IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Patent No.	:	10,886,012	Examiner	:	Evans Desrosiers
Issue Date	:	January 5, 2021	Conf. No.	:	9792
Application No.	:	16/131,094			
Filed	:	September 14, 2018			
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

REPLY TO OFFICE COMMUNICATION OF JULY 14, 2022

In order to receive a decision on the petition filed on June 25, 2021, petitioner is providing the following information:

(1) a confirmation or denial that the district court proceeding is ongoing;

The civil action at the United States District Court for the District of Massachusetts under Civil Action No. 1:21−CV−10865−NMG, is ongoing.

(2) an identification of any other ongoing court proceeding(s) which involve this patent;

There are no other ongoing proceedings of which we're aware. We are only aware of the above-identified proceeding at the United States District Court for the District of Massachusetts under Civil Action No. 1:21−CV−10865−NMG.

(3) for any ongoing court proceeding identified in this notice or in the response, petitioner should additionally confirm that a) the court(s) has/have been alerted that the petition was filed and b) that the court(s) does/do not object to the USPTO issuing a decision on the petition filed June 25, 2021; and

All required notices have been handled by litigation colleagues. All parties to the litigation have been given notice of the petition by virtue of production of certified file history. We are not aware of any statute, regulation, or rule that requires the Court to provide approval and/or objection with respect to the petition, but again all parties to the litigation have been given notice.

(4) any other information including any documents or other evidence that may reasonably be deemed material to the decision on the petition.

USPTO Examiners assigned to pending applications of the assignee have been notified of the civil action, United States District Court for the District of Massachusetts under Civil Action No. 1:21−CV−10865−NMG. In particular, court filings and associated communications of the civil action have been cited to the USPTO Examiner of US Patent Application Serial No. 17/167,247 filed on 4 February 2021 and for which a notice of allowance was mailed 26 January 2023 and an issue notification was mailed 7 June 2023. Additionally, the court filings and communications of the civil action have also been cited to the USPTO Examiner of US Patent Application 17/060,558 filed on 1 October 2020 and for which a notice of allowance was mailed 27 June 2023. As such, parties of the civil action have been notified and the USPTO Examiners assigned to pending patent applications have been notified to the civil action.

Apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: 30 June 2023

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay, Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

24248255.doc

Electronic Acknowledgement Receipt

EFS ID:	48239500
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Jeffrey J. Barclay/Cathy O'Brien
Filer Authorized By:	Jeffrey J. Barclay
Attorney Docket Number:	25412-0002003
Receipt Date:	30-JUN-2023
Filing Date:	14-SEP-2018
Time Stamp:	16:27:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	Reply.pdf	65169 263af8d3f31b7d4c8a1efb0fc58170cce73da373	no	2

Warnings:

Datavant Exhibit 1002

Information:	
Total Files Size (in bytes):	65169

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

26161 7590 07/14/2022
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	

ART UNIT	PAPER NUMBER
2491	

NOTIFICATION DATE	DELIVERY MODE
07/14/2022	ELECTRONIC

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

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

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

PATDOCTC@fr.com

Datavant Exhibit 1002

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Patent No. 10,886,012
Issue Date: 05 Jan 2021
Application No. 16/131,094
Filing or 371(c) Date: 14 Sep 2018
Attorney Docket No. 25412-0002003

REQUEST FOR INFORMATION

This is a request for clarifying information regarding the petition requesting the acceptance of a fee deficiency submission, filed under 37 CFR 1.28, on June 25, 2021.

On June 15, 2021, paper(s) was/were filed indicating that there is a district court proceeding which involves this patent.

In order to receive a decision on the petition filed on June 25, 2021, petitioner is required to respond to this notice with the following information: 1) a confirmation or denial that the district court proceeding is ongoing; 2) an identification of any other ongoing court proceeding(s) which involve this patent; 3) for any ongoing court proceeding identified in this notice or in the response, petitioner should additionally confirm that a) the court(s) has/have been alerted that the petition was filed and b) that the court(s) does/do not object to the USPTO issuing a decision on the petition filed June 25, 2021; and 4) any other information including any documents or other evidence that may reasonably be deemed material to the decision on the petition.

Telephone inquiries concerning this notice may be directed to Anna Pagonakis at (571) 270-3505.

/Cheryl Gibson-Baylor/
Cheryl Gibson-Baylor
Office of Petitions

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
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	163121

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 04/08/2022 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

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:	/Jeffrey J. Barclay, Reg. No. 48,950/
Name:	Jeffrey J. Barclay
Registration Number:	48950

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :67142

Sale Accounting Date:06/28/2021

Sale Item Reference Number	Effective Date
16131094	06/25/2021

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20216RB55504781	1599	MAINTENANCE/PETITION INTERNAL FEE CODE	$950.00	Deposit Account

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Patent No.	:	10,886,012	Examiner	:	Evans Desrosiers
Issue Date	:	January 5, 2021	Conf. No.	:	9792
Application No.	:	16/131,094			
Filed	:	September 14, 2018			
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

REQUEST UNDER 37 C.F.R. § 1.28(c) TO EXCUSE ERROR IN SMALL ENTITY STATUS

Pursuant to 37 C.F.R. § 1.28(c), Applicant requests that the Office excuse an error in establishing small entity status for the above-identified application. Small entity status was established for the application and fees were paid as a small entity, in good faith. It has subsequently been discovered that the application may not have been entitled to small entity status on or after January 1, 2019. Applicant is choosing to pay large entity fees out of an abundance of caution.

The deficiency owed is calculated as follows, as required under 37 C.F.R. § 1.28(c)(2)(i):

Type of Fee Paid	Date Paid	Amount Paid as a Small Entity	Current Large Entity Fee	Deficiency Owed
One-month extension of time	6/10/2020	$110.00	$220.00	$110.00
Information Disclosure Statement	6/10/2020	$120.00	$260.00	$140.00
Issue fee payment	11/24/2020	$500.00	$1,200.00	$700.00
TOTAL DEFICIENCY OWED				**$950.00**

Any delay in paying the correct amount of the fees itemized above was unintentional.

Pursuant to 37 C.F.R. § 1.28(d), the present payment of deficiency operates as notification of loss of small entity status under 37 C.F.R. § 1.27(g)(2). The Office is authorized to charge any additional fees owed and requested to credit any overpayments to Deposit Account No 06-1050.

Respectfully submitted,

Date: 25 June 2021

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay
Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

Electronic Acknowledgement Receipt

EFS ID:	43093935
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Jeffrey J. Barclay/Cathy O'Brien
Filer Authorized By:	Jeffrey J. Barclay
Attorney Docket Number:	25412-0002003
Receipt Date:	25-JUN-2021
Filing Date:	14-SEP-2018
Time Stamp:	15:12:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notification of loss of entitlement to small entity status	25412-0002003.pdf	68608 6b03eb3b10e7042a85fe5b8da934d8faf1a38a05	no	1

Warnings:

Datavant Exhibit 1002

Information:	
Total Files Size (in bytes):	68608

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Patent No.	:	10,886,012	Examiner	:	Evans Desrosiers
Issue Date	:	January 5, 2021	Conf. No.	:	9792
Application No.	:	16/131,094			
Filed	:	September 14, 2018			
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

REQUEST UNDER 37 C.F.R. § 1.28(c) TO EXCUSE ERROR IN SMALL ENTITY STATUS

Pursuant to 37 C.F.R. § 1.28(c), Applicant requests that the Office excuse an error in establishing small entity status for the above-identified application. Small entity status was established for the application and fees were paid as a small entity, in good faith. It has subsequently been discovered that the application may not have been entitled to small entity status on or after January 1, 2019. Applicant is choosing to pay large entity fees out of an abundance of caution.

The deficiency owed is calculated as follows, as required under 37 C.F.R. § 1.28(c)(2)(i):

Type of Fee Paid	Date Paid	Amount Paid as a Small Entity	Current Large Entity Fee	Deficiency Owed
One-month extension of time	6/10/2020	$110.00	$220.00	$110.00
Information Disclosure Statement	6/10/2020	$120.00	$260.00	$140.00
Issue fee payment	11/24/2020	$500.00	$1,200.00	$700.00
TOTAL DEFICIENCY OWED				**$950.00**

Any delay in paying the correct amount of the fees itemized above was unintentional.

Pursuant to 37 C.F.R. § 1.28(d), the present payment of deficiency operates as notification of loss of small entity status under 37 C.F.R. § 1.27(g)(2). The Office is authorized to charge any additional fees owed and requested to credit any overpayments to Deposit Account No 06-1050.

Respectfully submitted,

Date: 25 June 2021

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay
Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

AO 120 (Rev. 3/04)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Massachusetts on the following ✓ Patents or Trademarks:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	5/25/2021	District of Massachusetts

PLAINTIFF	DEFENDANT
MILLIMAN, INC., MILLIMAN SOLUTIONS, LLC, and VIGILYTICS LLC	GRADIENT A.I. CORP., STANFORD A. SMITH, and SAMUEL CHASE PETTUS

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	SEE ATTACHED		
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY Amendment Answer Cross Bill Other Pleading		
	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1			
2			
3			
4			
5			

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Datavant Exhibit 1002

AO 120 - ATTACHMENT PAGE

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	U.S. Patent No. 9,118,641	Aug. 25, 2015	Vigilytics LLC
2	U.S. Patent No. 9,323,892	Apr. 26, 2016	Vigilytics LLC
3	U.S. Patent No. 9,665,685	May 30, 2017	Vigilytics LLC
4	U.S. Patent No. 9,965,651	May 8, 2018	Vigilytics LLC
5	U.S. Patent No. 10,109,375	Oct. 23, 2018	Vigilytics LLC
6	U.S. Patent No. 10,886,012	Jan. 5, 2021	Vigilytics LLC

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 10,886,012 B1
APPLICATION NO. : 16/131094
DATED : January 5, 2021
INVENTOR(S) : Andrew L. Paris, III

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

In the Claims

Column 10, Line 42: In Claim 1, delete "device-implemented" and replace it with -- device implemented --, therefor.

Column 11, Line 47 (approx.): In Claim 11, between the words "least" and "minimum" insert -- a --, therefor.

Signed and Sealed this
Thirtieth Day of March, 2021



Drew Hirshfeld
Performing the Functions and Duties of the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	: 2491
Patent No.	:	10,886,012	Examiner	: Evans Desrosiers
Issue Date	:	January 5, 2021	Conf. No.	: 9792
Serial No.	:	16/131,094		
Filed	:	September 14, 2018		
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING		

Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION

Please issue a certificate of correction in accordance with the attached form.

The errors to be corrected were made by applicant. The fee of $160 is being paid with this request.

Apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: February 23, 2021

/Christopher Reilly/
Christopher L. Reilly
Reg. No. 74,063

Customer Number 26161
Fish & Richardson P.C.
Telephone: +1 (617) 368-2170
Facsimile: (877) 769-7945

24097922.doc

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
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.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,886,012

APPLICATION NO.: 16/131,094

ISSUE DATE : January 5, 2021

INVENTOR(S) : Andrew L. Paris III

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

Column 10, Line 42: In claim 1, delete “device-implemented” and replace it with - - device implemented - -, therefor.

Column 11, Line 47 (approx.): In claim 11, between the words “least” and “minimum” insert - - a - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):
Fish & Richardson P.C.
P.O. Box 1022
Minneapolis, MN 55440-1022

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, 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 selection option2.

Electronic Patent Application Fee Transmittal

Application Number:	16131094
Filing Date:	14-Sep-2018
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Filer:	Christopher Leo Reilly/Cathy O'Brien
Attorney Docket Number:	25412-0002003

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
CERTIFICATE OF CORRECTION	2811	1	160	160

Datavant Exhibit 1002

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Electronic Acknowledgement Receipt

EFS ID:	41995183
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Christopher Leo Reilly/Cathy O'Brien
Filer Authorized By:	Christopher Leo Reilly
Attorney Docket Number:	25412-0002003
Receipt Date:	23-FEB-2021
Filing Date:	14-SEP-2018
Time Stamp:	12:49:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$160
RAM confirmation Number	E20212MC50181518
Deposit Account	061050
Authorized User	Cathy O'Brien

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

37 CFR 1.21 (Miscellaneous fees and charges)

Datavant Exhibit 1002

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	RequestforCOC.pdf	104926 5dd3c2340b4def0ed45aab2d7a98905b96e2d69c	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30574 c5c0e194640bc9e1a62c6e98ba49e569bf29c144	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	135500		

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 NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/131,094	01/05/2021	10886012	25412-0002003	9792

26161 7590 12/16/2020

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

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

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

Andrew L. Paris III, Victor, NY;
Vigilytics LLC, Victor, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Datavant Exhibit 1002

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.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

26161 7590 12/07/2020
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	

ART UNIT	PAPER NUMBER
2491	

NOTIFICATION DATE	DELIVERY MODE
12/07/2020	ELECTRONIC

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

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

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

PATDOCTC@fr.com

Datavant Exhibit 1002

Response to Rule 312 Communication	Application No.	Applicant(s)	
	16/131,094	Paris, Andrew L.	
	Examiner	Art Unit	AIA (FITF) Status
	EVANS DESROSIERS	2491	No

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

1. ☑ The amendment filed on 24 November 2020 under 37 CFR 1.312 has been considered, and has been:
   a) ☑ entered.
   b) ☐ entered as directed to matters of form not affecting the scope of the invention.
   c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
      Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.
   d) ☐ disapproved. See explanation below.
   e) ☐ entered in part. See explanation below.

/EVANS DESROSIERS/
Primary Examiner, Art Unit 2491

Datavant Exhibit 1002

OK TO ENTER: /E.D/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Application No.	:	16/131,094	Examiner	:	Evans Desrosiers
Filed	:	September 14, 2018	Confirmation No.	:	9792
			Notice of Allowance Date: 8/26/2020		
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE
PURSUANT TO 37 C.F.R. §1.312

Please amend the application as indicated on the following pages. This amendment is being filed concurrently with the payment of the issue fee.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	: 2491
Application No.	:	16/131,094	Examiner	: Evans Desrosiers
Filed	:	September 14, 2018	Confirmation No.	: 9792
			Notice of Allowance Date: 8/26/2020	
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING		

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE
PURSUANT TO 37 C.F.R. §1.312

Please amend the application as indicated on the following pages. This amendment is being filed concurrently with the payment of the issue fee.

Electronic Patent Application Fee Transmittal

Application Number:	16131094
Filing Date:	14-Sep-2018
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Filer:	Christopher Leo Reilly/Cathy O'Brien
Attorney Docket Number:	25412-0002003

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	41208993
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Christopher Leo Reilly/Cathy O'Brien
Filer Authorized By:	Christopher Leo Reilly
Attorney Docket Number:	25412-0002003
Receipt Date:	24-NOV-2020
Filing Date:	14-SEP-2018
Time Stamp:	11:03:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$500
RAM confirmation Number	E2020ANB03401737
Deposit Account	061050
Authorized User	Cathy O'Brien

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

37 CFR 1.21 (Miscellaneous fees and charges)

Datavant Exhibit 1002

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	Reply.pdf	59675 3ba8381679baf405aa2b605a91f87546def223d1	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	PartB.pdf	122732 f84bdf004f9cb82b8b40d5e1318110d14e585ced	no	1
Warnings:					
Information:					
3		AmendmentAfterAllowance.pdf	71914 f4b30cb054484ef02330af30c2923afa7a27149f	yes	6

Multipart Description/PDF files in .zip description

Document Description	Start	End
Applicant Arguments/Remarks Made in an Amendment	6	6
Claims	2	5
Amendment after Notice of Allowance (Rule 312)	1	1

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30460 5f1de5f18a35b23a9a6ecece5935e3d6f5ecbe6d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	284781		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Application No.	:	16/131,094	Examiner	:	Evans Desrosiers
Filed	:	September 14, 2018	Confirmation No.	:	9792
			Notice of Allowance Date: August 26, 2020		
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO NOTICE OF ALLOWANCE

In response to the Notice of Allowance dated August 26, 2020, enclosed are a completed Part B - Fee(s) Transmittal and an Amendment after Allowance.

The issue fee is being paid with this reply on the Electronic Filing System. Apply those fees and any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

COMMENTS ON EXAMINER'S REASONS FOR ALLOWANCE

It is recognized that in accordance with M.P.E.P. § 1302.14, the Examiner's reasons for allowance need not set forth all of the details as to why the claims are allowed. In the above-referenced application, it is not conceded that the Examiner's stated reasons for allowance are the only reasons for which the claims are allowable. The Examiner's reasons for allowance indicate that particular claim elements are not disclosed or suggested by the prior art of record, yet the claims may be patentable for other reasons as well, including the inventive combination of all of the recited claim elements. It is not conceded that the specific limitations identified by the Examiner are necessary to distinguish the art of record or to satisfy the requirements of 35 U.S.C. § 112. Moreover, the Examiner does not assert, and it would not be conceded, that the Examiner's reasons have any bearing on the patentability of claims in any other applications directed to the disclosed subject matter.

In addition, each dependent claim stands on its own and may be allowable on its own merits. In particular, each dependent claim may be allowable on the basis of a combination of

some of the features recited in the dependent claim and its base claim(s), which combination of features may not include all of the limitations identified in the Examiner's reasons for allowance.

Respectfully submitted,

Date: November 24, 2020

/Christopher Reilly/
Christopher L. Reilly
Reg. No. 74,063

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

24066123.doc

Datavant Exhibit 1002

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22314-1450

By fax, send to: (571) 273-2885

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

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

26161 7590 08/26/2020

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

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

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Cathy A. O'Brien	(Typed or printed name)
/Cathy A. O'Brien/	(Signature)
November 24, 2020	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

TITLE OF INVENTION: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0	$0	$500	11/26/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
DESROSIERS, EVANS	2491	713-168000

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 03-09 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 Fish & Richardson P.C.
2
3

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Vigilytics LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Victor, NY

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

4a. Fees Submitted: [X] Issue Fee [ ] Publication Fee (if required) [ ] Advance Order - # of Copies

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

[X] Electronic Payment via EFS-Web [ ] Enclosed check [ ] Non-electronic payment by credit card (Attach form PTO-2038)

[X] The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account No. 06-1050

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

[ ] Applicant certifying micro entity status. See 37 CFR 1.29 — **NOTE**: Absent a valid Certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

[ ] 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 as a notification of loss of entitlement to micro entity status.

[ ] Applicant changing to regular undiscounted fee status. — **NOTE**: Checking this box will be taken as a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Christopher Reilly/ Date November 24, 2020

Typed or printed name Christopher L. Reilly Registration No. 74,063

24066125.doc

Datavant Exhibit 1002

REMARKS

Applicant has amended claim 40 to correct a typographical error. No new matter was added.

Apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: November 24, 2020

/Christopher Reilly/
Christopher L. Reilly
Reg. No. 74,063

Customer Number 26161
Fish & Richardson P.C.
Telephone: +1 (617) 368-2170
Facsimile: (877) 769-7945

24066406.doc

Listing of Claims (replacing all prior versions):

1 – 20. (Canceled)

21. (Previously Presented) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Previously Presented) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Previously Presented) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Previously Presented) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Previously Presented) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Previously Presented) A system comprising:

a user computing device that produces an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Previously Presented) The system of claim 27, in which the healthcare data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least minimum number of individuals.

33. (Previously Presented) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Previously Presented) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective healthcare data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Previously Presented) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Currently Amended) The computer readable storage devices of claim 34, in which to produce the requested healthcare information ~~includes~~, the server determines if the group includes at least a minimum number of individuals.

41. (Previously Presented) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Previously Presented) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Previously Presented) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

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

26161 7590 08/26/2020
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	
ART UNIT	PAPER NUMBER
2491	

DATE MAILED: 08/26/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

TITLE OF INVENTION: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	11/27/2020

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

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

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed 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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

Datavant Exhibit 1002

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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

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

26161 7590 08/26/2020
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

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

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

TITLE OF INVENTION: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	11/27/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
DESROSIERS, EVANS	2491	713-168000

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 03-09 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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

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

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

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

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Datavant Exhibit 1002

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.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

26161 7590 08/26/2020

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	
ART UNIT	PAPER NUMBER
2491	

DATE MAILED: 08/26/2020

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

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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

Datavant Exhibit 1002

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Datavant Exhibit 1002

Notice of Allowability	Application No. 16/131,094	Applicant(s) Paris, Andrew L.	
	Examiner EVANS DESROSIERS	Art Unit 2491	AIA (FITF) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 06/10/2020.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

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

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

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. 08/18/2020.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/EVANS DESROSIERS/
Primary Examiner, Art Unit 2491

Datavant Exhibit 1002

Continuation of 3. The allowed claim(s) is/are: 21-22,24-28,30-35 and 37-43

Notice of Pre-AIA or AIA Status

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

DETAILED ACTION

This communication is in response to the Applicant's arguments filed on 06/10/2020 in which Claims 21-40 are presented for examination.

Status of claims

Claims 21-43 are pending; of which claims 21-22, 24-28, 30-35, 37-43 are allowed.

Terminal Disclaimer

The terminal disclaimer filed on 06/10/2020 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the US Patent No. 10,109,375 has been reviewed and is accepted. The terminal disclaimer has been recorded.

EXAMINER'S AMENDMENT

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 FR 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 via email on 08/18/2020 by applicant representative Mr. Jeffrey Barclay (Reg. 48,950).

The application has been amended as follows:

1 – 20. (Canceled)

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Proposed Amendment) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Proposed Amendment) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Proposed Amendment) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Proposed Amendment) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Proposed Amendment) A system comprising:

a user computing device that produces an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Proposed Amendment) The system of claim 27, in which the healthcare data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least minimum number of individuals.

33. (Proposed Amendment) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Proposed Amendment) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Proposed Amendment) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective healthcare data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Proposed Amendment) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information includes, the server determines if the group includes at least a minimum number of individuals.

41. (Newly Proposed) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Newly Proposed) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Newly Proposed) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

REASON FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: None of the prior arts of record individually or in combination explicitly teach or fairly suggest the each and every claimed limitation of the current invention as amended by the applicant, especially the independent claim include "receiving a request message for healthcare information that characterizes a group composed of a number of individuals, wherein the request message for healthcare information is sent to an encryption server that is configured to determine if the number of individuals in the request is at least a defined minimum number of individuals, and wherein the request message includes a batch number and at least one report option; producing, by a processor of an encryption server, a unique request token from identifying data for each individual included in the group , wherein the request tokens are encrypted before being transmitted over a network"; in combination with all the elements of each independent claim as amended by Applicant on 08/18/2020. The claim has been considered persuasive, in light of its limitations, as well as enabling portions of the specification.

The dependent claims further limit the independent claims and are considered allowable on the same basis as the independent claims as well as for the further limitations set forth.

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EVANS DESROSIERS whose telephone number is (571)270-5438. The examiner can normally be reached on Monday -Thursday 7:00 am - 5:30 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ashok B. Patel can be reached on 5712723972. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/EVANS DESROSIERS/
Primary Examiner, Art Unit 2491

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	16/131,094	Paris, Andrew L.	
	Examiner	Art Unit	AIA (FITF) Status
	EVANS DESROSIERS	2491	No

All participants (applicant, applicant's representative, PTO personnel):

(1) EVANS DESROSIERS. (3) _____.

(2) Jeffrey Barclay. (4) _____.

Date of Interview: 18 August 2020.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☑ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 21.

Identification of prior art discussed: N/A.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Amendments have been prepared by the Examiner (See attached) and reached out to Applicant representative and proposed the amendments to Applicant representative Mr. Jeffrey Barclay In response, the Applicant representative agreed with the Examiner's amendments and authorized the Examiner's to enter the amendment in order to place the application in condition for allowance..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☑ Attachment

/EVANS DESROSIERS/ Primary Examiner, Art Unit 2491	

Datavant Exhibit 1002

Notice of References Cited	Application/Control No. 16/131,094	Applicant(s)/Patent Under Reexamination Paris, Andrew L.	
	Examiner EVANS DESROSIERS	Art Unit 2491	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20090024416-A1	01-2009	McLaughlin; Mark R.	G16H10/65	705/3
*	B	US-20060229919-A1	10-2006	Pugh; Timothy	G06Q50/24	705/3
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

Datavant Exhibit 1002

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	**Art Unit**
	EVANS DESROSIERS	2491

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

CLAIMS

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

CLAIM		DATE								
Final	Original	02/10/2020	08/19/2020							
-	1	-	-							
-	2	-	-							
-	3	-	-							
-	4	-	-							
-	5	-	-							
-	6	-	-							
-	7	-	-							
-	8	-	-							
-	9	-	-							
-	10	-	-							
-	11	-	-							
-	12	-	-							
-	13	-	-							
-	14	-	-							
-	15	-	-							
-	16	-	-							
-	17	-	-							
-	18	-	-							
-	19	-	-							
-	20	-	-							
1	21	✓	=							
2	22	✓	=							
-	23	✓	-							
3	24	✓	=							
4	25	✓	=							
5	26	✓	=							
7	27	✓	=							
8	28	✓	=							
-	29	✓	-							
9	30	✓	=							
10	31	✓	=							
11	32	✓	=							
12	33	✓	=							
14	34	✓	=							
15	35	✓	=							
-	36	✓	-							
16	37	✓	=							
17	38	✓	=							
18	39	✓	=							
19	40	✓	=							
6	41		=							
13	42		=							

Datavant Exhibit 1002

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	**Art Unit**
	EVANS DESROSIERS	2491

CLAIM		DATE								
Final	Original	02/10/2020	08/19/2020							
20	43		=							

Datavant Exhibit 1002

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	Art Unit
	EVANS DESROSIERS	2491

CPC - Searched*		
Symbol	Date	Examiner
H04L63/08 H04L63/08 H04L9/08	02/10/2020	ED
H04L63/08 H04L63/08 H04L9/08	08/19/2020	ED

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
713	168	02/10/2020	ED
713	168	08/19/2020	ED

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST	02/10/2020	ED
INVENTORS	02/10/2020	ED
GOOGLE	02/10/2020	ED
EAST	08/19/2020	ED
INVENTORS	08/19/2020	ED
GOOGLE		

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	Art Unit
	EVANS DESROSIERS	2491

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
713	168	08/19/2020	ED
H04L	63/08	08/19/2020	ED

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	**Art Unit**
	EVANS DESROSIERS	2491

CPC								
Symbol							**Type**	**Version**
G16H	/	10	/	60			F	2018-01-01

CPC Combination Sets									
Symbol							**Type**	**Set**	**Ranking**	**Version**
	/		/							

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/EVANS DESROSIERS/ Primary Examiner, Art Unit 2491	19 August 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	21	1

U.S. Patent and Trademark Office

Part of Paper No.: 20200819

Datavant Exhibit 1002

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	**Art Unit**
	EVANS DESROSIERS	2491

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04L	/	29	/	06

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/EVANS DESROSIERS/ Primary Examiner, Art Unit 2491	19 August 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	21	1

Datavant Exhibit 1002

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	**Art Unit**
	EVANS DESROSIERS	2491

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
-	1	-	10	-	19	8	28	16	37						
-	2	-	11	-	20	-	29	17	38						
-	3	-	12	1	21	9	30	18	39						
-	4	-	13	2	22	10	31	19	40						
-	5	-	14	-	23	11	32	6	41						
-	6	-	15	3	24	12	33	13	42						
-	7	-	16	4	25	14	34	20	43						
-	8	-	17	5	26	15	35								
-	9	-	18	7	27	-	36								

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/EVANS DESROSIERS/ Primary Examiner, Art Unit 2491	19 August 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	21	1

Datavant Exhibit 1002

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	40	("20020016923" | "20030154405" | "20040078236" | "20050119941" | "20050177050" | "20050267782" | "20060089857" | "20070033419" | "20070106752" | "20070106753" | "20070130465" | "20070157297" | "20070185737" | "20080040151" | "20080071577" | "20080137848" | "20080281631" | "20080304663" | "20080306952" | "20090171692" | "20090257586" | "20100217973" | "20100325148" | "20110196704" | "20110231422" | "20110255690" | "20120246661" | "5721777" | "5956400" | "6302844" | "6874085" | "6947561" | "7650628" | "7716487" | "8037052" | "8055910" | "8108355" | "8131646" | "8229742" | "8296341").PN.	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:54
L2	14	("9479490" | "8286228" | "7747540" | "20120291114" | "20120170750" | "20120159588" | "20110282940" | "20100274910" | "20080028215" | "20070143860" | "20060242210" | "20060155993" | "20050165698" | "20040267870").PN.	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57
L3	2	L2 and (address near5 book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L4	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L5	0	(identif$5 near5 conatct near5 address near5 book) with identifier	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L6	0	(identif$5 near5 conatct) same (address near5 book) with identifier	US-PGPUB; USPAT; USOCR;	OR	OFF	2020/08/19 08:57

			FPRS; EPO; JPO; IBM_TDB			
L7	1,922	conatct nea5 (address adj book) with identifier	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L8	270	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L9	208	L8 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L10	125,818	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L11	81,146	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L12	16	L9 and L10	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L13	16	L9 and L12	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L14	7	L9 and L11	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L15	21	L7 and (authoriz$5 near5 access$5 near5 (address adj book))	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L16	16	L15 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR;	OR	OFF	2020/08/19 08:57

			FPRS; EPO; JPO; IBM_TDB			
L17	1,379	((contact nea5 (address adj book) with identifier) same ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L18	0	((contact near5 (address adj book) with identifier) same ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L19	5	((contact near5 (address adj book) with identifier) and ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L20	24	((expos$3 reveal$3 un$1cover) near5 contact near5 information) same (address adj book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L21	23	L20 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L22	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L23	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L24	125,818	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57
L25	81,146	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2020/08/19 08:57

L26	270	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L27	24	((expos$3 reveal$3 un$1cover) near5 contact near5 information) same (address adj book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L28	0	L26 and L27	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L29	7	L24 and L25 and L26	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
L30	7	L29 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/08/19 08:57
S1	14	("9479490" | "8286228" | "7747540" | "20120291114" | "20120170750" | "20120159588" | "20110282940" | "20100274910" | "20080028215" | "20070143860" | "20060242210" | "20060155993" | "20050165698" | "20040267870").PN.	US-PGPUB; USPAT	OR	OFF	2017/07/19 07:46
S2	2	S1 and (address near5 book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 07:54
S3	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 08:03
S4	0	(identif$5 near5 conatct near5 address near5 book) with identifier	US-PGPUB; USPAT;	OR	OFF	2017/07/19 08:09

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S5	0	(identif$5 near5 conatct) same (address near5 book) with identifier	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 08:10
S6	1,587	conatct nea5 (address adj book) with identifier	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 08:11
S7	206	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 08:12
S8	185	S7 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 08:13
S9	114,678	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 08:46
S10	48,988	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 08:55
S11	16	S8 and S9	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 08:56
S12	16	S8 and S11	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 09:02
S13	7	S8 and S10	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 09:03

S14	18	S6 and (authoriz$5 near5 access$5 near5 (address adj book))	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/19 09:07
S15	15	S14 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 09:07
S16	1,101	((contact nea5 (address adj book) with identifier) same ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 11:37
S17	0	((contact near5 (address adj book) with identifier) same ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 11:37
S18	4	((contact near5 (address adj book) with identifier) and ((expos$3 reveal$3 un$1cover) near5 contact near5 information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 11:37
S19	20	((expos$3 reveal$3 un$1cover) near5 contact near5 information) same (address adj book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 13:09
S20	19	S19 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/19 13:10
S21	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2018/01/22 11:42
S22	2	("20170104747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2018/01/29 19:25

S23	116,939	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2018/01/29 19:32
S24	53,512	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2018/01/29 19:32
S25	220	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2018/01/29 19:32
S26	20	((expos$3 reveal$3 un$1cover) near5 contact near5 information) same (address adj book)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2018/01/29 19:33
S27	0	S25 and S26	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2018/01/29 19:37
S28	7	S23 and S24 and S25	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2018/01/29 19:37
S29	7	S28 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2018/01/29 19:37

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L31	51,512	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57

L32	77	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57
L33	80,894	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57
L34	7	L31 and L32 and L33	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57
L35	7	L34 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT	OR	OFF	2020/08/19 08:57
S30	36,522	(G06F21/31 H04L63/08 H04L63/083).CPC.	US-PGPUB; USPAT	OR	OFF	2018/01/29 19:38
S31	65	(conatct nea5 (address adj book) with identifier).ab.	US-PGPUB; USPAT	OR	OFF	2018/01/29 19:38
S32	80,745	713/168-174,182-186,202.ccls. 709/206,225,229,249,389.ccls. 726/2-8.ccls.	US-PGPUB; USPAT	OR	OFF	2018/01/29 19:39
S33	7	S30 and S31 and S32	US-PGPUB; USPAT	OR	OFF	2018/01/29 19:39
S34	7	S33 and (@pd or @ptad or @prad or @ad or @rlad)<"20130607"	US-PGPUB; USPAT	OR	OFF	2018/01/29 19:40

8/19/2020 9:12:20 AM
C:\Users\edesrosiers\Documents\EAST\Workspaces\16131094.wsp

Desrosiers, Evans

From: Jeffrey Barclay <Barclay@fr.com>
Sent: Wednesday, August 19, 2020 11:09 AM
To: Desrosiers, Evans
Cc: Cathy O'Brien; APS Outgoing; Jeffrey Barclay
Subject: Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)
Attachments: Proposed claim amendment for US Application Serial No 16_131094 (FR 25412-0002003) 19 August 2020.docx

Examiner Desrosiers,

Thank you again for our telephone conversation yesterday.

Please find attached one MS-Word document that contains an updated claim set that includes the amendments we discussed.
Additionally, the updated claim set includes a small adjustment to two dependent claims.
I just left you a voicemail message regarding the claims.
If helpful, please call me at any time.

Thank you again for your time in this matter,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

****
This email message is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized use or disclosure is prohibited. If you are not the intended recipient, please contact the sender by reply email and destroy all copies of the original message.
****

Datavant Exhibit 1002

Proposed claim amendments for US Patent Application No. 16/131,094
(F&R matter 25412-0002003)

1 – 20. (Canceled)

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Proposed Amendment) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Proposed Amendment) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Proposed Amendment) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Proposed Amendment) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Proposed Amendment) A system comprising:

a user computing device that produces an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Proposed Amendment) The system of claim 27, in which the healthcare data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least minimum number of individuals.

33. (Proposed Amendment) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Proposed Amendment) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Proposed Amendment) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective healthcare data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Proposed Amendment) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information includes, the server determines if the group includes at least a minimum number of individuals.

41. (Newly Proposed) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Newly Proposed) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Newly Proposed) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2491

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	1.	2002/0016923	02/2002	Knaus			
	2.	2003/0154405	08/2003	Harrison			
	3.	2004/0078236	04/2004	Stoodley			
	4.	2005/0119941	06/2005	James			
	5.	2005/0267782	12/2005	Zahlmann			
	6.	2005/0177050	08/2005	Cohen			
	7.	2006/0089857	04/2006	Zimmerman			
	8.	2007/0033419	02/2007	Kocher			
	9.	2007/0106752	05/2007	Moore			
	10.	2007/0106753	05/2007	Moore			
	11.	2007/0130465	06/2007	Zeng			
	12.	2007/0157297	07/2007	Patrick			
	13.	2007/0185737	08/2007	Friedlander			
	14.	2008/0040151	02/2008	Moore			
	15.	2008/0071577	03/2008	Highley			
	16.	2008/0137848	06/2008	Kocher			
	17.	2008/0281631	11/2008	Syth			
	18.	2008/0304663	12/2008	Canarad			
	19.	2008/0306952	12/2008	Lynn			
	20.	2009/0171692	07/2009	Zilberman			
	21.	2009/0257586	10/2009	Takahashi			
	22.	2010/0217973	08/2010	Kress			
	23.	2010/0325148	12/2010	Anderson			
	24.	2011/0196704	08/2011	Mansour			
	25.	2011/0231422	09/2011	Rawlings			
	26.	2011/0255690	10/2011	Kocher			
	27.	2012/0246661	09/2012	Nishimura			

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.L./

Datavant Exhibit 1002

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2491

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	28.	5,721,777	02/1998	Blaze			
	29.	5,956,400	09/1999	Chaum			
	30.	6,302,844	10/2001	Walker			
	31.	6,874,085	03/2005	Koo			
	32.	6,947,561	09/2005	Faber			
	33.	7,650,628	01/2010	Zimmerman			
	34.	7,716,487	05/2010	Venkatesan			
	35.	8,037,052	10/2011	Kariathungal			
	36.	8,055,910	11/2011	Kocher			
	37.	8,108,355	01/2012	Zhang			
	38.	8,131,646	03/2012	Kocher			
	39.	8,229,742	07/2012	Zimmerman			
	40.	8,296,341	10/2012	Hagan			

Foreign Patent Documents or Published Foreign Patent Applications							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	41.	CA 2760773	11/11/2010	Canada			
	42.	WO 2007/108814	09/27/2007	WIPO			
	43.	WO 2010/129653	11/11/2010	WIPO			

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.D/

Examiner Signature	Date Considered
/EVANS DESROSIERS/	08/19/2020

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.D/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Application No.	:	16/131,094	Examiner	:	Evans Desrosiers
Filed	:	September 14, 2018	Conf. No.	:	9792
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

INTERVIEW SUMMARY

The undersigned again appreciates Examiner Evans Desrosiers and his time for taking part in the series of telephone conversations with the undersigned between 22 July 2020 and 28 July 2020, and on 18 August 2020. As discussed during the conversation on 28 July 2020, a complete claim set was prepared and sent to the Examiner in an electronic mail message. This claim set includes the amendments to independent claim 21, 27, and 34 along with amendments to dependent claims and some newly proposed dependent claims. An attached appendix contains the electronic mail message sent to the Examiner and amended claim set that was attached to the electronic mail message. The undersigned also thanks Examiner Desrosiers for his time and for the follow-up telephone conversation on 28 July 2020. During that conversation, the Examiner indicated an additional amendment would place the application in condition for allowance. On 18 August 2020, the Undersigned and Examiner Desrosiers further discussed the pending claims, and the Undersigned sent an electronic mail message to the Examiner that contained a complete claim set. On 19 August 2020 the Undersigned sent a follow-up electronic mail message to the Examiner that contained the complete claim set and an amendment to two dependent claims. Each of these electronic mail messages are also included in the appendix.

Respectfully submitted,

Date: 19 August 2020

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay
Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

From:	Jeffrey Barclay
Sent:	Tuesday, July 28, 2020 11:59 AM
To:	evans.desrosiers@uspto.gov
Cc:	Cathy O'Brien; APS Outgoing; Jeffrey Barclay
Subject:	Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)
Attachments:	Proposed claim amendment for US Application Serial No 16_131,094 (F&R 25412-0002003).docx

Examiner Desrosiers,

Thank you again for our telephone conversation this morning.

Please find attached one MS-Word document that contains a proposed claim set including the amendments we briefly discussed this morning.
I will plan to call you in one hour (1 PM east coast time) to discuss the claims (or to set up a time with you to discuss the claims).

Thanks again for your time in this matter,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

Datavant Exhibit 1002

Proposed claim amendments for US Patent Application No. 16/131,094
(F&R matter 25412-0002003)

1 – 20. (Canceled)

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group;

sending the request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Proposed Amendment) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Proposed Amendment) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Proposed Amendment) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Proposed Amendment) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Proposed Amendment) A system comprising:

a user computing device that produces a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Previously Presented) The system of claim 27, in which the data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least a minimum number of individuals.

33. (Proposed Amendment) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Proposed Amendment) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group;

sending the request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Proposed Amendment) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information includes, the server determines if the group includes at least a minimum number of individuals.

41. (Newly Proposed) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Newly Proposed) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Newly Proposed) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

From: Jeffrey Barclay
Sent: Tuesday, July 28, 2020 1:37 PM
To: evans.desrosiers@uspto.gov
Cc: Cathy O'Brien; APS Outgoing; Jeffrey Barclay
Subject: RE: Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)

Examiner Desrosiers,

Thank you for your recent telephone call.

Below find below, the proposed amendment that we briefly discussed:

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

To continue our conversation, I will call you right now.

Thanks again for all your time,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

From: Jeffrey Barclay
Sent: Tuesday, July 28, 2020 11:59 AM
To: 'evans.desrosiers@uspto.gov' <evans.desrosiers@uspto.gov>
Cc: Cathy O'Brien <OBrien@fr.com>; 'APS Outgoing' <APSO@fr.com>; Jeffrey Barclay <Barclay@fr.com>
Subject: Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)

Examiner Desrosiers,

Datavant Exhibit 1002

Thank you again for our telephone conversation this morning.

Please find attached one MS-Word document that contains a proposed claim set including the amendments we briefly discussed this morning.
I will plan to call you in one hour (1 PM east coast time) to discuss the claims (or to set up a time with you to discuss the claims).

Thanks again for your time in this matter,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

Datavant Exhibit 1002

From:	Jeffrey Barclay
Sent:	Tuesday, August 18, 2020 8:21 PM
To:	evans.desrosiers@uspto.gov
Cc:	Cathy O'Brien; APS Outgoing; Jeffrey Barclay
Subject:	Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)
Attachments:	Proposed claim amendment for US Application Serial No 16_131,094 (FR 25412-0002003).docx

Examiner Desrosiers,

Thank you again for our telephone conversation this afternoon.

Please find attached one MS-Word document that contains a complete claim set that includes the amendments we discussed.
As we briefly covered, I will call in the morning to check with you about these claim amendments.

Thanks again for your time in this matter,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

Datavant Exhibit 1002

Proposed claim amendments for US Patent Application No. 16/131,094
(F&R matter 25412-0002003)

1 – 20. (Canceled)

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Proposed Amendment) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Proposed Amendment) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Proposed Amendment) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Proposed Amendment) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Proposed Amendment) A system comprising:

a user computing device that produces an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Previously Presented) The system of claim 27, in which the data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least a minimum number of individuals.

