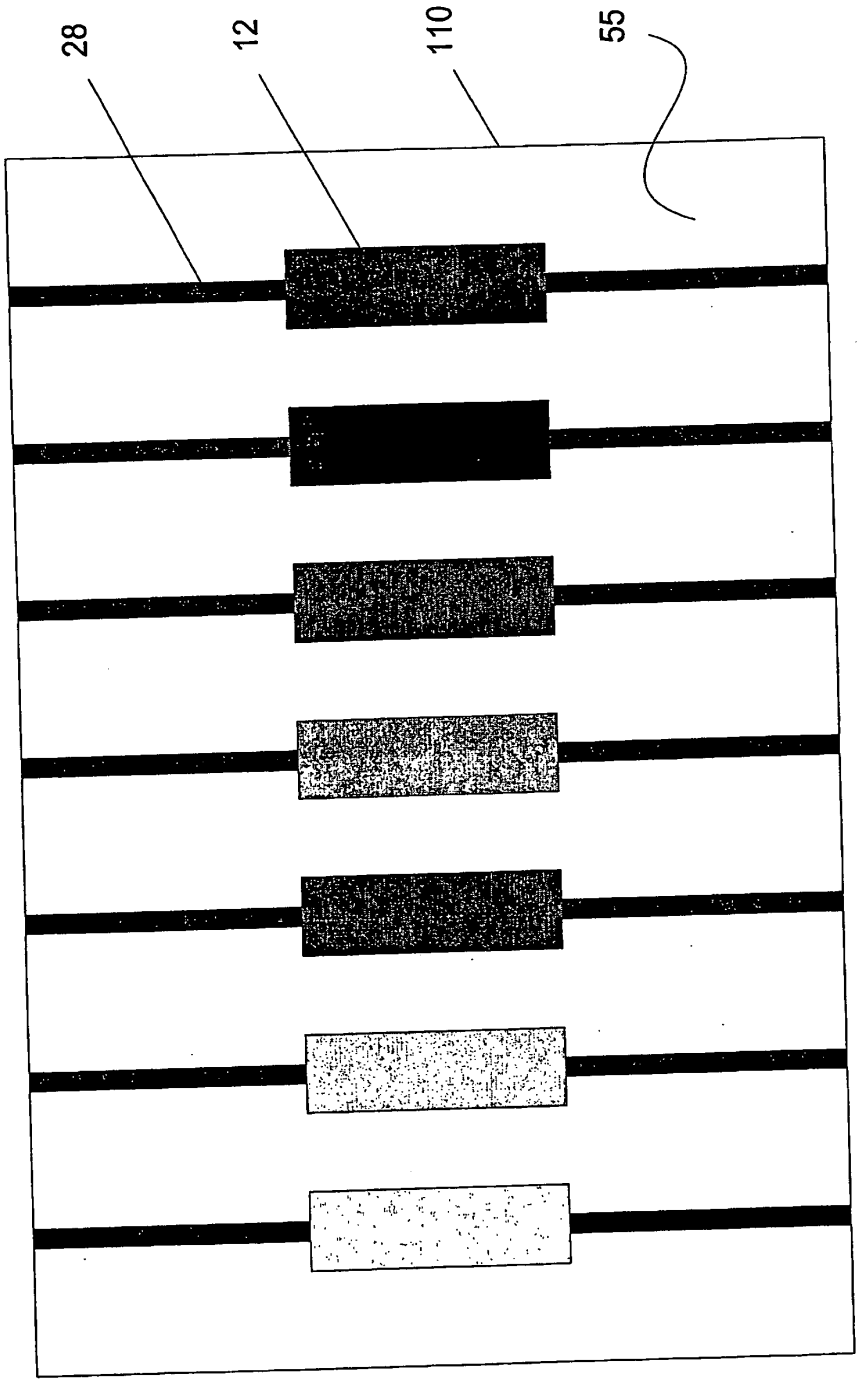


FIG. 11

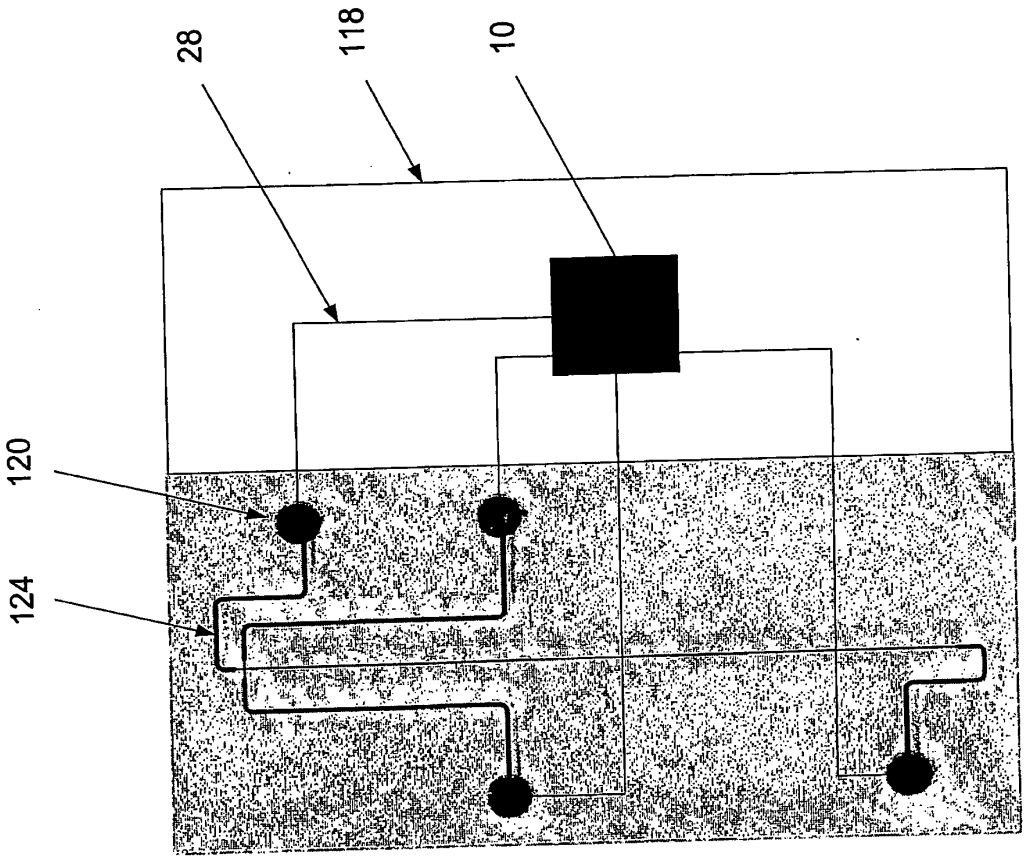


FIG. 12