33. (Proposed Amendment) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Proposed Amendment) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Proposed Amendment) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information includes, the server determines if the group includes at least a minimum number of individuals.

41. (Newly Proposed) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Newly Proposed) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Newly Proposed) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

From:	Jeffrey Barclay
Sent:	Wednesday, August 19, 2020 11:09 AM
To:	evans.desrosiers@uspto.gov
Cc:	Cathy O'Brien; APS Outgoing; Jeffrey Barclay
Subject:	Proposed claim set for US Patent Application Serial No. 16/131,094 (F&R 25412-0002003)
Attachments:	Proposed claim amendment for US Application Serial No 16_131094 (FR 25412-0002003) 19 August 2020.docx

Examiner Desrosiers,

Thank you again for our telephone conversation yesterday.

Please find attached one MS-Word document that contains an updated claim set that includes the amendments we discussed.
Additionally, the updated claim set includes a small adjustment to two dependent claims.
I just left you a voicemail message regarding the claims.
If helpful, please call me at any time.

Thank you again for your time in this matter,

Jeff

Jeffrey Barclay :: Principal
Fish & Richardson P.C.
+1-617-368-2191 direct :: Barclay@fr.com
fr.com

Datavant Exhibit 1002

Proposed claim amendments for US Patent Application No. 16/131,094
(F&R matter 25412-0002003)

1 – 20. (Canceled)

21. (Proposed Amendment) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Proposed Amendment) The user computing device implemented method of claim 21, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Proposed Amendment) The user computing device implemented method of claim 21, in which to produce the requested healthcare information, the server encrypts respective data that identifies each individual.

25. (Proposed Amendment) The user computing device implemented method of claim 21, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Proposed Amendment) The user computing device implemented method of claim 21, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

27. (Proposed Amendment) A system comprising:

a user computing device that produces an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Proposed Amendment) The system of claim 27, in which the healthcare data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Previously Presented) The system of claim 27, in which the server provides the requested healthcare information if the group includes at least minimum number of individuals.

33. (Proposed Amendment) The system of claim 27, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

34. (Proposed Amendment) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, an encrypted request message for healthcare information that characterizes a group composed of multiple individuals, the encrypted request message including a unique token produced by the user device for each individual included in the group;

sending the encrypted request message to a server to produce the healthcare information, the server is configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the unique tokens associated with healthcare data are absent identities of individuals, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Proposed Amendment) The computer readable storage devices of claim 34, in which to produce the requested healthcare information, the server encrypts respective healthcare data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Proposed Amendment) The computer readable storage devices of claim 34, in which the healthcare data includes data that represents medical related information associated with the individuals of the group.

40. (Previously Presented) The computer readable storage devices of claim 34, in which to produce the requested healthcare information includes, the server determines if the group includes at least a minimum number of individuals.

41. (Newly Proposed) The user computing device implemented method of claim 21, wherein the server removes the identities of the individuals from the healthcare data.

42. (Newly Proposed) The system of claim 27, wherein the server removes the identities of the individuals from the healthcare data.

43. (Newly Proposed) The computer readable storage devices of claim 34, wherein the server removes the identities of the individuals from the healthcare data.

Electronic Acknowledgement Receipt

EFS ID:	40326217
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Jeffrey J. Barclay/Cathy O'Brien
Filer Authorized By:	Jeffrey J. Barclay
Attorney Docket Number:	25412-0002003
Receipt Date:	19-AUG-2020
Filing Date:	14-SEP-2018
Time Stamp:	13:16:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant summary of interview with examiner	InterviewSummary.pdf	304220 1faaf2ec4c18b6908315f81a8c1e1bf1d2d08788	no	18

Warnings:

Datavant Exhibit 1002

Information:	
Total Files Size (in bytes):	304220

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.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 16/131,094 *	16/131,094	Paris, Andrew L.	
	Examiner	**Art Unit**	
	DESROSIERS, EVANS	2491	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: 10 June 2020	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/TRINA STEPTOE/

Technology Center: OPLC

Telephone: (571)272-2577

2 TD`s

Datavant Exhibit 1002

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2491

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	1.	2002/0016923	02/2002	Knaus			
	2.	2003/0154405	08/2003	Harrison			
	3.	2004/0078236	04/2004	Stoodley			
	4.	2005/0119941	06/2005	James			
	5.	2005/0267782	12/2005	Zahlmann			
	6.	2005/0177050	08/2005	Cohen			
	7.	2006/0089857	04/2006	Zimmerman			
	8.	2007/0033419	02/2007	Kocher			
	9.	2007/0106752	05/2007	Moore			
	10.	2007/0106753	05/2007	Moore			
	11.	2007/0130465	06/2007	Zeng			
	12.	2007/0157297	07/2007	Patrick			
	13.	2007/0185737	08/2007	Friedlander			
	14.	2008/0040151	02/2008	Moore			
	15.	2008/0071577	03/2008	Highley			
	16.	2008/0137848	06/2008	Kocher			
	17.	2008/0281631	11/2008	Syth			
	18.	2008/0304663	12/2008	Canarad			
	19.	2008/0306952	12/2008	Lynn			
	20.	2009/0171692	07/2009	Zilberman			
	21.	2009/0257586	10/2009	Takahashi			
	22.	2010/0217973	08/2010	Kress			
	23.	2010/0325148	12/2010	Anderson			
	24.	2011/0196704	08/2011	Mansour			
	25.	2011/0231422	09/2011	Rawlings			
	26.	2011/0255690	10/2011	Kocher			
	27.	2012/0246661	09/2012	Nishimura			

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Datavant Exhibit 1002

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2491

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	28.	5,721,777	02/1998	Blaze			
	29.	5,956,400	09/1999	Chaum			
	30.	6,302,844	10/2001	Walker			
	31.	6,874,085	03/2005	Koo			
	32.	6,947,561	09/2005	Faber			
	33.	7,650,628	01/2010	Zimmerman			
	34.	7,716,487	05/2010	Venkatesan			
	35.	8,037,052	10/2011	Kariathungal			
	36.	8,055,910	11/2011	Kocher			
	37.	8,108,355	01/2012	Zhang			
	38.	8,131,646	03/2012	Kocher			
	39.	8,229,742	07/2012	Zimmerman			
	40.	8,296,341	10/2012	Hagan			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	41.	CA 2760773	11/11/2010	Canada			
	42.	WO 2007/108814	09/27/2007	WIPO			
	43.	WO 2010/129653	11/11/2010	WIPO			

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Datavant Exhibit 1002

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/131,094	06/10/2020 05:57:16 PM ET	25412-0002003

Title of Invention

DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9792	FILED BY	Cathy O'Brien
PATENT CENTER #	60036143	AUTHORIZED BY	Jeffrey Barclay
CUSTOMER #	26161	FILING DATE	09/14/2018
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Andrew Paris III

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
DA / 061050	E202060H58301290	Cathy O'Brien

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
061050	37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	100.00	1	100.00
2806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	120.00	1	120.00
2814	STATUTORY DISCLAIMER, INCLUDING TERMINAL DISCLAIMER	160.00	2	320.00
			TOTAL AMOUNT:	$540.00

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 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.

Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2760773 A1 2010/11/11

(21) 2 760 773

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2010/05/05
(87) Date publication PCT/PCT Publication Date: 2010/11/11
(85) Entrée phase nationale/National Entry: 2011/11/02
(86) N° demande PCT/PCT Application No.: US 2010/033695
(87) N° publication PCT/PCT Publication No.: 2010/129653
(30) Priorité/Priority: 2009/05/05 (US61/175,538)

(51) Cl.Int./Int.Cl. *A61B 5/00* (2006.01)
(71) Demandeur/Applicant:
INGENIX, INC., US
(72) Inventeur/Inventor:
ANDERSON, DAVID R., US
(74) Agent: BERESKIN & PARR LLP/S.E.N.C.R.L.,S.R.L.

(54) Titre : SYSTEME ET PROCEDE POUR L'EVALUATION RAPIDE DE REPARTITIONS DE VALEURS DE LABORATOIRE
(54) Title: SYSTEM AND METHOD FOR RAPID ASSESSMENT OF LAB VALUE DISTRIBUTIONS

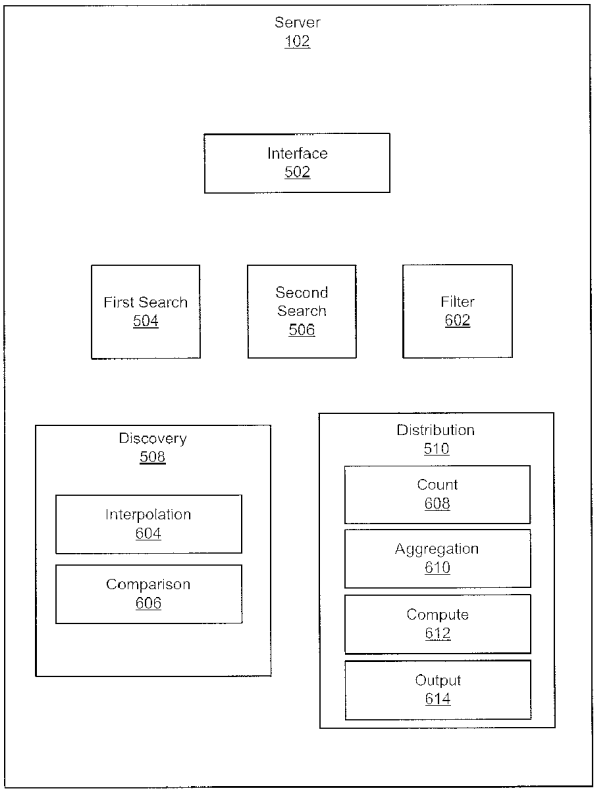


FIG. 6

(57) Abrégé/Abstract:
System and methods for rapid assessment of lab value distributions are provided. In one embodiment, the system includes a data storage device and a server. The data storage device may be configured to store a database comprising one or more records,

(21) 2 760 773

(13) A1

(57) Abrégé(suite)/Abstract(continued):
wherein the records are identified by one or more test codes. The server may receive a medical code, search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records.

Datavant Exhibit 1002

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 November 2010 (11.11.2010)

PCT

(10) International Publication Number
WO 2010/129653 A1

(51) International Patent Classification:
A61B 5/00 (2006.01)

(21) International Application Number:
PCT/US2010/033695

(22) International Filing Date:
5 May 2010 (05.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/175,538 5 May 2009 (05.05.2009) US

(71) Applicant *(for all designated States except US)*: **INGENIX, INC.** [US/US]; Mail Route MN002-0245, 12125 Technology Drive, Eden Prairie, MN 55344 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **ANDERSON, David, R.** [US/US]; 2330 Manuela Drive, Chaska, MN 55318 (US).

(74) Agent: **DHARIA, Anuj**; Fulbright & Jaworski L.L.P., 600 Congress Ave., Suite 2400, Austin, TX 78701 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR RAPID ASSESSMENT OF LAB VALUE DISTRIBUTIONS

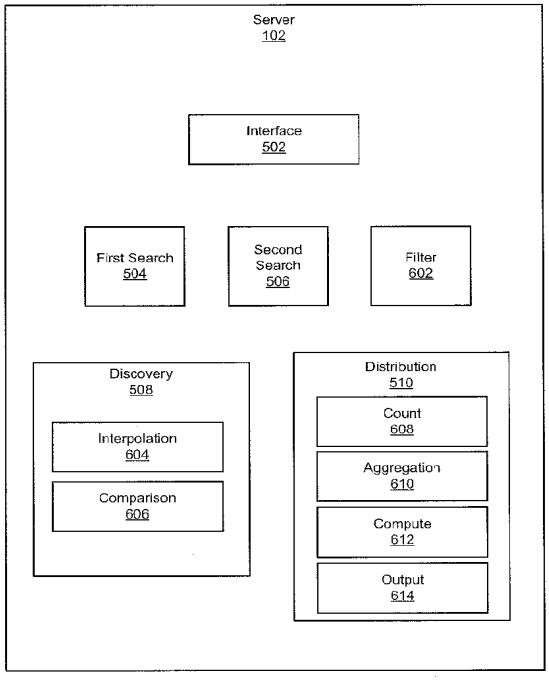


FIG. 6

(57) Abstract: System and methods for rapid assessment of lab value distributions are provided. In one embodiment, the system includes a data storage device and a server. The data storage device may be configured to store a database comprising one or more records, wherein the records are identified by one or more test codes. The server may receive a medical code, search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records.

WO 2010/129653 A1

WO 2010/129653 A1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

Datavant Exhibit 1002

DESCRIPTION

SYSTEM AND METHOD FOR RAPID ASSESSMENT OF LAB VALUE DISTRIBUTIONS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 61/175,538 filed May 5, 2009, the entire contents of which is specifically incorporated herein by reference without disclaimer.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] This invention relates to health related data analysis and more particularly relates to a system and method for rapid assessment of lab value distributions between comparison groups.

DESCRIPTION OF THE RELATED ART

[0003] Most corporations, including health insurance corporations, maintain a high volume of data. Such data may be analyzed and exploited for valuable information regarding business trends, and other important statistics. Data mining is a common strategy for identifying and analyzing such data.

[0004] There are many various forms of data mining. Custom analytic operations may be developed to meet specific needs. Alternatively, commercially available statistical analysis tools, such as Statistical Analysis Software (SAS) may be used to identify statistical trends in data.

[0005] Health insurance companies typically maintain databases of health insurance claim information, demographic information, and other data about health insurance plan members. Such information may be used to gain valuable insights into early disease diagnosis, relationship between lab tests and diseases or drug treatments, and disease severity. Unfortunately, typical methods for analyzing such data are often cumbersome, costly, and require unworkably high processing times and resources.

[0006] The referenced shortcomings are not intended to be exhaustive, but rather are among many that tend to impair the effectiveness of previously known techniques in disease

Datavant Exhibit 1002

management, diagnosis and treatment; however, those mentioned here are sufficient to demonstrate that the methodologies appearing in the art have not been satisfactory and that a significant need exists for the techniques described and claimed in this disclosure.

SUMMARY OF THE INVENTION

[0007] From the foregoing discussion, it should be apparent that a need exists for a system and method to rapidly analyze, discover, and summarize differences in lab value distribution between comparison groups, particularly in any temporal context of any temporal attribute.

[0008] A system is presented for rapid assessment of lab value distributions. In one embodiment, the system includes a data storage device configured to store a database comprising one or more records, wherein the records are identified by one or more test codes. The system may also include a server in data communication with the data storage device. The server may be suitably programmed to receive a medical code (where lab values may include a range of interest), search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records.

[0009] In one embodiment, the server may compare a first value representing the first group and a second value representing the second group of records. In a further embodiment, the server may interpolate the first group of records to obtain the first value and to interpolate the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile, such as 5%, 32%, 50%, 95%, or any intermediate percentile. For example, values of median in both groups may be compared.

[0010] In a certain embodiment, the server may count distinct records in the first group of records and the second group of records. The server may also aggregate records from the first group and from the second group according to a selected attribute, such as a selected range of test values, and/or compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

Datavant Exhibit 1002

[0011] The server may further select the first group of records from within a time interval, such as a time span (*e.g.*, about 30 days) before or after of initial diagnosis or disease onset. In a further embodiment, the server may select records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter.

[0012] A method is also presented for comparing two groups of records to analyze their distribution discrepancy. In one embodiment, the method includes receiving a medical code, searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generating an output comprising a distribution graph on a shared scale from the first and second group of records. The method in the disclosed embodiments substantially includes the steps necessary to carry out the functions presented above with respect to the operation of the system of the present invention.

[0013] The method may further include comparing a first value representing the first group and a second value representing the second group of records. Additionally, the method may also include interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile, such as any intermediate percentile from5%-95%, or. In a particular embodiment, median-associated values may be compared.

[0014] In a certain embodiment, the method may include counting distinct records in the first group of records and the second group of records. The method may also include aggregating records from the first group and from the second group according to a selected attribute, such a test value or range. In a still another embodiment, the method may also comprise computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

[0015] To process records at any temporal interval related to a disease, the method may further comprise selecting the first group of records from within a time interval. Such a time interval may be relative to the date or time of the individual's first occurrence of the disease associated with medical code or the date or time when the individual is first diagnosed. In a still

Datavant Exhibit 1002

further embodiment, the method may comprise selecting records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter, age, gender, or the like.

[0016] There may be also provided a tangible computer program product comprising a computer readable medium having computer usable program code executable to perform operations comprising: receiving a medical code; searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code; searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and generating an output comprising a distribution graph on a shared scale from the first and second group of records.

[0017] The operations may further include comparing a first value representing the first group and a second value representing the second group of records. Moreover, the operations may include interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

[0018] In a certain embodiment, the operations may include counting distinct records in the first group of records and the second group of records. The operations may also include aggregating records from the first group and from the second group according to a selected attribute. In still another embodiment, the operations may also include computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

[0019] For a temporal analysis, the operations may further comprise selecting the first group of records from within a time interval. In a still further embodiment, the operations may also include selecting records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter, age, gender, or the like.

[0020] For a record with multiple lab test values, the record could comprise an average, a first reading or a last reading of a test. To further analyze disease-associated parameters, each record in the first group of records may share a limiting criterion with each record in the second group of records, for example, those records in the first and second group may have the same age range,

Datavant Exhibit 1002

gender, or geographic residence. Furthermore, the control population could be a normal group or a cohort group. In certain aspects, the distribution graph may be a histogram or any format suitable for presenting a distribution.

[0021] The term "associated" is referred to as connected or related. The term "coupled" is defined as connected, although not necessarily directly, and not necessarily mechanically.

[0022] The terms "a" and "an" are defined as one or more unless this disclosure explicitly requires otherwise.

[0023] The term "substantially" and its variations are defined as being largely but not necessarily wholly what is specified as understood by one of ordinary skill in the art, and in one non-limiting embodiment "substantially" refers to ranges within 10%, preferably within 5%, more preferably within 1%, and most preferably within 0.5% of what is specified.

[0024] The terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has" and "having"), "include" (and any form of include, such as "includes" and "including") and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method or device that "comprises," "has," "includes" or "contains" one or more steps or elements possesses those one or more steps or elements, but is not limited to possessing only those one or more elements. Likewise, a step of a method or an element of a device that "comprises," "has," "includes" or "contains" one or more features possesses those one or more features, but is not limited to possessing only those one or more features. Furthermore, a device or structure that is configured in a certain way is configured in at least that way, but may also be configured in ways that are not listed.

[0025] Other features and associated advantages will become apparent with reference to the following detailed description of specific embodiments in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The following drawings form part of the present specification and are included to further demonstrate certain aspects of the present invention. The invention may be better

Datavant Exhibit 1002

understood by reference to one or more of these drawings in combination with the detailed description of specific embodiments presented herein.

[0027] FIG. 1 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0028] FIG. 2 is a schematic block diagram illustrating one embodiment of a database system for rapid assessment of lab value distributions;

[0029] FIG. 3 is a schematic block diagram illustrating one embodiment of a computer system that may be used in accordance with certain embodiments of the system for rapid assessment of lab value distributions;

[0030] FIG. 4 is a schematic logical diagram illustrating one embodiment of abstraction layers of operation in a system for rapid assessment of lab value distributions;

[0031] FIG. 5 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0032] FIG. 6 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0033] FIG. 7 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0034] FIG. 8 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0035] FIG. 9 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0036] FIG. 10 is an output illustrating one embodiment of discovery results generated by rapid assessment of lab value distributions;

[0037] FIG. 11 is an output illustrating one embodiment of distribution results generated by rapid assessment of lab value distributions;

Datavant Exhibit 1002

[0038] FIG. 12 is an example of linear interpolation which may be used for rapid assessment of lab value distributions;

[0039] FIG. 13 is an output illustrating one embodiment of discovery results generated by rapid assessment of lab value distributions;

[0040] FIG. 14 is an output illustrating one embodiment of distribution results generated by rapid assessment of lab value distributions;

[0041] FIG. 15 is a screen-shot diagram illustrating one embodiment of a graphical user interface for rapid assessment of lab value distributions.

DETAILED DESCRIPTION

[0042] Various features and advantageous details are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well known starting materials, processing techniques, components, and equipment are omitted so as not to unnecessarily obscure the invention in detail. It should be understood, however, that the detailed description and the specific examples, while indicating embodiments of the invention, are given by way of illustration only, and not by way of limitation. Various substitutions, modifications, additions, and/or rearrangements within the spirit and/or scope of the underlying inventive concept will become apparent to those skilled in the art from this disclosure.

[0043] Certain units described in this specification have been labeled as modules, in order to more particularly emphasize their implementation independence. A module is "[a] self-contained hardware or software component that interacts with a larger system." Alan Freedman, "The Computer Glossary" 268 (8th ed. 1998). A module comprises a component of a machine, a machine or a plurality of machines that are suitably programmed to operate according to executable instructions. For example, a module may be implemented as a hardware circuit comprising custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices, a controller, or the like.

Datavant Exhibit 1002

[0044] Modules may also include software-defined units or instructions that, when executed by a processing machine or device, retrieve and transform data stored on a data storage device from a first state to a second state. An identified module of executable code may, for instance, comprise one or more physical blocks of computer instructions which may be organized as an object, procedure, or function. Nevertheless, the executables of an identified module need not be physically located together, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module, and when executed by the processor, achieve the stated data transformation.

[0045] Indeed, a module of executable code may be a single instruction, or many instructions, and may even be distributed over several different code segments, among different programs, and across several memory devices. Similarly, operational data may be identified and illustrated herein within modules, and may be embodied in any suitable form and organized within any suitable type of data structure. The operational data may be collected as a single data set, or may be distributed over different locations including over different storage devices.

[0046] In the following description, numerous specific details are provided, such as examples of programming, software modules, user selections, network transactions, database queries, database structures, hardware modules, hardware circuits, hardware chips, etc., to provide a thorough understanding of the present embodiments. One skilled in the relevant art will recognize, however, that the invention may be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

[0047] FIG. 1 illustrates one embodiment of a system 100 for rapid assessment of lab value distributions. The system 100 may include a server 102, a data storage device 104, a network 108, and a user interface device 110. In a further embodiment, the system 100 may include a storage controller 106, or storage server, configured to manage data communications between the data storage device 104, and the server 102 or other components in communication with the network 108. In an alternative embodiment, the storage controller 106 may be coupled to the network 108. In a general embodiment, the system 100 may store databases comprising records, perform searches of those records, and generate outputs in response to information contained in these records. Specifically, the system 100 may receive a medical code (where lab values may

Datavant Exhibit 1002

include a range of interest) and generate an output based on a first group of records associated with individual having a medical code as compared with a second groups of records of a control population..

[0048] In one embodiment, the user interface device 110 is referred to broadly and is intended to encompass a suitable processor-based device such as a desktop computer, a laptop computer, a Personal Digital Assistant (PDA), a mobile communication device or organizer device having access to the network 108. In a further embodiment, the user interface device 110 may access the Internet to access a web application or web service hosted by the server 102 and provide a user interface for enabling a user to enter or receive information. For example, the user may enter a medical code, a test code, a time interval, a limiting criterion, a selected attribute for generating an output, or the like.

[0049] The network 108 may facilitate communications of data between the server 102 and the user interface device 110. The network 108 may include any type of communications network including, but not limited to, a direct PC to PC connection, a local area network (LAN), a wide area network (WAN), a modem to modem connection, the Internet, a combination of the above, or any other communications network now known or later developed within the networking arts which permits two or more computers to communicate, one with another.

[0050] In one embodiment, the server 102 is suitably programmed to receive a medical code (where lab values may include a range of interest), search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. Additionally, the server may access data stored in the data storage device 104 via a Storage Area Network (SAN) connection, a LAN, a data bus, or the like.

[0051] The data storage device 104 may include a hard disk, including hard disks arranged in an Redundant Array of Independent Disks (RAID) array, a tape storage drive comprising a magnetic tape data storage device, an optical storage device, or the like. In one embodiment, the data storage device 104 may store health related data, such as insurance claims data, consumer

Datavant Exhibit 1002

data, or the like. The data may be arranged in a database and accessible through Structured Query Language (SQL) queries, or other data base query languages or operations.

[0052] FIG. 2 illustrates one embodiment of a data management system 200 configured to store and manage data for rapid assessment of lab value distributions. In one embodiment, the system 200 may include a server 102. The server 102 may be coupled to a data-bus 202. In one embodiment, the system 200 may also include a first data storage device 204, a second data storage device 206 and/or a third data storage device 208. In further embodiments, the system 200 may include additional data storage devices (not shown). In such an embodiment, each data storage device 204-208 may host a separate database of healthcare claim data, lab data, physical test data, disease progression data, demographic data, socioeconomic data, administrative data, clinical data, or the like. The customer information in each database may be keyed to a common field or identifier, such as an individual's name, social security number, customer number, or the like. Alternatively, the storage devices 204-208 may be arranged in a RAID configuration for storing redundant copies of the database or databases through either synchronous or asynchronous redundancy updates.

[0053] In one embodiment, the server 102 may submit a query to selected data storage devices 204-208 to collect a consolidated set of data elements associated with an individual or group of individuals. The server 102 may store the consolidated data set in a consolidated data storage device 210. In such an embodiment, the server 102 may refer back to the consolidated data storage device 210 to obtain a set of data elements associated with a specified individual or group. Alternatively, the server 102 may query each of the data storage devices 204-208 independently or in a distributed query to obtain the set of data elements associated with a specified individual or group. In another alternative embodiment, multiple databases may be stored on a single consolidated data storage device 210.

[0054] In various embodiments, the server 102 may communicate with the data storage devices 204-210 over the data-bus 202. The data-bus 202 may comprise a SAN, a LAN, or the like. The communication infrastructure may include Ethernet, Fibre-Chanel Arbitrated Loop (FC-AL), Small Computer System Interface (SCSI), and/or other similar data communication schemes associated with data storage and communication. For example, there server 102 may communicate indirectly with the data storage devices 204-210; the server may first communicate with a storage server or storage controller 106.

Datavant Exhibit 1002

[0055] In one example of the system 200, the first data storage device 204 may store data associated with clinical data that may be comprised in insurance claims made by one or more individuals. The clinical data may include data associated with medical services, procedures, and prescriptions utilized by the individual. In one embodiment, the second data storage device 206 may store diagnosis data associated with the individual. The diagnosis data may include one or more diagnoses of conditions which the individual suffers from or is at risk of. The third data storage device 208 may store lab test data associated with the individual. For example, the third data storage device 208 may include data associated with the individual's lab test results and/or clinical observations. A fourth data storage device (not shown) may store demographic data. For example, the demographic data may include information relating to the individual's demographics include gender, race or ethnicity, age, income, disabilities, mobility, educational attainment, home ownership, employment status, location, or the like.

[0056] The server 102 may host a software application configured for rapid assessment of lab value distributions. The software application may further include modules for interfacing with the data storage devices 204-210, interfacing a network 108, interfacing with a user, and the like. In a further embodiment, the server 102 may host an engine, application plug-in, or application programming interface (API). In another embodiment, the server 102 may host a web service or web accessible software application.

[0057] FIG. 3 illustrates a computer system 300 adapted according to certain embodiments of the server 102 and/or the user interface device 110. The central processing unit (CPU) 302 is coupled to the system bus 304. The CPU 302 may be a general purpose CPU, a processor, or a microprocessor. The present embodiments are not restricted by the architecture of the CPU 302, so long as the CPU 302 supports the modules and operations as described herein. The CPU 302 may execute the various logical instructions according to the present embodiments. For example, the CPU 302 may execute machine-level instructions according to the exemplary operations described below with reference to FIGs. 7-9.

[0058] The computer system 300 also may include Random Access Memory (RAM) 308, which may be SRAM, DRAM, SDRAM, or the like. The computer system 300 may utilize RAM 308 to store the various data structures used by a software application suitably programmed for rapid assessment of lab value distributions. The computer system 300 may also include Read Only Memory (ROM) 306 which may be PROM, EPROM, EEPROM, optical storage, or the like.

Datavant Exhibit 1002

The ROM may store configuration information for booting the computer system 300. The RAM 308 and the ROM 306 hold user and system 100 data.

[0059] The computer system 300 may also include an input/output (I/O) adapter 310, a communications adapter 314, a user interface adapter 316, and a display adapter 322. The I/O adapter 310 and/or the user interface adapter 316 may, in certain embodiments, enable a user to interact with the computer system 300 in order to input information for authenticating a user, identifying an individual or group, receiving health profile information, or entering information like a medical code, a test code, a temporal range, a percentile, a limiting criterion, or a selected test value range. In a further embodiment, the display adapter 322 may display a graphical user interface associated with a software or web-based application for generating an output comprising a distribution graph.

[0060] The I/O adapter 310 may connect to one or more storage devices 312, such as one or more of a hard drive, a Compact Disk (CD) drive, a floppy disk drive, a tape drive, to the computer system 300. The communications adapter 314 may be adapted to couple the computer system 300 to the network 106, which may be one or more of a LAN and/or WAN, and/or the Internet. The user interface adapter 316 may couple user input devices, such as a keyboard 320 and a pointing device 318, to the computer system 300. The display adapter 322 may be driven by the CPU 302 to control the display on the display device 324.

[0061] The present embodiments are not limited to the architecture of system 300. Rather the computer system 300 is provided as an example of one type of computing device that may be adapted to perform the functions of a server 102 and/or the user interface device 110. For example, any suitable processor-based device may be utilized including without limitation, including personal data assistants (PDAs), computer game consoles, and multi-processor servers. Moreover, the present embodiments may be implemented on application specific integrated circuits (ASIC) or very large scale integrated (VLSI) circuits. In fact, persons of ordinary skill in the art may utilize any number of suitable structures capable of executing logical operations according to the described embodiments.

[0062] FIG. 4 illustrates one embodiment of a network-based system 400 for rapid assessment of lab value distributions. In one embodiment, the network-based system 400 includes a server 102. Additionally, the network-based system 400 may include a user interface

Datavant Exhibit 1002

device 110. In still a further embodiment, the network-based system 400 may include one or more network-based client applications 402 configured to be operated over a network 108 including an intranet, the Internet, or the like. In still another embodiment, the network-based system 400 may include one or more data storage devices 104.

[0063] The network-based system 400 may include components or devices configured to operate in various network layers. For example, the server 102 may include modules configured to work within an application layer 404, a presentation layer 406, a data access layer 408 and a metadata layer 410. In a further embodiment, the server 102 may access one or more data sets 418-422 that comprise a data layer or data tier 412. For example, a first data set 418, a second data set 420 and a third data set 422 may comprise a data tier 412 that is stored on one or more data storage devices 204-208.

[0064] One or more web applications 412 may operate in the application layer 404. For example, a user may interact with the web application 412 though one or more I/O interfaces 318 and 320 configured to interface with the web application 412 through an I/O adapter 310 that operates on the application layer. In one particular embodiment, a web application 412 may be provided for rapid assessment of lab value distributions that includes software modules configured to perform the steps of receiving a medical code, searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generating an output comprising a distribution graph on a shared scale from the first and second group of records.

[0065] In a further embodiment, the server 102 may include components, devices, hardware modules, or software modules configured to operate in the presentation layer 406 to support one or more web services 414. For example, a web application 412 may access or provide access to a web service 414 to perform one or more web-based functions for the web application 412. In one embodiment, a web application 412 may operate on a first server 102 and access one or more web services 414 hosted on a second server (not shown) during operation.

[0066] For example, a web application 412 for identifying diagnostic records and/or analyzing diagnostic data, or other information may access a first web service 414 for identifying records of

Datavant Exhibit 1002

a first group of individuals associated with a diagnostic code and a second web service 414 for identifying a control population such as a normal group or a cohort group. The web services 414 may receive a medical code. In response, the web service 414 may return data associated with individuals having the medical code, statistics, distributions, graphs, or the like. One of ordinary skill in the art will recognize various web-based architectures employing web services 414 for modular operation of a web application 412.

[0067] In one embodiment, a web application 412 or a web service 414 may access one or more of the data sets 418-422 through the data access layer 408. In certain embodiments, the data access layer 408 may be divided into one or more independent data access layers (DALs) 416 for accessing individual data sets 418-422 in the data tier 412. These individual data access layers 416 may be referred to as data sockets or adapters. The data access layers 416 may utilize metadata from the metadata layer 410 to provide the web application 412 or the web service 414 with specific access to the data set 412.

[0068] For example, the data access layer 416 may include operations for performing a query of the data sets 418-422 to retrieve specific information for the web application 412 or the web service 414. In a more specific example, the data access layer 416 may include a query for records associated with individuals who have been diagnosed with a particular disease, such as diabetes, or who are associated with a medical code (where lab values may include a range of interest), such as an ICD-9 code, associated with a diagnosis of diabetes.

[0069] FIG. 5 illustrates a certain embodiment of a system 500 for rapidly processing and viewing lab value distributions. In one embodiment, the system 500 comprises a data storage device 104 and a server 102 configured to load and operate software modules 502-508 configured for rapid assessment of lab value distributions. Alternatively, the system 500 may include hardware modules 502-508 configured with analogue or digital logic, firmware executing FPGAs, or the like configured to receive a medical code, search a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. In such embodiments, the system 500 may also

Datavant Exhibit 1002

include an interface 502, such as an I/O adapter 310, a communication adapter 314, a user interface adapter 316, or the like.

[0070] In one embodiment, the server 102 may include one or more software defined modules configured to search a dataset 418-422 on a data storage device 204-208 to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. In one embodiment, these modules may include an interface module 502, a first search module 504, a second search module 506, and a distribution module 510. Optionally, the server 102 may also include a discovery module 508 as described in further detail below with relation to FIG. 6.

[0071] Generally, the interface module 502 may receive user inputs and display user outputs. For example, the interface module 502 may receive a medical code. The interface module may further receive one or more test codes, temporal interval, limiting criterion, percentile, selected test value ranges, and/or other user inputs. In a further embodiment, the interface module 502 may display discovery or detailed distribution analysis results. Such analysis results may include statistics, tables, charts, graphs, recommendations, and the like.

[0072] Structurally, the interface module 502 may include one or more of an I/O adapter 310, a communications adapter 314, a user interface adapter 316, and/or a display adapter 322. The interface module 502 may further include I/O ports, pins, pads, wires, busses, and the like for facilitating communications between the CPU 302 and the various adapters and interface components 310-324. The interface module may also include software defined components for interfacing with other software modules on the server 102.

[0073] In a specific embodiment, the server 102 may load and execute computer software configured to generate, retrieve, send, or otherwise operate SQL instructions. For example, the first search module 504 may communicate a first SQL query to the data storage device 104, which is configured to search the database for a first group of records associated with individuals having the medical code and identified by the test code.

Datavant Exhibit 1002

[0074] The medical code may include a medical code used to group and identify diseases, disorders, symptoms, or medical signs and stored in a database of healthcare insurance information, a medical code indicative of a risk of developing a pathologic or disease condition, or a medical code identifying a treatment or a procedure. In a specific embodiment, the first search operation may identify a first group of individuals having records that include a specified ICD-9 medical code. For example, the first search may identify a first group of records in the database associated with individuals that have been diagnosed with diabetes. In another embodiment, the medical code may represent a risk, such as a metabolic syndrome, which is characterized by a group of metabolic risk factors or a combination of medical disorders that increase the risk of developing cardiovascular disease and diabetes. In a further embodiment, the medical code may include an identification or classification of individuals after treatment with one or more drugs or procedures for post-treatment or post-procedure diagnosis.

[0075] In an additional embodiment, the test code may be a code or classification for identifying a laboratory test or a clinical test or observation, such as a LOINC® code (Logical Observations Identifiers, Names, Codes), a universal code system for reporting laboratory and other clinical observations. For each observation, the database may include a code (of which 25 000 are laboratory test observations), a long formal name, a "short" 30-character name, and synonyms. It was identified by the Health Level Seven (HL7) Standards Development Organization as a preferred code set for laboratory test names in transactions between health care facilities, laboratories, laboratory testing devices, and public health authorities.

[0076] A record may comprise multiple lab test values identified by a common test code, wherein an average, first reading or last reading, or the like of the multiple values can be used to represent a data point for this record.

[0077] The first or second search may also involve a temporal component to aggregate records. If a test code has a time aspect, the searches may obtain multiple records associated with the same individual, but identified by a set of test codes at different time point within a common time interval. Those records may be processed, *e.g.*, averaged, to yield a data value representing the time interval associated with the individual.

[0078] In certain aspects, the first search module 504 may be configured to search the database for a first group of records within a selected temporal interval, while matching the test

Datavant Exhibit 1002

code and medical code. Specifically, the first search module 504 may generate a first search query configured to retrieve for a first group of records within a selected temporal interval, while matching the test code and medical code. In a further embodiment, the first group of records may include a temporal component, which may specify a time period before, during, or after an event, such as a diagnosis, a disease or disorder or onset, a procedure, or a drug treatment. In a particular aspect, the first group of records may be from within a clean period or disease-free period before the individuals are diagnosed with a disease or a disorder, for example, from within about 30, 60, 120, or 180 days before a diabetic diagnosis.

[0079] The second search module 506 may generate and/or communicate a second SQL query to the database in response to or independent of the results of the first SQL query. The second query may be configured to search the database for a second group of records, each record in the second group of records identified with the same test code as that identify the records in the first group, but associated with a control population. The second group of records may be cohorts of the first group of records, or records of a normal group, or all records identified by the test code in the database, or records filtered by a limiting criterion which is shared by the first group of records. Such a limiting criterion may include a field value that indicates certain specified characteristics of the individuals associated with the records, such as age, gender, lab tests, lab results, other diseases or diagnoses, use of medication, and the like. In a certain embodiment, the second group of records may also have a temporal component or are associated with a temporal interval, for example, each record in the second group may be associated with individuals having at least three years of record in the database.

[0080] By way of example, the first search module 504 may identify a first group of individuals that have been diagnosed with diabetes or some other illness based on an ICD-9 medical code associated with such a medical diagnosis. The second search module 506 may then identify cohorts for each individual or record identified by the first search. The cohorts may share one or more common second index attributes with the individuals or records identified in the first group, such as age, gender, or the like; however, the cohorts would not have the medical code. In this example, the cohorts may be the same age and gender as the individuals in the first group, but not have been diagnosed with diabetes.

[0081] In another embodiment, the second search module 506 may generate a group of records associated with a normal group, such as a relatively normal group of individuals not

Datavant Exhibit 1002

associated with the medical code used in the first search or a normal group of disease-free individuals, a master group of records which include test values associated with each lab test and lab test unit stored in the database, or a group of filtered records associated with a selected limiting criterion, which can be created before, during or after the first search, or dynamically at run time applying any desired limiting criterion, such as age or gender.

[0082] In a further embodiment, the first search module 504 and the second search module 506 may be integrated into a single search module. Specifically, a single set of SQL instructions may be used to both identify the first group of records and identify the second group of records. The benefits of this embodiment may include reduced system overhead, reduced search and analysis time, reduced labor for configuration and generation of queries, etc. For example, with a single integrated SQL query, a user may be able to obtain results for analysis in far less time than the user might otherwise expect. Such an embodiment may not require separate analysis and generation of separate queries for the first group and the second group. Consequently, a significant time savings may be realized.

[0083] In one embodiment, the discovery module 508 may discover one or more lab tests relating to disease diagnosis or treatment evaluation. In order to do so, the discovery module 508 may extract the difference between representative values from the first and second group of records identified by the same test code but associated with different diagnosis status. For example, the discovery module may include analogue or digital logic, firmware, or software configured to carry out one or more discoveries according to one or more predefined logic functions. In a further embodiment, the server 102 may include a software defined discovery module 508 configured to perform analysis and comparison of the information and data retrieved from the database for the first group of records and the associated second group of records.

[0084] In a specific embodiment, the first search module 504 and the second search module 506 may feed retrieved data into a spreadsheet configured to perform one or more calculations on the data. For example an Excel® spreadsheet may include one or more embedded functions or operations configured to calculate statistics such as percentages, averages, odds ratios and other probabilities, counts, summations, and the like. The data may be automatically imported into a spreadsheet using a macro, a software-based script, or the like. In an alternative embodiment, the discovery module 508 may include hard-coded or dynamically variable software functions for calculating such statistics and generating results for a user. In a further embodiment, the

Datavant Exhibit 1002

discovery module 508 may also create outputs such as statistics, tables, charts, graphs, recommendations, and the like, and particularly identify one or more test codes that indicate a significant difference between two groups of records based on a selected discovery threshold or criterion. "Significant difference" may be referred to as a statistically significant difference, such as a significance level of 5%, 1% or 0.1%.

[0085] FIG. 6 illustrates a further embodiment of a system 500 for rapid assessment of lab value distributions. The system 500 may include a server 102 as described in FIG. 5. In a further embodiment, the server 102 may include additional software defined modules. For example, the server 102 may include a filter module 602. The discovery module 508 may further include an interpolation module 602 and a comparison module 604. The distribution module 510 may also include a count module 606, an aggregation module 608, a compute module 610, and a graph module 612.

[0086] In a further embodiment, the filter module 602 may narrow the first group or second group of records according to a limiting criterion. The filter module 602 may narrow the first or second group of records by restricting search parameters before the first or second search is performed. Alternatively, the filter module 602 may filter, remove, or otherwise delete the search results according to the limiting criterion. In a certain embodiment, multiple limiting criteria may be used to restrict the scope of the returned search results. In one embodiment, a limiting criterion may include a field value, such as record date, age, gender, or the like.

[0087] In an alternative embodiment, an SQL command generated by the server 102 or stored in RAM 308 or on the data storage device 312 may include instructions, that when executed by a storage controller 104 or the CPU 302 on the server 102, may perform a search for records matching the limiting criterion before or in combination with the first or second search. In a specific embodiment, an SQL operation embedded with the first or second search may activate the filter.