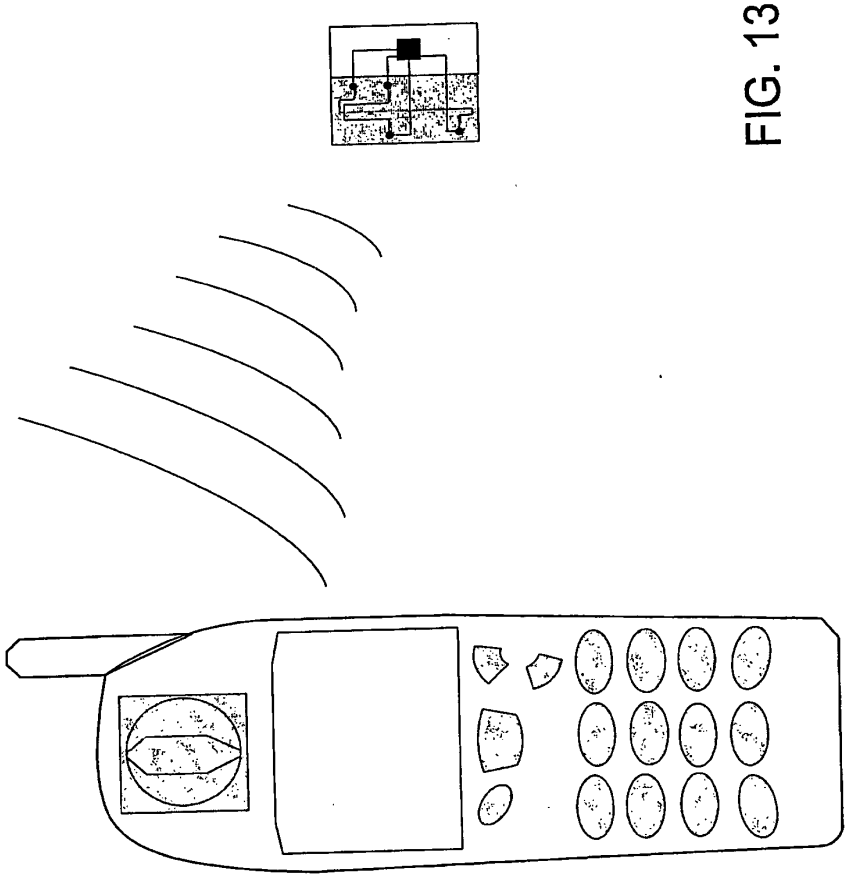


FIG. 13

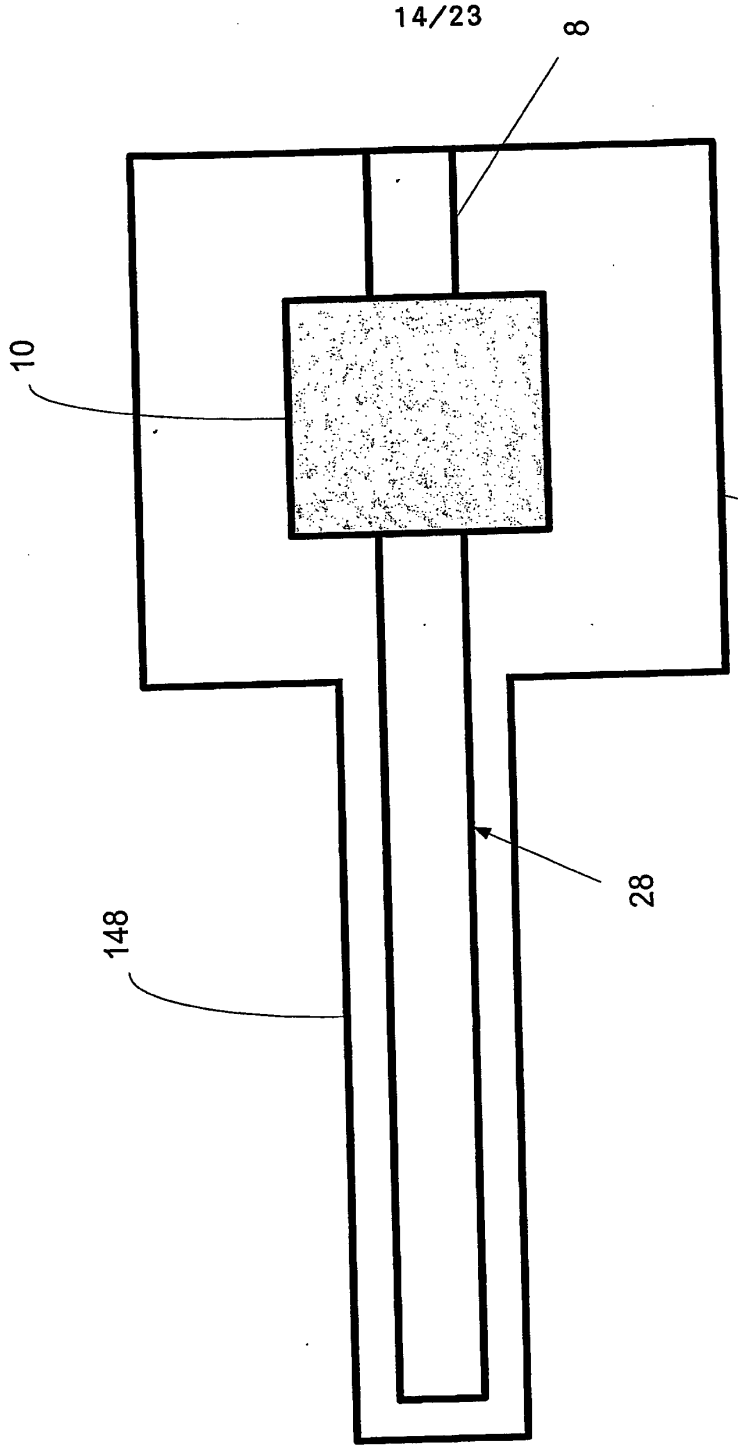


FIG. 14

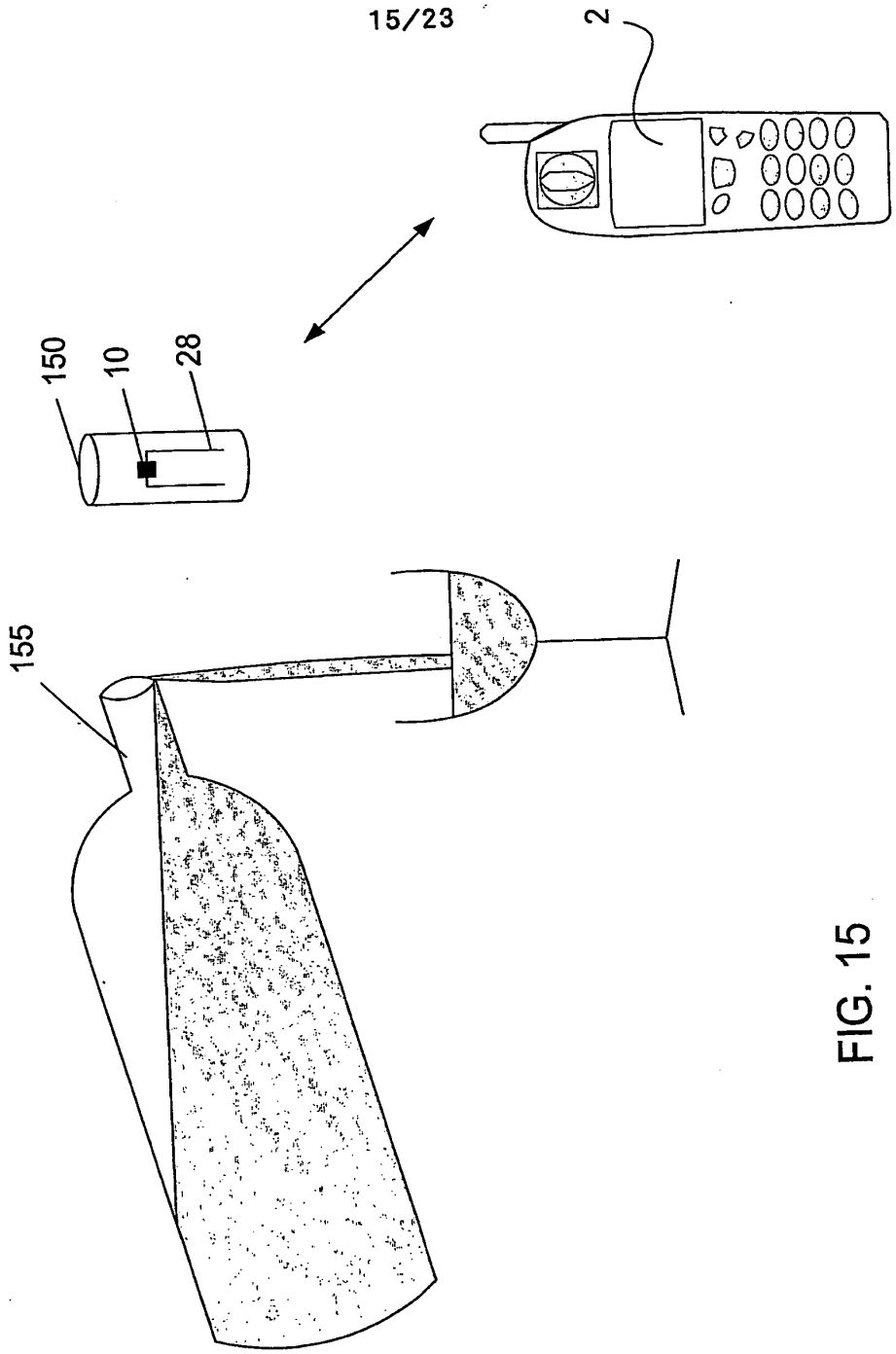


FIG. 15

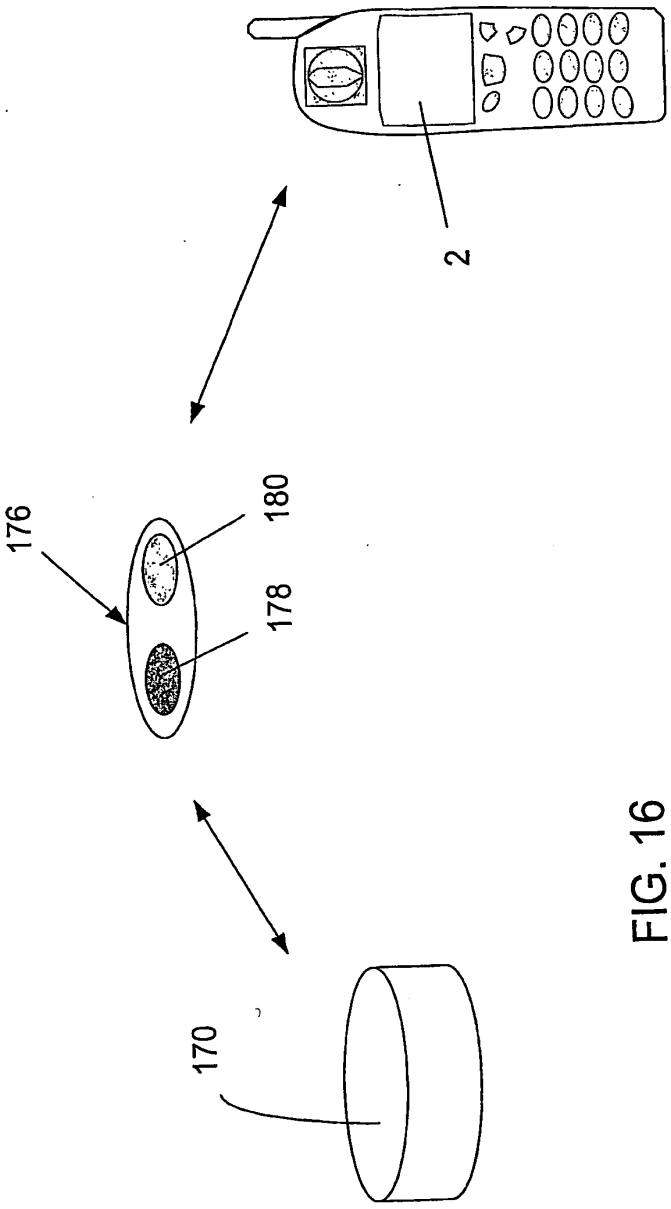


FIG. 16