[0088] In a certain embodiment, the discovery module 508 may include an interpolation module 602 configured to derive a percentile value from the first group or the second group of records for comparison. The percentile may be any one ranging from 1% to 99%, such as a median, 5%, 32%, or 95%. The interpolation function may involve fitting a function to the data comprised in the records and evaluating that function at the desired point, or calculate the

Datavant Exhibit 1002

interpolated data by statistical methods. For example, interpolation methods may include a linear interpolation, a piecewise constant interpolation, a polynomial interpolation, a spline interpolation, or a non-linear interpolation such as an interpolation via Gaussian processes. In a specific embodiment, an SQL command may be generated by the serve 102 or the interpolation module 602 for calculating a percentile value from the first or second group of records. For example, such an SQL command may be designed similarly as that exemplified in FIG. 12 for linear interpolation from a group of data points.

[0089] In a further embodiment, the representative values of the corresponding percentile of both groups may be processed by a comparison module 604. For example, such a comparison module 604 may generate an output comprising a graph showing the difference between the two corresponding values, like a percentage shift of the first value associated with the medical code from the second value associated with a control group. For a particular medical code, a plurality of test codes may be assembled by the comparison module 604 to show the shift of the diagnosed group from the control group, as exemplified in FIG. 10. The relative degree of the shift associated with a test code may represent its relevance with the medical code and usefulness in the diagnosis.

[0090] In one embodiment, the distribution module 510 may include a count module 606 configured to count distinct records in the first group of records and the second group of records. The counting function may be implemented using a hardware-based counter. Alternatively, the counting function may be implemented in a software. In a specific embodiment, the server 102 or CPU 302 may execute SQL instructions configured to provide the record count in response to search or query results. In such an embodiment, the counting function may be integrated with the search and filter instructions into a single set of SQL commands or instructions.

[0091] In a further embodiment, the distribution module 510 may include an aggregation module 608 configured to aggregate records from the first group and from the second group according to a selected attribute, such as a series of bucket ranges created manually or derived empirically. The server 102 may also include other modules for computing, formatting, and otherwise producing statistics, including a compute module 610 and an output module 612. The compute module 610 may compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute. The output module 612 may generate, format, and provide a graphical

Datavant Exhibit 1002

representation of the statistics. These modules 606-612 may be stand-alone modules implemented in hardware, firmware, or software. Alternatively, the functions may be accomplished through commercial calculation products or spreadsheets, software or SQL instructions that are integrated with the other functions of the server 102. In a specific embodiment, the distribution module 510, including some or all of its component modules 606-612, may communicate the statistics with the interface module 502 for display or communication to a user.

[0092] Although the various functions of the server 102 and the CPU or processor 302 are described in the context of modules, the methods, processes, and software described herein are not limited to a modular structure. Rather, some or all of the functions described in relation to the modules of FIGs. 5-6 may be implemented in various formats including, but not limited to, a single set of integrated instructions, commands, code, queries, etc. In one embodiment, the functions may be implemented in database query instructions, including SQL, PLSQL, or the like. Alternatively, the functions may be implemented in software coded in C, C++, C#, php, Java, or the like. In still another embodiment, the functions may be implemented in web based instructions, including HTML, XML, etc.

[0093] The schematic flow chart diagrams that follow are generally set forth as logical flow chart diagrams. As such, the depicted order and labeled steps are indicative of one embodiment of the presented method. Other steps and methods may be conceived that are equivalent in function, logic, or effect to one or more steps, or portions thereof, of the illustrated method. Additionally, the format and symbols employed are provided to explain the logical steps of the method and are understood not to limit the scope of the method. Although various arrow types and line types may be employed in the flow chart diagrams, they are understood not to limit the scope of the corresponding method. Indeed, some arrows or other connectors may be used to indicate only the logical flow of the method. For instance, an arrow may indicate a waiting or monitoring period of unspecified duration between enumerated steps of the depicted method. Additionally, the order in which a particular method occurs may or may not strictly adhere to the order of the corresponding steps shown.

[0094] FIG. 7 illustrates one embodiment of a method 700 for rapid assessment of lab value distributions. In one embodiment, the method 700 starts when the interface module 502 receives 702 a medical code. The medical code is also known as a diagnosis code or a clinical attribute of

Datavant Exhibit 1002

interest. The method 700 may continue when the server 102 issues a command to search 704 a database stored on the data storage device 104 for a first group of records. The first group of records may be associated with the individuals having the medical code, and identified by a test code. For example, the server 102 may send an SQL query to the database to retrieve healthcare records associated with individuals that have been diagnosed with diabetes as indicated by the presence of an ICD-9 code associated with diagnosis of diabetes in the individual's records, while also storing information about lab test values identified by one or more test codes.

[0095] The server 102 may then issue a command to search 706 the database for a second group of records. Each record in the second group of records may share a common test code with a record in the first group of records, but is associated with a control population, a majority of which does not have the medical code. For example, SQL query issued by the server 102 may also include a query statement to search for a second group of individuals, each individual having the same age and/or gender as an individual identified in the first group, but not having the diabetes medical code in their record. These individuals in the second group may be considered cohorts of the individuals in the first group of records. In another embodiment, the second group of records may be associated with a normal group which may include all health or disease-free individuals or a group including all individuals with records available in the database of all time points or a specific time period.

[0096] The server 102 may then receive the results from the database searches 704 and 706. The distribution module 510 may then generate 708 an output comprising a distribution graph on a shared scale from the first group of records and the second group of records. For example, a spreadsheet program may calculate distribution of records identified by the test code in the presence of the received medical code as compared with those of a control group. The distribution may include averages, probabilities, and other computational products including identification of trends and commonalities among the records.

[0097] FIG. 8 illustrates another embodiment of a method 800 for rapid assessment of lab value distributions. In one embodiment, the method 800 starts when the interface module 502 receives 802 a test code, a medical code, a percentile, and one or more limiting criteria or time intervals. For example, the interface module 502 may include a graphical user interface. The interface module 502 may receive user inputs consisting of identifiers or indicants of the test

Datavant Exhibit 1002

codes, medical codes, or limiting criteria. Such indicants may include a selection of a field value, such as an ICD-9 code value, an age value, a gender value, or the like.

[0098] Limiting criteria may include windowing values configured to limit or restrict the time frames from which records will be searched, restrictions on minimum enrollment time, minimum number of records, gender restrictions, age restrictions, weight restrictions, physical conditions, healthcare patterns, other diagnoses or identified lab values, and other similar threshold and limiting values. The filter module 602 may incorporate the limiting criterion into a query used to filter 802 the records by the limiting criterion before, during or after the search 806 or the search 808. For example, the query may search for all records associated with individuals that have been diagnosed with diabetes, but the query may be restricted to return only results associated with individuals that have at least two years worth of records in the database. In a further embodiment, the filter module 602 may use the same limiting criterion for both searches 806-808 to identify a cohort for the first group of records. Specific time interval relative to the diagnosis associated with the medical code may be also used to filter 804 records to assess lab value distributions at the specific time interval.

[0099] For the discovery module 508, the interpolation module 602 may interpolate 810 percentile values from both group of records according to a received or selected percentile. An example of interpolation 810 is illustrated in FIG. 12. The price records in FIG. 12 may be replaced by health care records. The server may send such an SQL instruction based on FIG. 12 to interpolate different percentile values of the records as exemplified in FIG. 10 for records in the presence of a plurality of test codes (*e.g.*, LOINC code) listed in the first column in the presence of a common medical code, 292.4 representing thalassemia. In a further embodiment, the comparison module 604 may compare 812 the corresponding percentile values of both groups and generate 814 an output comprising a graph showing the comparison, such as a percentage shift of the median of the first group in the presence of thalassemia from the median of the second group associated with a normal population for multiple LOINC codes in FIG. 10. Discovery 810-814 may help identify or confirm test codes that may be potentially relevant for a particular medical code and may be used for disease diagnosis or prediction, as well as treatment evaluation. However, discovery steps of those test codes may be optional; for example, these steps may not be necessary for test codes known to be associated with the medical code.

Datavant Exhibit 1002

[0100] In the distribution module 510, records may also be retrieved by search 806 and 808, and optionally filter 804. In an embodiment, the count module 606 may count 904 distinct records in both groups for a total number of records and also records in each aggregated category as the aggregation module 608 may aggregate 906 records from the first group and from the second group according to a selected attribute, such as a series of bucketed ranges of test values for distribution. An example of aggregation 906 is illustrated in FIG. 11. The compute module 610 may then compute an odds ratio, an average, or some other mathematical statistic and the output module 612 may generate an output comprising one or more distribution graphs to display one or more statistics calculated by the server 102. For example, the graph may be a histogram as illustrated in FIG. 11.

[0101] In a specific example, the server 102 may send a single set of SQL instruction to perform the first search 806, perform the second search 808, and other searching functions, such as filtering 804.

[0102] In a further embodiment, the SQL instructions may include instructions for interpolating 810 percentile values from both groups. In a still further embodiment, the SQL instructions may also include comparing 812 the corresponding percentile values and generate 814 an output comprising a graph showing the comparison, for example, in the format of percentage shift which may also be ranked by the degree of shift. For example, one embodiment of SQL instructions that may be used to perform the method of FIG. 8 may include:

```
select c.loinc_code||' '||loinc_code_desc,a.*,b.*,-
(a.interpolated50th-
      b.interpolated50th)/(a.interpolated50th+b.interpolated50t
h)/2 percent_shift_of_median  from

foo_loinc_distribution_sigmas a,

loinc c,

(

select  loinc_code,result_units_name,u_mem,max(case when .50
between decile and      lead_decile then (lead_delta-
delta_from_index)/(lead_decile-decile)*0.50
      +(delta_from_index-(lead_delta-
delta_from_index)/(lead_decile-decile)*decile)  else -
      99999 end ) interpolated50th, max(case when .32 between
decile and lead_decile then   (lead_delta-
delta_from_index)/(lead_decile-decile)*0.32 +(delta_from_index-
(lead_delta-      delta_from_index)/(lead_decile-
decile)*decile)  else -99999 end) interpolated32th,   max(case
when .95 between decile and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.95
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile)  else -
```


Datavant Exhibit 1002

```
99999 end )       interpolated95th,max(case when .05 between
decile and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.05
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile) else -
99999 end ) interpolated5th,  max(case when .68 between decile
and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.68
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile)  else -
99999 end ) interpolated68th

from

(

select iv4.*, cast(result_value_nbr as float)
delta_from_index,cast(rn as float)/u_mem  decile,lead(cast(rn
as float)/u_mem) over (partition by
loinc_code,result_units_name  order by rn)
lead_decile,lead(result_value_nbr) over (partition by
      loinc_code,result_units_name order by rn) lead_delta

from

(

select iv3.*, max(rn) over(   partition by
loinc_code,result_units_name ) u_mem

from

(

select iv2.*, row_number() over (   partition by
loinc_code,result_units_name   order by   result_value_nbr asc)
rn

from

(

select
a.loinc_code,a.result_units_name,a.individual_id,avg(result_val
ue_nbr)     result_value_nbr

from

(

select individual_id,min(service_from_date) min_dos  from
diagnosis a,      foo_members_with_condition6 b where
decm_code like'250%' and      b.dx=a.diagnosis_key group by
individual_id

   ) iv,

foo_members_with_lab6 a

   where a.individual_id=iv.individual_id and service_from_date
between min_dos+-1400   and min_dos+-365

group by a.loinc_code,a.result_units_name,a.individual_id


) iv2
```


Datavant Exhibit 1002

```
) iv3

) iv4 where  u_mem>19

) iv5 group by loinc_code,result_units_name,u_mem

) b where a.loinc_code=b.loinc_code          and
a.result_units_name=b.result_units_name   and a.loinc_code not
in ('0','1')  and a.result_units_name <> ' '

and a.loinc_code=c.loinc_code and ( b.interpolated50th not
between a.interpolated32th    and a.interpolated68th or
a.interpolated50th not between b.interpolated32th and
b.interpolated68th)

order by abs((a.interpolated50th-
b.interpolated50th)/(a.interpolated50th+b.interpolated50th)/2)
desc
```

[0103] In a further embodiment, the SQL instructions may include instructions for counting 904 distinct records and/or aggregating 906 the records. In still another embodiment, the same set of SQL instructions may include functions for generating 908 an output comprising a probability distribution graph by computing statistics, such as the odds ratio of a specified test value or range within the records. One particular embodiment of SQL instructions that may be used to perform the method of FIG. 9 may include:

```
select iv4.*,u_mems/tot1 percent_all,members_with_disease/tot2
percent_with_disease from     (

select iv3.*,sum(u_mems) over () tot1,sum(members_with_disease)
over () tot2 from (

select
b.loinc_code,b.result_units_name,rng,u_mems,rn,count(distinct
individual_id)    members_with_disease from

(select * from foo_normal_distributions where loinc_code='785-
6' and      result_units_name='pg' ) b

left outer join

(

select
a.individual_id,min_dos,decm_code,loinc_code,result_units_name,
avg(result_value_nbr)   result_value_nbr from

(

SELECT decm_code,  b.individual_id, MIN(service_from_date)
min_dos

FROM diagnosis  a, foo_members_with_condition6 b

WHERE decm_code like '282.4'

AND b.dx=a.diagnosis_key

GROUP BY decm_code, b.individual_id
```


Datavant Exhibit 1002

```
) iv2

,

foo_members_with_lab6 a

where a.individual_id=iv2.individual_id and service_from_date
between min_dos+-180 and      min_dos+-2

group by
a.individual_id,min_dos,decm_code,loinc_code,result_units_name


) iv3 on ( iv3.loinc_code=b.loinc_code and
iv3.result_units_name=b.result_units_name and
      result_value_nbr >bucketstart and result_value_nbr<=
bucketend)

group by b.loinc_code,b.result_units_name,rng,u_mems,rn

) iv3

) iv4  order by rn
```

[0104] FIG. 10 illustrates one embodiment of an output 1000 from the discovery module 508, which may include an interpolation table 1002 or a comparison graph 1004. In a certain embodiment, each row in the table 1002 may represent a first group of records in the presence of a medical code 282.4 thalassemia that is identified by a specific test code in the first column. For example, the test code may be LOINC code 785-6 representing erythrocyte mean corpuscular hemoglobin, and the associated first group of records (not shown) may be interpolated to obtain values representing 50% (median), 32%, 95%, and 5%. In a particular embodiment, the median of the first group of records identified by the specific test code in the presence of the medical code is compared with the median of a control group of records, particularly, a normal group, which is the middle line corresponding to 0.0% in the graph 1004. The difference between the two medians for each test code is represented as a percentage shift (= (median of diseased group of records-median of normal group of records)/median of normal group of records x 100%) from the middle line, which has also be used to rank the order of the list of test codes from least to most in terms of absolute value of difference.

[0105] FIG. 11 illustrates an embodiment of results or outputs that may be derived from the distribution module 510. A specific test code, for example, LOINC code 785-6, is received or selected for the first search 806 to identify a first group of records associated with the test code and in the presence of the medical code 282.4. A table 1102 may include one or more fields for displaying counting, aggregating and computing results. The first and second group of records may be aggregated according to selected attributes, in particular, a set of test value ranges (RNG

Datavant Exhibit 1002

field), and counted in each range with results presented in the U_MEM field for the second group (normal control) and in MEMBERS_WITH_DISEASE for the first group (diseased). Percentage of the number of records in each test value range over the total number of records in the first or second group may also be calculated to yield results shown in fields of PERCENT_DISEASED or PERCENT_ALL, respectively. Graph 1104 and 1106 show a distribution of numbers of records in the bucket ranges for normal group and diseased group, respectively. Histogram 1108 overlay the percentages of records in each value range for both groups and show a difference in their distribution pattern.

[0106] FIG. 12 illustrates an example for interpolation of a percentile value from a group of records. Protocol 1202 explains interpolating a raw source of random prices by using a linear function to extract a value at 80% by using SQL instructions. Table 1204 presents such a raw source of random prices and table 1206 shows the result of the interpolation of 80%.

[0107] FIG. 13 illustrates an embodiment of the discovery module used for pre-disease diagnosis or predicting a risk for a disease. List 1302 provide examples of risk factors for identifying metabolic syndrome candidates, one or more of which may be used as the medical code to search for the first group of records in the database. Alternatively, a temporal window in combination with the diabetic medical code may be used to search a first group of records collected three years to thirty days prior to diabetic diagnosis or in the presence of a diabetic medical code. Graph 1304 shows the output comprising the ranked percentage shift of the medians of the first group of records from the normal medians for a plurality of test codes. A test code with a significant percentage shift may be a potential pre-diabetic marker or a useful diabetic early predictor, such as LOINC code 2086-7, associated with a nearly -12% shift.

[0108] FIG. 14 illustrates an embodiment of the distribution module used for pre-disease diagnosis or predicting a risk for a disease. Distribution of percentage of records in each histogram range for the pre-disease group (one to three years prior to diabetes diagnosis) and control group are compared in graph 1400.

[0109] FIG. 15 illustrates one embodiment of a graphical user interface (GUI) 1500 for use in accordance with the interface module 502. As illustrated, the GUI 1500 may include one or more fields for receiving user inputs, one or more buttons for issuing a command or controlling the server, application, or code, and one or more descriptive or informational names or elements for

Datavant Exhibit 1002

providing user instructions and prompts. As illustrated in the informational diagram in FIG. 15, certain limiting criteria or temporal interval may include a clean period value, or time period prior to the occurrence of the medical code. For example, if the medical code is a medical code for diabetes, the clean period criteria may be a time frame, such as two years, before the occurrence of the medical code. In such an embodiment, the first search module 504 may only return records for individuals who have not only been diagnosed with diabetes, but also have a minimum of two years worth of records prior to the diagnosis.

[0110] The limiting criteria may also include an aggregation window, or time frame for collecting records associated with the individual. The aggregation window variable may include a time frame before or after the occurrence of the medical code from which to collect records. For example, the filter module 602 may only collect records for two years prior to the occurrence of the medical code and for ninety days after the occurrence of the medical code.

[0111] All of the methods disclosed and claimed herein can be made and executed without undue experimentation in light of the present disclosure. While the systems and methods of this invention have been described in terms of preferred embodiments, it will be apparent to those of skill in the art that variations may be applied to the methods and in the steps or in the sequence of steps of the method described herein without departing from the concept, spirit and scope of the invention. In addition, modifications may be made to the disclosed apparatus and components may be eliminated or substituted for the components described herein where the same or similar results would be achieved. All such similar substitutes and modifications apparent to those skilled in the art are deemed to be within the spirit, scope, and concept of the invention as defined by the appended claims.

Datavant Exhibit 1002

CLAIMS

1. A method for comparing two groups of records comprising:

receiving a medical code;

searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generating an output comprising a distribution graph on a shared scale from the first and second group of records.

2. The method of claim 1, further comprising comparing a first value representing the first group and a second value representing the second group of records.

3. The method of claim 2, further comprising interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

4. The method of claim 1, wherein generating the output further comprises counting distinct records in the first group of records and the second group of records.

5. The method of claim 1, wherein generating the output further comprises aggregating records from the first group and from the second group according to a selected attribute.

6. The method of claim 5, wherein generating the output further comprises computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

7. The method of claim 1, further comprising selecting the first group of records from within a time interval.

8. The method of claim 1, wherein the record comprises an average, a first reading or a last

Datavant Exhibit 1002

reading of a test.

9. The method of claim 1, further comprising selecting records in the first group and in the second group according to a limiting criterion.

10. A system comprising:

a data storage device configured to store a database comprising one or more records, wherein the records are identified by one or more test codes;

a server in data communication with the data storage device, suitably programmed to:

receive a medical code;

search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generate an output comprising a distribution graph on a shared scale from the first and second group of records.

11. The system of claim 10, wherein the server is further configured to compare a first value representing the first group and a second value representing the second group of records.

12. The system of claim 11, wherein the server is further configured to interpolate the first group of records to obtain the first value and to interpolate the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

13. The system of claim 10, wherein the server is further configured to count distinct records in the first group of records and the second group of records.

14. The system of claim 10, wherein the server is further configured to aggregate records from the first group and from the second group according to a selected attribute.

15. The system of claim 14, wherein the server is further configured to compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a

Datavant Exhibit 1002

number of records in the second group having the selected attribute.

16. The system of claim 10, wherein the server is further configured to select the first group of records from within a time interval.

17. The system of claim 10, wherein the server is further configured to select records in the first group and in the second group according to a limiting criterion.

18. A tangible computer program product comprising a computer readable medium having computer usable program code executable to perform operations comprising:

receiving a medical code;

searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generating an output comprising a distribution graph on a shared scale from the first and second group of records.

19. The computer program product of claim 18, further comprising comparing a first value representing the first group and a second value representing the second group of records.

20. The computer program product of claim 19, further comprising interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

21. The computer program product of claim 18, further comprising counting distinct records in the first group of records and the second group of records.

22. The computer program product of claim 18, further comprising aggregating records from the first group and from the second group according to a selected attribute.

23. The computer program product of claim 22, further comprising computing a probability in

Datavant Exhibit 1002

response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

24. The computer program product of claim 18, further comprising selecting the first group of records from within a time interval.

25. The computer program product of claim 18, further comprising selecting records in the first group and in the second group according to a limiting criterion.

Datavant Exhibit 1002

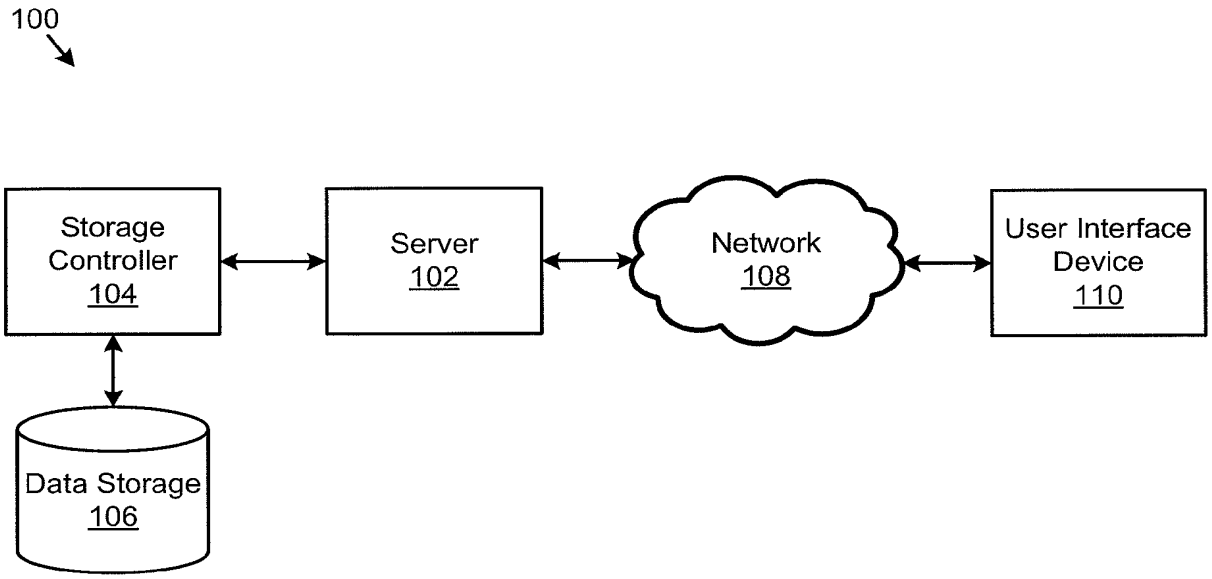

100
Storage Controller 104
Server 102
Network 108
User Interface Device 110
Data Storage 106

FIG. 1

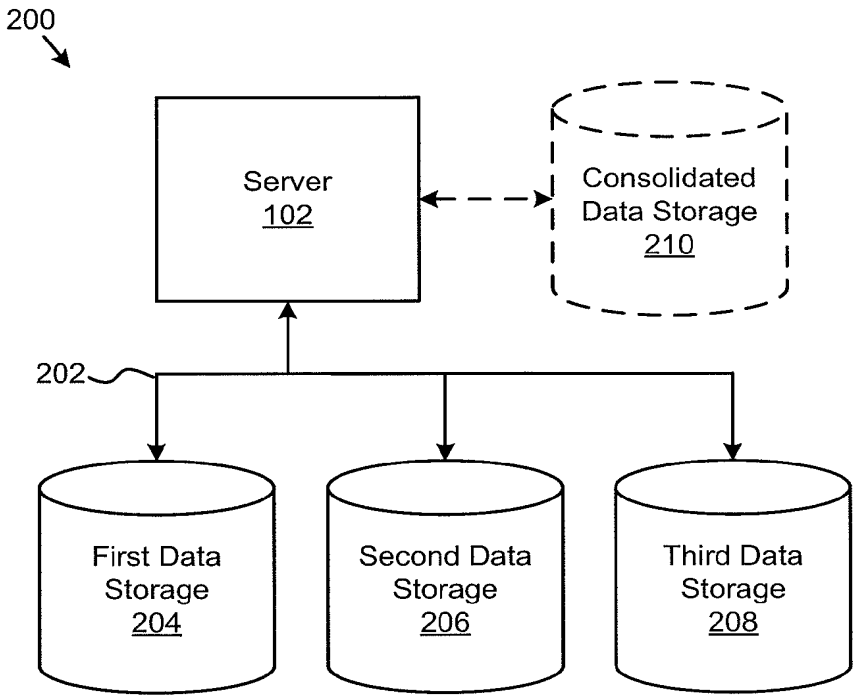

200
Server
102
Consolidated
Data Storage
210
202
First Data
Storage
204
Second Data
Storage
206
Third Data
Storage
208

FIG. 2

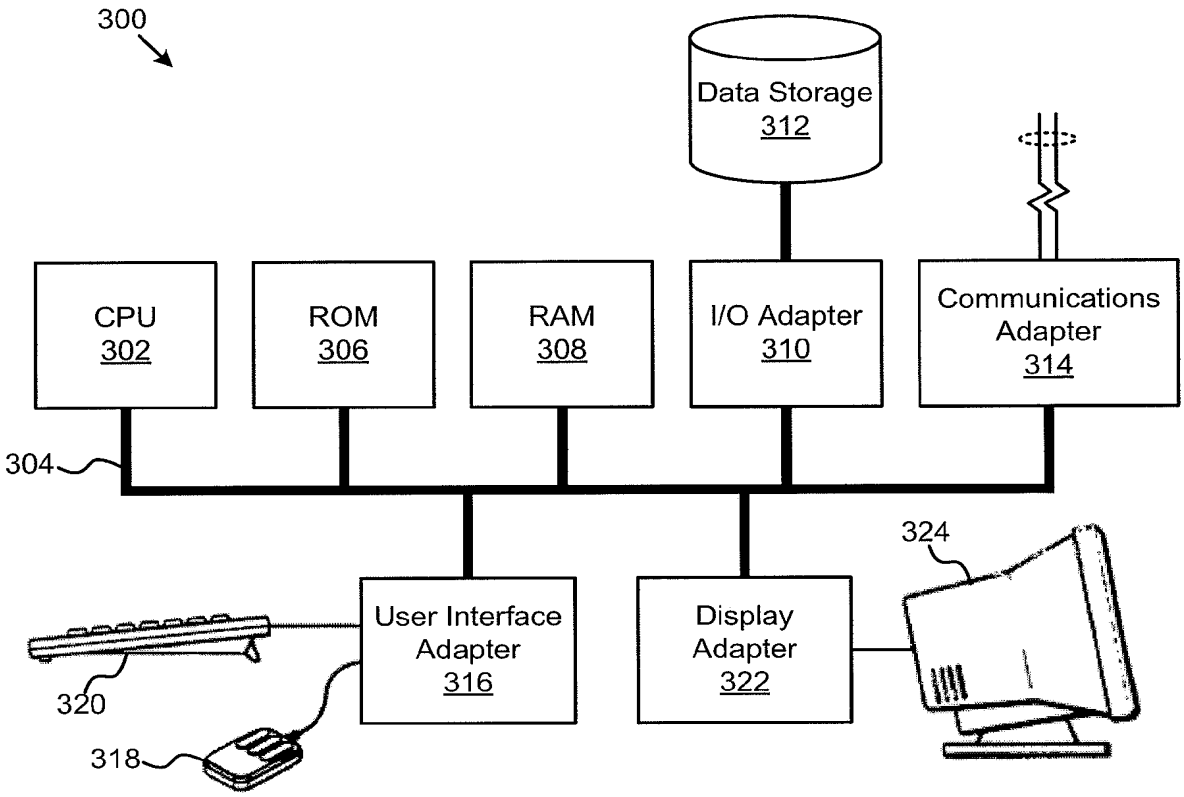


FIG. 3

Datavant Exhibit 1002

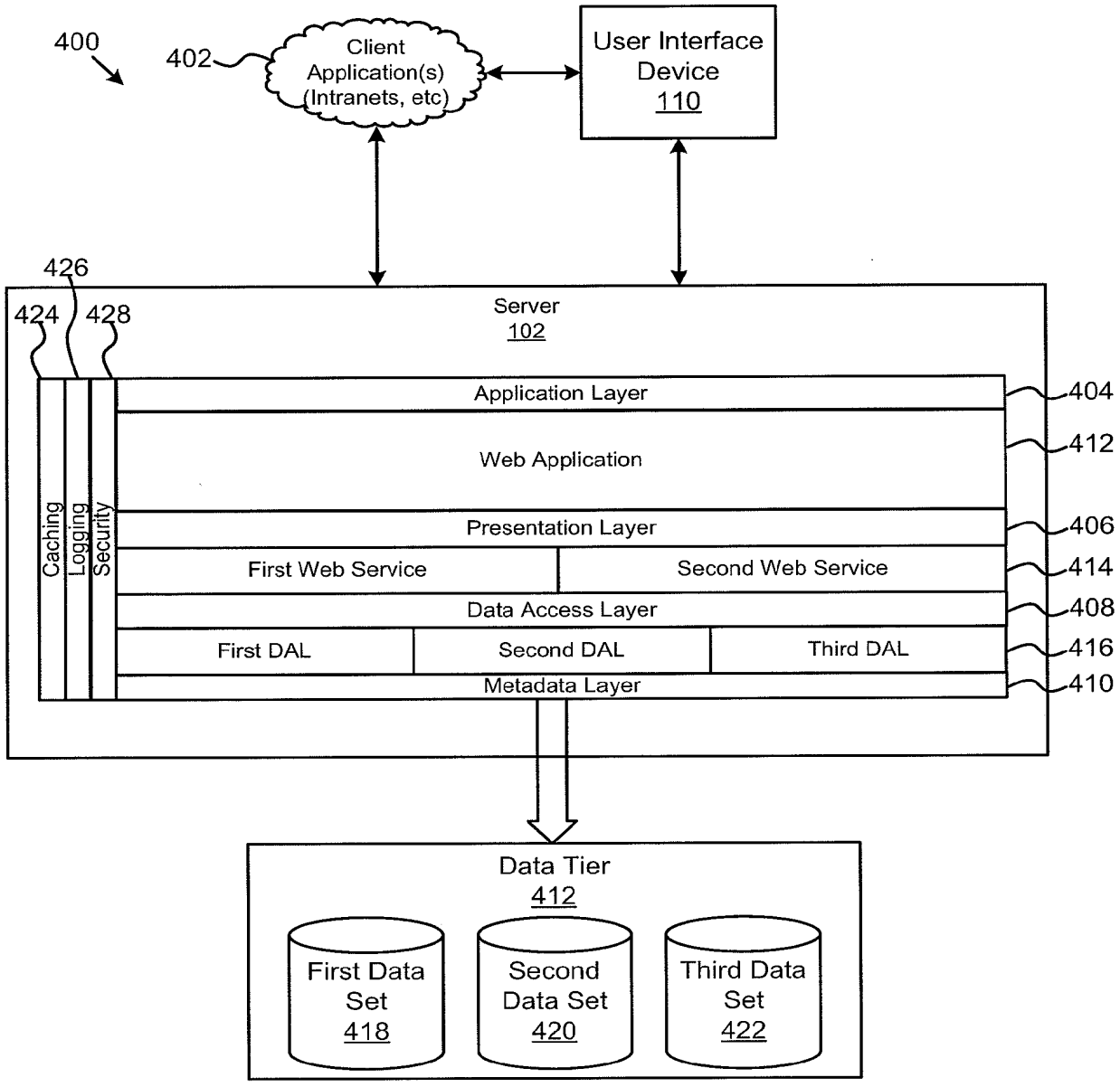


FIG. 4

Datavant Exhibit 1002

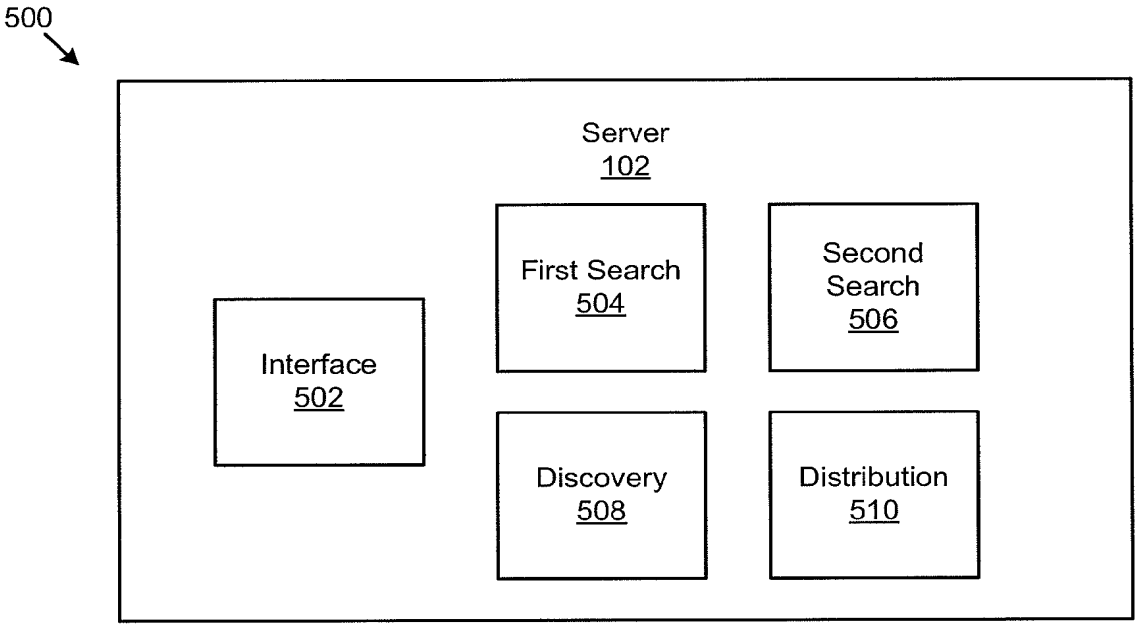


FIG. 5

Datavant Exhibit 1002

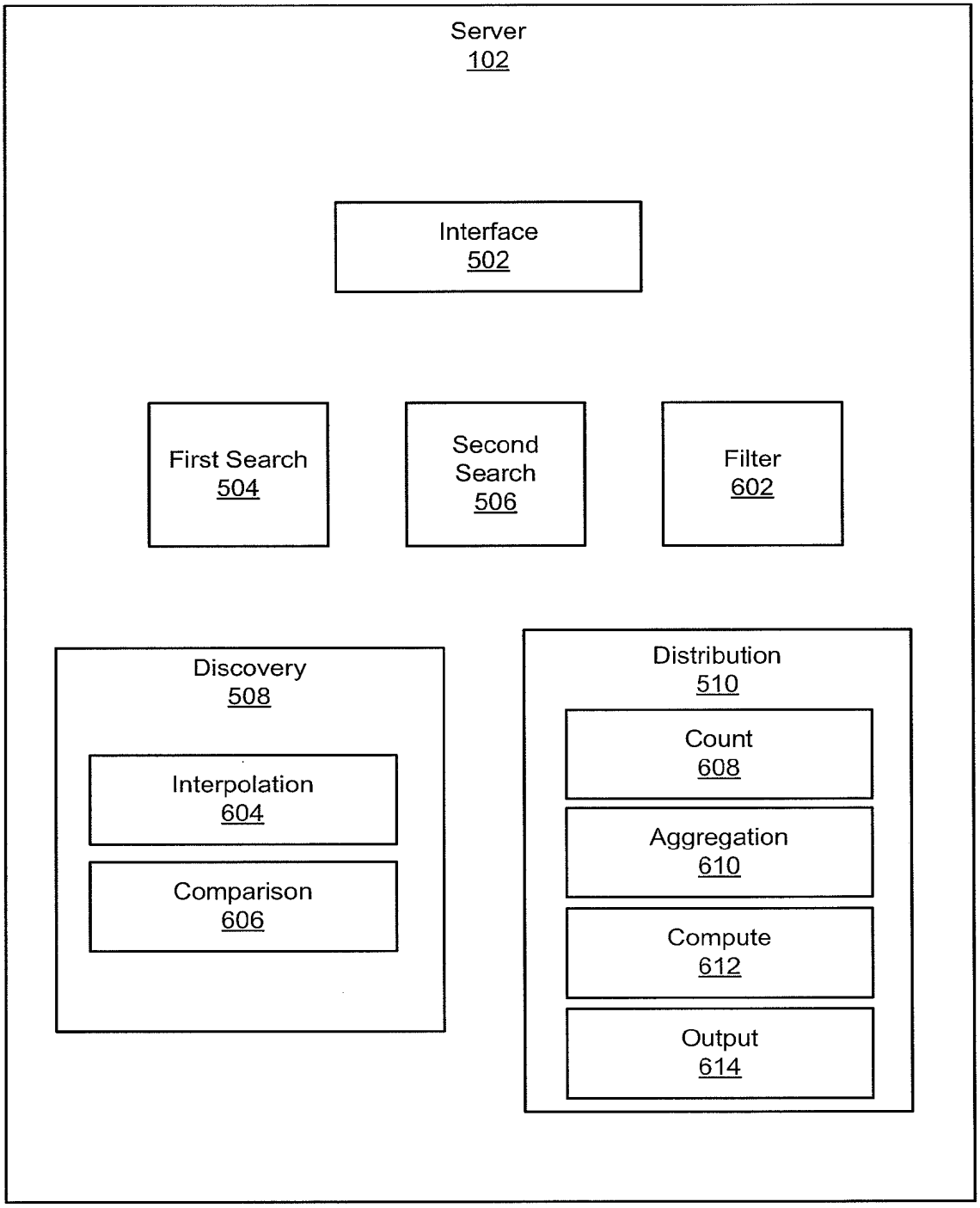


FIG. 6

Datavant Exhibit 1002

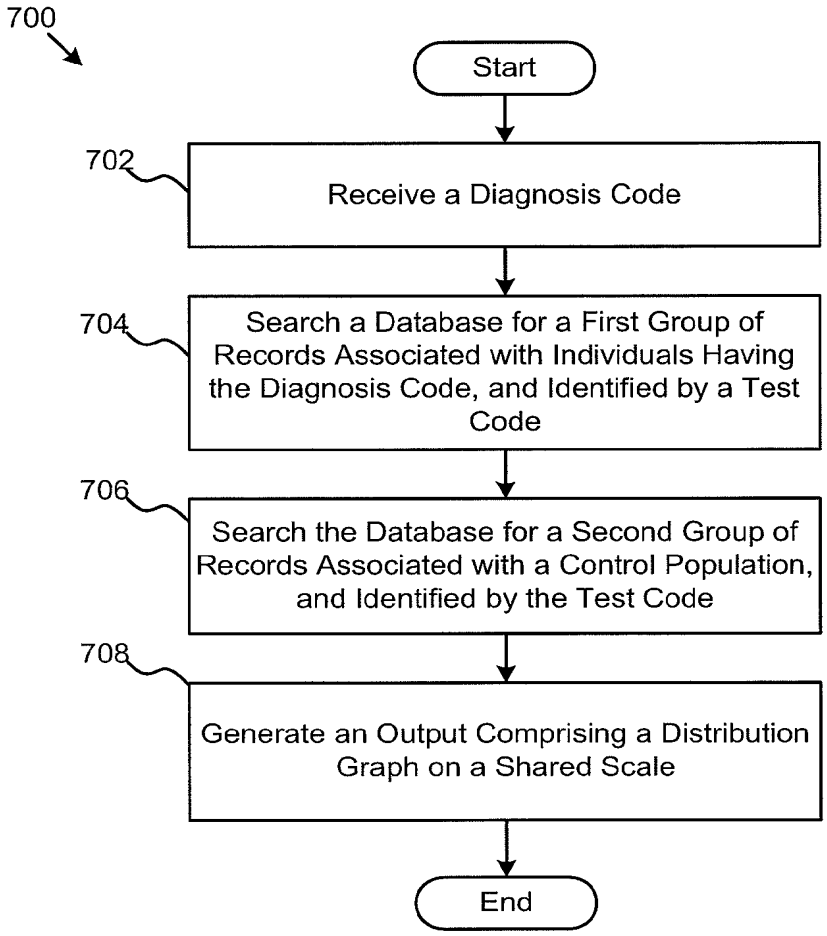


FIG. 7

Datavant Exhibit 1002

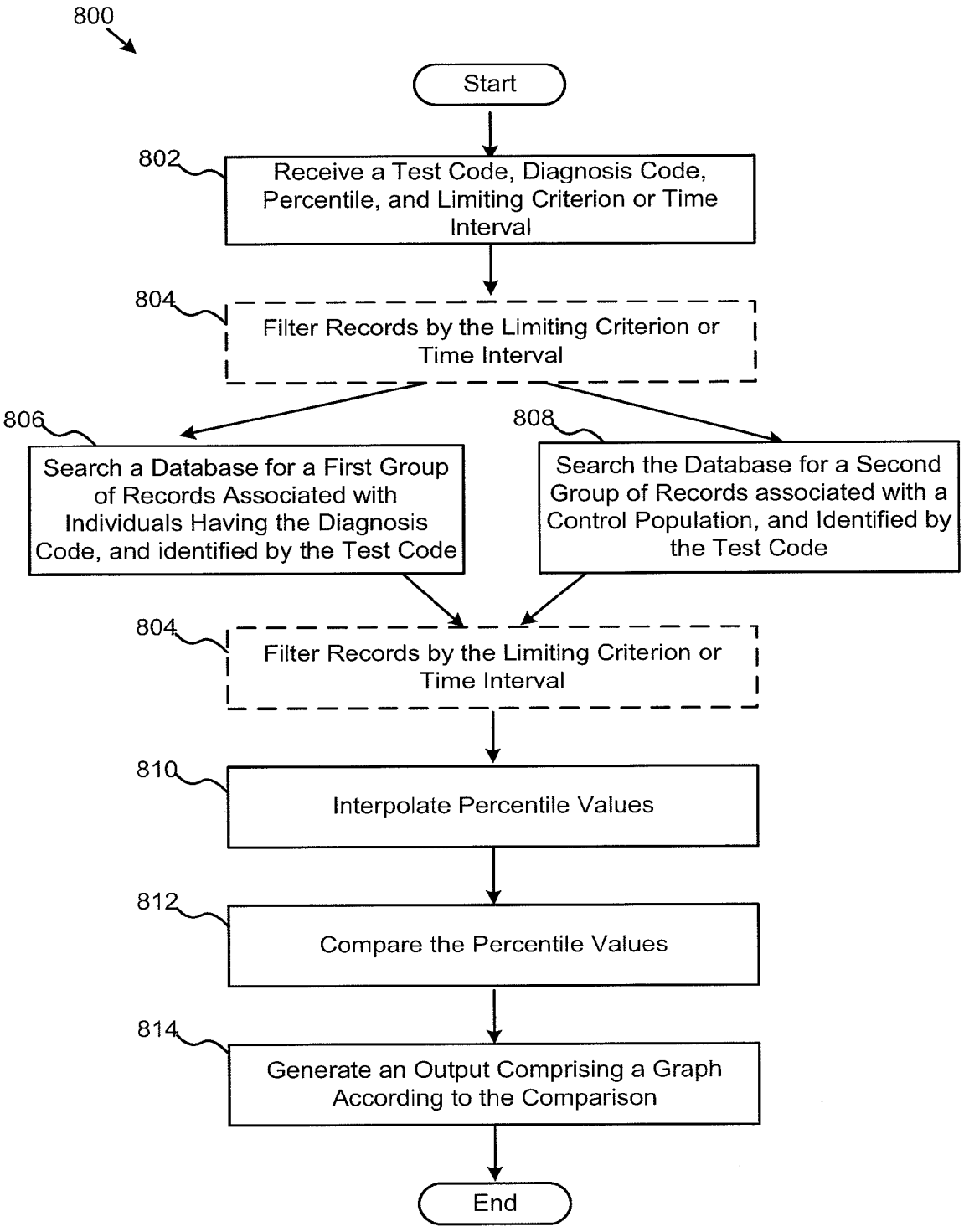


FIG. 8

Datavant Exhibit 1002

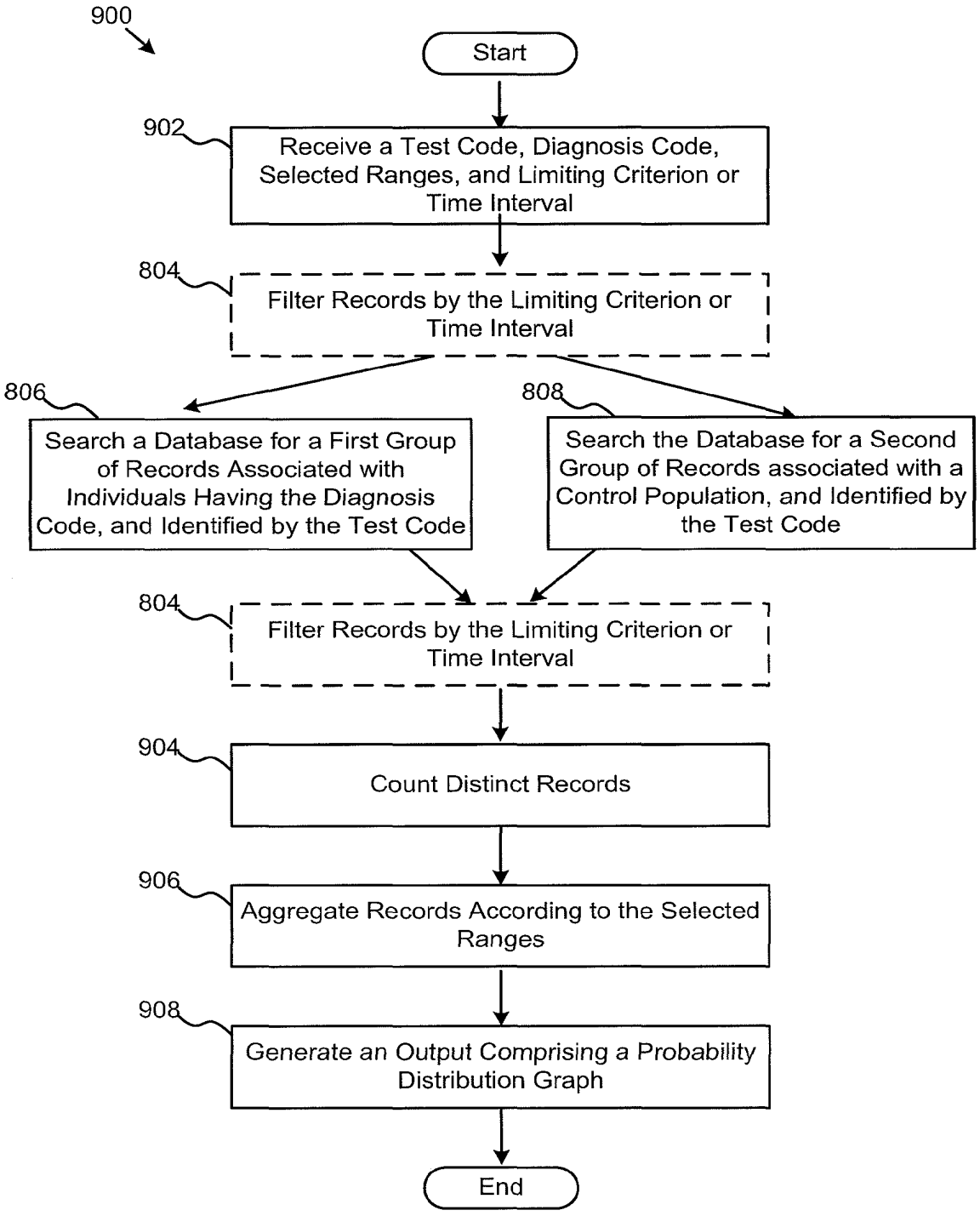


FIG. 9

Datavant Exhibit 1002

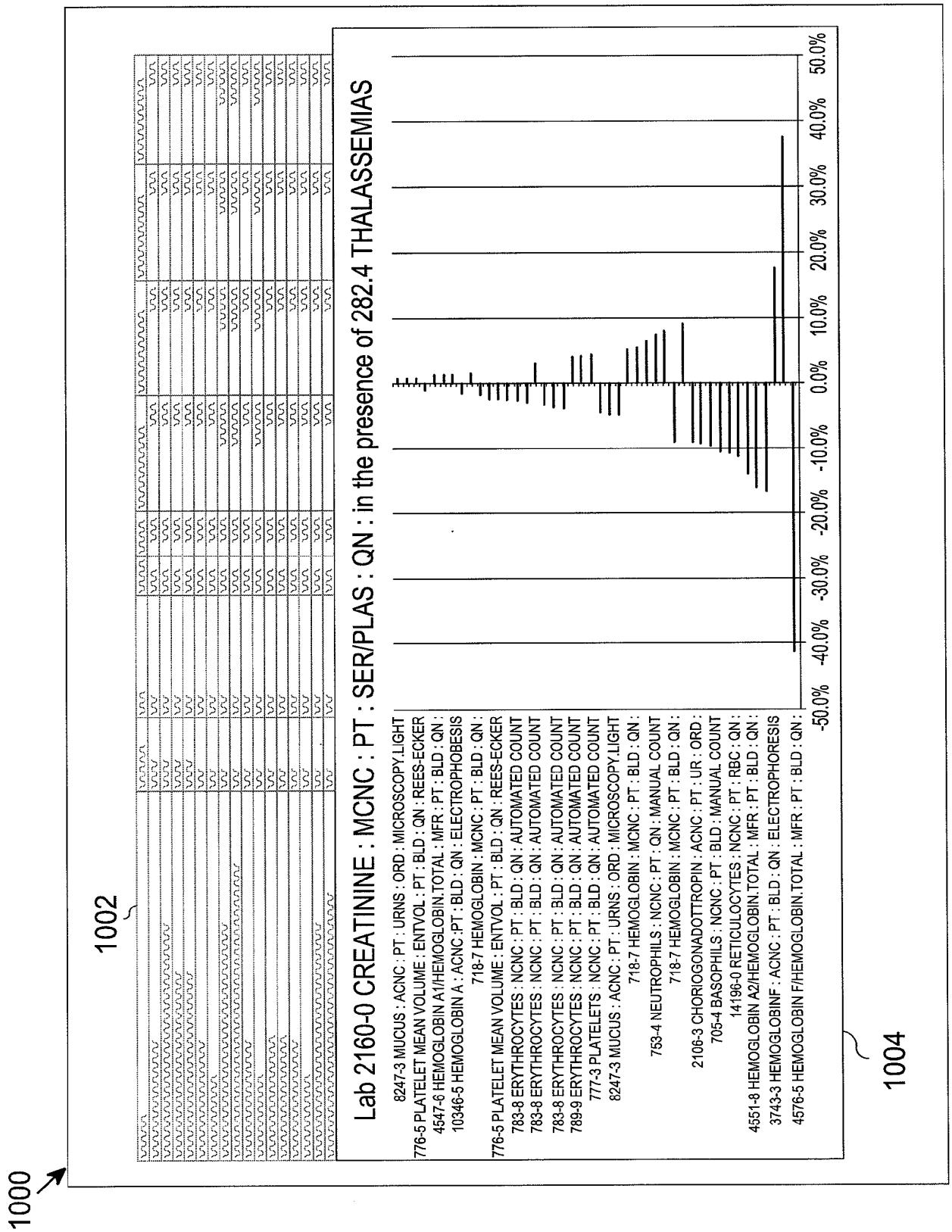

1000
1002
1004
Lab 2160-0 CREATININE : MCNC : PT : SER/PLAS : QN : in the presence of 282.4 THALASSEMIAS
8247-3 MUCUS : ACNC : PT : URNS : ORD : MICROSCOPY.LIGHT
776-5 PLATELET MEAN VOLUME : ENTVOL : PT : BLD : QN : REES-ECKER
4547-6 HEMOGLOBIN A1/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
10346-5 HEMOGLOBIN A : ACNC :PT : BLD : QN : ELECTROPHOBESIS
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
776-5 PLATELET MEAN VOLUME : ENTVOL : PT : BLD : QN : REES-ECKER
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
789-9 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
777-3 PLATELETS : NCNC : PT : BLD : QN : AUTOMATED COUNT
8247-3 MUCUS : ACNC : PT : URNS : ORD : MICROSCOPY.LIGHT
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
753-4 NEUTROPHILS : NCNC : PT : QN : MANUAL COUNT
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
2106-3 CHORIOGONADOTTROPIN : ACNC : PT : UR : ORD :
705-4 BASOPHILS : NCNC : PT : BLD : MANUAL COUNT
14196-0 RETICULOCYTES : NCNC : PT : RBC : QN :
4551-8 HEMOGLOBIN A2/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
3743-3 HEMOGLOBINF : ACNC : PT : BLD : QN : ELECTROPHORESIS
4576-5 HEMOGLOBIN F/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
-50.0% -40.0% -30.0% -20.0% -10.0% 0.0% 10.0% 20.0% 30.0% 40.0% 50.0%

FIG. 10

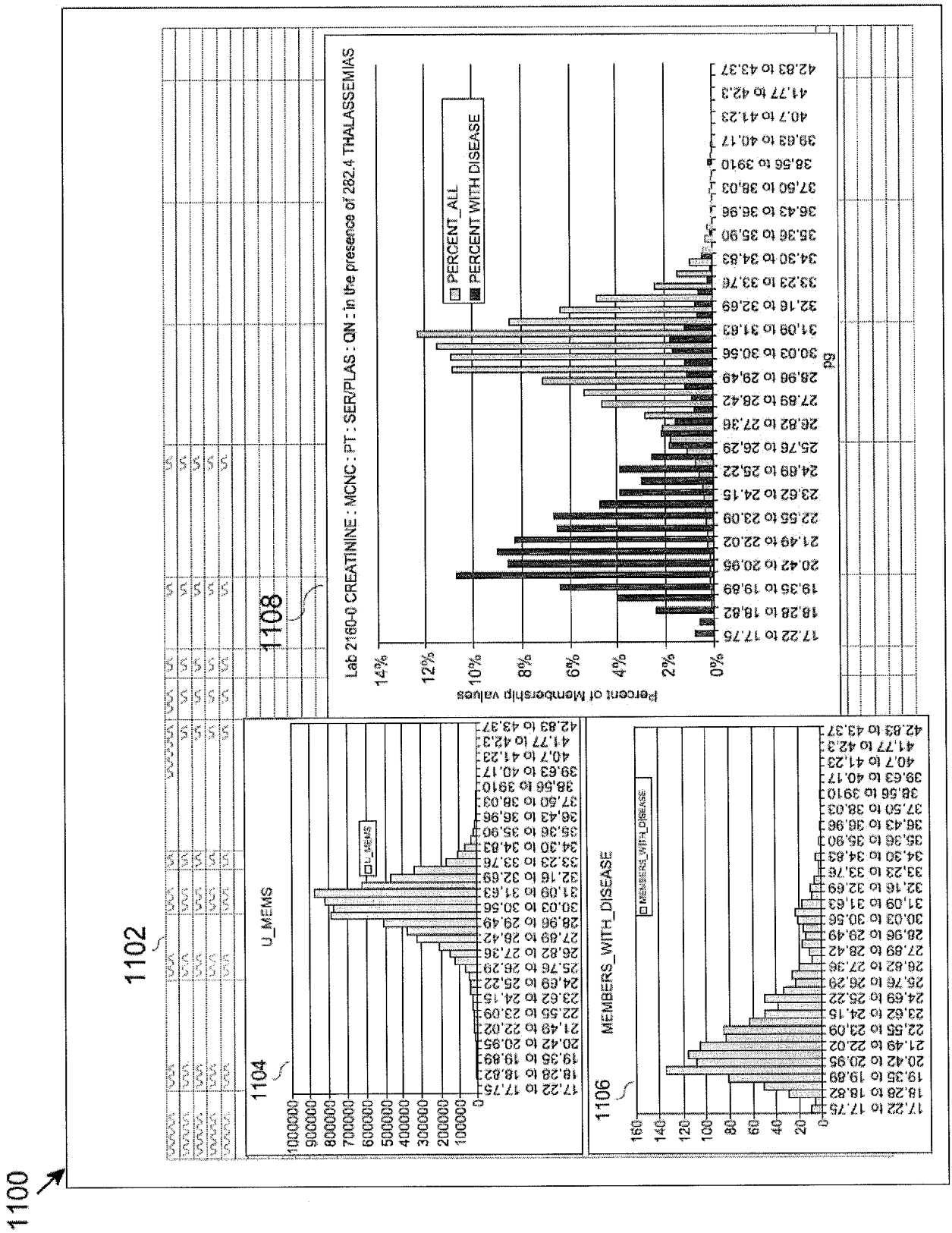

1100
1102
1104
U_MEMS
1106
MEMBERS_WITH_DISEASE
1108
Lab 2160-0 CREATININE : MCNC : PT : SER/PLAS : QN : in the presence of 282.4 THALASSEMIAS
PERCENT_ALL
PERCENT WITH DISEASE
Percent of Membership values
Bg

FIG. 11

RN	PERCENTILE	RND	LEAD_PERC	LEAD_RND
1	0.037037037	$2.44	0.074074074	$5.29
2	0.074074074	$5.29	0.111111111	$6.50
3	0.111111111	$6.50	0.148148148	$9.58
4	0.148148148	$9.58	.0185185185	$13.64
5	.0185185185	$13.64	0.222222222	$17.43
6	0.222222222	$17.43	0.259259259	$21.76
7	0.259259259	$21.76	0.296296296	$24.19
8	0.296296296	$24.19	0.333333333	$28.29
9	0.333333333	$28.29	0.37037037	$36.05
10	0.37037037	$36.05	0.407407407	$38.45
11	0.407407407	$38.45	0.444444444	$39.34
12	0.444444444	$39.34	0.481481481	$45.63
13	0.481481481	$45.63	0.518518519	$46.01
14	0.518518519	$46.01	0.555555555	$51.91
15	0.555555555	$51.91	0.592592593	$53.26
16	0.592592593	$53.26	0.62962963	$54.74
17	0.62962963	$54.74	0.66666667	$56.45
18	0.66666667	$56.45	0.703703704	$60.31
19	0.703703704	$60.31	0.740704741	$69.40
20	0.740704741	$69.40	0.77777778	$70.63
21	0.77777778	$70.63	0.814814815	$72.33
22	0.814814815	$72.33	0.851851852	$73.28
23	0.851851852	$73.28	.0888888889	$75.01
24	.0888888889	$75.01	0.925925926	$77.75
25	0.925925926	$77.75	0.962962963	$80.54
26	0.962962963	$80.54	1	$99.11
27	1	$99.11		

RN	PERCENTILE	RND	LEAD_PE	LEAD_RN	M	X	B	INTERPOLATED80TH
21	0.777777778	$70.63	0.814815	$72.73	$45.79	0.8	$35.02	$71.65

FIG. 12

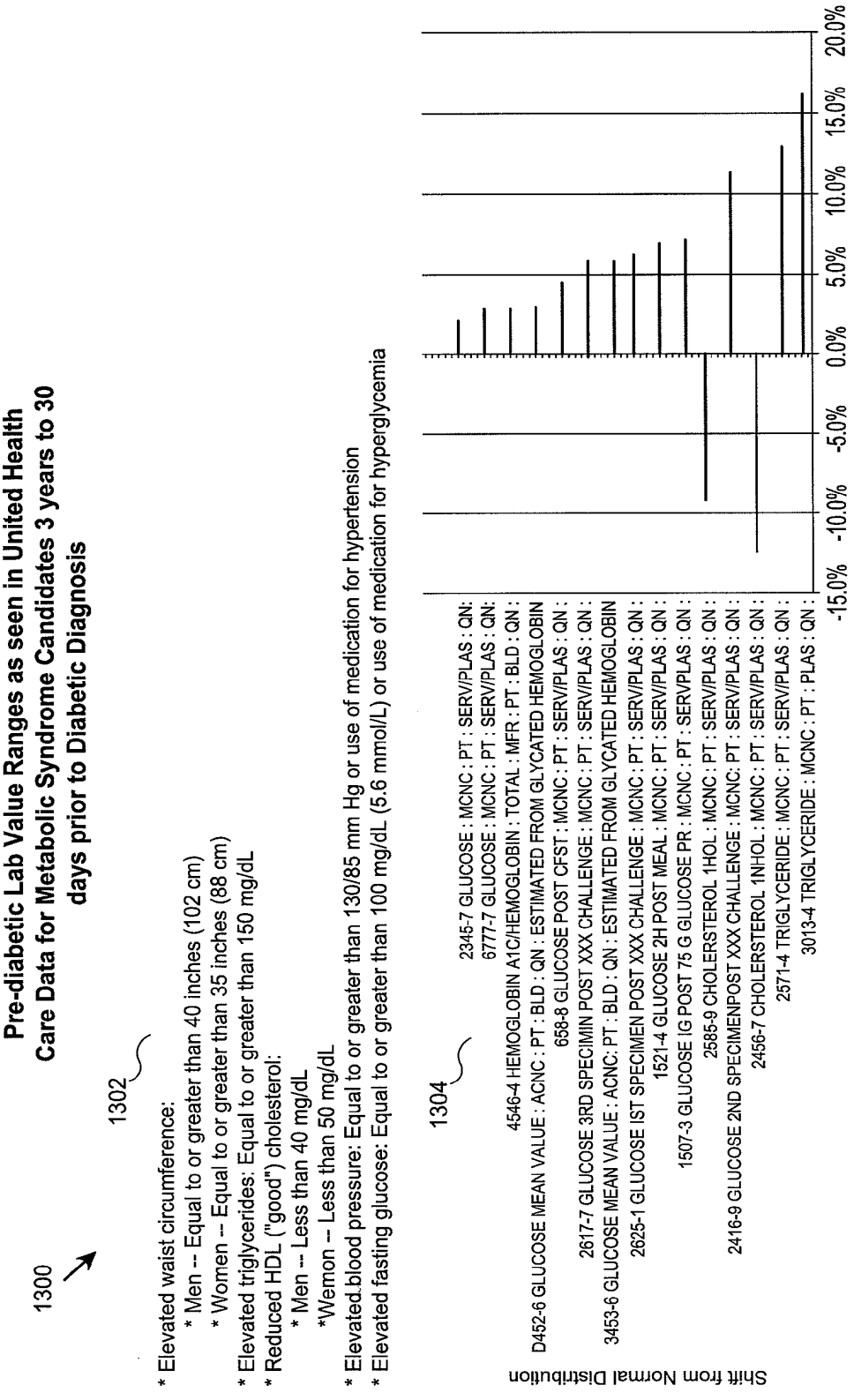


FIG. 13

Datavant Exhibit 1002

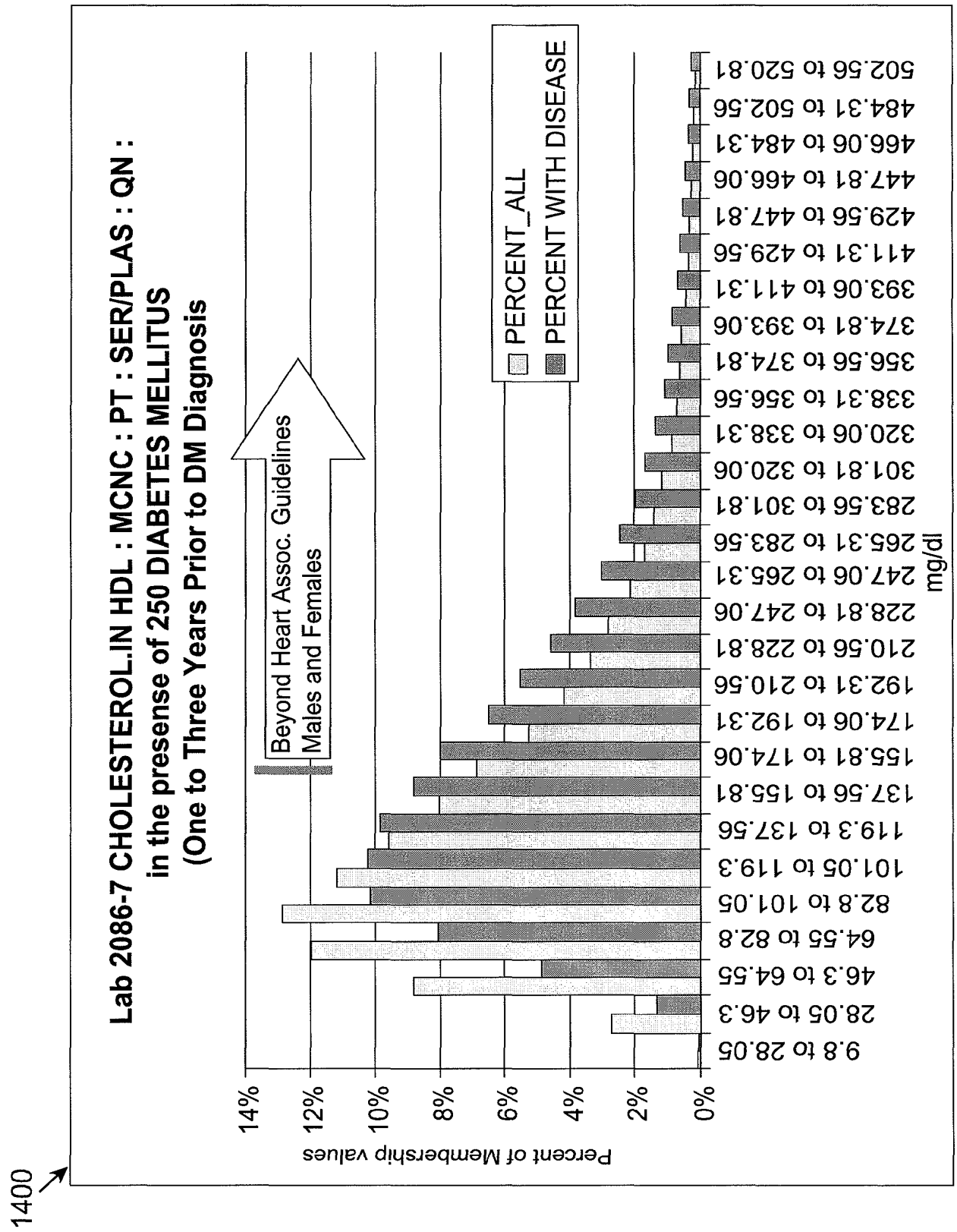

1400
Lab 2086-7 CHOLESTEROL.IN HDL : MCNC : PT : SER/PLAS : QN :
in the presense of 250 DIABETES MELLITUS
(One to Three Years Prior to DM Diagnosis
Beyond Heart Assoc. Guidelines
Males and Females
PERCENT_ALL
PERCENT WITH DISEASE
Percent of Membership values
14%
12%
10%
8%
6%
4%
2%
0%
9.8 to 28.05
28.05 to 46.3
46.3 to 64.55
64.55 to 82.8
82.8 to 101.05
101.05 to 119.3
119.3 to 137.56
137.56 to 155.81
155.81 to 174.06
174.06 to 192.31
192.31 to 210.56
210.56 to 228.81
228.81 to 247.06
247.06 to 265.31
265.31 to 283.56
283.56 to 301.81
301.81 to 320.06
320.06 to 338.31
338.31 to 356.56
356.56 to 374.81
374.81 to 393.06
393.06 to 411.31
411.31 to 429.56
429.56 to 447.81
447.81 to 466.06
466.06 to 484.31
484.31 to 502.56
502.56 to 520.81
mg/dl

FIG. 14

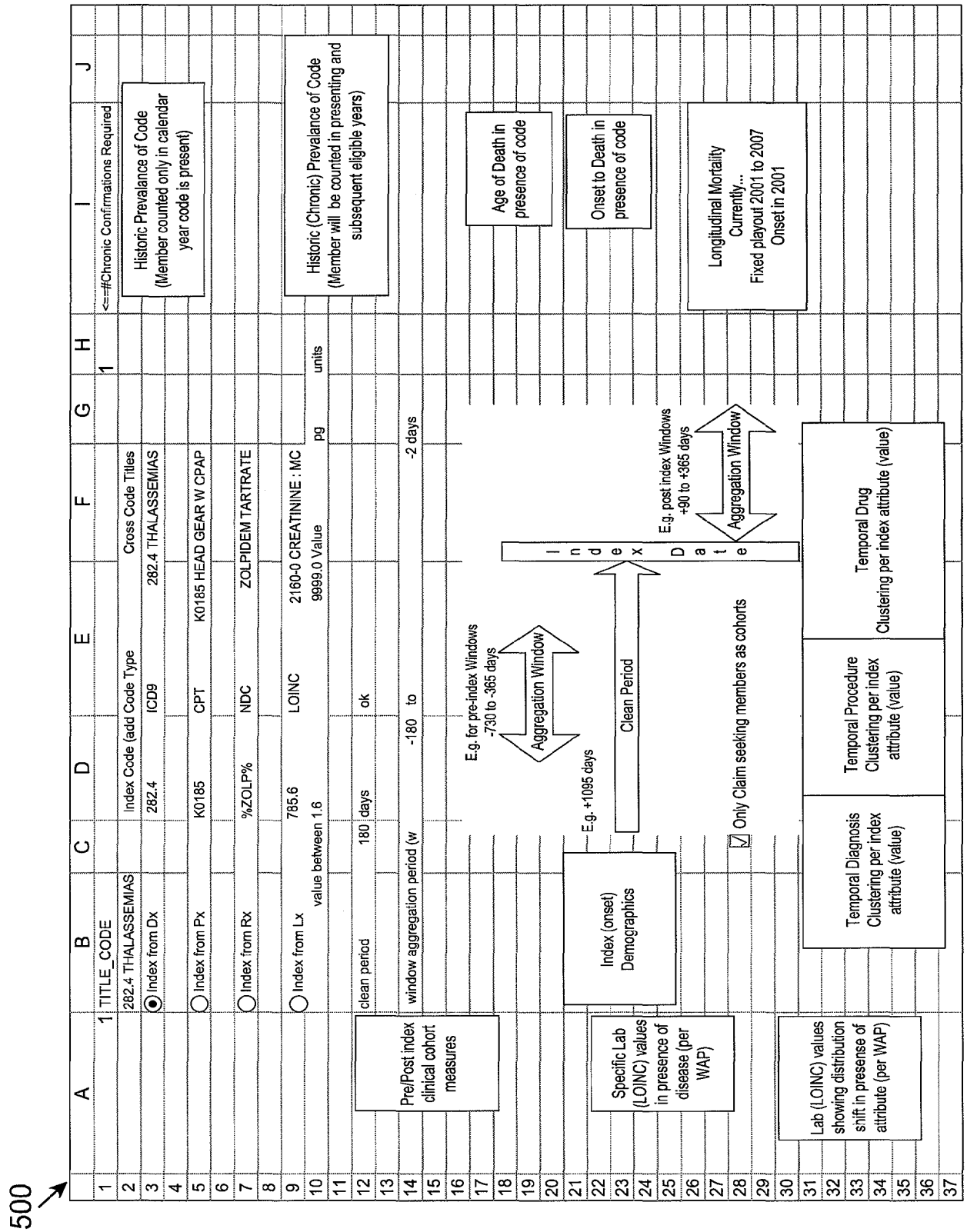


FIG. 15

Datavant Exhibit 1002

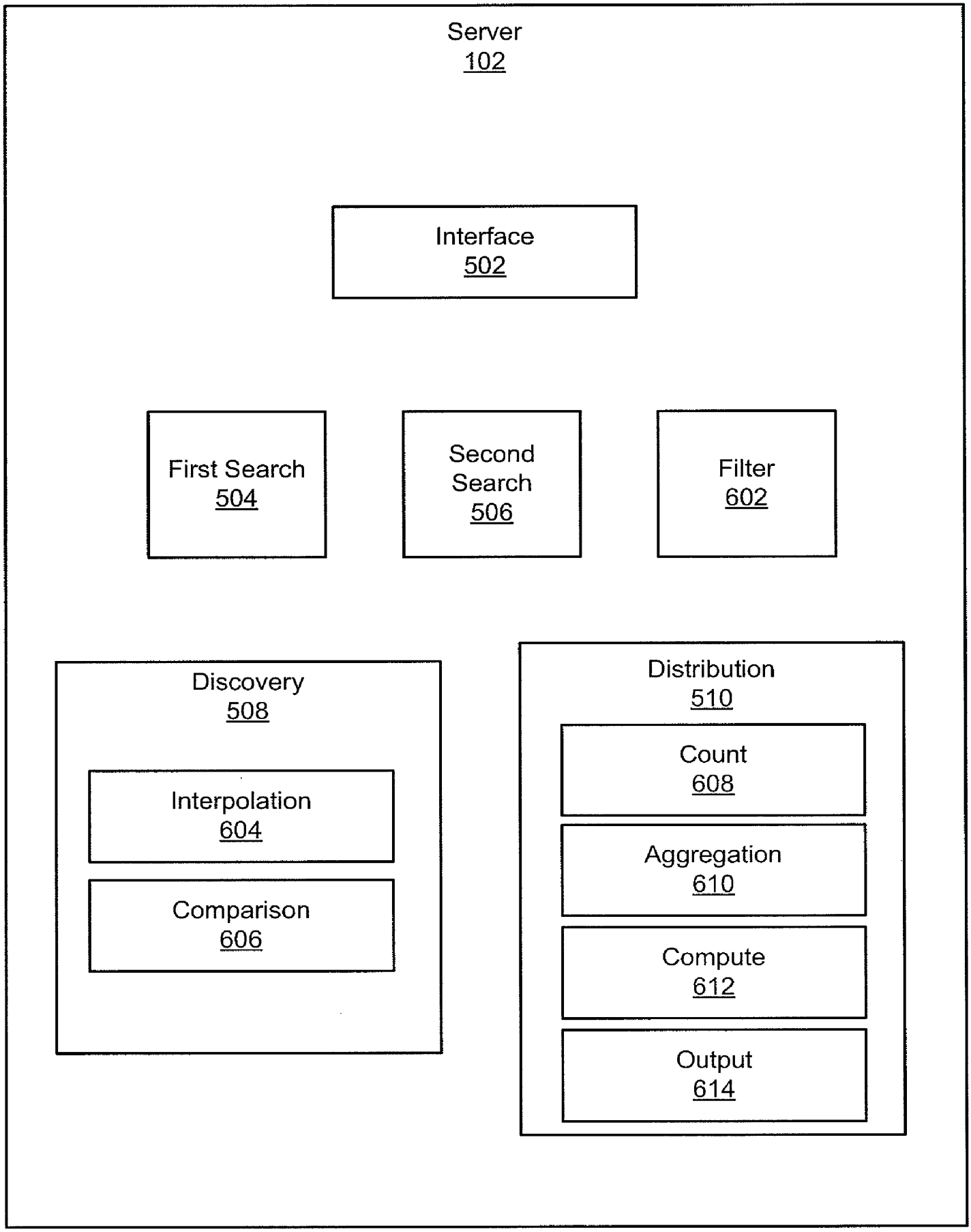


FIG. 6

Datavant Exhibit 1002

PTO/AIA/26 (04-14)
Approved for use through 11/30/2020. 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.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25412-0002003

In re Application of: Vigilytics LLC

Application No.: 16/131,094

Filed: September 14, 2018

For: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

The applicant, Vigilytics LLC, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,118,641 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 48,950

/Jeffrey J. Barclay, Reg. No. 48,950/ — Signature
10 June 2020 — Date

Jeffrey J. Barclay — Typed or printed name

Agent of record — Title
617-542-5070 — Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/131,094	06/10/2020 05:57:16 PM ET	25412-0002003

Title of Invention

DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9792	FILED BY	Cathy O'Brien
PATENT CENTER #	60036143	FILING DATE	09/14/2018
CUSTOMER #	26161	FIRST NAMED INVENTOR	Andrew Paris III
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Jeffrey Barclay

Documents

TOTAL DOCUMENTS: 10

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
WO_2007108814_A1.pdf		45	Foreign Reference	1375 KB
WO_2010129653_A1.pdf		51	Foreign Reference	1285 KB
CA_2760773_A1.pdf		53	Foreign Reference	2655 KB
ReplytoOA.pdf		10	-	113 KB
ReplytoOA-A....pdf	(1-1)	1	Amendment/Req. Reconsideration-After Non-Final Reject	58 KB
ReplytoOA-CLM.pdf	(2-5)	4	Claims	56 KB

ReplytoOA-REM.pdf	(6-10)	5	Applicant Arguments/Remarks Made in an Amendment	96 KB
Terminal_Disclaimer.pdf		1	Terminal Disclaimer Filed	60 KB
TerminalDisclaimer.pdf		1	Terminal Disclaimer Filed	60 KB
IDS.pdf		3	-	155 KB
IDS-TRAN.LET.pdf	(1-1)	1	Transmittal Letter	52 KB
IDS-IDS.pdf	(2-3)	2	Information Disclosure Statement (IDS) Form (SB08)	99 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
WO_2007108814_A1.pdf	A366E67179DD2F3BB82577B7529CC2303343C153ADCC93007E5527642326BCFFFCAE21F121F2BC60C2747BBB7796692CB9CD16EAC4EEE61C2F5876E5538F0CB2
WO_2010129653_A1.pdf	1E6C300D139284E61B6F9228C8AD2848ECA279A6DA0753D8101117558F8B03848FB03E76AB460D8D9B7EBF1BBEF86704E7044CA5F79D0BE3C16D274AD72E3C99
CA_2760773_A1.pdf	08AFF786B8C79D6D86C9F60A68022F5B01E0FB67F6625A0C600EB7B7A101D18610734DABB73B904DF1D7C5CD002DB1119372869DE0346473296737DC8CB63526
ReplytoOA.pdf	65445993DA2CF40FE2DD50BAA434F2E4B3E861703C8C49847019255EA82DA4B5BE92D836020616D9D4734D0671D3596461C30B294BCDBA96EF05D6C95B70F119
ReplytoOA-A....pdf	AA2FAC25B90BE94451BD518FCD5ADD1F38209C0D855115BC66330D0522E42ACB68D8C8924163C578DC422C40CB7C9D903C511B9FCC870ADF146EE4BDE774F236

ReplytoOA-CLM.pdf	84841C897E25DDDD2CBEFC1572AC525FACEAD53F062A06A1F84672A717A8C020C48C2F53291CD72EBF4A09D755DA85D3951EE2EFA37E96CC08795E320B3894AA
ReplytoOA-REM.pdf	E618D312737BD9CBE96C9F1B6503A8CC13E830E265A0A3A2B3A4E0053C68E25C2E5F3C76238CDA8184A2D9B4B5AD21C369CF8AFC19249ACF737687F71D985C6F
Terminal_Disclaimer.pdf	2A68DF72CE9EB9051D651AA12348EA9AA72A90733F4D5241FB85F6ABA75E5BB90AC234432CAE7F3F1C8DF29A2FF0E411D56925434A1DDF258F7C9655D00B5F26
TerminalDisclaimer.pdf	972A76F22E05235D5AB7A23D5CF4DA331673BAC029CF59B35A620D5A4F06CA9A6911CC9CD6C5346A941C2136163553840A90281F81F8B132DF3EBD1CC77A72BD
IDS.pdf	D2606CEDA8499A72D8FE372FB252E771EC0596084C813757C5CC3473190C9CB0D103BC08342A9EFB2587170A03472143EFAC2EA108A1A75B51238FD1BCA97094
IDS-TRAN.LET.pdf	512CB20DDDA67A4541558475C3E6AB76FCF63D8F2A39A82474DD26FB6E7FB2AE2520B13DB558C3BCA3E3D9893D67D13AA8BF6F32A5CC8637A1EEA4FFB51FC7F9
IDS-IDS.pdf	3D634CD7EC6C18D1BECABF25166984D450BE8BC6819B9FB46B2B99AEA5CA243C7BFE9809AA97F701CB2E59D9ABB143CD2482D3AF8E7F0169991F66C5E3F0C464

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 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.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 September 2007 (27.09.2007)

PCT

(10) International Publication Number
WO 2007/108814 A1

(51) International Patent Classification:
G06F 19/00 (2006.01)

(21) International Application Number:
PCT/US2006/017237

(22) International Filing Date: 4 May 2006 (04.05.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/384,231 17 March 2006 (17.03.2006) US

(71) Applicant *(for all designated States except US)*: **INGENIX, INC.**; 12125 Technology Drive, Eden Prairie, Minnesota 55344 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **ANDERSON, David** [US/US]; 2330 Manuela Drive, Chaska, Minnesota 55318 (US). **RAWLINGS, Jean** [US/US]; 5761 S. 3260 W., Roy, Utah 84067 (US). **ARTHUR, Jonathan** [US/US]; 2513 Burl Oak Curve, Hudson, Wisconsin 54016 (US).