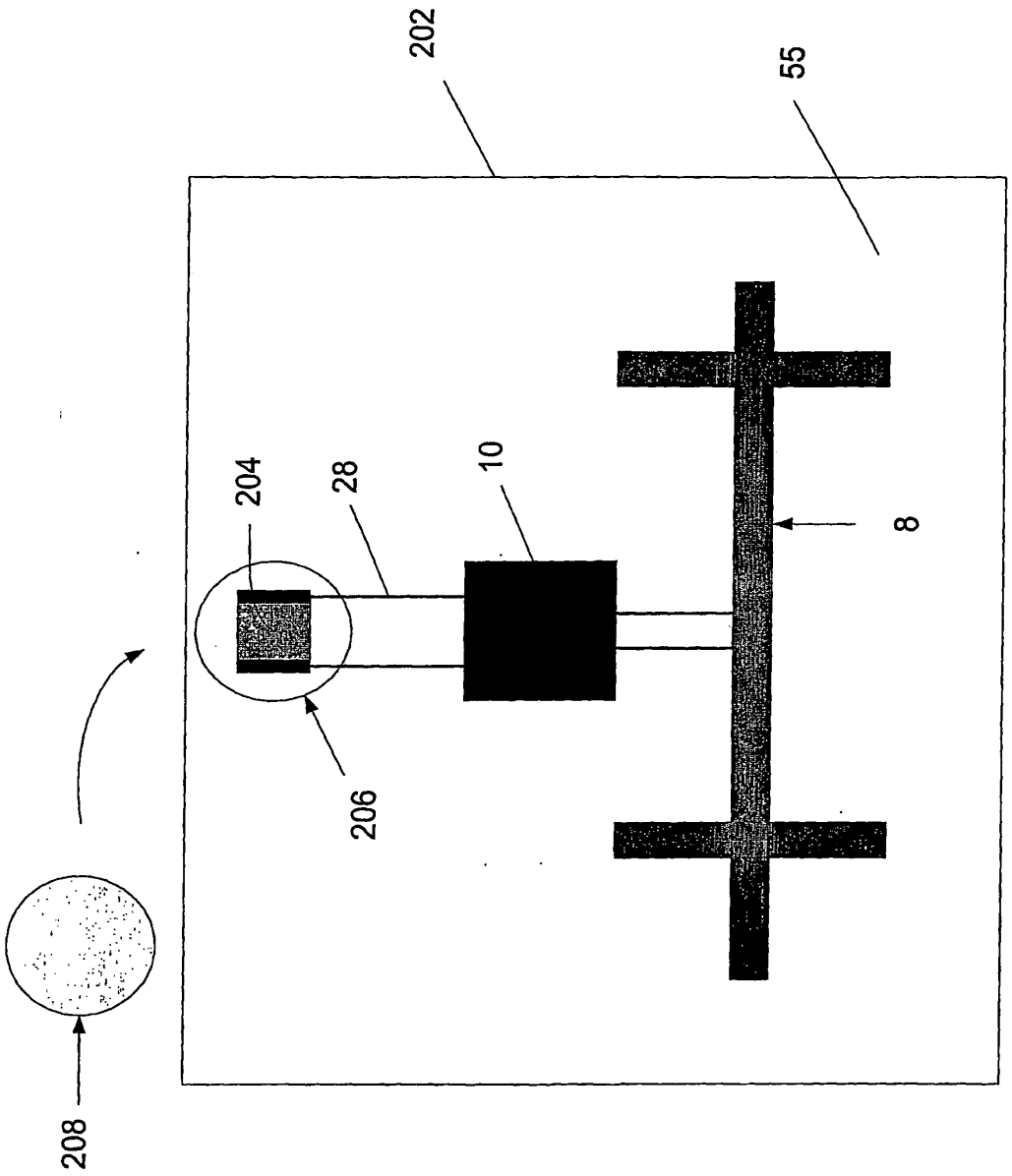


FIG. 17

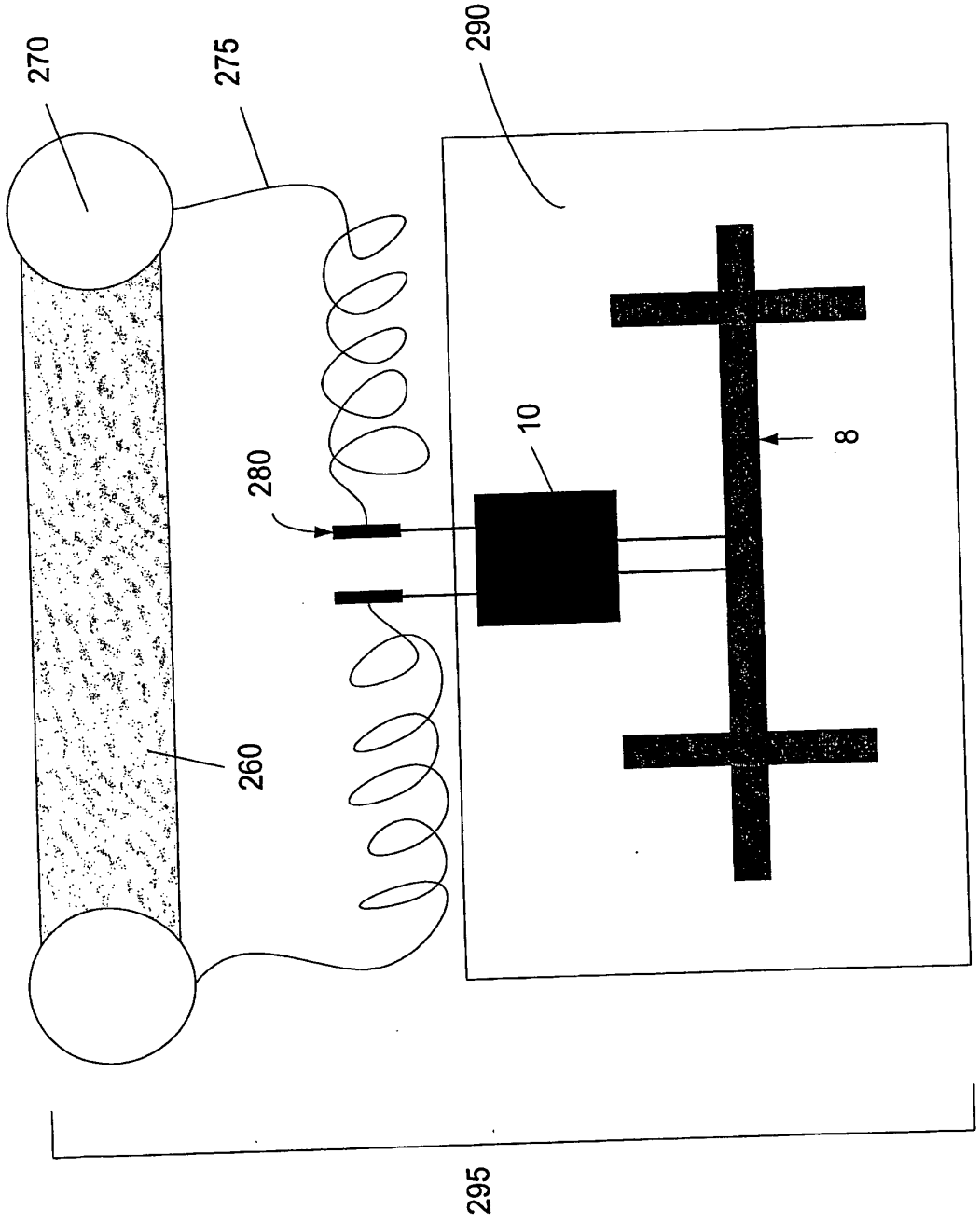


FIG. 18

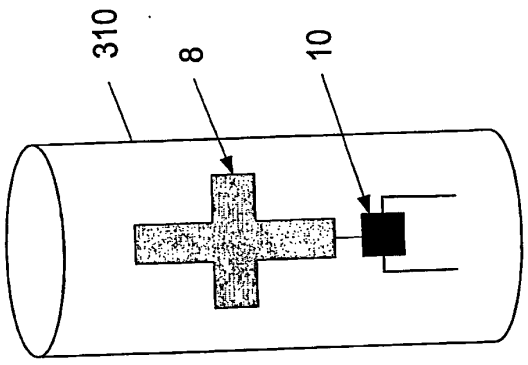