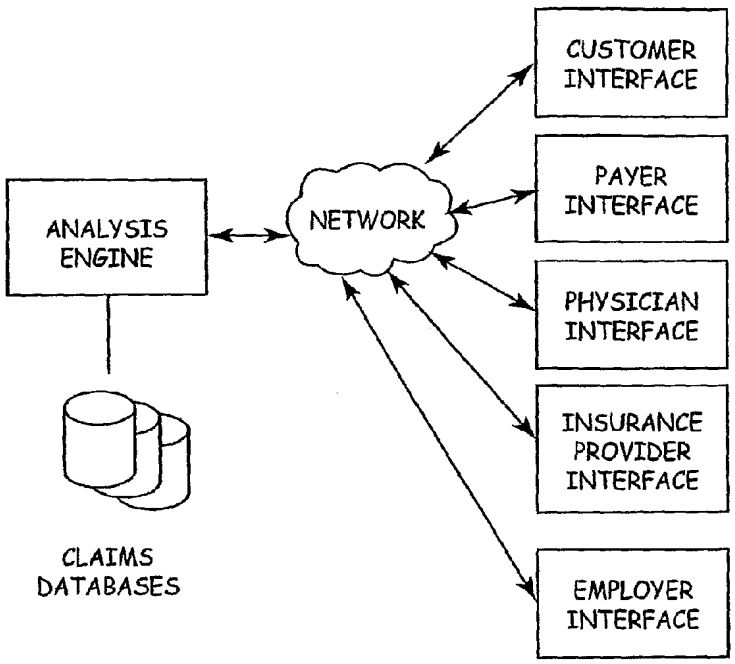
(74) Agents: **LUEDKE, Adriana** et al.; Dorsey & Whitney LLP, Suite 1500, 50 South Sixth Street, Minneapolis, Minnesota 55402-1498 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR IDENTIFYING AND ANALYZING PATTERNS OR ABERRATIONS IN HEALTHCARE CLAIMS



(57) Abstract: In a system and method for identifying aberrations in treatment pattern for a medical condition, a group of healthcare claim data to be analyzed is identified, wherein the group of healthcare claim data to be analyzed includes claim data representing treatment of the medical condition. Actual treatment pattern data is generated that represents the claim data in the group of healthcare claim data to be analyzed. Defined treatment pattern data for the medical condition is retrieved and compared to the actual treatment pattern data to identify one or more discrepancies therebetween, and corresponding comparison data representing the results of the comparison is generated. The actual treatment pattern data may represent a patient's treatment for the medical condition, and the defined treatment pattern data may represent treatment of a group of other patients for the medical condition. Alternatively, the actual treatment pattern data may represent treatment of multiple patients for the medical condition by a healthcare provider, and the defined treatment pattern data may represent an established procedure for treatment of the medical condition. The system and method may also generate the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

WO 2007/108814 A1

Datavant Exhibit 1002

RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

— *with amended claims*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Datavant Exhibit 1002

SYSTEM AND METHOD FOR IDENTIFYING AND ANALYZING PATTERNS OR ABERRATIONS IN HEALTHCARE CLAIMS

FIELD OF THE INVENTION

This invention relates, in general, to data processing techniques, and more specifically to analyzing healthcare data.

BACKGROUND OF THE INVENTION

In the healthcare industry, payers of medical claims face the challenge of identifying and preventing healthcare fraud and abuse. One industry-wide effort relates to establishing rules engines that provide the capability to prevent payment to fraudulent claims. Several analytic tools are available, such as products offered by IBM (FAMS), Fair Isaac, and VIPS, but these products have minimal interoperability, operate very slowly in a traditional reporting fashion and/or require significant configuration, and require an intense effort to modify. Tools like SAS and SPSS provide statistical analysis capability to review very large data sets but they require either a predefined binary target or a test data set in order to derive relevant aberrancy patterns within the claims data. However, such tools may require significant upfront consulting fees, and the accuracy of such tools may be compromised during use.

Additionally, existing systems often focus on identification of aberrations or fraud in the context of claim data associated with an individual patient. However, some types of fraud are difficult to detect on an individual basis. Thus, there is a need for a system that can identify fraud and other claim data aberrations (e.g., billing irregularities) based upon analysis of groups of claim data.

As recognized by the present inventors, what is needed is a method and system for identifying and analyzing patterns of healthcare claims, so that fraud or other patterns of interest may be identified from the healthcare claims. It is against this background that various embodiments of the present invention were developed.

SUMMARY

In light of the above and according to one broad aspect of one embodiment of the present invention, disclosed herein is a method for identifying aberrations in a patient's treatment pattern for a medical condition, aberrations in treatment patterns representing treatment of a number of patients for the same medical condition by one or more healthcare

providers, or aberrations in patterns based upon other claim data groupings as desired by the user. Aberrations in treatment patterns identified by the system and method may be indicative, for example, of fraud, improper or poor quality of medical treatment, improper billing practices, and/or other undesirable aspects of treatment of the medical condition.

In one embodiment of the present invention, a method for identifying aberrations in treatment pattern for a medical condition includes the steps of: identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed includes claim data representing treatment of the medical condition; generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed; retrieving defined treatment pattern data for the medical condition; comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and generating comparison data representing the results of the comparison. The method may further include the step of displaying the actual treatment pattern data, the defined treatment pattern data, and the comparison data and/or the step of generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

The actual treatment pattern data may represent a patient's treatment for the medical condition, and the defined treatment pattern data may represent treatment of a group of other patients for the medical condition. Alternatively, the actual treatment pattern data may represent treatment of multiple patients for the medical condition by a healthcare provider, and the defined treatment pattern data may represent an established procedure for treatment of the medical condition. The actual treatment pattern data may include treatment dates, categories of treatment, and a list of treatments provided.

The established procedure may be derived from evidence based medicine and/or from historical claim data analysis.

A system for identifying aberrations in treatment pattern for a medical condition in accordance with the present invention includes a database for storing healthcare claim data and a processor. The processor identifies a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed includes claim data representing treatment of the medical condition; generates actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed; retrieves defined treatment pattern data for the medical condition; compares the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and generates comparison data representing the results of the comparison.

Datavant Exhibit 1002

The features, utilities and advantages of the various embodiments of the invention will be apparent from the following more particular description of embodiments of the invention as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates an example of a block diagram for identifying and analyzing patterns of healthcare claims, in accordance with one embodiment of the present invention.

Fig. 2 illustrates an example of operations for identifying and analyzing patterns of healthcare claims in accordance with one embodiment of the present invention.

Fig. 2A illustrates another example of operations for identifying and analyzing patterns of healthcare claims in accordance with one embodiment of the present invention.

Fig. 3 illustrates an example of a display layout for pattern analysis of healthcare claims data, in accordance with one embodiment of the present invention.

Fig. 4 illustrates an example of a display layout to analyze treatment patterns received by a group of patients having a medical condition, in accordance with one embodiment of the present invention.

Fig. 5 illustrates an example of a display layout wherein a comparison or overlay of individual treatments and group treatment is illustrated, in accordance with one embodiment of the present invention.

Fig. 6 illustrates an example of a display screen of a geographic market report of claims data, , in accordance with one embodiment of the present invention.

Fig. 7 illustrates an example display screen of a chapter 5 sub category/diagnosis selection screen, in accordance with one embodiment of the present invention.

Fig. 8 illustrates an example display screen of medical service providers organized by regions, in accordance with one embodiment of the present invention.

Fig. 9 illustrates a geographic map of members of a healthcare plan that have received a particular medical diagnosis, in accordance with one embodiment of the present invention.

Fig. 10 illustrates an example display screen of a regional 15 pattern for a particular medical diagnosis, in accordance with one embodiment of the present invention.

Fig. 11 illustrates an example display screen of a profile of diagnosis codes used rarely and commonly by a particular medical service provider, in accordance with one embodiment of the present invention.

Datavant Exhibit 1002

Fig. 12 illustrates an example display screen of a geographic map showing a medical service provider's member distribution, in accordance with one embodiment of the present invention.

Fig. 13 illustrates an example display screen of healthcare claims data corresponding to a particular medical service provider, in accordance with one embodiment of the present invention.

Fig. 14 illustrates an example display screen of a treatment pattern as provided by a particular medical service provider for a particular medical diagnosis, in accordance with one embodiment of the present invention.

Fig. 15 illustrates an example display screen of a overlay or comparison between a healthcare pattern provided by a service provider for a particular diagnosis as compared with a pattern generated from evidence based medicine, in accordance with one embodiment of the present invention.

Fig. 16 is an example of a classification of categories for analyzing healthcare claims data, in accordance with one embodiment of the present invention.

Fig. 17 is an example of a traversing the classifications of categories for analyzing healthcare claims data, in accordance with one embodiment of the present invention.

Fig. 18 is a further example of traversing the classifications of categories for analyzing healthcare claims data, in accordance with one embodiment of the present invention.

Fig. 19 is an example of mapping a problem statement and a solution to the classification of categories of Fig. 18, in 5 accordance with one embodiment of the present invention.

DETAILED DESCRIPTION

Embodiments of the present invention provide for deriving healthcare treatment patterns for a patient from healthcare claims data and displaying such treatment patterns. These treatment patterns can be compared to group treatment patterns derived from healthcare claims data, so that aberrations in the patient's treatment pattern can be identified. These aberrations can help identify fraud, over utilization, or other problems. Moreover, using the patient's treatment patterns, if any combinations of events of interest occurred to the patient (i.e., such as an adverse drug reaction), such events of interest can be located to the extent they may have occurred in other patient's healthcare claims data.

Datavant Exhibit 1002

In one example, graphical user interfaces or display screens allow users to quickly drill down on data associated with aberrant billing patterns, identifying claim ID, provider, specialty, regions, state, employer, diagnosis code, procedure code, etc., and any combination of one or more data points. The user interfaces can be used to identify types of trends that exist in the data and target the factors that may be related to such trends. Various embodiments of the present invention are described herein, and may be implemented as methods, systems, apparatus or in other forms.

Fig. 1 illustrates a block diagram of a system for identifying and analyzing patterns of healthcare claims, in accordance with one embodiment of the present invention. As shown in Fig. 1, an analysis engine is provided which reads and processes data from a database of healthcare claims. In one example, the database may include multiple information sources having healthcare claims data. In one example, a conventional claims database is utilized which contains data, including IDC9 code data, of medical claims. In one example, the database may include procedure code descriptions, such as a CPT code, for each claim line item. The data may also include ICD-9 codes, which are an International Classification of Disease indicating why a particular procedure or medical service was performed, also known as a "diagnosis" codes.

To create groupings of claim data to be analyzed for patterns and aberrations in accordance with the present invention, claim data may be grouped using any grouping methodology or definition desired by the user. For example, groupings of claim data to be analyzed by the analysis engine may be episode treatment groups (ETGs), which define a grouping of medical episodes of related etiology. A detailed description of the grouping of medical claim data into ETGs is described in U.S. Patent No. 6,223,164 B1, issued April 24, 2001 to Seare et al., and U.S. Patent No. 6,370,511 B1, issued April 9, 2002 to Dang, both of which are incorporated herein by reference. Groupings of data may be performed by the medical service provider or by the facility where the service is provided.

Various interfaces may be provided to the analysis engine, including interfaces for customers, interfaces for payers, interfaces for physicians, interfaces for insurance providers, and interfaces for employers, as examples. Each of these interfaces may be implemented over a network, for instance within a browser program of the user for providing remote access to the analysis engine and the data stored in the claims database.

Generally, the analysis engine allows for identification of patterns present in healthcare treatments of individual patients or groups of patients. These patterns have numerous uses as described herein, for instance for comparing a pattern of treatment received

Datavant Exhibit 1002

by an individual patient against the general pattern of treatment of a group of patients having the same medical condition as the individual patients.

Fig. 2 illustrates an example of operations for identifying and analyzing patterns of healthcare claims, in accordance with one embodiment of the present invention. At operation 10, a display of patient data is created using a desired display layout. Numerous examples of display layouts are described herein. In one example, the display layout includes treatments data and categories of services rendered, and may also include diagnosis codes and a list of actual services received. The category of services may be arranged to include categories such as maintenance services, complication services, surgery services, lab/radiology services, and pharmacy services, and one example. At operation 20, using the display of operation 10, patterns of interest with respect to the patient's treatment are identified. There may be a multitude of patterns of interest that may be identified, and may include, but are not limited to: excess prescriptions of medicines, skewed frequencies of treatments or office visits, the onset of a major medical acute condition, etc.

Using the patterns of interest identified in operation 20, subgroups of patients with the same or similar pattern of interest may be identified. In one example operation 30 includes mining the claims database for additional patients which may also have experienced the same or similar pattern as identified by operation 20. In this regard, where a pattern of interest identified in operation 20 includes, for example, an adverse reaction to a medical treatment or a combination of drugs, operation 30 can mine the claims database to determine if other patients have experienced similar adverse reactions.

In operation 40, the data of the subgroups identified by operation 30 can be studied and variables within the data set can be isolated to identified other trends. For instance, where a subgroup of patients has experienced and adverse reaction to a medical treatment or combination of prescribed drugs, operation 40 may examine whether the patients in the subgroups have other traits in common or other statistical analysis may be performed. Hence operations 20-40 can be used to examine whether a pattern of interest that the individual patient experienced was also experienced by other patients whose records are in the claims database.

In another embodiment, in place of operations 20-40, a set of operations can be performed to identify aberrations in the treatment pattern of an individual patient when compared against a group of patients have the same medically diagnosed condition. In one example, a group treatment pattern as received by a group of patients for the medical condition is derived from the healthcare claims data and this group treatment pattern is

Datavant Exhibit 1002

compared to the first display to one or more discrepancies therebetween. A second display of the group treatment pattern may be provided, and the first display and the second display may be combined to visually display the one or more discrepancies between patterns of treatment.

Fig. 2A illustrates an alternative operation for identifying and analyzing patterns of healthcare claims in accordance with the present invention. In step 210, the analysis engine of Fig. 1 identifies a group of claim data to be analyzed, such as claim data relating to treatment of a certain medical condition, e.g., condition X, by a certain healthcare provider, e.g., provider A. The group of claim data may be defined by gathering all ETG claim data for the condition X where the provider of care is provider A.

In step 220, the analysis engine creates pattern data illustrating all treatments given to patients of provider A relating to the treatment of condition X.

In step 230, the analysis engine retrieves from an associated database the applicable predefined pattern of treatment for condition X. The predefined pattern of treatment may be, for example, defined based upon evidence based medicine standards or defined through historical claim analysis. The predefined pattern of treatment for condition X may be defined to take into account factors such as the difficulty of the treatments provided by provider A and/or provider A's casemix. By considering the applicable casemix, provider A's treatment patterns are compared with other healthcare providers that have a similar casemix. By considering the applicable staging indicators (e.g., risk of mortality or severity of illness), provider A's treatment patterns are compared against treatment of condition A at similar levels of difficulty or complications.

In step 240, provider A's treatment patterns are compared against the predefined treatment pattern retrieved by the analysis engine and displayed to the user. Using this method, the user may identify, for example, unusual, unnecessary, and/or excessive treatments routinely provided by provider A in treatment of condition X; unusual, unnecessary, and/or excessive use of facilities by provider A in treatment of condition X; and/or unusual, unnecessary, and/or excessive billing practices by provider A. Identification of such aberrations may be indicative of fraud, poor quality of care, billing irregularities, etc., that may be difficult to detect when examining claim data relating only to one patient being treated by provider A for condition X. The results of this comparison may be used, for example, to generate reports concerning treatment patterns of certain healthcare providers to enable assessment of the performance of the healthcare provider for various purposes. Similar analyses may be performed for multiple medical conditions and/or multiple healthcare providers.

Datavant Exhibit 1002

Fig. 3 illustrates an example of a display layout for pattern analysis of healthcare claims data performed using the process illustrated in FIG. 2. In this example, claims data relating to historical healthcare treatment of an individual patient is illustrated. In this example, the display layout includes data representations of treatment dates, diagnosis codes, and categories of healthcare services. In one example, the treatment dates are plotted in ascending order along the lower horizontal axis from left to right, and the left most vertical axis includes the category of healthcare services. The category of healthcare services may include various subcategories, such as a maintenance subcategory, a subcategory for complications, a subcategory for surgery, a subcategory for laboratory work or radiology, a subcategory for pharmaceuticals or prescriptions, and the like. Depending upon the particular implementation, the subcategories used in the display layout may vary.

The display layout may also include a list of services received, or representation thereof, which may be arranged to be displayed within each subcategory to which the particular service corresponds. It can be seen that for each data point based on actual healthcare claim data, the data point is plotted to correspond with the date of the treatment, and is also plotted to be displayed within the appropriate category of services provided. Moreover, in one example, for each data point, the diagnosis codes relating to that data point may be displayed, as well as a description or representation of the actual services performed.

In this example, the patient has been categorized in a group of patients having the medical condition of leukemia. By grouping the patients into various groups based on the medical conditions they suffer from, treatment patterns for all such patients in a particular group can be identified, and variations of treatments received by individual patients can be readily identified when compared against the pattern of treatment that other patients in the group receive.

Further, if desired, each data point may include the actual cost associated with the medical service or event that occurred and is represented by that data point.

Using a display layout such as illustrated in Fig. 3, actual healthcare claims data events can be plotted within the display layout. For instance, in Fig. 3, the first service received for this individual patient analysis was on January 1, 2002, and included an "Executive Profile 80053" that is displayed within the category of laboratory/radiology services. That event included diagnosis codes V581 and 205.10 in this example. It can be seen that the next events that occurred in time based on the healthcare claims data were the prescriptions of medicine including "GLEEVEC 100mg 25724" and "ALLOPURINOL 300mg 7037." Later in time, approximately around April 1, 2002, the patient received an

Datavant Exhibit 1002

office visit, had some blood work performed, and received an automated hemogram and executive profile laboratory/radiology work. Three more drugs were prescribed (TENORETIC 50mg 6779, INDOMETHACIN 50mg 5084, and GLYBURIDE MICRO 6mrx, 16602).

The other services received by this patient during the course of their healthcare treatment are shown in this example Fig. 3. From this display layout, it can be seen that prior to May 1, 2003, the patient suffered a major coronary complication that included emergency care. Accordingly, because the display layout of this example provides historical healthcare claims data, such a display layout permits a medical practitioner or other entity to quickly examine the history of treatment to determine whether a significant or meaningful pattern exists in the treatment, and can help identify whether a variation in treatment has been experienced by a patient when compared with typical patterns for treating a patient with similar medical issues.

Accordingly, the display layout of Fig. 3 provides a simple visual display where a pattern change can be identified quickly (in this case, the major coronary event that occurred prior to May 1, 2003) and such pattern change can be isolated with an analysis of what occurred prior to the complication. In this case, it can be seen that immediately prior to the complication, a new drug "MONOPRIL 20mg 3877" was added to this patient's treatment regiment. At this point in the analysis, a comparison may be made with other patients in the system to determine whether other patients may have the same or similar pattern of treatment that resulted in a coronary event. Because the claims data base in the system includes claims data of various treatments for millions of patients over numerous years, it may be possible to identify similar situations in other patients. Such results could then be used to initially identify potential adverse side effects of medications or adverse interactions between two or more drugs. Once a pattern of interest has been identified (such as a potential adverse side effect or adverse drug interaction) further data processing can be performed by isolating or analyzing a subset of patients who experienced the particular pattern or adverse side effect. For instance, of the subset of patients, the claims data may be further examined to determine whether there is an indication in the patient's body that may be responsible for the adverse reaction, such as a type of gene, co-morbidity, patient weight, other medical conditions such as diabetes or other variables. Additional information concerning analysis of safety concerns for new drugs is found in U.S. Provisional Patent Application Serial No. 60/674,958, entitled "System and Method for Early Detection of Safety Concerns for New Drugs," filed April 25, 2005.

Datavant Exhibit 1002

Fig. 4 illustrates an example of a display layout to show a pattern of treatment received by a group of patients. In this example, the group of patients each have the medical condition of leukemia, the same condition as the individual patient whose pattern of care is represented in Fig. 3. As with the display layout of Fig. 3, in the layout of the example of display of Fig. 4, when displaying group behavior, treatment dates are typically normalized around an anchor date which might be day 0- first diagnosis, or day 0- start of treatment, and may further include diagnosis codes and representations of actual services received, or categories of services provided. In Fig. 4 the data points shown may be derived from the database of claims data. Moreover, each data point can include average or typical costs for each medical procedure or event represented by the particular data point.

In the example of Fig. 4, it can be seen that the group of patients having leukemia experienced a general treatment program that includes a steady set of immunizations, office visits at least every six months, periodic blood draws and hemograms, as well as eye examinations and prescriptions of "Glyburide micro 6 mrx 16602."

The patterns of treatment such as shown in Fig. 4 can be used for comparison against an individuals' actual treatment history or against a group of individuals' treatments histories or patterns thereof, as shown below with regard to Fig. 5.

In the example of Fig. 5, the individual's actual treatment (Fig. 3) is compared against a pattern of treatment received by a group of patients having the same medical condition (Fig. 4). Hence, using the overlay of Fig. 5, it is possible to compare how an individual's treatment was similar to or different from the typical pattern of treatment received by patients having the same or similar medical condition, and aberrations in the individual's treatment pattern can be identified. In the example of Fig. 5 for instance, the overlay display indicates that the individual patient received their flu vaccine and immunization, as well as their diagnostic ophthalmologic exams and special eye exams, consistent with those received by the group of patients. In contrast, the patient received a large number of chest x-rays which was inconsistent with the treatment pattern of the group. Fig. 5 also illustrates a number of other differences between the treatment received by the individual and the pattern of treatment received by the group of patients.

Using the display layout of Fig. 4, patterns of treatment for patients having a particular diagnosis, or access patterns for a particular diagnosis, can be created from actual medical claims data to provide evidence based medicine patterns derived out of the data. Patterns analyzed based on evidence based medicine are identified by analyzing claims from patients' medical records or claim stream from a particular healthcare provider to test the

Datavant Exhibit 1002

provider's compliance with standard guidelines, such as rules from published scientific investigations, published pharmacy safety information, and/or expert opinion, billing practices, etc. A comparison between the standard guidelines and patterns in patients' treatment data may be used to identify aberrations in the provider's conduct.

Alternatively, a pattern can be introduced into the display layout, and that pattern can be compared to entries within the claims data base. For instance, a pattern of best practices or best treatment practices can be introduced and then used for comparison purposes against other patterns derived from the claims data or compared against treatments received by individuals or by groups of individuals represented within the claims database. Other patterns may include patterns by specialty group, patterns of quality in which actual treatment patterns are compared to predefined treatment patterns to assess the quality of care provided to one or more patients and/or provided by one or more healthcare providers, patterns of physician's treating habits to see how often a physician sees patients, patterns of over utilization and under utilization, and patterns of wellness programs.

Embodiments of the present invention may be used to notify insurance providers and their members of fraud because the display layouts may be used to examine the ways in which the patients are receiving care. For instance, if the diagnosis codes don't support the services or prescriptions being received by a patient, such may indicate fraud.

Embodiments of the invention may also be used as case management tools, because particular patterns of best treatment practices can be matched up with physicians who empirically treat their patients according to such best practices, and hence new patients with such conditions can be referred to those physicians.

For example, employers may use embodiments of the inventions to help design or adjust their medical benefit programs. Employers can perform sensitivity analysis to study potential costs or effects of changes in health care policies.

For instance, if the employer or a payer is proposing to change co-payments for office visits from $15 to $20, the employer or payer can retrieve and study the general access pattern for the groups of employees and determine whether the change in the co-payment amount will result in any cost savings.

Fig. 6-15 illustrate examples of display screens which may be utilized with one or more embodiments of the present invention. In Fig. 6, a trend analysis or geographic market report is illustrated which may be useful for viewing by a payer to determine where insurance costs are originating from on a per member per month basis, in one example. In Fig. 6, a target per member per month cost is shown for physician visits, in-patient treatment, and out-

Datavant Exhibit 1002

patient treatment, as well as per member per month actual cost of physician visits, in-patient treatments and out-patient treatments. A per member per month trend field is also provided for physician visits, in-patient services, and out-patient services. For instance, in the first row of data from the market of New York, it can be seen that for a first group of claim types relating to connective tissue, the actual per member per month costs of physician visits is $17.94 versus a projected target per member per month cost of $15.73, expressed as a trend difference of 1.6%. The user of the software is able to drill down deeper into these numbers by selecting one or more links provided in the example display screen of Fig. 6.

Fig. 7 illustrates an example display screen wherein a search window is provided so that a user can conduct a search of data for a particular markets and for a particular diagnosis code categories. The display screen provides a display of the number of patients, and encounters and providers in the data set, as well as the averages of the net amounts paid per patients per encounter, or per provider.

Fig. 8 illustrates an example display screen showing costs by market region, and also includes names of providers, specialty of providers, diagnosis code categories, and the net amounts paid, amounts covered, and number of unique patients, encounters, and providers in the data set. For instance, this display screen can be used by a payer to see that $981.39 is being paid per member per month to medical service provider Dr. John M. Smith. If the user desires to see more information about the patients and claims of John Smith, the user can select the link to John Smith and further information may be displayed.

Fig. 9 illustrates an example of a geographic map showing the location and distribution of members that have experienced the same diagnosis as was diagnosed by Dr. John Smith. If a user clicks on a portion of the map, then further information may be displayed about the treatment that patients in that geographic region are receiving.

Fig. 10 illustrates an example of a display screen showing treatment patterns that patients in the geographic region are receiving for the particular diagnosis. These displays may be provided in a similar format as described above with regard to display layouts for pattern analysis.

Fig. 11 illustrates another sample display screen wherein a profile of a medical service provider is shown. In one example, the display screen of Fig. 11 may include a list of the rarest diagnosis codes used by the provider, as well as the most common diagnosis codes used by the provider. For each entry in either the rarest diagnosis codes or the most common diagnosis codes, the fields may be provided for quantifying the total number of encounters with this diagnosis, the specific numbers of encounters with this diagnosis and the unique

Datavant Exhibit 1002

number of patients of this provider that have experienced this diagnosis, as well as a percentage quantifying the percentage of the providers patients that have been given this diagnosis. For instance, under the list of most common diagnosis codes used by the provider Dr. John Smith, hypertension has been diagnosed by this provider 11.12% of all the patients of this provider.

Fig. 12 illustrates an example display screen wherein the medical service providers distribution of membership is illustrated. Fig. 13 illustrates an example display screen wherein the details of claims data and treatments may be displayed for diagnosis/treatments made by a service provider. Here, the detailed report is provided for a single service provider, Dr. John Smith. Claims data detail may include a specialty code, a claimant identification, a service date, procedure codes, net paid amounts, amount submitted, and diagnosis codes. From the claimant ID link, a user may select this link in order to generate the individual patients' treatment pattern, such as was discussed above with regard to Figs. 3-5.

Figs. 14-15 provide another example of a display of treatment pattern for an individual under the care of a particular service provider (Fig. 14), as well as an overlay (Fig. 15) between the treatment pattern for the individual compared against an evidenced based medicine practice pattern (events represented small squares in Fig. 15) which illustrates the differences between how the patient was treated for this particular diagnosis by this particular service provider against how an evidence based medicine practice pattern empirically treats such a diagnosis. From this comparison in Fig. 15, aberrations in treatment provided to the individual may be identified.

Fig. 16-19 illustrate an example of a taxonomy or ordered groups of categories that can be utilized provide a user with control over how to analyze claims data within the claims database for addressing a particular need of the user. This taxonomy can be utilized in an attempt to standardize methods for the identification and classification of problem statements for which solutions based on analysis of healthcare data are created. The taxonomy illustrates how all of the different type of information sets can be grouped together to generate the pattern graphic.

By crafting a problem statement and a solution statement that conforms with the taxonomy, embodiments of the present invention can provide statistical analysis of healthcare claims data as well as relevant displays of results related to the particular problem statement formed.

Datavant Exhibit 1002

In one example and as shown in Fig. 16, the taxonomy may include categories for quantitative elements, segment elements, sub segment elements, and entity elements which can be used to help define the problem statement that the user wishes to address. The taxonomy may also include categories including the market perspective, format, and view which may be utilized to form a solution statement to address the particular problem statement.

The quantitative elements category may include costs/efficiency, quality/effectiveness, value, and risk. The segment category may include group health, P&C, pharmaceuticals, government, employer. The sub segments may include HMO, PPO, TPA, indemnity, CMS, POS, consumer, auto, DOD, VA, in one example. The entity may include physician, hospital, lab, other professional, other facility, patient, pharmacy, in one example. The component category may include segment, entity type, specialty, geographic, demographic, data element, and derived, in one example. Inherent components may be included in the source data and may form a reference point between the entity category and the view category towards the development of a solution. Derived components may be developed from the source data to create a new level of grouping that is not inherently present in the source data, such as aggregation.

A view category may be provided which may include elements of pharmacy, research, subrogation, fraud, actuarial, claims administration, disease management, pricing and underwriting, network management, clinical operations, customer service administration, claims administration, claims administration, net work and provider management, utilization management, and employer, and one example. The views can represent the prospective of the organization utilizing the software as well as the characteristics of organizations within the industry.

A format category may also be included which may include elements of scorecard, summary, profile, trend, pattern, benchmark, and detail, and one example. The formats address the needs of a specific customer solution. The scorecard format can provide an overview which compares multiple entities within levels. Scorecards may also be used to compare individual or multiple, quantitative segment and entity summary levels in a numeric format. Comparative formats include the summary, profile, trend, pattern, and benchmark formats. The detail format provides the values (source data or derived data) directly.

The taxonomy may also include a market prospective category including elements of payer, patient, and provider in one example. The market perspective elements represent the

Datavant Exhibit 1002

prospective of the individual viewing the data, and can provide context in terms of the use and display of the data.

As shown in Fig. 17, a path from the top level of the taxonomy to the bottom level of the taxonomy may be identified to select applicable elements within the various categories as desired by the user. In Fig. 18, selected elements may be organized in order to frame a solution. In Fig. 19, a detailed problem statement can be defined having a specific goal within the elements selected. In creating the problem statement, the derived components to be used can be defined, as well as the applicable customers, views, and formats, that will be used. For instance, in Fig. 19, the problem statement may include "our organization needs to better understand COSTS within the HMO SUB SEGMENT related to PHYSICIAN/HOSPITAL/LAB/PHARMACY by SPECIALTY/GEOGRAPHY." The solution statement may, in one example, states "to meet our problems we will use a SCORECARD/PROFILE FORMAT that answers our ACTUARIAL questions using DERIVED VALUES."

Hence, it can be seen that embodiments of the present invention provide for identifying aberrations or important patterns in a patient's treatment for a medical condition.

Embodiments of the invention can be embodied in a computer program product. It will be understood that a computer program product including features of the present invention may be created in a computer usable medium (such as a CD-ROM or other medium) having computer readable code embodied therein. The computer usable medium preferably contains a number of computer readable program code devices configured to cause a computer to affect the various functions required to carry out the invention, as herein described.

While the methods disclosed herein have been described and shown with reference to particular operations performed in a particular order, it will be understood that these operations may be combined, sub-divided, or re-ordered to form equivalent methods without departing from the teachings of the present invention. Accordingly, unless specifically indicated herein, the order and grouping of the operations is not a limitation of the present invention.

It should be appreciated that reference throughout this specification to "one embodiment" or "an embodiment" or "one example" or "an example" means that a particular feature, structure or characteristic described in connection with the embodiment may be included, if desired, in at least one embodiment of the present invention. Therefore, it should be appreciated that two or more references to "an embodiment" or "one embodiment" or "an

Datavant Exhibit 1002

alternative embodiment" or "one example" or "an example" in various portions of this specification are not necessarily all referring to the same embodiment.

Furthermore, the particular features, structures or characteristics may be combined as desired in one or more embodiments of the invention.

It should be appreciated that in the foregoing description of exemplary embodiments of the invention, various features of the invention are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of one or more of the various inventive aspects. This method of disclosure, however, is not to be interpreted as reflecting an intention that the claimed inventions require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed embodiment, and each embodiment described herein may contain more than one inventive feature.

While the invention has been particularly shown and described with reference to embodiments thereof, it will be understood by those skilled in the art that various other changes in the form and details may be made without departing from the spirit and scope of the invention.

Datavant Exhibit 1002

CLAIMS

What is claimed is:

1. A method for identifying aberrations in treatment pattern for a medical condition, comprising:

identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed comprises claim data representing treatment of the medical condition;

generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed;

retrieving defined treatment pattern data for the medical condition;

comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and

generating comparison data representing the results of the comparison.

2. The method of claim 1, further comprising the step of:

displaying the actual treatment pattern data, the defined treatment pattern data, and the comparison data.

3. The method of claim 1, wherein the actual treatment pattern data represents a patient's treatment for the medical condition and the defined treatment pattern data represents treatment of a group of other patients for the medical condition.

4. The method of claim 1, wherein the actual treatment pattern data represents treatment of multiple patients for the medical condition by a healthcare provider and the defined treatment pattern data represents an established procedure for treatment of the medical condition.

5. The method of claim 4, wherein the established procedure is derived from evidence based medicine.

6. The method of claim 4, wherein the established procedure is derived from historical claim data analysis.

7. The method of claim 1, wherein the actual treatment pattern data includes treatment dates, categories of treatment, and a list of treatments provided.

8. The method of claim 1, further comprising the step of:

generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

9. A system for identifying aberrations in treatment pattern for a medical condition, comprising:

Datavant Exhibit 1002

a database for storing healthcare claim data; and

a processor for:

identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed comprises claim data representing treatment of the medical condition;

generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed;

retrieving defined treatment pattern data for the medical condition;

comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and

generating comparison data representing the results of the comparison.

10. The system of claim 9, further comprising a display device for displaying the actual treatment pattern data, the defined treatment pattern data, and the comparison data.

11. The system of claim 9, wherein the actual treatment pattern data represents a patient's treatment for the medical condition and the defined treatment pattern data represents treatment of a group of other patients for the medical condition.

12. The system of claim 9, wherein the actual treatment pattern data represents treatment of multiple patients for the medical condition by a healthcare provider and the defined treatment pattern data represents an established procedure for treatment of the medical condition.

13. The system of claim 12, wherein the established procedure is derived from evidence based medicine.

14. The system of claim 12, wherein the established procedure is derived from historical claim data analysis.

15. The system of claim 9, wherein the actual treatment pattern data includes treatment dates, categories of treatment, and a list of treatments provided.

16. The system of claim 9, wherein the processor generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

17. A system for identifying aberrations in treatment pattern for a medical condition, comprising:

means for storing healthcare claim data; and

Datavant Exhibit 1002

means for identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed comprises claim data representing treatment of the medical condition;

means for generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed;

means for retrieving defined treatment pattern data for the medical condition;

means for comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and

means for generating comparison data representing the results of the comparison.

18. The system of claim 17, wherein the actual treatment pattern data represents a patient's treatment for the medical condition and the defined treatment pattern data represents treatment of a group of other patients for the medical condition.

19. The system of claim 17, wherein the actual treatment pattern data represents treatment of multiple patients for the medical condition by a healthcare provider and the defined treatment pattern data represents an established procedure for treatment of the medical condition.

20. The system of claim 17, further comprising means for generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

Datavant Exhibit 1002

Received by International Bureau on 26 March 2007

What is claimed is:

9. A system for identifying aberrations in treatment pattern for a medical condition, comprising:

means for storing healthcare claim data; and

processing means including:

means for identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed comprises claim data representing treatment of the medical condition;

means for generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed;

means for retrieving defined treatment pattern data for the medical condition;

means for comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and

means for generating comparison data representing the results of the comparison,

wherein the actual treatment pattern data represents a patient's treatment for the medical condition and the defined treatment pattern data represents treatment of a group of other patients for the medical condition.

10. The system of Claim 9, further comprising means for displaying the actual treatment pattern data, the defined treatment pattern data, and the comparison data.

15. The system of Claim 9, wherein the actual treatment pattern data includes treatment dates, categories of treatment, and a list of treatments provided.

16. The system of Claim 9, further comprising means for generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

17. A system for identifying aberrations in treatment pattern for a medical condition, comprising:

means for storing healthcare claim data; and

processing means including:

Teavant Exhibit 1002

means for identifying a group of healthcare claim data to be analyzed, wherein the group of healthcare claim data to be analyzed comprises claim data representing treatment of the medical condition;

means for generating actual treatment pattern data representing the claim data in the group of healthcare claim data to be analyzed;

means for retrieving defined treatment pattern data for the medical condition;

means for comparing the actual treatment pattern data to the defined treatment pattern data to identify one or more discrepancies therebetween; and

means for generating comparison data representing the results of the comparison,

wherein the actual treatment pattern data represents treatment of multiple patients for the medical condition by a healthcare provider and the defined treatment pattern data represents an established procedure for treatment of the medical condition.

18. The system of Claim 17, wherein the established procedure is derived from historical claim data analysis.

19. The system of Claim 17, wherein the actual treatment pattern data includes treatment dates, categories of treatment, and a list of treatments provided.

20. The system of Claim 17, further comprising means for generating the defined treatment pattern data by identifying and compiling claim data relating to treatment of the medical condition from a database of historical claim data.

21. The system of Claim 17, further comprising means for displaying the actual treatment pattern data, the defined treatment pattern data, and the comparison data.