FIG. 19 A

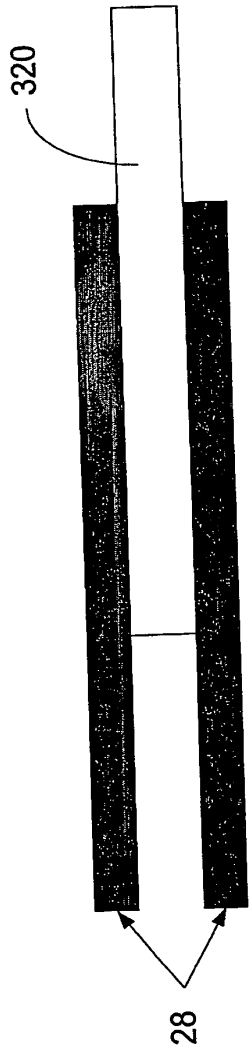


FIG. 19 B

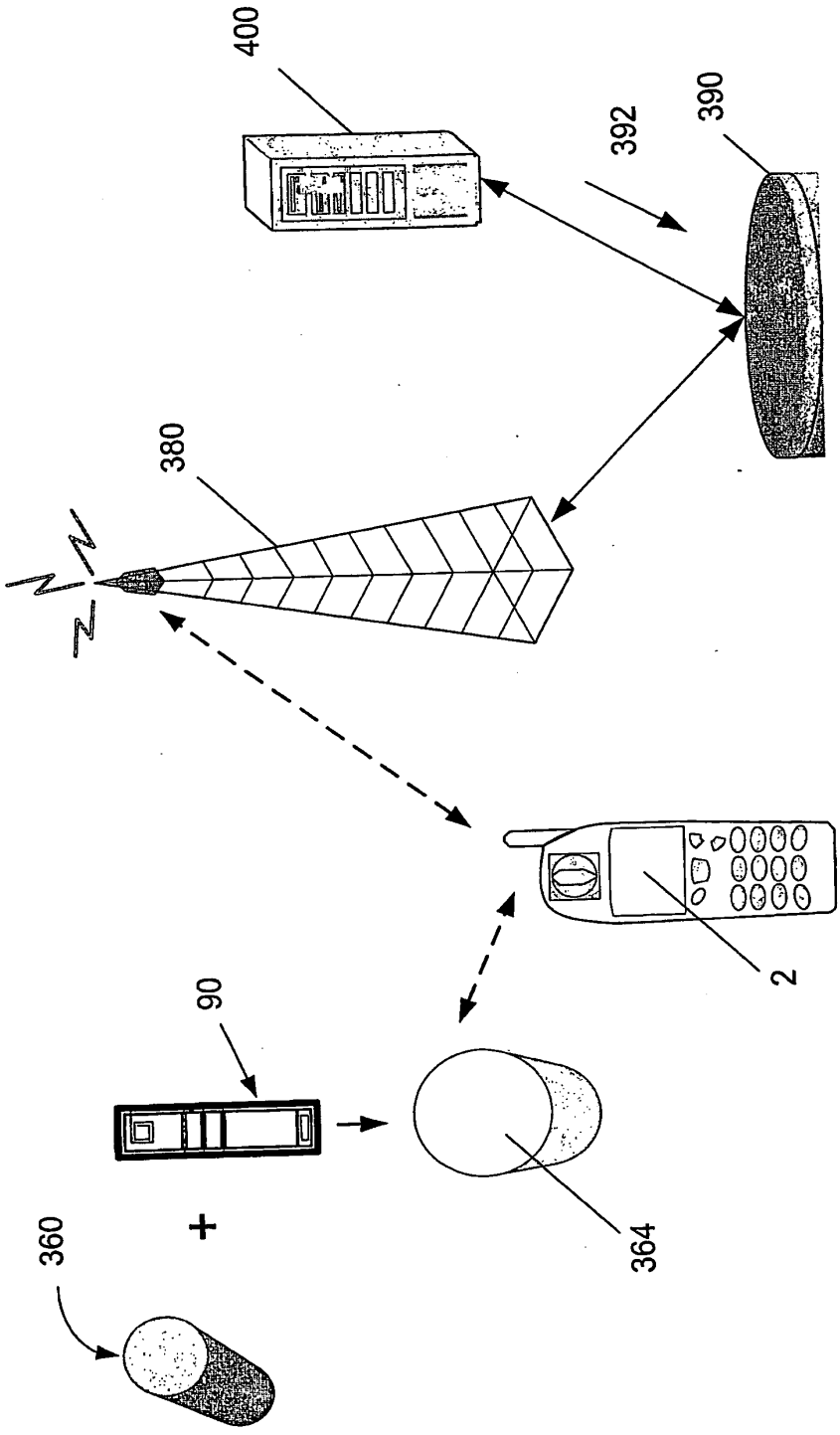


FIG. 20

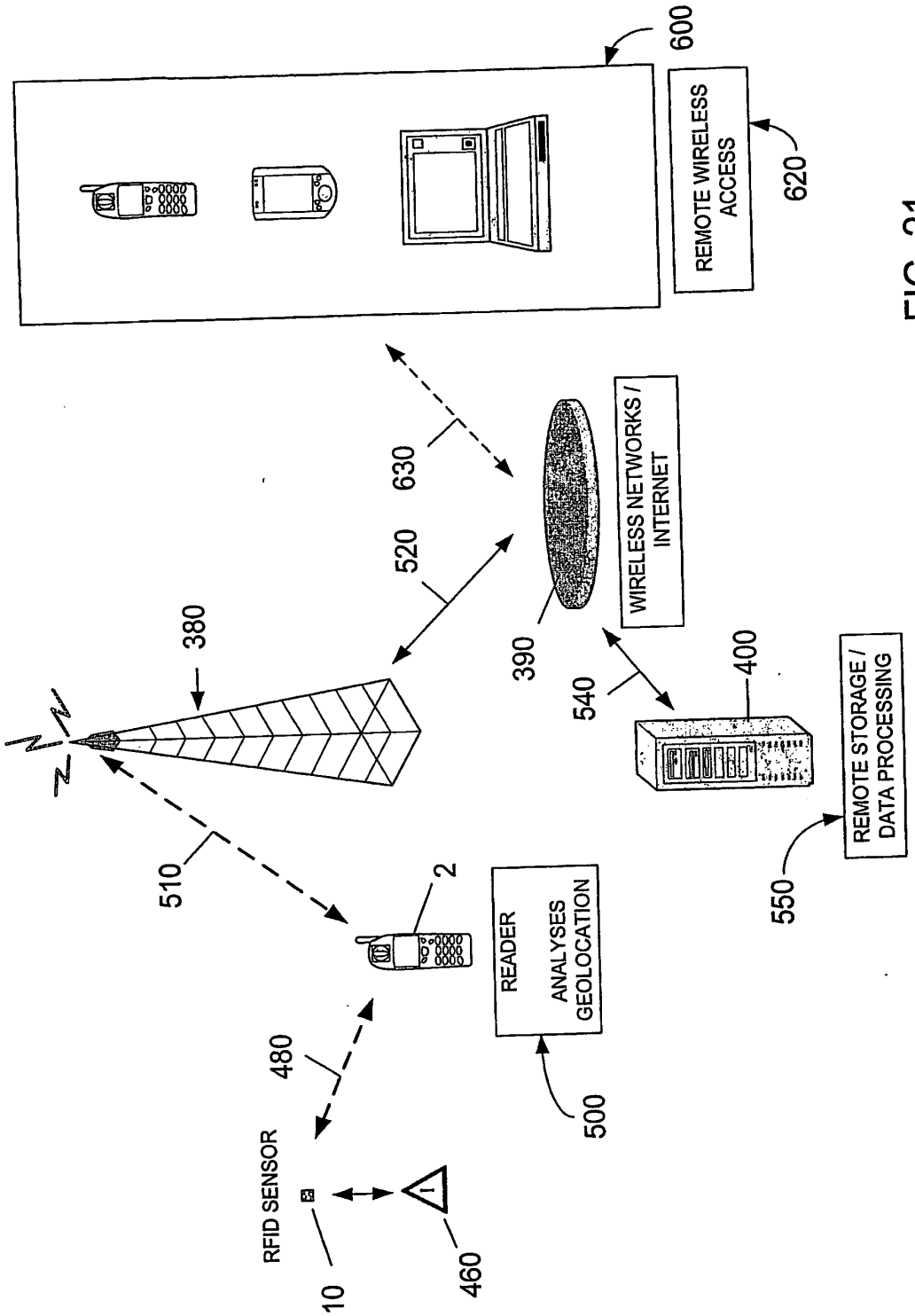
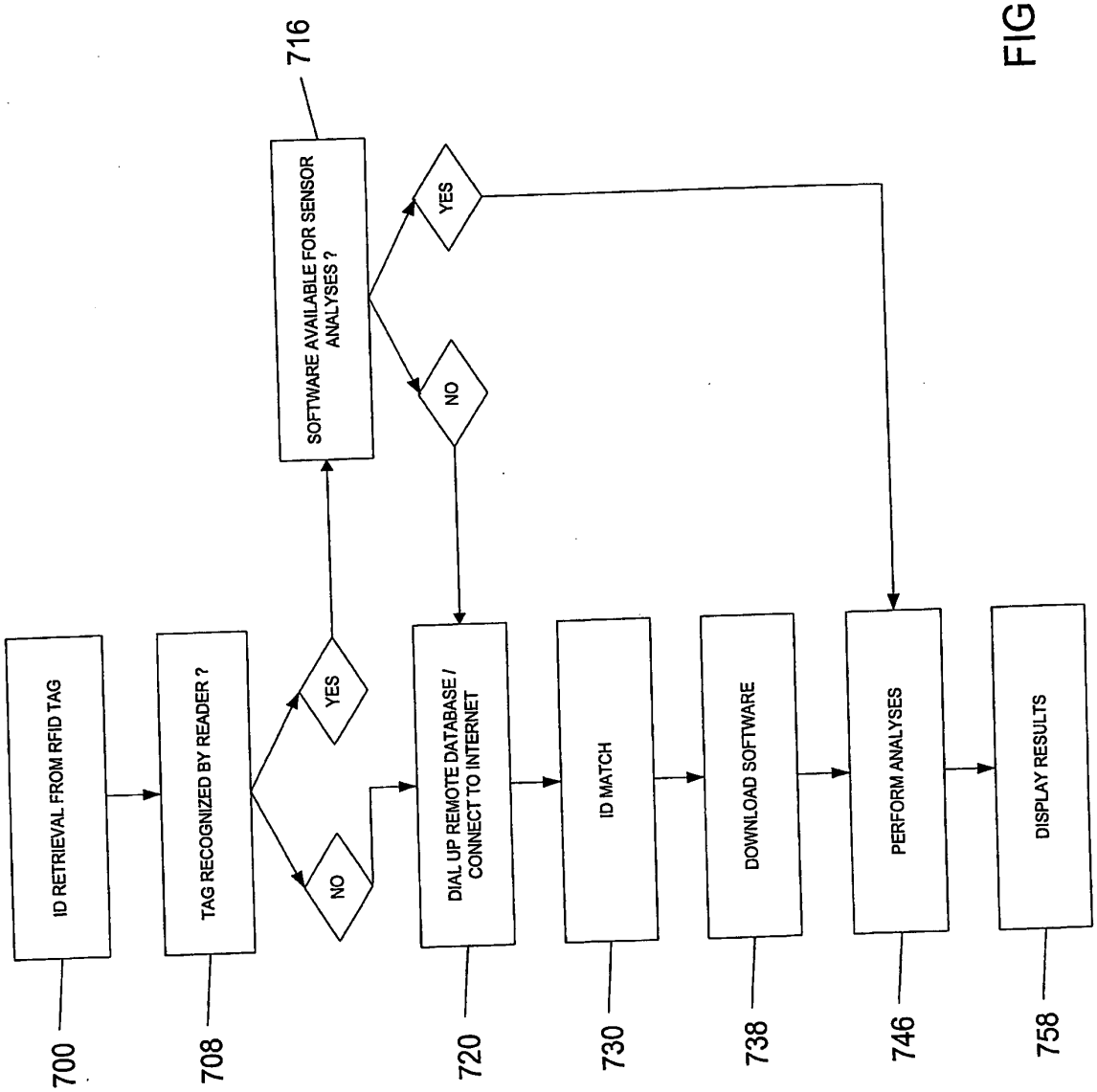