AMENDED SHEET (ARTICLE 19) Datavant Exhibit 1002

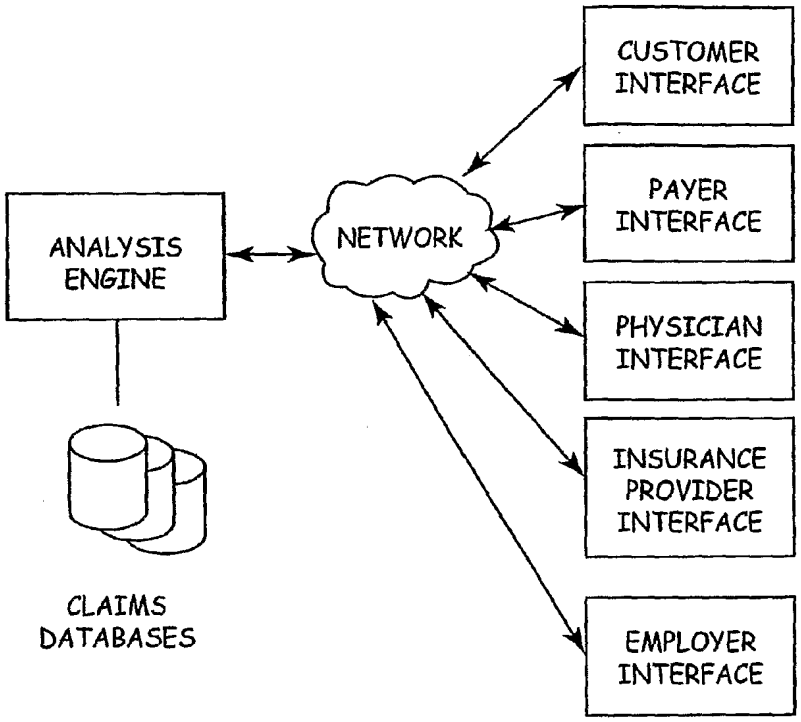


FIG. 1

Datavant Exhibit 1002

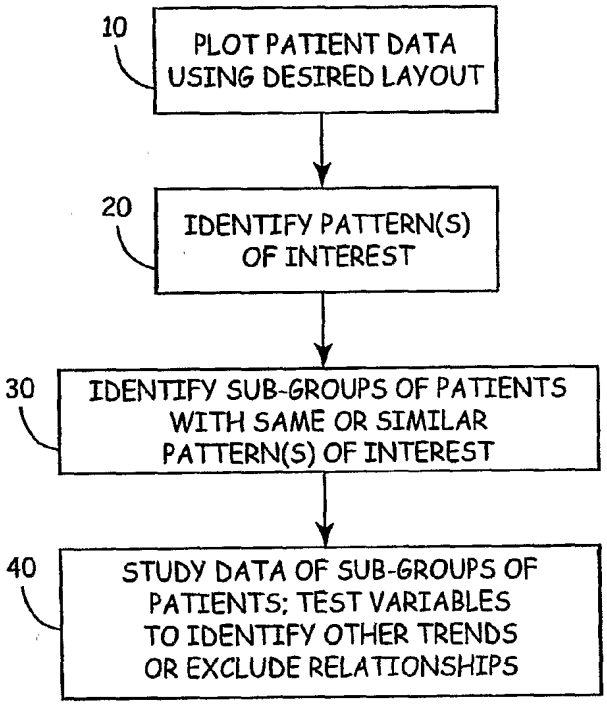


FIG. 2

Datavant Exhibit 1002

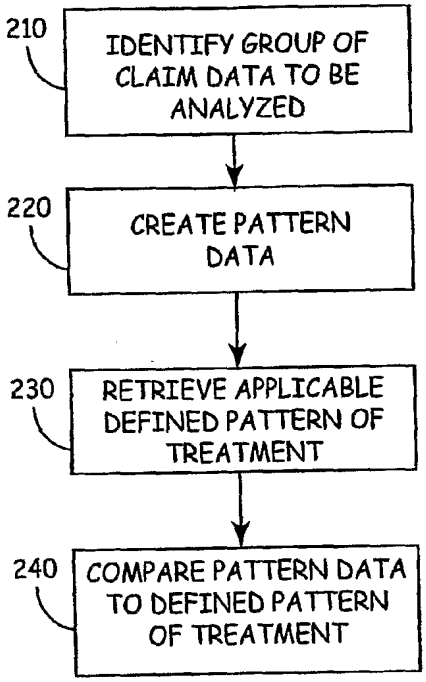


FIG. 2A

Datavant Exhibit 1002

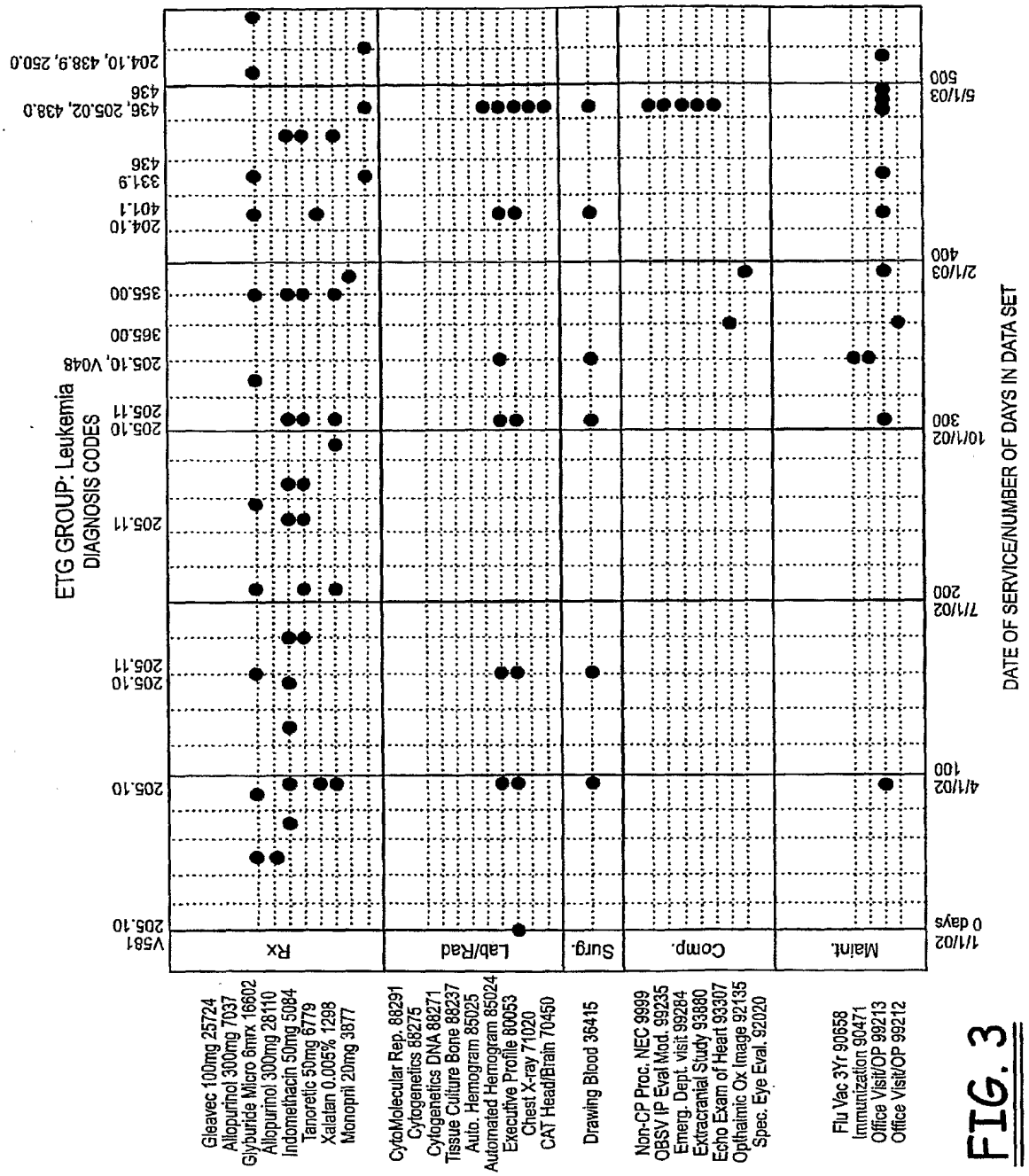


FIG. 3

Datavant Exhibit 1002

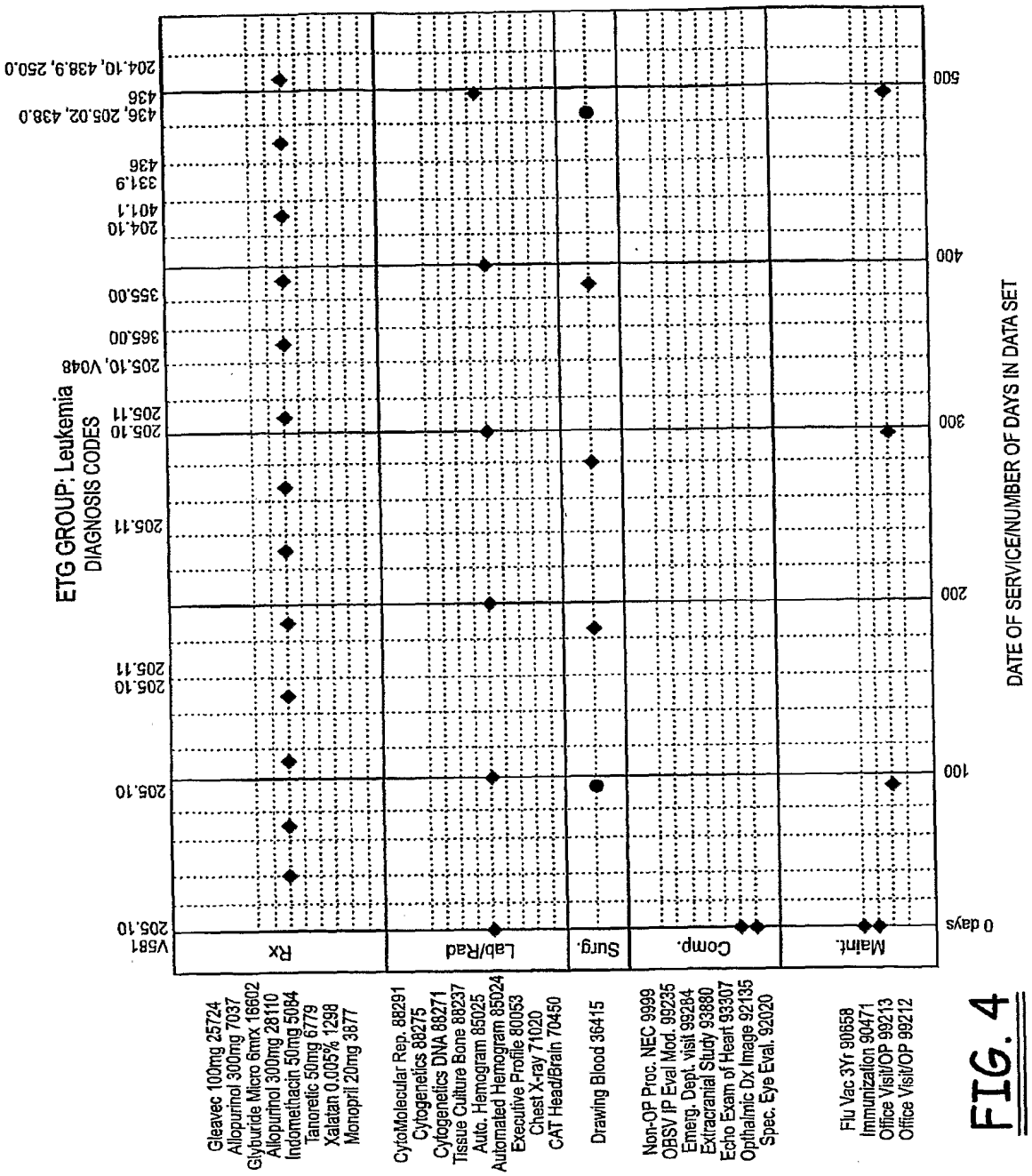


FIG. 4

Datavant Exhibit 1002

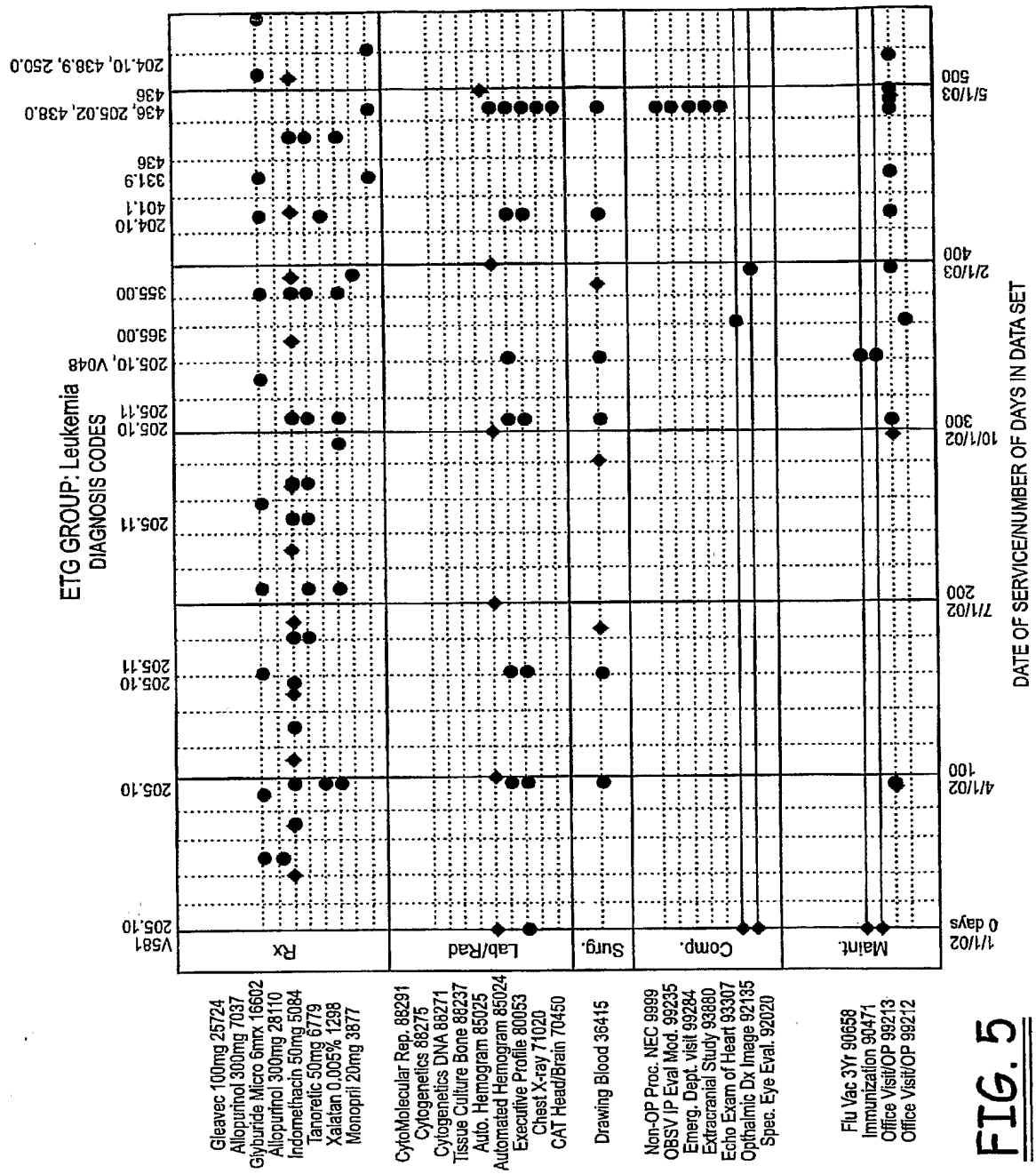
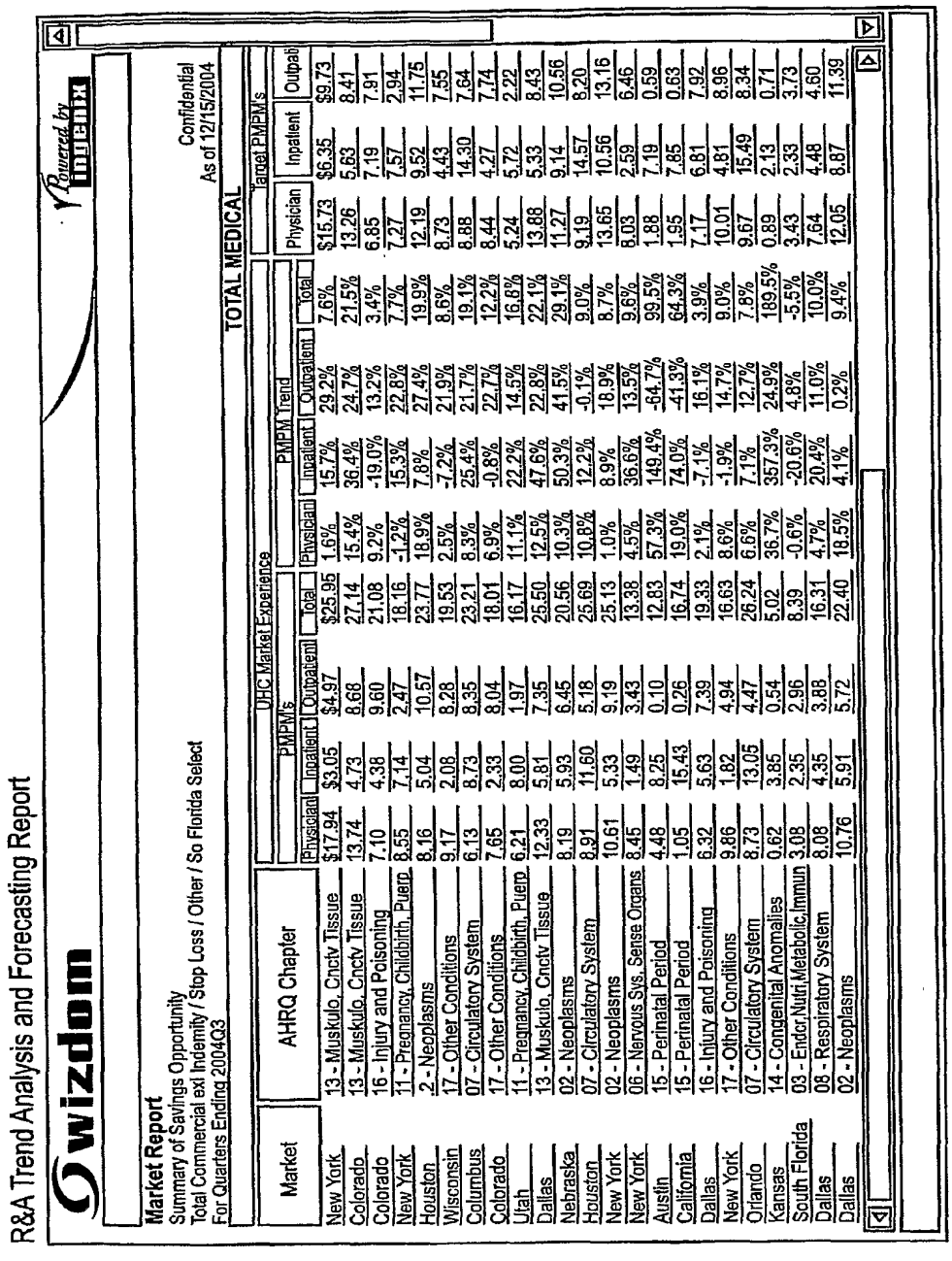


FIG. 5

Datavant Exhibit 1002



R&A Trend Analysis and Forecasting Report

Powered by Ingenix

Market Report

Summary of Savings Opportunity

Total Commercial exl Indemnity / Stop Loss / Other / So Florida Select

For Quarters Ending 2004Q3

Confidential

As of 12/15/2004

TOTAL MEDICAL

Market	AHRQ Chapter	UHC Market Experience PMPM's				PMPM Trend			Target PMPM's		
		Physician	Inpatient	Outpatient	Total	Physician	Inpatient	Outpatient	Total	Physician	Inpatient	Outpati
New York	13 - Musculo, Cnctv Tissue	$17.94	$3.05	$4.97	$25.96	1.6%	15.7%	29.2%	7.6%	$15.73	$6.35	$9.73
Colorado	13 - Musculo, Cnctv Tissue	13.74	4.73	8.68	27.14	15.4%	36.4%	24.7%	21.5%	13.26	5.63	8.41
Colorado	16 - Injury and Poisoning	7.10	4.38	9.60	21.08	9.2%	-19.0%	13.2%	3.4%	6.85	7.19	7.91
New York	11 - Pregnancy, Childbirth, Puerp	8.55	7.14	2.47	18.16	-1.2%	15.3%	22.8%	7.7%	7.27	7.57	2.94
Houston	2 - Neoplasms	8.16	5.04	10.57	23.77	18.9%	7.8%	27.4%	19.9%	12.19	9.52	11.75
Wisconsin	17 - Other Conditions	9.17	2.08	8.28	19.53	2.5%	-7.2%	21.9%	8.6%	8.73	4.43	7.55
Columbus	07 - Circulatory System	6.13	8.73	8.35	23.21	8.3%	25.4%	21.7%	19.1%	8.88	14.30	7.64
Colorado	17 - Other Conditions	7.65	2.33	8.04	18.01	6.9%	-0.8%	22.7%	12.2%	8.44	4.27	7.74
Utah	11 - Pregnancy, Childbirth, Puerp	6.21	8.00	1.97	16.17	11.1%	22.2%	14.5%	16.8%	5.24	5.72	2.22
Dallas	13 - Musculo, Cnctv Tissue	12.33	5.81	7.35	25.50	12.5%	47.6%	22.8%	22.1%	13.88	5.33	8.43
Nebraska	02 - Neoplasms	8.19	5.93	6.45	20.56	10.3%	50.3%	41.5%	29.1%	11.27	9.14	10.56
Houston	07 - Circulatory System	8.91	11.60	5.18	25.69	10.8%	12.2%	-0.1%	9.0%	9.19	14.57	8.20
New York	02 - Neoplasms	10.61	5.33	9.19	25.13	1.0%	8.9%	18.9%	8.7%	13.65	10.56	13.16
New York	06 - Nervous Sys, Sense Organs	8.45	1.49	3.43	13.38	4.5%	36.6%	13.5%	9.6%	8.03	2.59	6.46
Austin	15 - Perinatal Period	4.48	8.25	0.10	12.83	57.3%	149.4%	-64.7%	99.5%	1.88	7.19	0.59
California	15 - Perinatal Period	1.05	15.43	0.26	16.74	19.0%	74.0%	-41.3%	64.3%	1.95	7.85	0.63
Dallas	16 - Injury and Poisoning	6.32	5.63	7.39	19.33	2.1%	-7.1%	16.1%	3.9%	7.17	6.81	7.92
New York	17 - Other Conditions	9.86	1.82	4.94	16.63	8.6%	-1.9%	14.7%	9.0%	10.01	4.81	8.96
Orlando	07 - Circulatory System	8.73	13.05	4.47	26.24	6.6%	7.1%	12.7%	7.8%	9.67	15.49	8.34
Kansas	14 - Congenital Anomalies	0.62	3.85	0.54	5.02	36.7%	357.3%	24.9%	189.5%	0.89	2.13	0.71
South Florida	03 - Endor,Nutri,Metabolic,Immun	3.08	2.35	2.96	8.39	-0.6%	-20.6%	4.8%	-5.5%	3.43	2.33	3.73
Dallas	08 - Respiratory System	8.08	4.35	3.88	16.31	4.7%	20.4%	11.0%	10.0%	7.64	4.48	4.60
Dallas	02 - Neoplasms	10.76	5.91	5.72	22.40	18.5%	4.1%	0.2%	9.4%	12.05	8.87	11.39

FIG. 6

Datavant Exhibit 1002

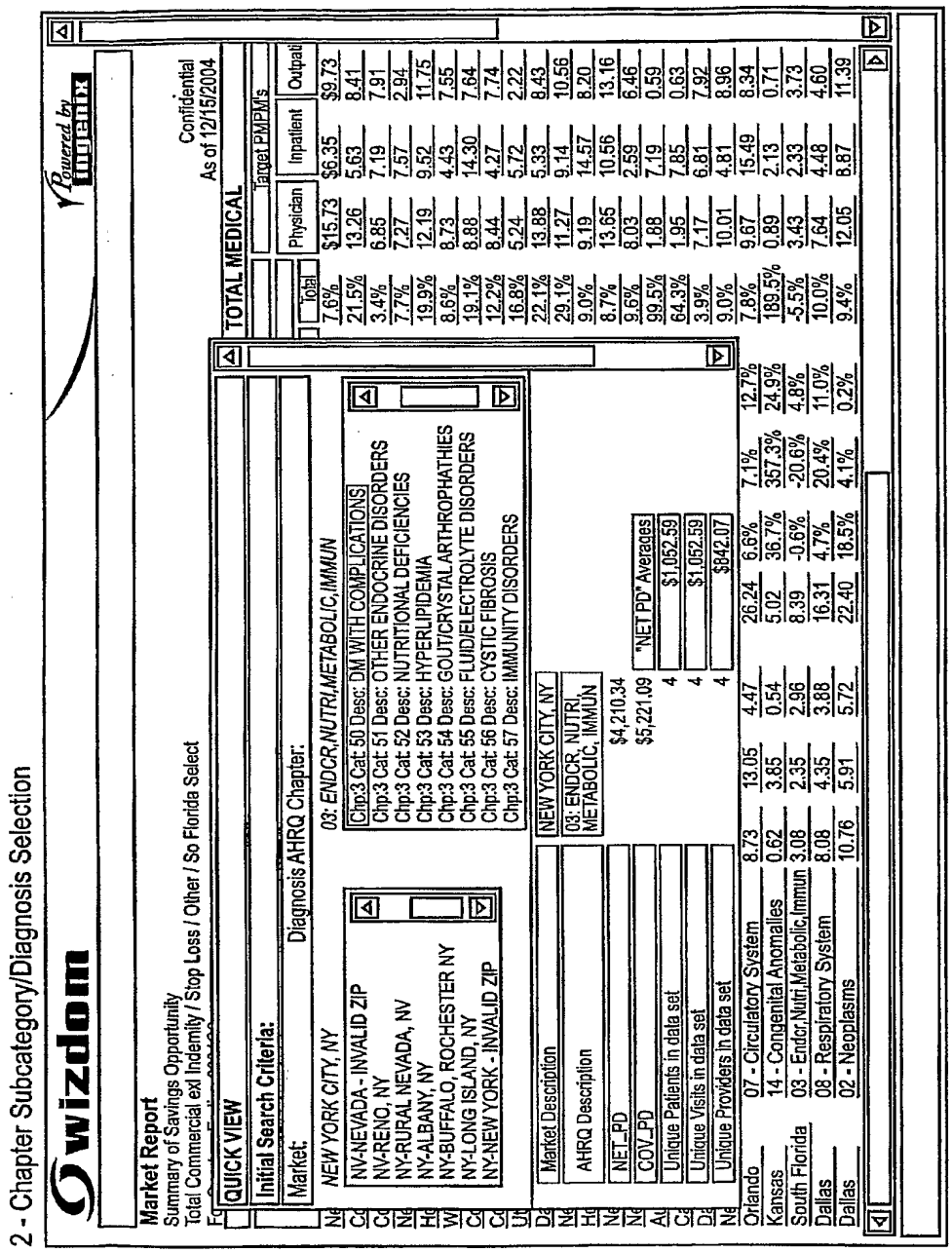


FIG. 7

Datavant Exhibit 1002

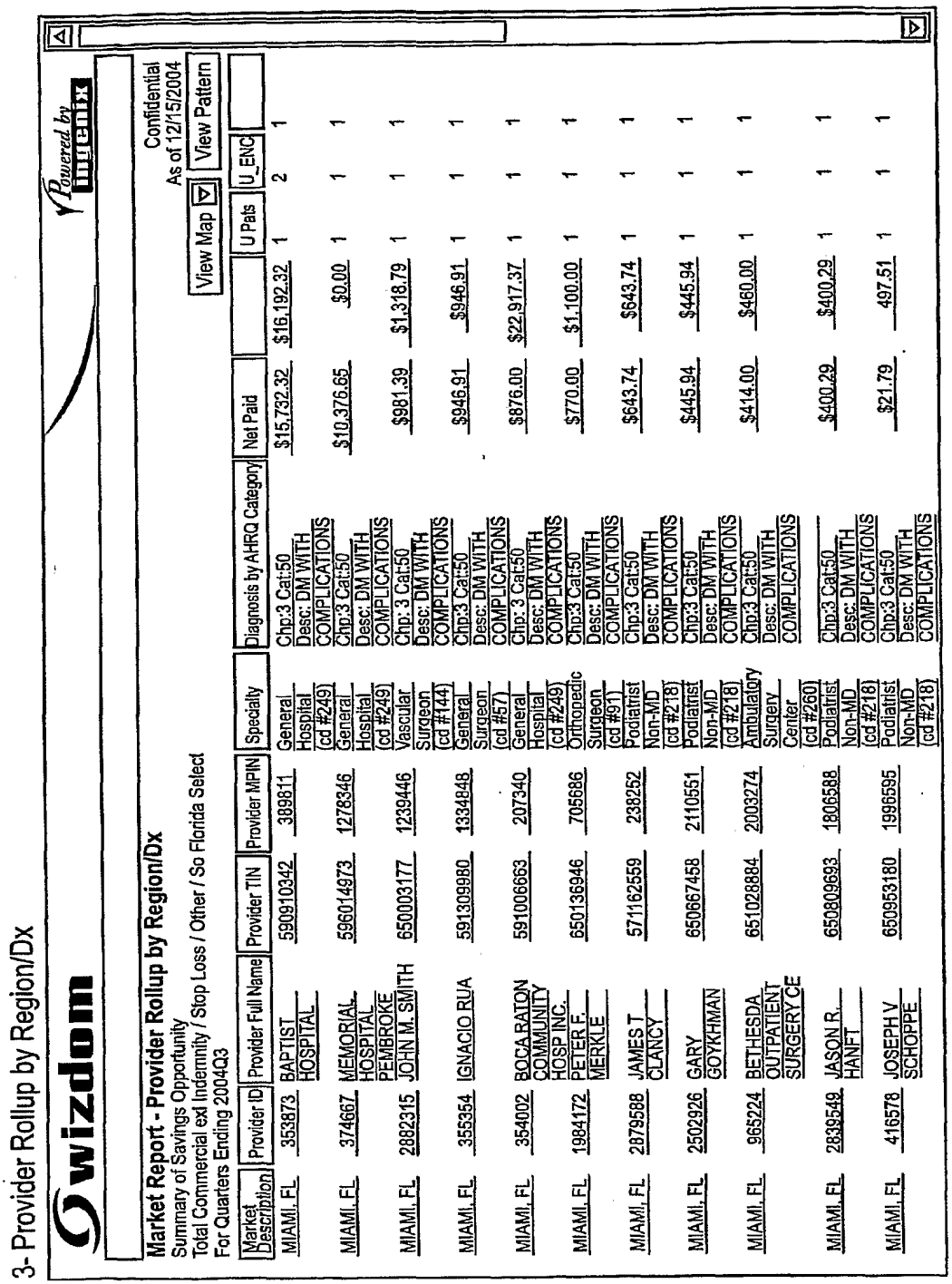

3- Provider Rollup by Region/Dx
wizdom
Powered by
Market Report - Provider Rollup by Region/Dx
Summary of Savings Opportunity
Total Commercial exl Indemnity / Stop Loss / Other / So Florida Select
For Quarters Ending 2004Q3
Confidential
As of 12/15/2004
View Map
View Pattern
Market Description
Provider ID
Provider Full Name
Provider TIN
Provider MPIN
Specialty
Diagnosis by AHRQ Category
Net Paid
U Pats
U_ENC
MIAMI, FL 353873 BAPTIST HOSPITAL 590910342 389811 General Hospital (cd #249) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $15,732.32 $16,192.32 1 2 1
MIAMI, FL 374667 MEMORIAL HOSPITAL PEMBROKE 596014973 1278346 General Hospital (cd #249) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $10,376.65 $0.00 1 1 1
MIAMI, FL 2882315 JOHN M. SMITH 650003177 1239446 Vascular Surgeon (cd #144) Chp: 3 Cat:50 Desc: DM WITH COMPLICATIONS $981.39 $1,318.79 1 1 1
MIAMI, FL 355354 IGNACIO RUA 591309980 1334848 General Surgeon (cd #57) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $946.91 $946.91 1 1 1
MIAMI, FL 354002 BOCA RATON COMMUNITY HOSP INC. 591006663 207340 General Hospital (cd #249) Chp: 3 Cat:50 Desc: DM WITH COMPLICATIONS $876.00 $22,917.37 1 1 1
MIAMI, FL 1984172 PETER F. MERKLE 650136946 705686 Orthopedic Surgeon (cd #91) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $770.00 $1,100.00 1 1 1
MIAMI, FL 2879588 JAMES T CLANCY 571162559 238252 Podiatrist Non-MD (cd #218) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $643.74 $643.74 1 1 1
MIAMI, FL 2502926 GARY GOYKHMAN 650667458 2110551 Podiatrist Non-MD (cd #218) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $445.94 $445.94 1 1 1
MIAMI, FL 965224 BETHESDA OUTPATIENT SURGERY CE 651028884 2003274 Ambulatory Surgery Center (cd #260) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $414.00 $460.00 1 1 1
MIAMI, FL 2839549 JASON R. HANFT 650809693 1806588 Podiatrist Non-MD (cd #218) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $400.29 $400.29 1 1 1
MIAMI, FL 416578 JOSEPH V SCHOPPE 650953180 1996595 Podiatrist Non-MD (cd #218) Chp:3 Cat:50 Desc: DM WITH COMPLICATIONS $21.79 497.51 1 1 1

FIG. 8

3A- Region member Population for Dx (Geographic)

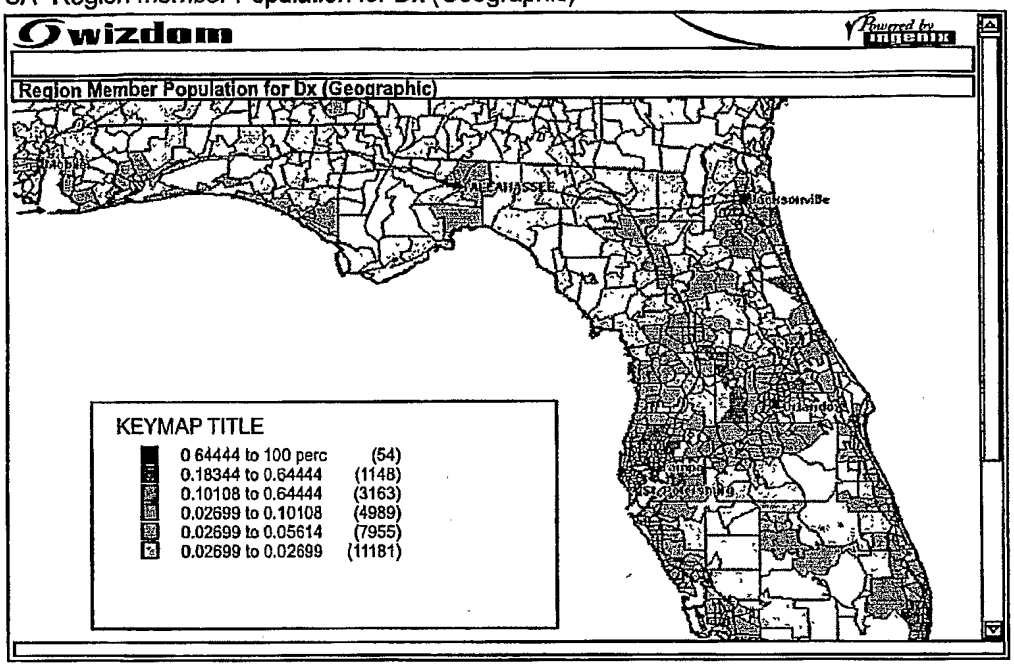


FIG. 9

Datavant Exhibit 1002

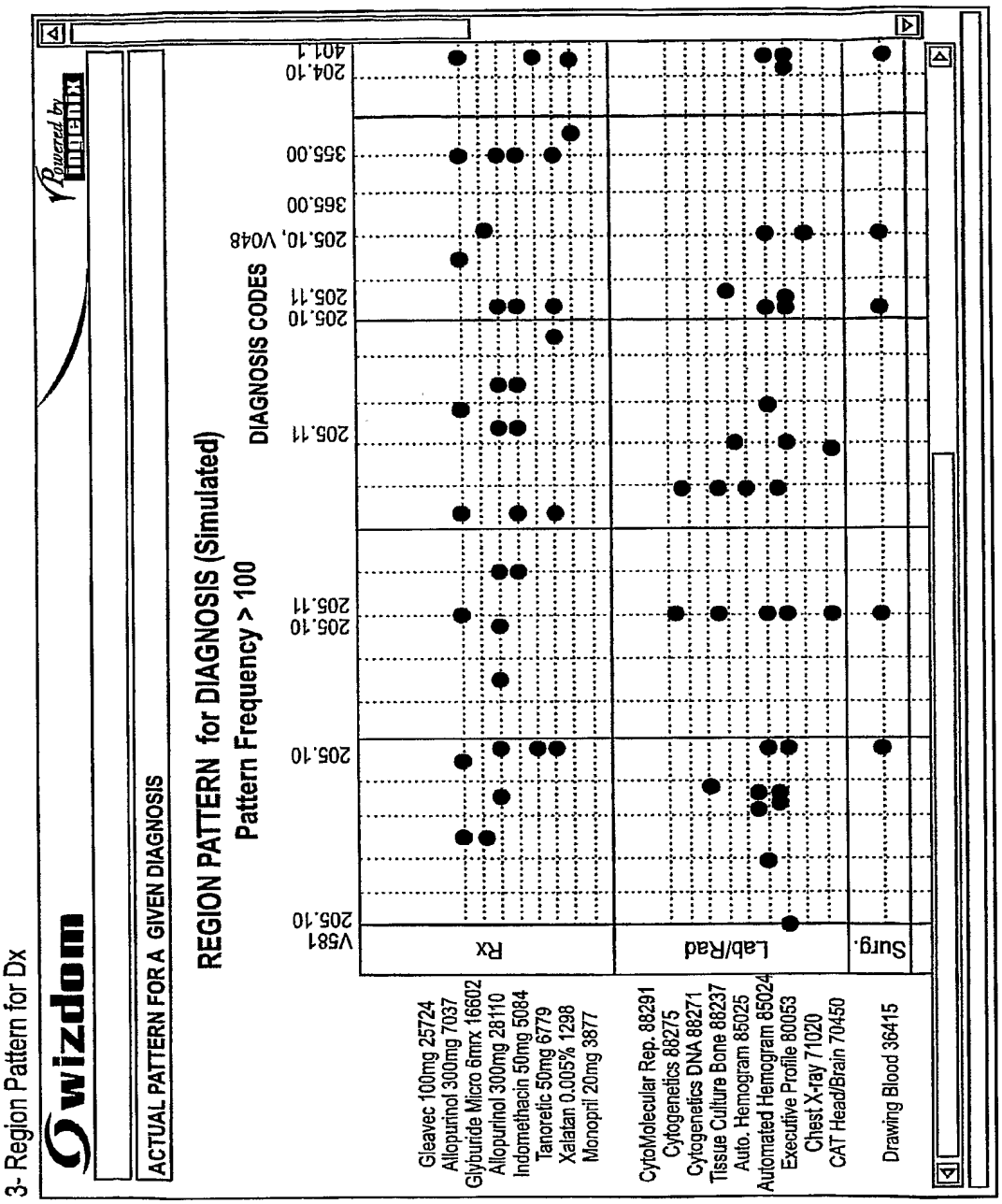
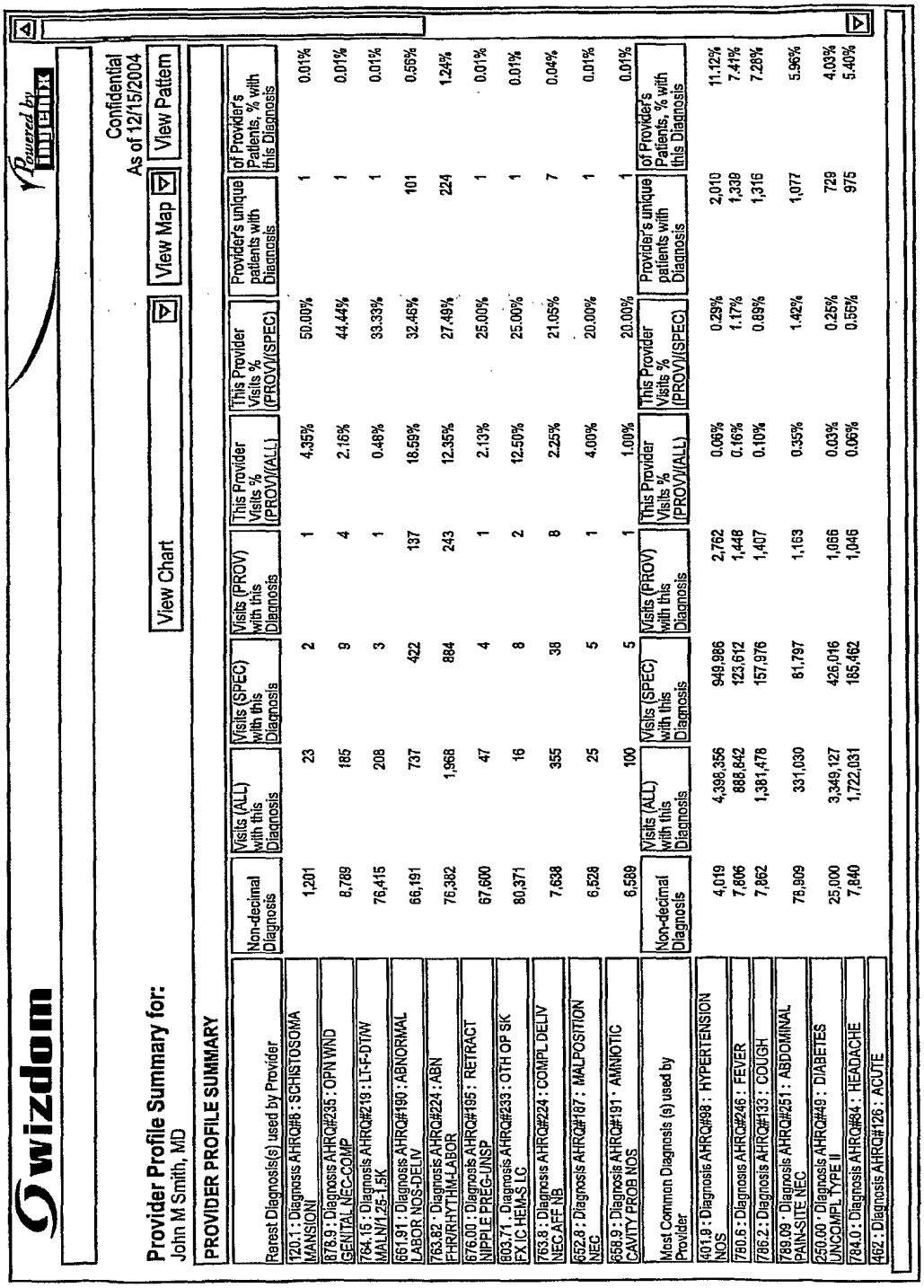


FIG. 10

Datavant Exhibit 1002

4- Provider Profile



Wizdom — Powered by Imetrix

Confidential
As of 12/15/2004

Provider Profile Summary for:
John M Smith, MD

View Chart | View Map | View Pattern

PROVIDER PROFILE SUMMARY

Rarest Diagnosis(s) used by Provider	Non-decimal Diagnosis	Visits (ALL) with this Diagnosis	Visits (SPEC) with this Diagnosis	Visits (PROV) with this Diagnosis	This Provider Visits % (PROV)/(ALL)	This Provider Visits % (PROV)/(SPEC)	Provider's unique patients with Diagnosis	% of Provider's Patients, % with this Diagnosis
120.1 : Diagnosis AHRQ#8 : SCHISTOSOMA MANSONI	1,201	23	2	1	4.35%	50.00%	1	0.01%
878.9 : Diagnosis AHRQ#235 : OPN WND GENITAL NEC-COMP	8,789	185	9	4	2.16%	44.44%	1	0.01%
764.15 : Diagnosis AHRQ#219 : LT-F-DTW MALN/1.25-1.5K	76,415	208	3	1	0.48%	33.33%	1	0.01%
661.91 : Diagnosis AHRQ#190 : ABNORMAL LABOR NOS-DELIV	66,191	737	422	137	18.59%	32.46%	101	0.55%
763.82 : Diagnosis AHRQ#224 : ABN FHR/RHYTHM-LABOR	76,382	1,968	884	243	12.35%	27.49%	224	1.24%
676.00 : Diagnosis AHRQ#195 : RETRACT NIPPLE PREG-UNSP	67,600	47	4	1	2.13%	25.00%	1	0.01%
603.71 : Diagnosis AHRQ#233 : OTH OP SK FX IC HEM-S LC	80,371	16	8	2	12.50%	25.00%	1	0.01%
763.8 : Diagnosis AHRQ#224 : COMPL DELIV NEC AFE NB	7,638	355	38	8	2.25%	21.05%	7	0.04%
652.8 : Diagnosis AHRQ#187 : MALPOSITION NEC	6,528	25	5	1	4.00%	20.00%	1	0.01%
658.9 : Diagnosis AHRQ#191 : AMNIOTIC CAVITY PROB NOS	6,589	100	5	1	1.00%	20.00%	1	0.01%

Most Common Diagnosis (s) used by Provider	Non-decimal Diagnosis	Visits (ALL) with this Diagnosis	Visits (SPEC) with this Diagnosis	Visits (PROV) with this Diagnosis	This Provider Visits % (PROV)/(ALL)	This Provider Visits % (PROV)/(SPEC)	Provider's unique patients with Diagnosis	% of Provider's Patients, % with this Diagnosis
401.9 : Diagnosis AHRQ#98 : HYPERTENSION NOS	4,019	4,398,356	949,986	2,762	0.06%	0.29%	2,010	11.12%
780.6 : Diagnosis AHRQ#246 : FEVER	7,806	888,842	123,612	1,448	0.16%	1.17%	1,338	7.41%
786.2 : Diagnosis AHRQ#133 : COUGH	7,862	1,381,478	157,976	1,407	0.10%	0.89%	1,316	7.28%
789.09 : Diagnosis AHRQ#251 : ABDOMINAL PAIN-SITE NEC	78,909	331,030	81,797	1,163	0.35%	1.42%	1,077	5.96%
250.00 : Diagnosis AHRQ#49 : DIABETES UNCOMPL TYPE II	25,000	3,349,127	426,016	1,066	0.03%	0.25%	729	4.03%
784.0 : Diagnosis AHRQ#84 : HEADACHE	7,840	1,722,031	185,462	1,046	0.06%	0.56%	975	5.40%
462 : Diagnosis AHRQ#126 : ACUTE								

FIG. 11

Datavant Exhibit 1002

4A- Provider's Member Distribution (Geographic)

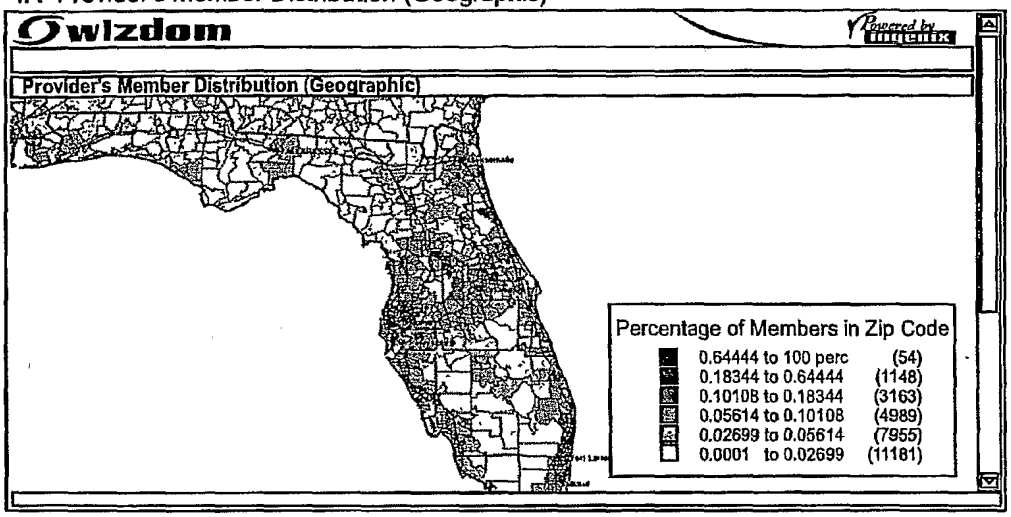


FIG. 12

Datavant Exhibit 1002

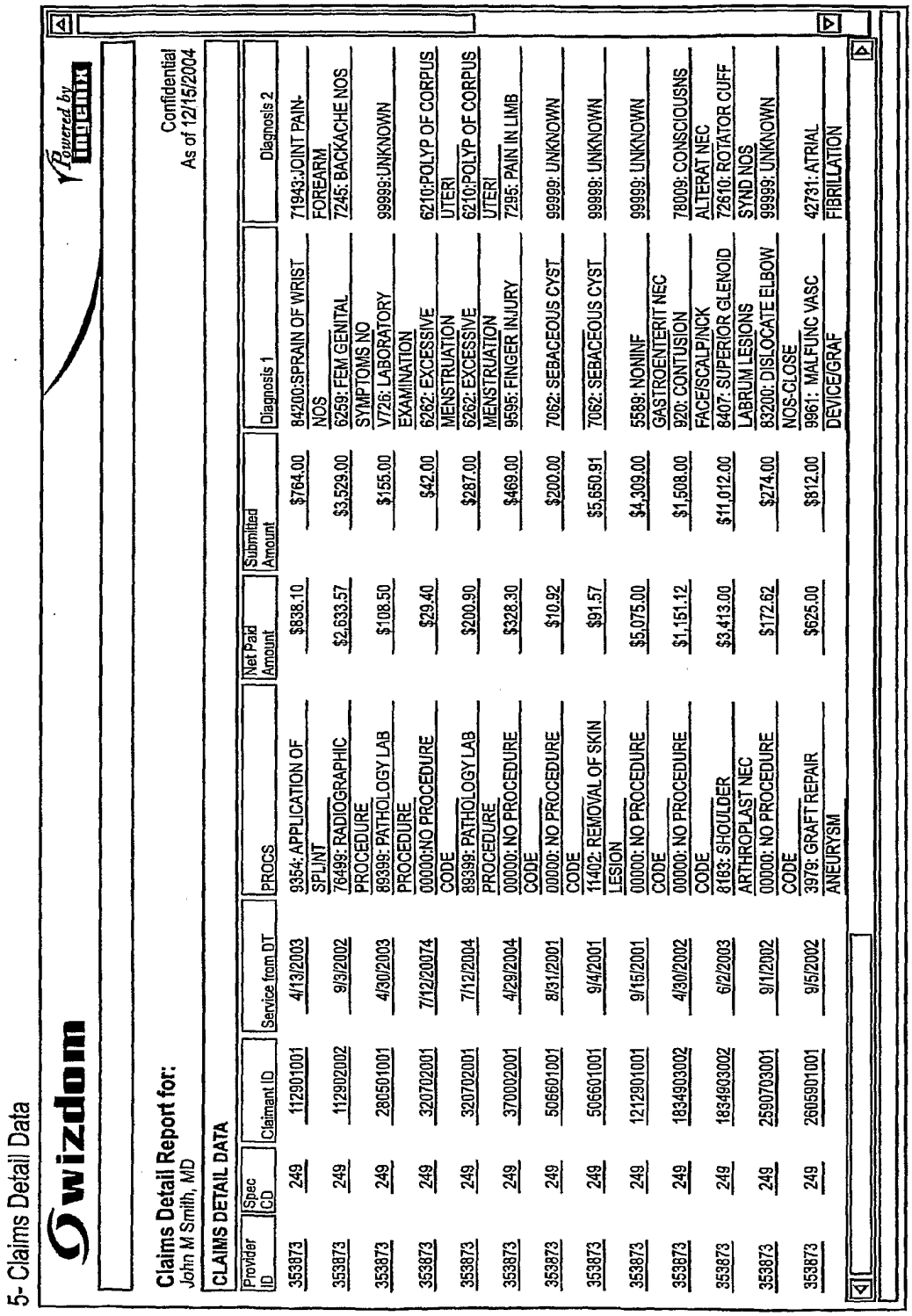


FIG. 13

Datavant Exhibit 1002

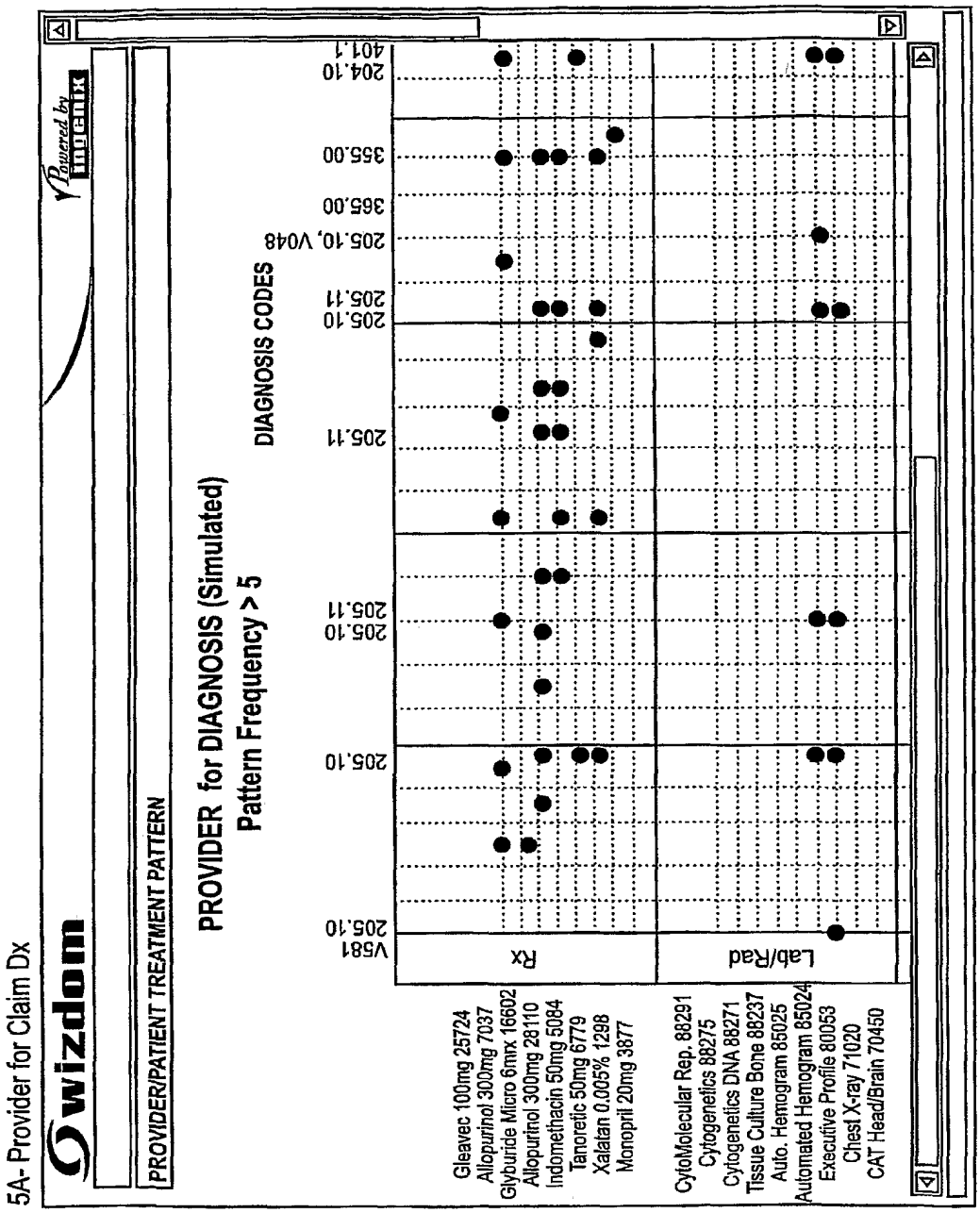


FIG. 14

Datavant Exhibit 1002

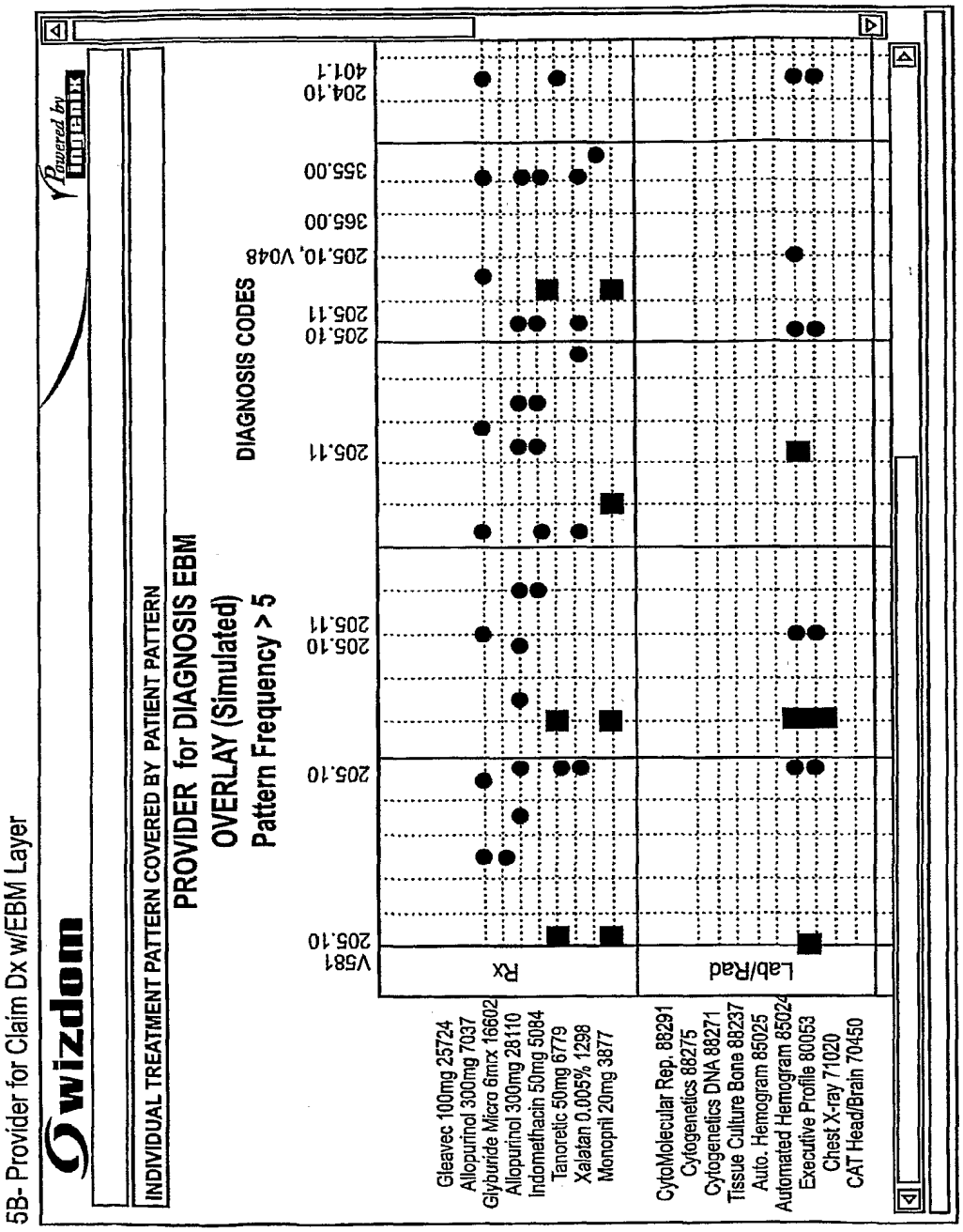


FIG. 15

Datavant Exhibit 1002

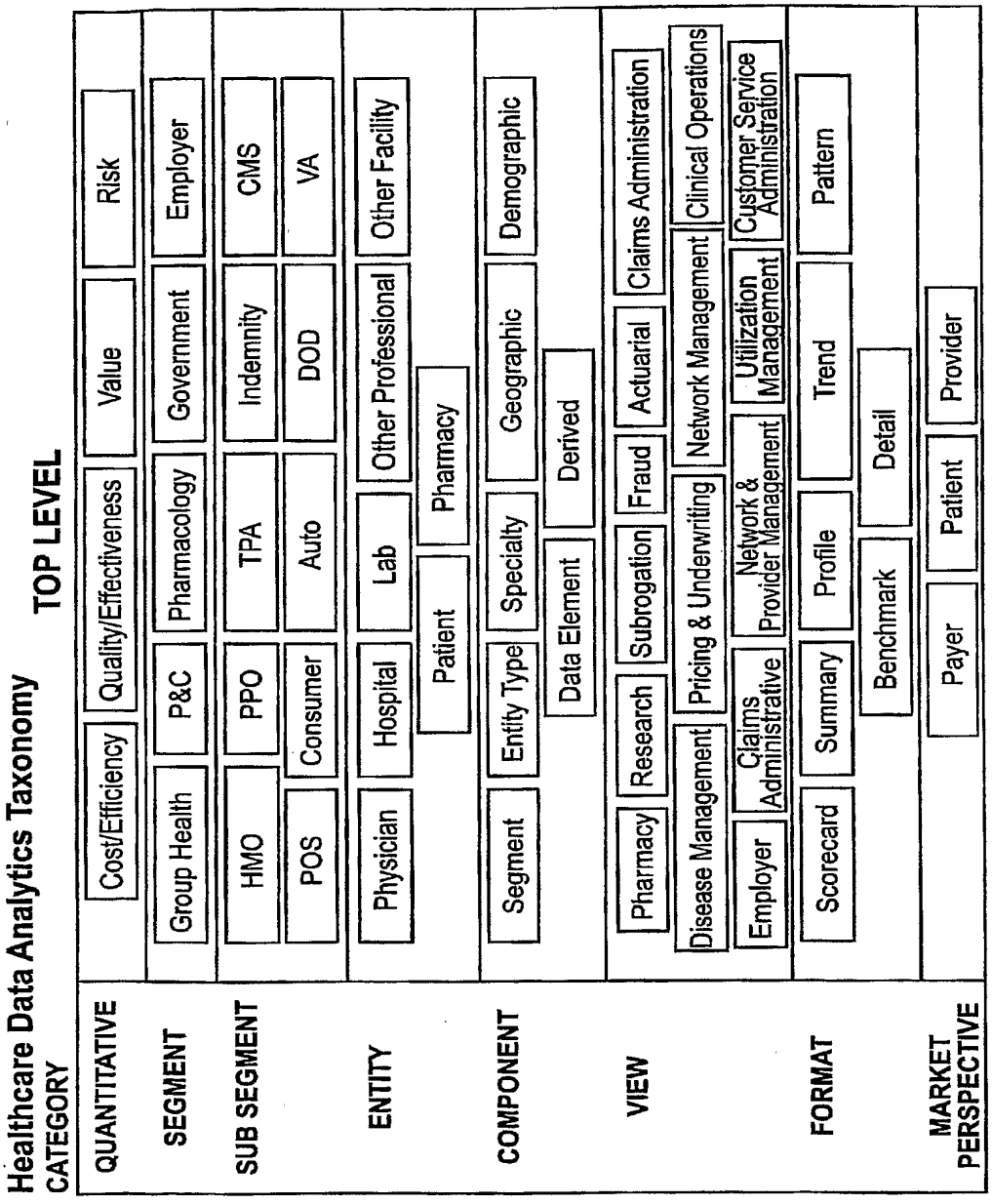


FIG. 16

Datavant Exhibit 1002

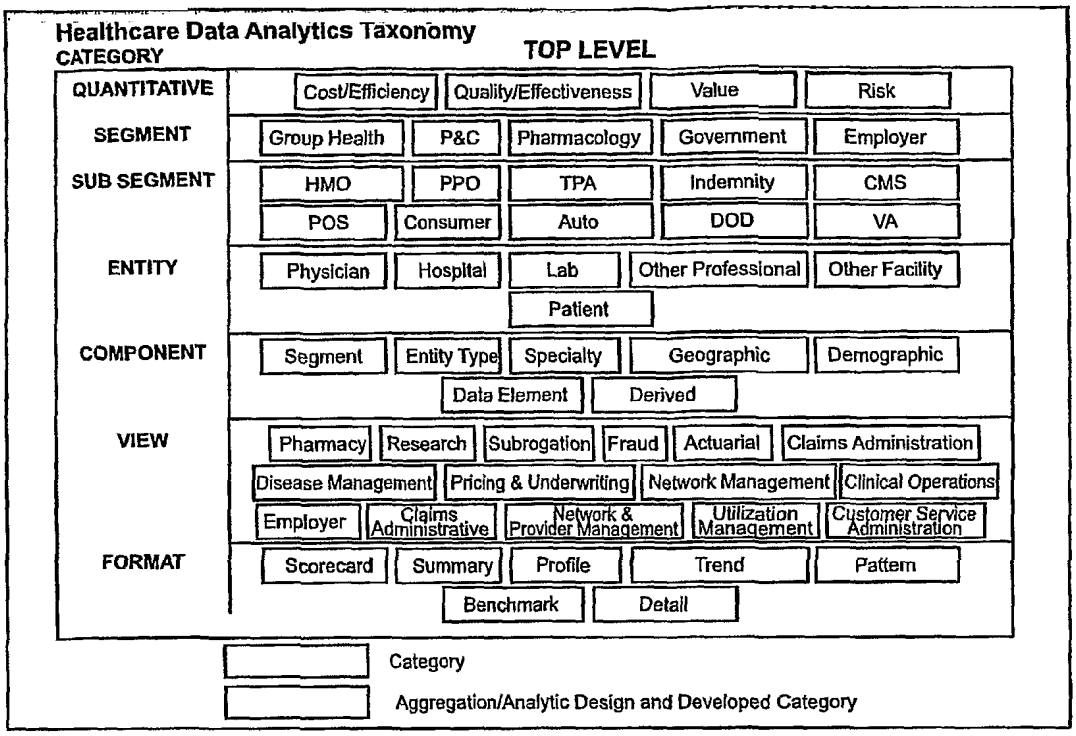


FIG. 17

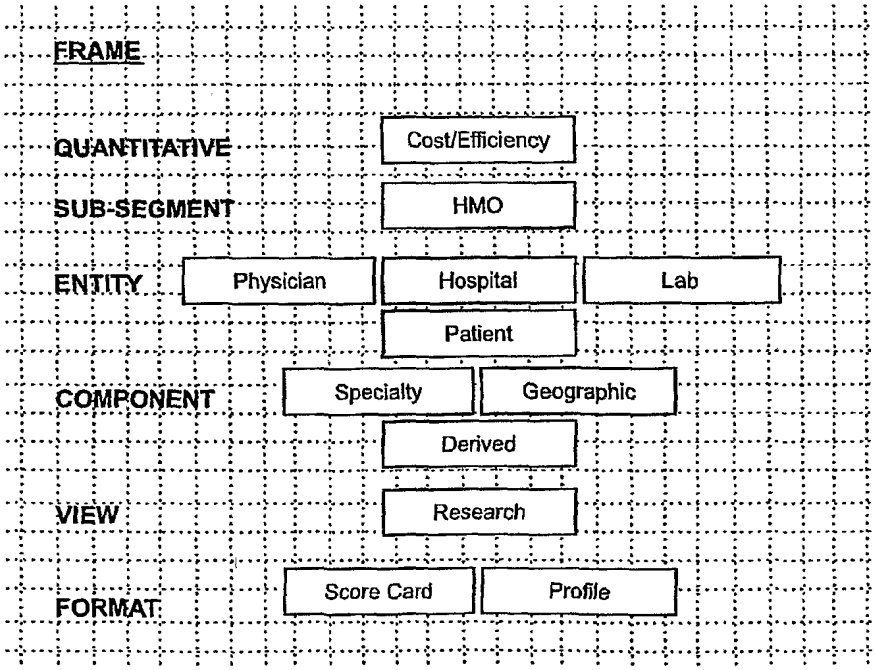


FIG. 18

Datavant Exhibit 1002

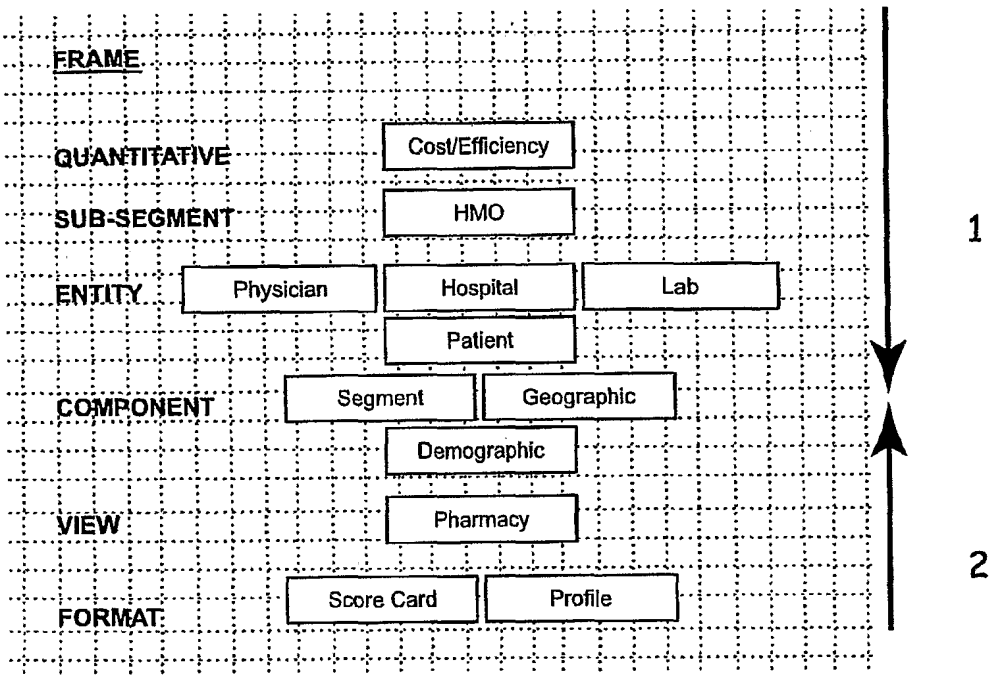


FIG. 19

Datavant Exhibit 1002

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/017237

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F19/00

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)
G06F

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 practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96/00423 A (MEDICODE INC [US]) 4 January 1996 (1996-01-04) claims 1-37; figures 1-15 page 8, line 34 - page 9, line 33 page 44, line 1 - page 60, line 24 page 62, line 8 - page 67, line 20 page 109, line 18 - page 110, line 26	1-20
A	US 6 826 536 B1 (FORMAN BERT [US]) 30 November 2004 (2004-11-30) figures 1-13 column 4, line 27 - column 10, line 38 column 11, line 9 - column 16, line 46 column 19, line 19 - column 20, line 19	1-20

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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 document but 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	Date of mailing of the international search report
18 December 2006	28/12/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	SCHECHNER-RESOM, M

Form PCT/ISA/210 (second sheet) (April 2005)

Datavant Exhibit 1002

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/017237

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/21313 A2 (BLOODHOUND SOFTWARE INC [US]; ABED SAMIR IBRAHIM [US]; WALLACE MICHAEL) 14 March 2002 (2002-03-14) figures 1-11 page 7, line 16 - page 10, line 30	1-20

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Datavant Exhibit 1002

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2006/017237

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9600423	A	04-01-1996	AU	2947995 A	19-01-1996
			CA	2196549 A1	04-01-1996
			EP	0786113 A1	30-07-1997
			US	5557514 A	17-09-1996
			US	6223164 B1	24-04-2001
US 6826536	B1	30-11-2004	NONE		
WO 0221313	A2	14-03-2002	AU	8708201 A	22-03-2002

Datavant Exhibit 1002

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 November 2010 (11.11.2010)

PCT

(10) International Publication Number
WO 2010/129653 A1

(51) International Patent Classification:
A61B 5/00 (2006.01)

(21) International Application Number:
PCT/US2010/033695

(22) International Filing Date:
5 May 2010 (05.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/175,538 5 May 2009 (05.05.2009) US

(71) Applicant *(for all designated States except US)*: **INGENIX, INC.** [US/US]; Mail Route MN002-0245, 12125 Technology Drive, Eden Prairie, MN 55344 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **ANDERSON, David, R.** [US/US]; 2330 Manuela Drive, Chaska, MN 55318 (US).

(74) Agent: **DHARIA, Anuj**; Fulbright & Jaworski L.L.P., 600 Congress Ave., Suite 2400, Austin, TX 78701 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR RAPID ASSESSMENT OF LAB VALUE DISTRIBUTIONS

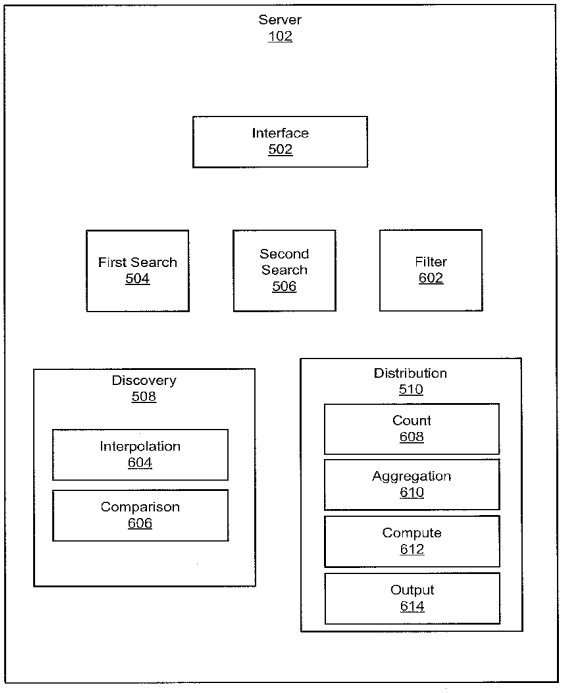


FIG. 6

(57) Abstract: System and methods for rapid assessment of lab value distributions are provided. In one embodiment, the system includes a data storage device and a server. The data storage device may be configured to store a database comprising one or more records, wherein the records are identified by one or more test codes. The server may receive a medical code, search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records.

WO 2010/129653 A1

Datavant Exhibit 1002

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

Datavant Exhibit 1002

DESCRIPTION

SYSTEM AND METHOD FOR RAPID ASSESSMENT OF LAB VALUE DISTRIBUTIONS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 61/175,538 filed May 5, 2009, the entire contents of which is specifically incorporated herein by reference without disclaimer.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] This invention relates to health related data analysis and more particularly relates to a system and method for rapid assessment of lab value distributions between comparison groups.

DESCRIPTION OF THE RELATED ART

[0003] Most corporations, including health insurance corporations, maintain a high volume of data. Such data may be analyzed and exploited for valuable information regarding business trends, and other important statistics. Data mining is a common strategy for identifying and analyzing such data.

[0004] There are many various forms of data mining. Custom analytic operations may be developed to meet specific needs. Alternatively, commercially available statistical analysis tools, such as Statistical Analysis Software (SAS) may be used to identify statistical trends in data.

[0005] Health insurance companies typically maintain databases of health insurance claim information, demographic information, and other data about health insurance plan members. Such information may be used to gain valuable insights into early disease diagnosis, relationship between lab tests and diseases or drug treatments, and disease severity. Unfortunately, typical methods for analyzing such data are often cumbersome, costly, and require unworkably high processing times and resources.

[0006] The referenced shortcomings are not intended to be exhaustive, but rather are among many that tend to impair the effectiveness of previously known techniques in disease

Datavant Exhibit 1002

management, diagnosis and treatment; however, those mentioned here are sufficient to demonstrate that the methodologies appearing in the art have not been satisfactory and that a significant need exists for the techniques described and claimed in this disclosure.

SUMMARY OF THE INVENTION

[0007] From the foregoing discussion, it should be apparent that a need exists for a system and method to rapidly analyze, discover, and summarize differences in lab value distribution between comparison groups, particularly in any temporal context of any temporal attribute.

[0008] A system is presented for rapid assessment of lab value distributions. In one embodiment, the system includes a data storage device configured to store a database comprising one or more records, wherein the records are identified by one or more test codes. The system may also include a server in data communication with the data storage device. The server may be suitably programmed to receive a medical code (where lab values may include a range of interest), search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records.

[0009] In one embodiment, the server may compare a first value representing the first group and a second value representing the second group of records. In a further embodiment, the server may interpolate the first group of records to obtain the first value and to interpolate the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile, such as 5%, 32%, 50%, 95%, or any intermediate percentile. For example, values of median in both groups may be compared.

[0010] In a certain embodiment, the server may count distinct records in the first group of records and the second group of records. The server may also aggregate records from the first group and from the second group according to a selected attribute, such as a selected range of test values, and/or compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

[0011] The server may further select the first group of records from within a time interval, such as a time span (*e.g.*, about 30 days) before or after of initial diagnosis or disease onset. In a further embodiment, the server may select records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter.

[0012] A method is also presented for comparing two groups of records to analyze their distribution discrepancy. In one embodiment, the method includes receiving a medical code, searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generating an output comprising a distribution graph on a shared scale from the first and second group of records. The method in the disclosed embodiments substantially includes the steps necessary to carry out the functions presented above with respect to the operation of the system of the present invention.

[0013] The method may further include comparing a first value representing the first group and a second value representing the second group of records. Additionally, the method may also include interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile, such as any intermediate percentile from5%-95%, or. In a particular embodiment, median-associated values may be compared.

[0014] In a certain embodiment, the method may include counting distinct records in the first group of records and the second group of records. The method may also include aggregating records from the first group and from the second group according to a selected attribute, such a test value or range. In a still another embodiment, the method may also comprise computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

[0015] To process records at any temporal interval related to a disease, the method may further comprise selecting the first group of records from within a time interval. Such a time interval may be relative to the date or time of the individual's first occurrence of the disease associated with medical code or the date or time when the individual is first diagnosed. In a still

further embodiment, the method may comprise selecting records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter, age, gender, or the like.

[0016] There may be also provided a tangible computer program product comprising a computer readable medium having computer usable program code executable to perform operations comprising: receiving a medical code; searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code; searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and generating an output comprising a distribution graph on a shared scale from the first and second group of records.

[0017] The operations may further include comparing a first value representing the first group and a second value representing the second group of records. Moreover, the operations may include interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

[0018] In a certain embodiment, the operations may include counting distinct records in the first group of records and the second group of records. The operations may also include aggregating records from the first group and from the second group according to a selected attribute. In still another embodiment, the operations may also include computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

[0019] For a temporal analysis, the operations may further comprise selecting the first group of records from within a time interval. In a still further embodiment, the operations may also include selecting records in the first group and in the second group according to a limiting criterion, such as a disease-related parameter, age, gender, or the like.

[0020] For a record with multiple lab test values, the record could comprise an average, a first reading or a last reading of a test. To further analyze disease-associated parameters, each record in the first group of records may share a limiting criterion with each record in the second group of records, for example, those records in the first and second group may have the same age range,

gender, or geographic residence. Furthermore, the control population could be a normal group or a cohort group. In certain aspects, the distribution graph may be a histogram or any format suitable for presenting a distribution.

[0021] The term "associated" is referred to as connected or related. The term "coupled" is defined as connected, although not necessarily directly, and not necessarily mechanically.

[0022] The terms "a" and "an" are defined as one or more unless this disclosure explicitly requires otherwise.

[0023] The term "substantially" and its variations are defined as being largely but not necessarily wholly what is specified as understood by one of ordinary skill in the art, and in one non-limiting embodiment "substantially" refers to ranges within 10%, preferably within 5%, more preferably within 1%, and most preferably within 0.5% of what is specified.

[0024] The terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has" and "having"), "include" (and any form of include, such as "includes" and "including") and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method or device that "comprises," "has," "includes" or "contains" one or more steps or elements possesses those one or more steps or elements, but is not limited to possessing only those one or more elements. Likewise, a step of a method or an element of a device that "comprises," "has," "includes" or "contains" one or more features possesses those one or more features, but is not limited to possessing only those one or more features. Furthermore, a device or structure that is configured in a certain way is configured in at least that way, but may also be configured in ways that are not listed.

[0025] Other features and associated advantages will become apparent with reference to the following detailed description of specific embodiments in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The following drawings form part of the present specification and are included to further demonstrate certain aspects of the present invention. The invention may be better

Datavant Exhibit 1002

understood by reference to one or more of these drawings in combination with the detailed description of specific embodiments presented herein.

[0027] FIG. 1 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0028] FIG. 2 is a schematic block diagram illustrating one embodiment of a database system for rapid assessment of lab value distributions;

[0029] FIG. 3 is a schematic block diagram illustrating one embodiment of a computer system that may be used in accordance with certain embodiments of the system for rapid assessment of lab value distributions;

[0030] FIG. 4 is a schematic logical diagram illustrating one embodiment of abstraction layers of operation in a system for rapid assessment of lab value distributions;

[0031] FIG. 5 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0032] FIG. 6 is a schematic block diagram illustrating one embodiment of a system for rapid assessment of lab value distributions;

[0033] FIG. 7 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0034] FIG. 8 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0035] FIG. 9 is a schematic flowchart diagram illustrating one embodiment of a method for rapid assessment of lab value distributions;

[0036] FIG. 10 is an output illustrating one embodiment of discovery results generated by rapid assessment of lab value distributions;

[0037] FIG. 11 is an output illustrating one embodiment of distribution results generated by rapid assessment of lab value distributions;

Datavant Exhibit 1002

[0038] FIG. 12 is an example of linear interpolation which may be used for rapid assessment of lab value distributions;

[0039] FIG. 13 is an output illustrating one embodiment of discovery results generated by rapid assessment of lab value distributions;

[0040] FIG. 14 is an output illustrating one embodiment of distribution results generated by rapid assessment of lab value distributions;

[0041] FIG. 15 is a screen-shot diagram illustrating one embodiment of a graphical user interface for rapid assessment of lab value distributions.

DETAILED DESCRIPTION

[0042] Various features and advantageous details are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well known starting materials, processing techniques, components, and equipment are omitted so as not to unnecessarily obscure the invention in detail. It should be understood, however, that the detailed description and the specific examples, while indicating embodiments of the invention, are given by way of illustration only, and not by way of limitation. Various substitutions, modifications, additions, and/or rearrangements within the spirit and/or scope of the underlying inventive concept will become apparent to those skilled in the art from this disclosure.

[0043] Certain units described in this specification have been labeled as modules, in order to more particularly emphasize their implementation independence. A module is "[a] self-contained hardware or software component that interacts with a larger system." Alan Freedman, "The Computer Glossary" 268 (8th ed. 1998). A module comprises a component of a machine, a machine or a plurality of machines that are suitably programmed to operate according to executable instructions. For example, a module may be implemented as a hardware circuit comprising custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices, a controller, or the like.

[0044] Modules may also include software-defined units or instructions that, when executed by a processing machine or device, retrieve and transform data stored on a data storage device from a first state to a second state. An identified module of executable code may, for instance, comprise one or more physical blocks of computer instructions which may be organized as an object, procedure, or function. Nevertheless, the executables of an identified module need not be physically located together, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module, and when executed by the processor, achieve the stated data transformation.

[0045] Indeed, a module of executable code may be a single instruction, or many instructions, and may even be distributed over several different code segments, among different programs, and across several memory devices. Similarly, operational data may be identified and illustrated herein within modules, and may be embodied in any suitable form and organized within any suitable type of data structure. The operational data may be collected as a single data set, or may be distributed over different locations including over different storage devices.

[0046] In the following description, numerous specific details are provided, such as examples of programming, software modules, user selections, network transactions, database queries, database structures, hardware modules, hardware circuits, hardware chips, etc., to provide a thorough understanding of the present embodiments. One skilled in the relevant art will recognize, however, that the invention may be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

[0047] FIG. 1 illustrates one embodiment of a system 100 for rapid assessment of lab value distributions. The system 100 may include a server 102, a data storage device 104, a network 108, and a user interface device 110. In a further embodiment, the system 100 may include a storage controller 106, or storage server, configured to manage data communications between the data storage device 104, and the server 102 or other components in communication with the network 108. In an alternative embodiment, the storage controller 106 may be coupled to the network 108. In a general embodiment, the system 100 may store databases comprising records, perform searches of those records, and generate outputs in response to information contained in these records. Specifically, the system 100 may receive a medical code (where lab values may

include a range of interest) and generate an output based on a first group of records associated with individual having a medical code as compared with a second groups of records of a control population..

[0048] In one embodiment, the user interface device 110 is referred to broadly and is intended to encompass a suitable processor-based device such as a desktop computer, a laptop computer, a Personal Digital Assistant (PDA), a mobile communication device or organizer device having access to the network 108. In a further embodiment, the user interface device 110 may access the Internet to access a web application or web service hosted by the server 102 and provide a user interface for enabling a user to enter or receive information. For example, the user may enter a medical code, a test code, a time interval, a limiting criterion, a selected attribute for generating an output, or the like.

[0049] The network 108 may facilitate communications of data between the server 102 and the user interface device 110. The network 108 may include any type of communications network including, but not limited to, a direct PC to PC connection, a local area network (LAN), a wide area network (WAN), a modem to modem connection, the Internet, a combination of the above, or any other communications network now known or later developed within the networking arts which permits two or more computers to communicate, one with another.

[0050] In one embodiment, the server 102 is suitably programmed to receive a medical code (where lab values may include a range of interest), search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. Additionally, the server may access data stored in the data storage device 104 via a Storage Area Network (SAN) connection, a LAN, a data bus, or the like.

[0051] The data storage device 104 may include a hard disk, including hard disks arranged in an Redundant Array of Independent Disks (RAID) array, a tape storage drive comprising a magnetic tape data storage device, an optical storage device, or the like. In one embodiment, the data storage device 104 may store health related data, such as insurance claims data, consumer

Datavant Exhibit 1002

data, or the like. The data may be arranged in a database and accessible through Structured Query Language (SQL) queries, or other data base query languages or operations.

[0052] FIG. 2 illustrates one embodiment of a data management system 200 configured to store and manage data for rapid assessment of lab value distributions. In one embodiment, the system 200 may include a server 102. The server 102 may be coupled to a data-bus 202. In one embodiment, the system 200 may also include a first data storage device 204, a second data storage device 206 and/or a third data storage device 208. In further embodiments, the system 200 may include additional data storage devices (not shown). In such an embodiment, each data storage device 204-208 may host a separate database of healthcare claim data, lab data, physical test data, disease progression data, demographic data, socioeconomic data, administrative data, clinical data, or the like. The customer information in each database may be keyed to a common field or identifier, such as an individual's name, social security number, customer number, or the like. Alternatively, the storage devices 204-208 may be arranged in a RAID configuration for storing redundant copies of the database or databases through either synchronous or asynchronous redundancy updates.

[0053] In one embodiment, the server 102 may submit a query to selected data storage devices 204-208 to collect a consolidated set of data elements associated with an individual or group of individuals. The server 102 may store the consolidated data set in a consolidated data storage device 210. In such an embodiment, the server 102 may refer back to the consolidated data storage device 210 to obtain a set of data elements associated with a specified individual or group. Alternatively, the server 102 may query each of the data storage devices 204-208 independently or in a distributed query to obtain the set of data elements associated with a specified individual or group. In another alternative embodiment, multiple databases may be stored on a single consolidated data storage device 210.

[0054] In various embodiments, the server 102 may communicate with the data storage devices 204-210 over the data-bus 202. The data-bus 202 may comprise a SAN, a LAN, or the like. The communication infrastructure may include Ethernet, Fibre-Chanel Arbitrated Loop (FC-AL), Small Computer System Interface (SCSI), and/or other similar data communication schemes associated with data storage and communication. For example, there server 102 may communicate indirectly with the data storage devices 204-210; the server may first communicate with a storage server or storage controller 106.

Datavant Exhibit 1002

[0055] In one example of the system 200, the first data storage device 204 may store data associated with clinical data that may be comprised in insurance claims made by one or more individuals. The clinical data may include data associated with medical services, procedures, and prescriptions utilized by the individual. In one embodiment, the second data storage device 206 may store diagnosis data associated with the individual. The diagnosis data may include one or more diagnoses of conditions which the individual suffers from or is at risk of. The third data storage device 208 may store lab test data associated with the individual. For example, the third data storage device 208 may include data associated with the individual's lab test results and/or clinical observations. A fourth data storage device (not shown) may store demographic data. For example, the demographic data may include information relating to the individual's demographics include gender, race or ethnicity, age, income, disabilities, mobility, educational attainment, home ownership, employment status, location, or the like.