600
REMOTE WIRELESS ACCESS
620
630
520
380
390
WIRELESS NETWORKS / INTERNET
540
400
REMOTE STORAGE / DATA PROCESSING
550
510
2
READER
ANALYSES
GEOLOCATION
500
480
RFID SENSOR
10
460

FIG. 21

FIG. 22


ID RETRIEVAL FROM RFID TAG
TAG RECOGNIZED BY READER ?
YES
NO
SOFTWARE AVAILABLE FOR SENSOR ANALYSES ?
YES
NO
DIAL UP REMOTE DATABASE / CONNECT TO INTERNET
ID MATCH
DOWNLOAD SOFTWARE
PERFORM ANALYSES
DISPLAY RESULTS
700
708
716
720
730
738
746
758

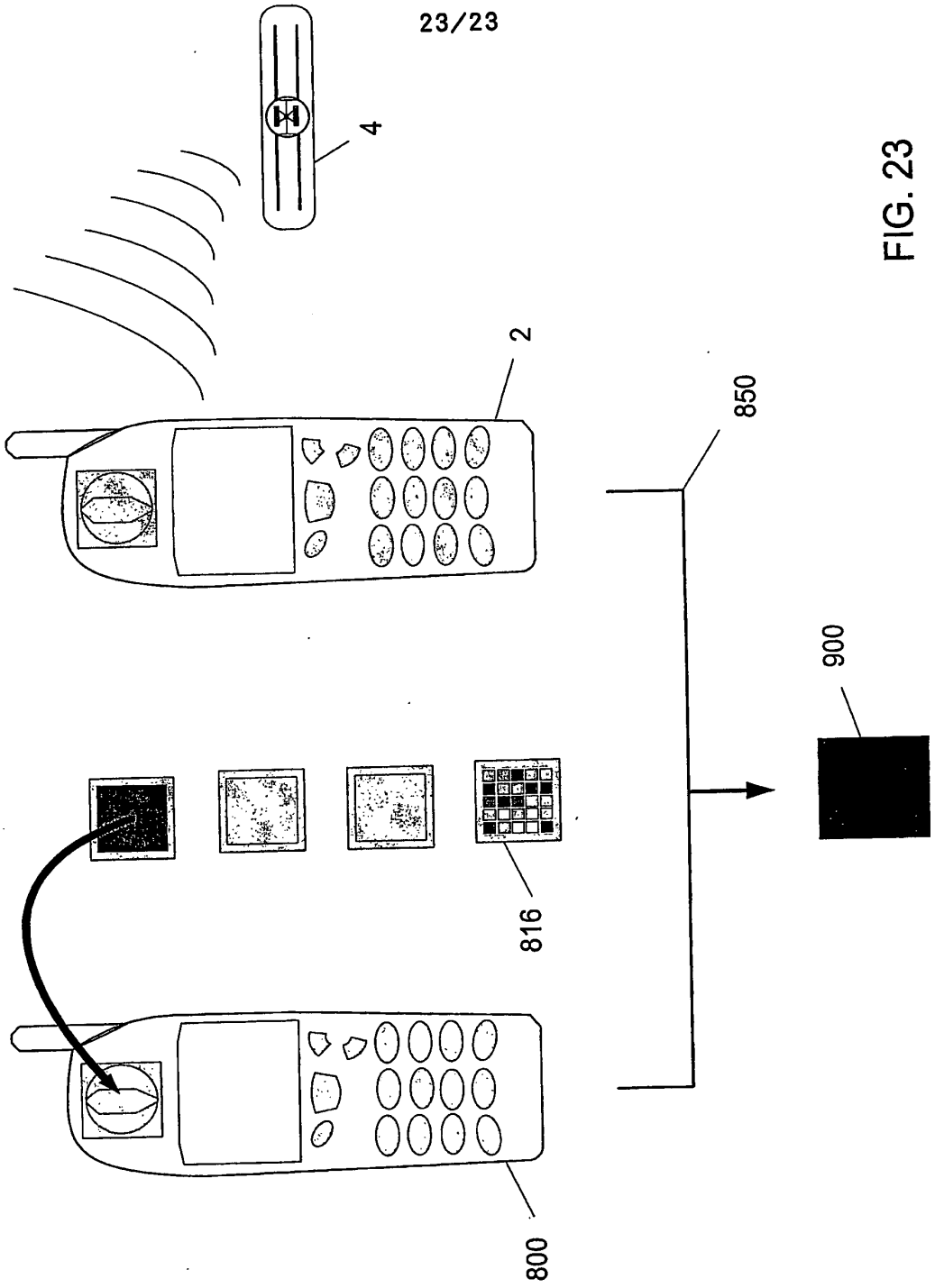


FIG. 23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/02171

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : H04B 7/00; C12Q 1/00; C12M 3/00; G08B 1/08, 21/00, 23/00; G08C 15/00
US CL : 455/41.2; 435/ 4, 287.1; 340/870.16, 870.4, 501, 539.1, 539.11, 573.1
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : Please See Continuation Sheet

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US 2004/0225199 A1 (EVANYK et al) 11 November 2004 (11.11.2004), paragraphs 50-61.	1-11, 13, 15-21, 24-37, 39-42 and 44-47
Y	US 2003/0004403 A1 (DRINAN et al) 02 January 2003 (02.01.2003), paragraph 126.	1-11, 13, 15-21 and 24-37
Y,P	US 2004/0061324 A1 (HOWARD) 01 April 2004 (01.04.2004), abstract.	2-4, 22 and 23
X,E	US 2005/0009122 A1 (WHELAN et al) 13 January 2005 (13.01.2005), paragraph 27.	38, 63 and 64
---		---
Y,E		24, 39-42 and 44-47

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
16 April 2005 (16.04.2005)

Date of mailing of the international search report
18 MAY 2005

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (703) 305-3230

Authorized officer
Raymond B. Persino
Telephone No. (571) 272-7856

Form PCT/ISA/210 (second sheet) (January 2004)

Continuation of B. FIELDS SEARCHED Item 1:
455/41.2, 11.1, 39, 550.1, 556.1; 435/ 4, 287.1; 340/870.01, 870.07, 870.16, 870.03, 870.4, 500, 501, 539.1, 539.11, 573.1

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PATENT COOPERATION TREATY

PCT

REC'D 08 MAY 2006
WIPO PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 66355-0007	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US05/02171	International filing date *(day/month/year)* 24 January 2005 (24.01.2005)	Priority date *(day/month/year)* 27 January 2004 (27.01.2004)
International Patent Classification (IPC) or national classification and IPC IPC(7): H04B 7/00 and US Cl.: 455/41.2		
Applicant PEETERS, JOHN P.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of ___ sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____ , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
19 October 2005 (19.10.2005)	20 January 2006 (20.01.2006)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Lewis G. West Telephone No. 571-272-2600

Form PCT/IPEA/409 (cover sheet)(April 2005)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US05/02171

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4(a))

☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☒ the description:
pages 1-28 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the claims:
pages 29-37 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the drawings:
pages 1/23-23/23 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

** If item 4 applies, some or all of those sheets may be marked "superseded."*

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Page 603

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-64	YES
	Claims NONE	NO
Inventive Step (IS)	Claims 1-64	YES
	Claims NONE	NO
Industrial Applicability (IA)	Claims 1-64	YES
	Claims NONE	NO

2. Citations and Explanations (Rule 70.7)
Please See Continuation Sheet

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

Claims 1-64 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest that disclosed by the prior art.

Regarding claim 1, the applicant includes the subject matter of: A diagnostics system comprising: a flexible patch having an adhesive portion and adapted to be positioned on a surface; a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and a wireless RFID reader adapted to communicate through the use of multiple protocols with said RFID tag and sensor module, said RFID reader being adapted to communicate over a network through the use of multiple communication protocols. The above subject matter is disclosed by EVANYK et al (US 2004/0225199 A1) in view of DRINAN et al (US 2003/0004403 A1). However, the applicant overcomes the references due to the applicant's earlier priority date. Therefore, the applicant's invention of claim 1 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 12, the applicant includes the subject matter of: the patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person. It is noted that this subject matter is not disclosed by any of the cited references.

Regarding claim 14, the applicant includes the subject matter of: a substrate having a sample input port enabling migration of an analyte by capillary forces; and at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area. It is noted that this subject matter is not disclosed by any of the cited references.

Regarding claim 25, the applicant includes the subject matter of: A human diagnostics system comprising: a patch having a radio frequency identification (RFID) tag and sensor module, and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements; a RFID reader communicative with said patch through the use of a network and adapted to analyze, receive, and transmit the signals from said patch through the use of multiple protocols; and a remote storage and data unit communicative with said RFID reader, said remote storage and data unit analyzing and storing data from said patch and said RFID, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network. The above subject matter is disclosed by EVANYK et al (US 2004/0225199 A1) in view of DRINAN et al (US 2003/0004403 A1). However, the applicant overcomes the references due to the

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Supplemental Box

applicant's earlier priority date. Therefore, the applicant's invention of claim 25 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 30, the applicant includes the subject matter of: A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising: a multi protocol REID reader that is compatible with and adapted to activate said RFID tag and sensor module; a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network. The above subject matter is disclosed by EVANYK et al (US 2004/0225199 A1) in view of DRINAN et al (US 2003/0004403 A1). However, the applicant overcomes the references due to the applicant's earlier priority date. Therefore, the applicant's invention of claim 30 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 35, the applicant includes the subject matter of: A diagnostics system comprising: a patch having an adhesive portion and adapted to be embedded within a structure; a radio frequency identification (RFID) tag and sensor module having an integrated temperature module, said RFID tag and sensor module being integrated with said patch and having an antenna and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and a wireless RFID reader communicative with said RFID tag and sensor module, said reader being adapted to communicate over a network through the use of multiple protocols. The above subject matter is disclosed by EVANYK et al (US 2004/0225199 A1) in view of DRINAN et al (US 2003/0004403 A1). However, the applicant overcomes the references due to the applicant's earlier priority date. Therefore, the applicant's invention of claim 35 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 38, the applicant includes the subject matter of: An immunoassay test strip system for use in conducting diagnostic measurements comprising: a substrate that forms a test strip; at least one test area located on said substrate for capturing antigens; and a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area. The above subject matter is disclosed by WHELAN et al (US 2005/0009122 A1). However, the applicant overcomes the references due to the applicant's earlier priority date. Therefore, the applicant's invention of claim 38 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 43, the applicant includes the subject matter of: the test strip is adapted to perform quantitative protein measurements. It is noted that this subject matter is not disclosed by any of the cited references.

Regarding claim 48, the applicant includes the subject matter of: A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of: providing a substrate; printing conductive leads on said substrate wherein said conductive leads define a sensor area; printing a protective cap doped with a material that is sensitive to pathogen specific enzymatic action within said sensor area; printing an antenna on said substrate; and integrating an REID tag and sensor module with said substrate. It is noted that this subject matter is not disclosed by any of the cited references. Therefore, the applicant's invention of claim 48 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 59, the applicant includes the subject matter of: A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising: conductive leads that enable transmission of signals; a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area; a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature; an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RIF chip receiving signals from said conductive leads and said temperature module, said RIF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RIF reader; and at least one antenna adapted to receive signals from the wireless RIF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor. It is noted that this subject matter is not disclosed by any of the cited references. Therefore, the applicant's invention of claim 59 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Regarding claim 63, the applicant includes the subject matter of: An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising: at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule. The above subject matter is disclosed by WHELAN et al (US 2005/0009122 A1). However, the applicant overcomes the references due to the applicant's earlier priority date. Therefore, the applicant's invention of claim 63 comprises a unique combination of subject matter that is neither taught nor suggested by the prior art.

Claims 1-64 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.

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Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII(i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

☐ This declaration is directed to the international application of which it forms a part (if filing declaration with application).

☐ This declaration is directed to international application No. PCT/ US05/02171 (if furnishing declaration pursuant to Rule 26ter.)

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications:

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

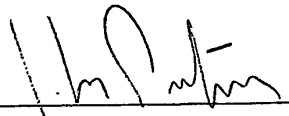
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment,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

Name: John P. Peeters

Residence: ~~Bethesda, Maryland~~ CHINCOTEAGUE, VIRGINIA
(city and either US state, if applicable, or country)

Mailing Address: 9505 Hemswell Place
Potomac, Maryland 20854

Citizenship: US



FEBRUARY 25, 2005

Inventor's Signature
(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of inventor, not that of the agent)

Date
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Citizenship:

Inventor's Signature
(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of inventor, not that of the agent)

Date
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".