[0056] The server 102 may host a software application configured for rapid assessment of lab value distributions. The software application may further include modules for interfacing with the data storage devices 204-210, interfacing a network 108, interfacing with a user, and the like. In a further embodiment, the server 102 may host an engine, application plug-in, or application programming interface (API). In another embodiment, the server 102 may host a web service or web accessible software application.

[0057] FIG. 3 illustrates a computer system 300 adapted according to certain embodiments of the server 102 and/or the user interface device 110. The central processing unit (CPU) 302 is coupled to the system bus 304. The CPU 302 may be a general purpose CPU, a processor, or a microprocessor. The present embodiments are not restricted by the architecture of the CPU 302, so long as the CPU 302 supports the modules and operations as described herein. The CPU 302 may execute the various logical instructions according to the present embodiments. For example, the CPU 302 may execute machine-level instructions according to the exemplary operations described below with reference to FIGs. 7-9.

[0058] The computer system 300 also may include Random Access Memory (RAM) 308, which may be SRAM, DRAM, SDRAM, or the like. The computer system 300 may utilize RAM 308 to store the various data structures used by a software application suitably programmed for rapid assessment of lab value distributions. The computer system 300 may also include Read Only Memory (ROM) 306 which may be PROM, EPROM, EEPROM, optical storage, or the like.

Datavant Exhibit 1002

The ROM may store configuration information for booting the computer system 300. The RAM 308 and the ROM 306 hold user and system 100 data.

[0059] The computer system 300 may also include an input/output (I/O) adapter 310, a communications adapter 314, a user interface adapter 316, and a display adapter 322. The I/O adapter 310 and/or the user interface adapter 316 may, in certain embodiments, enable a user to interact with the computer system 300 in order to input information for authenticating a user, identifying an individual or group, receiving health profile information, or entering information like a medical code, a test code, a temporal range, a percentile, a limiting criterion, or a selected test value range. In a further embodiment, the display adapter 322 may display a graphical user interface associated with a software or web-based application for generating an output comprising a distribution graph.

[0060] The I/O adapter 310 may connect to one or more storage devices 312, such as one or more of a hard drive, a Compact Disk (CD) drive, a floppy disk drive, a tape drive, to the computer system 300. The communications adapter 314 may be adapted to couple the computer system 300 to the network 106, which may be one or more of a LAN and/or WAN, and/or the Internet. The user interface adapter 316 may couple user input devices, such as a keyboard 320 and a pointing device 318, to the computer system 300. The display adapter 322 may be driven by the CPU 302 to control the display on the display device 324.

[0061] The present embodiments are not limited to the architecture of system 300. Rather the computer system 300 is provided as an example of one type of computing device that may be adapted to perform the functions of a server 102 and/or the user interface device 110. For example, any suitable processor-based device may be utilized including without limitation, including personal data assistants (PDAs), computer game consoles, and multi-processor servers. Moreover, the present embodiments may be implemented on application specific integrated circuits (ASIC) or very large scale integrated (VLSI) circuits. In fact, persons of ordinary skill in the art may utilize any number of suitable structures capable of executing logical operations according to the described embodiments.

[0062] FIG. 4 illustrates one embodiment of a network-based system 400 for rapid assessment of lab value distributions. In one embodiment, the network-based system 400 includes a server 102. Additionally, the network-based system 400 may include a user interface

device 110. In still a further embodiment, the network-based system 400 may include one or more network-based client applications 402 configured to be operated over a network 108 including an intranet, the Internet, or the like. In still another embodiment, the network-based system 400 may include one or more data storage devices 104.

[0063] The network-based system 400 may include components or devices configured to operate in various network layers. For example, the server 102 may include modules configured to work within an application layer 404, a presentation layer 406, a data access layer 408 and a metadata layer 410. In a further embodiment, the server 102 may access one or more data sets 418-422 that comprise a data layer or data tier 412. For example, a first data set 418, a second data set 420 and a third data set 422 may comprise a data tier 412 that is stored on one or more data storage devices 204-208.

[0064] One or more web applications 412 may operate in the application layer 404. For example, a user may interact with the web application 412 though one or more I/O interfaces 318 and 320 configured to interface with the web application 412 through an I/O adapter 310 that operates on the application layer. In one particular embodiment, a web application 412 may be provided for rapid assessment of lab value distributions that includes software modules configured to perform the steps of receiving a medical code, searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code, searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code, and generating an output comprising a distribution graph on a shared scale from the first and second group of records.

[0065] In a further embodiment, the server 102 may include components, devices, hardware modules, or software modules configured to operate in the presentation layer 406 to support one or more web services 414. For example, a web application 412 may access or provide access to a web service 414 to perform one or more web-based functions for the web application 412. In one embodiment, a web application 412 may operate on a first server 102 and access one or more web services 414 hosted on a second server (not shown) during operation.

[0066] For example, a web application 412 for identifying diagnostic records and/or analyzing diagnostic data, or other information may access a first web service 414 for identifying records of

a first group of individuals associated with a diagnostic code and a second web service 414 for identifying a control population such as a normal group or a cohort group. The web services 414 may receive a medical code. In response, the web service 414 may return data associated with individuals having the medical code, statistics, distributions, graphs, or the like. One of ordinary skill in the art will recognize various web-based architectures employing web services 414 for modular operation of a web application 412.

[0067] In one embodiment, a web application 412 or a web service 414 may access one or more of the data sets 418-422 through the data access layer 408. In certain embodiments, the data access layer 408 may be divided into one or more independent data access layers (DALs) 416 for accessing individual data sets 418-422 in the data tier 412. These individual data access layers 416 may be referred to as data sockets or adapters. The data access layers 416 may utilize metadata from the metadata layer 410 to provide the web application 412 or the web service 414 with specific access to the data set 412.

[0068] For example, the data access layer 416 may include operations for performing a query of the data sets 418-422 to retrieve specific information for the web application 412 or the web service 414. In a more specific example, the data access layer 416 may include a query for records associated with individuals who have been diagnosed with a particular disease, such as diabetes, or who are associated with a medical code (where lab values may include a range of interest), such as an ICD-9 code, associated with a diagnosis of diabetes.

[0069] FIG. 5 illustrates a certain embodiment of a system 500 for rapidly processing and viewing lab value distributions. In one embodiment, the system 500 comprises a data storage device 104 and a server 102 configured to load and operate software modules 502-508 configured for rapid assessment of lab value distributions. Alternatively, the system 500 may include hardware modules 502-508 configured with analogue or digital logic, firmware executing FPGAs, or the like configured to receive a medical code, search a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. In such embodiments, the system 500 may also

Datavant Exhibit 1002

include an interface 502, such as an I/O adapter 310, a communication adapter 314, a user interface adapter 316, or the like.

[0070] In one embodiment, the server 102 may include one or more software defined modules configured to search a dataset 418-422 on a data storage device 204-208 to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group is identified by a test code, search the database to obtain a second group of records associated with a control population, wherein each record of the second group is identified by the test code, and generate an output comprising a distribution graph on a shared scale from the first and second group of records. In one embodiment, these modules may include an interface module 502, a first search module 504, a second search module 506, and a distribution module 510. Optionally, the server 102 may also include a discovery module 508 as described in further detail below with relation to FIG. 6.

[0071] Generally, the interface module 502 may receive user inputs and display user outputs. For example, the interface module 502 may receive a medical code. The interface module may further receive one or more test codes, temporal interval, limiting criterion, percentile, selected test value ranges, and/or other user inputs. In a further embodiment, the interface module 502 may display discovery or detailed distribution analysis results. Such analysis results may include statistics, tables, charts, graphs, recommendations, and the like.

[0072] Structurally, the interface module 502 may include one or more of an I/O adapter 310, a communications adapter 314, a user interface adapter 316, and/or a display adapter 322. The interface module 502 may further include I/O ports, pins, pads, wires, busses, and the like for facilitating communications between the CPU 302 and the various adapters and interface components 310-324. The interface module may also include software defined components for interfacing with other software modules on the server 102.

[0073] In a specific embodiment, the server 102 may load and execute computer software configured to generate, retrieve, send, or otherwise operate SQL instructions. For example, the first search module 504 may communicate a first SQL query to the data storage device 104, which is configured to search the database for a first group of records associated with individuals having the medical code and identified by the test code.

[0074] The medical code may include a medical code used to group and identify diseases, disorders, symptoms, or medical signs and stored in a database of healthcare insurance information, a medical code indicative of a risk of developing a pathologic or disease condition, or a medical code identifying a treatment or a procedure. In a specific embodiment, the first search operation may identify a first group of individuals having records that include a specified ICD-9 medical code. For example, the first search may identify a first group of records in the database associated with individuals that have been diagnosed with diabetes. In another embodiment, the medical code may represent a risk, such as a metabolic syndrome, which is characterized by a group of metabolic risk factors or a combination of medical disorders that increase the risk of developing cardiovascular disease and diabetes. In a further embodiment, the medical code may include an identification or classification of individuals after treatment with one or more drugs or procedures for post-treatment or post-procedure diagnosis.

[0075] In an additional embodiment, the test code may be a code or classification for identifying a laboratory test or a clinical test or observation, such as a LOINC® code (Logical Observations Identifiers, Names, Codes), a universal code system for reporting laboratory and other clinical observations. For each observation, the database may include a code (of which 25 000 are laboratory test observations), a long formal name, a "short" 30-character name, and synonyms. It was identified by the Health Level Seven (HL7) Standards Development Organization as a preferred code set for laboratory test names in transactions between health care facilities, laboratories, laboratory testing devices, and public health authorities.

[0076] A record may comprise multiple lab test values identified by a common test code, wherein an average, first reading or last reading, or the like of the multiple values can be used to represent a data point for this record.

[0077] The first or second search may also involve a temporal component to aggregate records. If a test code has a time aspect, the searches may obtain multiple records associated with the same individual, but identified by a set of test codes at different time point within a common time interval. Those records may be processed, *e.g.*, averaged, to yield a data value representing the time interval associated with the individual.

[0078] In certain aspects, the first search module 504 may be configured to search the database for a first group of records within a selected temporal interval, while matching the test

Datavant Exhibit 1002

code and medical code. Specifically, the first search module 504 may generate a first search query configured to retrieve for a first group of records within a selected temporal interval, while matching the test code and medical code. In a further embodiment, the first group of records may include a temporal component, which may specify a time period before, during, or after an event, such as a diagnosis, a disease or disorder or onset, a procedure, or a drug treatment. In a particular aspect, the first group of records may be from within a clean period or disease-free period before the individuals are diagnosed with a disease or a disorder, for example, from within about 30, 60, 120, or 180 days before a diabetic diagnosis.

[0079] The second search module 506 may generate and/or communicate a second SQL query to the database in response to or independent of the results of the first SQL query. The second query may be configured to search the database for a second group of records, each record in the second group of records identified with the same test code as that identify the records in the first group, but associated with a control population. The second group of records may be cohorts of the first group of records, or records of a normal group, or all records identified by the test code in the database, or records filtered by a limiting criterion which is shared by the first group of records. Such a limiting criterion may include a field value that indicates certain specified characteristics of the individuals associated with the records, such as age, gender, lab tests, lab results, other diseases or diagnoses, use of medication, and the like. In a certain embodiment, the second group of records may also have a temporal component or are associated with a temporal interval, for example, each record in the second group may be associated with individuals having at least three years of record in the database.

[0080] By way of example, the first search module 504 may identify a first group of individuals that have been diagnosed with diabetes or some other illness based on an ICD-9 medical code associated with such a medical diagnosis. The second search module 506 may then identify cohorts for each individual or record identified by the first search. The cohorts may share one or more common second index attributes with the individuals or records identified in the first group, such as age, gender, or the like; however, the cohorts would not have the medical code. In this example, the cohorts may be the same age and gender as the individuals in the first group, but not have been diagnosed with diabetes.

[0081] In another embodiment, the second search module 506 may generate a group of records associated with a normal group, such as a relatively normal group of individuals not

associated with the medical code used in the first search or a normal group of disease-free individuals, a master group of records which include test values associated with each lab test and lab test unit stored in the database, or a group of filtered records associated with a selected limiting criterion, which can be created before, during or after the first search, or dynamically at run time applying any desired limiting criterion, such as age or gender.

[0082] In a further embodiment, the first search module 504 and the second search module 506 may be integrated into a single search module. Specifically, a single set of SQL instructions may be used to both identify the first group of records and identify the second group of records. The benefits of this embodiment may include reduced system overhead, reduced search and analysis time, reduced labor for configuration and generation of queries, etc. For example, with a single integrated SQL query, a user may be able to obtain results for analysis in far less time than the user might otherwise expect. Such an embodiment may not require separate analysis and generation of separate queries for the first group and the second group. Consequently, a significant time savings may be realized.

[0083] In one embodiment, the discovery module 508 may discover one or more lab tests relating to disease diagnosis or treatment evaluation. In order to do so, the discovery module 508 may extract the difference between representative values from the first and second group of records identified by the same test code but associated with different diagnosis status. For example, the discovery module may include analogue or digital logic, firmware, or software configured to carry out one or more discoveries according to one or more predefined logic functions. In a further embodiment, the server 102 may include a software defined discovery module 508 configured to perform analysis and comparison of the information and data retrieved from the database for the first group of records and the associated second group of records.

[0084] In a specific embodiment, the first search module 504 and the second search module 506 may feed retrieved data into a spreadsheet configured to perform one or more calculations on the data. For example an Excel® spreadsheet may include one or more embedded functions or operations configured to calculate statistics such as percentages, averages, odds ratios and other probabilities, counts, summations, and the like. The data may be automatically imported into a spreadsheet using a macro, a software-based script, or the like. In an alternative embodiment, the discovery module 508 may include hard-coded or dynamically variable software functions for calculating such statistics and generating results for a user. In a further embodiment, the

Datavant Exhibit 1002

discovery module 508 may also create outputs such as statistics, tables, charts, graphs, recommendations, and the like, and particularly identify one or more test codes that indicate a significant difference between two groups of records based on a selected discovery threshold or criterion. "Significant difference" may be referred to as a statistically significant difference, such as a significance level of 5%, 1% or 0.1%.

[0085] FIG. 6 illustrates a further embodiment of a system 500 for rapid assessment of lab value distributions. The system 500 may include a server 102 as described in FIG. 5. In a further embodiment, the server 102 may include additional software defined modules. For example, the server 102 may include a filter module 602. The discovery module 508 may further include an interpolation module 602 and a comparison module 604. The distribution module 510 may also include a count module 606, an aggregation module 608, a compute module 610, and a graph module 612.

[0086] In a further embodiment, the filter module 602 may narrow the first group or second group of records according to a limiting criterion. The filter module 602 may narrow the first or second group of records by restricting search parameters before the first or second search is performed. Alternatively, the filter module 602 may filter, remove, or otherwise delete the search results according to the limiting criterion. In a certain embodiment, multiple limiting criteria may be used to restrict the scope of the returned search results. In one embodiment, a limiting criterion may include a field value, such as record date, age, gender, or the like.

[0087] In an alternative embodiment, an SQL command generated by the server 102 or stored in RAM 308 or on the data storage device 312 may include instructions, that when executed by a storage controller 104 or the CPU 302 on the server 102, may perform a search for records matching the limiting criterion before or in combination with the first or second search. In a specific embodiment, an SQL operation embedded with the first or second search may activate the filter.

[0088] In a certain embodiment, the discovery module 508 may include an interpolation module 602 configured to derive a percentile value from the first group or the second group of records for comparison. The percentile may be any one ranging from 1% to 99%, such as a median, 5%, 32%, or 95%. The interpolation function may involve fitting a function to the data comprised in the records and evaluating that function at the desired point, or calculate the

interpolated data by statistical methods. For example, interpolation methods may include a linear interpolation, a piecewise constant interpolation, a polynomial interpolation, a spline interpolation, or a non-linear interpolation such as an interpolation via Gaussian processes. In a specific embodiment, an SQL command may be generated by the serve 102 or the interpolation module 602 for calculating a percentile value from the first or second group of records. For example, such an SQL command may be designed similarly as that exemplified in FIG. 12 for linear interpolation from a group of data points.

[0089] In a further embodiment, the representative values of the corresponding percentile of both groups may be processed by a comparison module 604. For example, such a comparison module 604 may generate an output comprising a graph showing the difference between the two corresponding values, like a percentage shift of the first value associated with the medical code from the second value associated with a control group. For a particular medical code, a plurality of test codes may be assembled by the comparison module 604 to show the shift of the diagnosed group from the control group, as exemplified in FIG. 10. The relative degree of the shift associated with a test code may represent its relevance with the medical code and usefulness in the diagnosis.

[0090] In one embodiment, the distribution module 510 may include a count module 606 configured to count distinct records in the first group of records and the second group of records. The counting function may be implemented using a hardware-based counter. Alternatively, the counting function may be implemented in a software. In a specific embodiment, the server 102 or CPU 302 may execute SQL instructions configured to provide the record count in response to search or query results. In such an embodiment, the counting function may be integrated with the search and filter instructions into a single set of SQL commands or instructions.

[0091] In a further embodiment, the distribution module 510 may include an aggregation module 608 configured to aggregate records from the first group and from the second group according to a selected attribute, such as a series of bucket ranges created manually or derived empirically. The server 102 may also include other modules for computing, formatting, and otherwise producing statistics, including a compute module 610 and an output module 612. The compute module 610 may compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute. The output module 612 may generate, format, and provide a graphical

Datavant Exhibit 1002

representation of the statistics. These modules 606-612 may be stand-alone modules implemented in hardware, firmware, or software. Alternatively, the functions may be accomplished through commercial calculation products or spreadsheets, software or SQL instructions that are integrated with the other functions of the server 102. In a specific embodiment, the distribution module 510, including some or all of its component modules 606-612, may communicate the statistics with the interface module 502 for display or communication to a user.

[0092] Although the various functions of the server 102 and the CPU or processor 302 are described in the context of modules, the methods, processes, and software described herein are not limited to a modular structure. Rather, some or all of the functions described in relation to the modules of FIGs. 5-6 may be implemented in various formats including, but not limited to, a single set of integrated instructions, commands, code, queries, etc. In one embodiment, the functions may be implemented in database query instructions, including SQL, PLSQL, or the like. Alternatively, the functions may be implemented in software coded in C, C++, C#, php, Java, or the like. In still another embodiment, the functions may be implemented in web based instructions, including HTML, XML, etc.

[0093] The schematic flow chart diagrams that follow are generally set forth as logical flow chart diagrams. As such, the depicted order and labeled steps are indicative of one embodiment of the presented method. Other steps and methods may be conceived that are equivalent in function, logic, or effect to one or more steps, or portions thereof, of the illustrated method. Additionally, the format and symbols employed are provided to explain the logical steps of the method and are understood not to limit the scope of the method. Although various arrow types and line types may be employed in the flow chart diagrams, they are understood not to limit the scope of the corresponding method. Indeed, some arrows or other connectors may be used to indicate only the logical flow of the method. For instance, an arrow may indicate a waiting or monitoring period of unspecified duration between enumerated steps of the depicted method. Additionally, the order in which a particular method occurs may or may not strictly adhere to the order of the corresponding steps shown.

[0094] FIG. 7 illustrates one embodiment of a method 700 for rapid assessment of lab value distributions. In one embodiment, the method 700 starts when the interface module 502 receives 702 a medical code. The medical code is also known as a diagnosis code or a clinical attribute of

interest. The method 700 may continue when the server 102 issues a command to search 704 a database stored on the data storage device 104 for a first group of records. The first group of records may be associated with the individuals having the medical code, and identified by a test code. For example, the server 102 may send an SQL query to the database to retrieve healthcare records associated with individuals that have been diagnosed with diabetes as indicated by the presence of an ICD-9 code associated with diagnosis of diabetes in the individual's records, while also storing information about lab test values identified by one or more test codes.

[0095] The server 102 may then issue a command to search 706 the database for a second group of records. Each record in the second group of records may share a common test code with a record in the first group of records, but is associated with a control population, a majority of which does not have the medical code. For example, SQL query issued by the server 102 may also include a query statement to search for a second group of individuals, each individual having the same age and/or gender as an individual identified in the first group, but not having the diabetes medical code in their record. These individuals in the second group may be considered cohorts of the individuals in the first group of records. In another embodiment, the second group of records may be associated with a normal group which may include all health or disease-free individuals or a group including all individuals with records available in the database of all time points or a specific time period.

[0096] The server 102 may then receive the results from the database searches 704 and 706. The distribution module 510 may then generate 708 an output comprising a distribution graph on a shared scale from the first group of records and the second group of records. For example, a spreadsheet program may calculate distribution of records identified by the test code in the presence of the received medical code as compared with those of a control group. The distribution may include averages, probabilities, and other computational products including identification of trends and commonalities among the records.

[0097] FIG. 8 illustrates another embodiment of a method 800 for rapid assessment of lab value distributions. In one embodiment, the method 800 starts when the interface module 502 receives 802 a test code, a medical code, a percentile, and one or more limiting criteria or time intervals. For example, the interface module 502 may include a graphical user interface. The interface module 502 may receive user inputs consisting of identifiers or indicants of the test

codes, medical codes, or limiting criteria. Such indicants may include a selection of a field value, such as an ICD-9 code value, an age value, a gender value, or the like.

[0098] Limiting criteria may include windowing values configured to limit or restrict the time frames from which records will be searched, restrictions on minimum enrollment time, minimum number of records, gender restrictions, age restrictions, weight restrictions, physical conditions, healthcare patterns, other diagnoses or identified lab values, and other similar threshold and limiting values. The filter module 602 may incorporate the limiting criterion into a query used to filter 802 the records by the limiting criterion before, during or after the search 806 or the search 808. For example, the query may search for all records associated with individuals that have been diagnosed with diabetes, but the query may be restricted to return only results associated with individuals that have at least two years worth of records in the database. In a further embodiment, the filter module 602 may use the same limiting criterion for both searches 806-808 to identify a cohort for the first group of records. Specific time interval relative to the diagnosis associated with the medical code may be also used to filter 804 records to assess lab value distributions at the specific time interval.

[0099] For the discovery module 508, the interpolation module 602 may interpolate 810 percentile values from both group of records according to a received or selected percentile. An example of interpolation 810 is illustrated in FIG. 12. The price records in FIG. 12 may be replaced by health care records. The server may send such an SQL instruction based on FIG. 12 to interpolate different percentile values of the records as exemplified in FIG. 10 for records in the presence of a plurality of test codes (*e.g.*, LOINC code) listed in the first column in the presence of a common medical code, 292.4 representing thalassemia. In a further embodiment, the comparison module 604 may compare 812 the corresponding percentile values of both groups and generate 814 an output comprising a graph showing the comparison, such as a percentage shift of the median of the first group in the presence of thalassemia from the median of the second group associated with a normal population for multiple LOINC codes in FIG. 10. Discovery 810-814 may help identify or confirm test codes that may be potentially relevant for a particular medical code and may be used for disease diagnosis or prediction, as well as treatment evaluation. However, discovery steps of those test codes may be optional; for example, these steps may not be necessary for test codes known to be associated with the medical code.

Datavant Exhibit 1002

[0100] In the distribution module 510, records may also be retrieved by search 806 and 808, and optionally filter 804. In an embodiment, the count module 606 may count 904 distinct records in both groups for a total number of records and also records in each aggregated category as the aggregation module 608 may aggregate 906 records from the first group and from the second group according to a selected attribute, such as a series of bucketed ranges of test values for distribution. An example of aggregation 906 is illustrated in FIG. 11. The compute module 610 may then compute an odds ratio, an average, or some other mathematical statistic and the output module 612 may generate an output comprising one or more distribution graphs to display one or more statistics calculated by the server 102. For example, the graph may be a histogram as illustrated in FIG. 11.

[0101] In a specific example, the server 102 may send a single set of SQL instruction to perform the first search 806, perform the second search 808, and other searching functions, such as filtering 804.

[0102] In a further embodiment, the SQL instructions may include instructions for interpolating 810 percentile values from both groups. In a still further embodiment, the SQL instructions may also include comparing 812 the corresponding percentile values and generate 814 an output comprising a graph showing the comparison, for example, in the format of percentage shift which may also be ranked by the degree of shift. For example, one embodiment of SQL instructions that may be used to perform the method of FIG. 8 may include:

```
select c.loinc_code||' '||loinc_code_desc,a.*,b.*,-
(a.interpolated50th-
      b.interpolated50th)/(a.interpolated50th+b.interpolated50t
h)/2 percent_shift_of_median  from

foo_loinc_distribution_sigmas a,

loinc c,

(

select  loinc_code,result_units_name,u_mem,max(case when .50
between decile and      lead_decile then (lead_delta-
delta_from_index)/(lead_decile-decile)*0.50
      +(delta_from_index-(lead_delta-
delta_from_index)/(lead_decile-decile)*decile)  else -
      99999 end ) interpolated50th, max(case when .32 between
decile and lead_decile then   (lead_delta-
delta_from_index)/(lead_decile-decile)*0.32 +(delta_from_index-
(lead_delta-      delta_from_index)/(lead_decile-
decile)*decile)  else -99999 end) interpolated32th,   max(case
when .95 between decile and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.95
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile)  else -
```


Datavant Exhibit 1002

```
99999 end )       interpolated95th,max(case when .05 between
decile and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.05
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile) else -
99999 end ) interpolated5th,  max(case when .68 between decile
and lead_decile then (lead_delta-
      delta_from_index)/(lead_decile-decile)*0.68
+(delta_from_index-(lead_delta-
      delta_from_index)/(lead_decile-decile)*decile)  else -
99999 end ) interpolated68th

from

(

select iv4.*, cast(result_value_nbr as float)
delta_from_index,cast(rn as float)/u_mem  decile,lead(cast(rn
as float)/u_mem) over (partition by
loinc_code,result_units_name  order by rn)
lead_decile,lead(result_value_nbr) over (partition by
      loinc_code,result_units_name order by rn) lead_delta

from

(

select iv3.*, max(rn) over(   partition by
loinc_code,result_units_name ) u_mem

from

(

select iv2.*, row_number() over (   partition by
loinc_code,result_units_name   order by   result_value_nbr asc)
rn

from

(

select
a.loinc_code,a.result_units_name,a.individual_id,avg(result_val
ue_nbr)     result_value_nbr

from

(

select individual_id,min(service_from_date) min_dos  from
diagnosis a,      foo_members_with_condition6 b where
decm_code like'250%' and      b.dx=a.diagnosis_key group by
individual_id

   ) iv,

foo_members_with_lab6 a

   where a.individual_id=iv.individual_id and service_from_date
between min_dos+-1400   and min_dos+-365

group by a.loinc_code,a.result_units_name,a.individual_id


) iv2
```


Datavant Exhibit 1002

```
) iv3

) iv4 where  u_mem>19

) iv5 group by loinc_code,result_units_name,u_mem

) b where a.loinc_code=b.loinc_code          and
a.result_units_name=b.result_units_name   and a.loinc_code not
in ('0','1')  and a.result_units_name <> ' '

and a.loinc_code=c.loinc_code and ( b.interpolated50th not
between a.interpolated32th    and a.interpolated68th or
a.interpolated50th not between b.interpolated32th and
b.interpolated68th)

order by abs((a.interpolated50th-
b.interpolated50th)/(a.interpolated50th+b.interpolated50th)/2)
desc
```

[0103] In a further embodiment, the SQL instructions may include instructions for counting 904 distinct records and/or aggregating 906 the records. In still another embodiment, the same set of SQL instructions may include functions for generating 908 an output comprising a probability distribution graph by computing statistics, such as the odds ratio of a specified test value or range within the records. One particular embodiment of SQL instructions that may be used to perform the method of FIG. 9 may include:

```
select iv4.*,u_mems/tot1 percent_all,members_with_disease/tot2
percent_with_disease from     (

select iv3.*,sum(u_mems) over () tot1,sum(members_with_disease)
over () tot2 from (

select
b.loinc_code,b.result_units_name,rng,u_mems,rn,count(distinct
individual_id)    members_with_disease from

(select * from foo_normal_distributions where loinc_code='785-
6' and      result_units_name='pg' ) b

left outer join

(

select
a.individual_id,min_dos,decm_code,loinc_code,result_units_name,
avg(result_value_nbr)   result_value_nbr from

(

SELECT decm_code,  b.individual_id, MIN(service_from_date)
min_dos

FROM diagnosis  a, foo_members_with_condition6 b

WHERE decm_code like '282.4'

AND b.dx=a.diagnosis_key

GROUP BY decm_code, b.individual_id
```

```
) iv2

,

foo_members_with_lab6 a

where a.individual_id=iv2.individual_id and service_from_date
between min_dos+-180 and      min_dos+-2

group by
a.individual_id,min_dos,decm_code,loinc_code,result_units_name


) iv3 on ( iv3.loinc_code=b.loinc_code and
iv3.result_units_name=b.result_units_name and
      result_value_nbr >bucketstart and result_value_nbr<=
bucketend)

group by b.loinc_code,b.result_units_name,rng,u_mems,rn

) iv3

) iv4  order by rn
```

[0104] FIG. 10 illustrates one embodiment of an output 1000 from the discovery module 508, which may include an interpolation table 1002 or a comparison graph 1004. In a certain embodiment, each row in the table 1002 may represent a first group of records in the presence of a medical code 282.4 thalassemia that is identified by a specific test code in the first column. For example, the test code may be LOINC code 785-6 representing erythrocyte mean corpuscular hemoglobin, and the associated first group of records (not shown) may be interpolated to obtain values representing 50% (median), 32%, 95%, and 5%. In a particular embodiment, the median of the first group of records identified by the specific test code in the presence of the medical code is compared with the median of a control group of records, particularly, a normal group, which is the middle line corresponding to 0.0% in the graph 1004. The difference between the two medians for each test code is represented as a percentage shift (= (median of diseased group of records-median of normal group of records)/median of normal group of records x 100%) from the middle line, which has also be used to rank the order of the list of test codes from least to most in terms of absolute value of difference.

[0105] FIG. 11 illustrates an embodiment of results or outputs that may be derived from the distribution module 510. A specific test code, for example, LOINC code 785-6, is received or selected for the first search 806 to identify a first group of records associated with the test code and in the presence of the medical code 282.4. A table 1102 may include one or more fields for displaying counting, aggregating and computing results. The first and second group of records may be aggregated according to selected attributes, in particular, a set of test value ranges (RNG

field), and counted in each range with results presented in the U_MEM field for the second group (normal control) and in MEMBERS_WITH_DISEASE for the first group (diseased). Percentage of the number of records in each test value range over the total number of records in the first or second group may also be calculated to yield results shown in fields of PERCENT_DISEASED or PERCENT_ALL, respectively. Graph 1104 and 1106 show a distribution of numbers of records in the bucket ranges for normal group and diseased group, respectively. Histogram 1108 overlay the percentages of records in each value range for both groups and show a difference in their distribution pattern.

[0106] FIG. 12 illustrates an example for interpolation of a percentile value from a group of records. Protocol 1202 explains interpolating a raw source of random prices by using a linear function to extract a value at 80% by using SQL instructions. Table 1204 presents such a raw source of random prices and table 1206 shows the result of the interpolation of 80%.

[0107] FIG. 13 illustrates an embodiment of the discovery module used for pre-disease diagnosis or predicting a risk for a disease. List 1302 provide examples of risk factors for identifying metabolic syndrome candidates, one or more of which may be used as the medical code to search for the first group of records in the database. Alternatively, a temporal window in combination with the diabetic medical code may be used to search a first group of records collected three years to thirty days prior to diabetic diagnosis or in the presence of a diabetic medical code. Graph 1304 shows the output comprising the ranked percentage shift of the medians of the first group of records from the normal medians for a plurality of test codes. A test code with a significant percentage shift may be a potential pre-diabetic marker or a useful diabetic early predictor, such as LOINC code 2086-7, associated with a nearly -12% shift.

[0108] FIG. 14 illustrates an embodiment of the distribution module used for pre-disease diagnosis or predicting a risk for a disease. Distribution of percentage of records in each histogram range for the pre-disease group (one to three years prior to diabetes diagnosis) and control group are compared in graph 1400.

[0109] FIG. 15 illustrates one embodiment of a graphical user interface (GUI) 1500 for use in accordance with the interface module 502. As illustrated, the GUI 1500 may include one or more fields for receiving user inputs, one or more buttons for issuing a command or controlling the server, application, or code, and one or more descriptive or informational names or elements for

Datavant Exhibit 1002

providing user instructions and prompts. As illustrated in the informational diagram in FIG. 15, certain limiting criteria or temporal interval may include a clean period value, or time period prior to the occurrence of the medical code. For example, if the medical code is a medical code for diabetes, the clean period criteria may be a time frame, such as two years, before the occurrence of the medical code. In such an embodiment, the first search module 504 may only return records for individuals who have not only been diagnosed with diabetes, but also have a minimum of two years worth of records prior to the diagnosis.

[0110] The limiting criteria may also include an aggregation window, or time frame for collecting records associated with the individual. The aggregation window variable may include a time frame before or after the occurrence of the medical code from which to collect records. For example, the filter module 602 may only collect records for two years prior to the occurrence of the medical code and for ninety days after the occurrence of the medical code.

[0111] All of the methods disclosed and claimed herein can be made and executed without undue experimentation in light of the present disclosure. While the systems and methods of this invention have been described in terms of preferred embodiments, it will be apparent to those of skill in the art that variations may be applied to the methods and in the steps or in the sequence of steps of the method described herein without departing from the concept, spirit and scope of the invention. In addition, modifications may be made to the disclosed apparatus and components may be eliminated or substituted for the components described herein where the same or similar results would be achieved. All such similar substitutes and modifications apparent to those skilled in the art are deemed to be within the spirit, scope, and concept of the invention as defined by the appended claims.

Datavant Exhibit 1002

CLAIMS

1. A method for comparing two groups of records comprising:

receiving a medical code;

searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generating an output comprising a distribution graph on a shared scale from the first and second group of records.

2. The method of claim 1, further comprising comparing a first value representing the first group and a second value representing the second group of records.

3. The method of claim 2, further comprising interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

4. The method of claim 1, wherein generating the output further comprises counting distinct records in the first group of records and the second group of records.

5. The method of claim 1, wherein generating the output further comprises aggregating records from the first group and from the second group according to a selected attribute.

6. The method of claim 5, wherein generating the output further comprises computing a probability in response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

7. The method of claim 1, further comprising selecting the first group of records from within a time interval.

8. The method of claim 1, wherein the record comprises an average, a first reading or a last

reading of a test.

9. The method of claim 1, further comprising selecting records in the first group and in the second group according to a limiting criterion.

10. A system comprising:

a data storage device configured to store a database comprising one or more records, wherein the records are identified by one or more test codes;

a server in data communication with the data storage device, suitably programmed to:

receive a medical code;

search the database to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

search the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generate an output comprising a distribution graph on a shared scale from the first and second group of records.

11. The system of claim 10, wherein the server is further configured to compare a first value representing the first group and a second value representing the second group of records.

12. The system of claim 11, wherein the server is further configured to interpolate the first group of records to obtain the first value and to interpolate the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

13. The system of claim 10, wherein the server is further configured to count distinct records in the first group of records and the second group of records.

14. The system of claim 10, wherein the server is further configured to aggregate records from the first group and from the second group according to a selected attribute.

15. The system of claim 14, wherein the server is further configured to compute a probability in response to a ratio of a number of records in the first group having the selected attribute and a

Datavant Exhibit 1002

number of records in the second group having the selected attribute.

16. The system of claim 10, wherein the server is further configured to select the first group of records from within a time interval.

17. The system of claim 10, wherein the server is further configured to select records in the first group and in the second group according to a limiting criterion.

18. A tangible computer program product comprising a computer readable medium having computer usable program code executable to perform operations comprising:

receiving a medical code;

searching a database stored on a data storage device to obtain a first group of records associated with individuals having the medical code, wherein each record of the first group of records is identified by a test code;

searching the database to obtain a second group of records associated with a control population, wherein each record of the second group of records is identified by the test code; and

generating an output comprising a distribution graph on a shared scale from the first and second group of records.

19. The computer program product of claim 18, further comprising comparing a first value representing the first group and a second value representing the second group of records.

20. The computer program product of claim 19, further comprising interpolating the first group of records to obtain the first value and interpolating the second group of records to obtain the second value, wherein the first and second values are associated with a shared percentile.

21. The computer program product of claim 18, further comprising counting distinct records in the first group of records and the second group of records.

22. The computer program product of claim 18, further comprising aggregating records from the first group and from the second group according to a selected attribute.

23. The computer program product of claim 22, further comprising computing a probability in

Datavant Exhibit 1002

response to a ratio of a number of records in the first group having the selected attribute and a number of records in the second group having the selected attribute.

24. The computer program product of claim 18, further comprising selecting the first group of records from within a time interval.

25. The computer program product of claim 18, further comprising selecting records in the first group and in the second group according to a limiting criterion.

Datavant Exhibit 1002

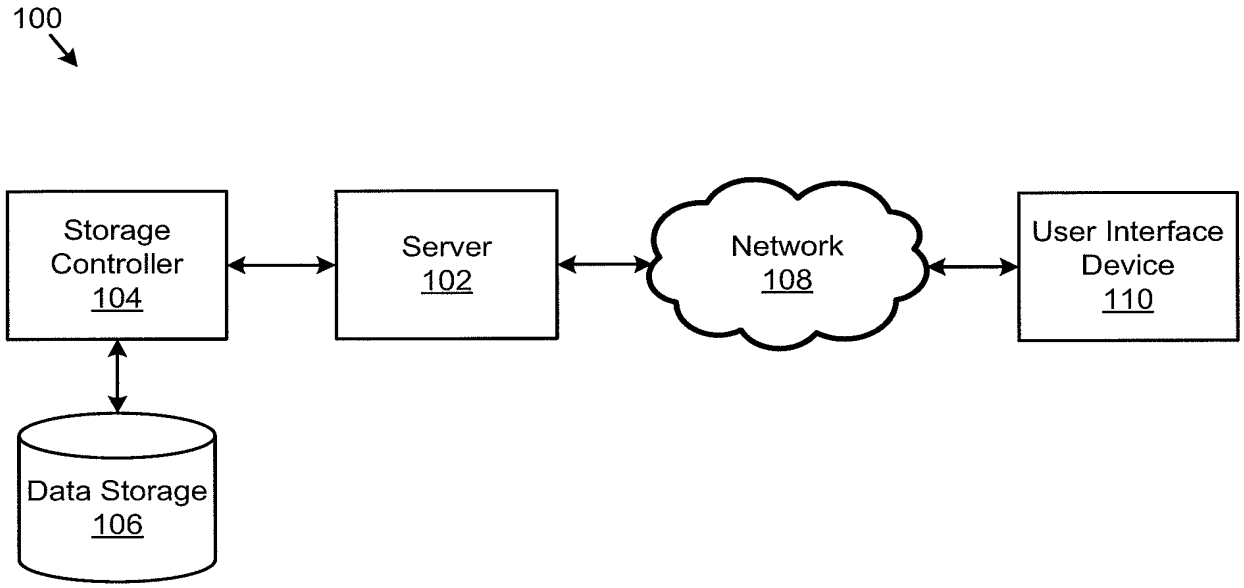

100
Storage Controller 104
Server 102
Network 108
User Interface Device 110
Data Storage 106

FIG. 1

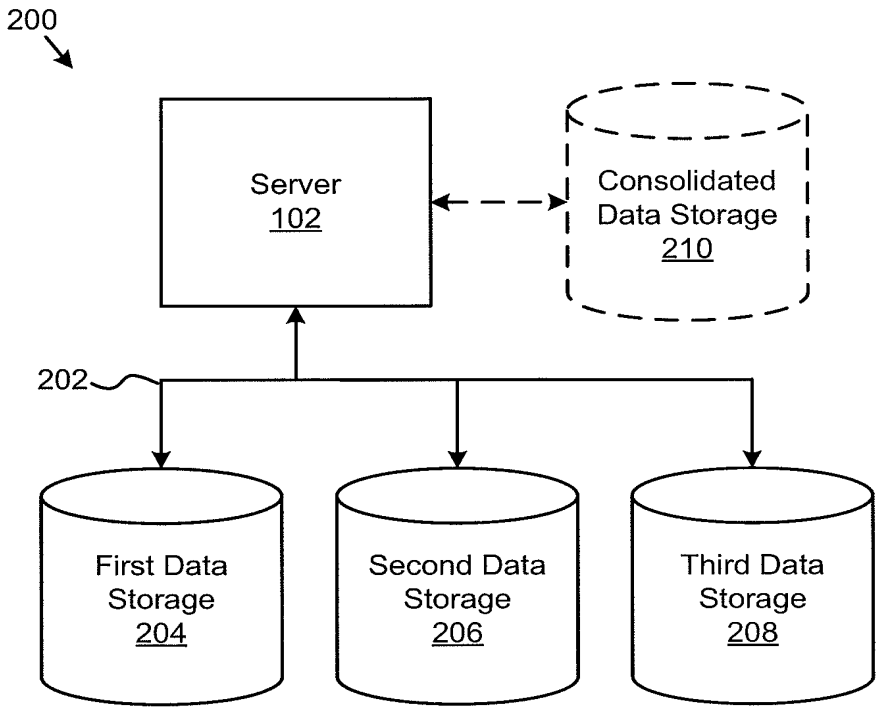

200
Server
102
Consolidated
Data Storage
210
202
First Data
Storage
204
Second Data
Storage
206
Third Data
Storage
208

FIG. 2

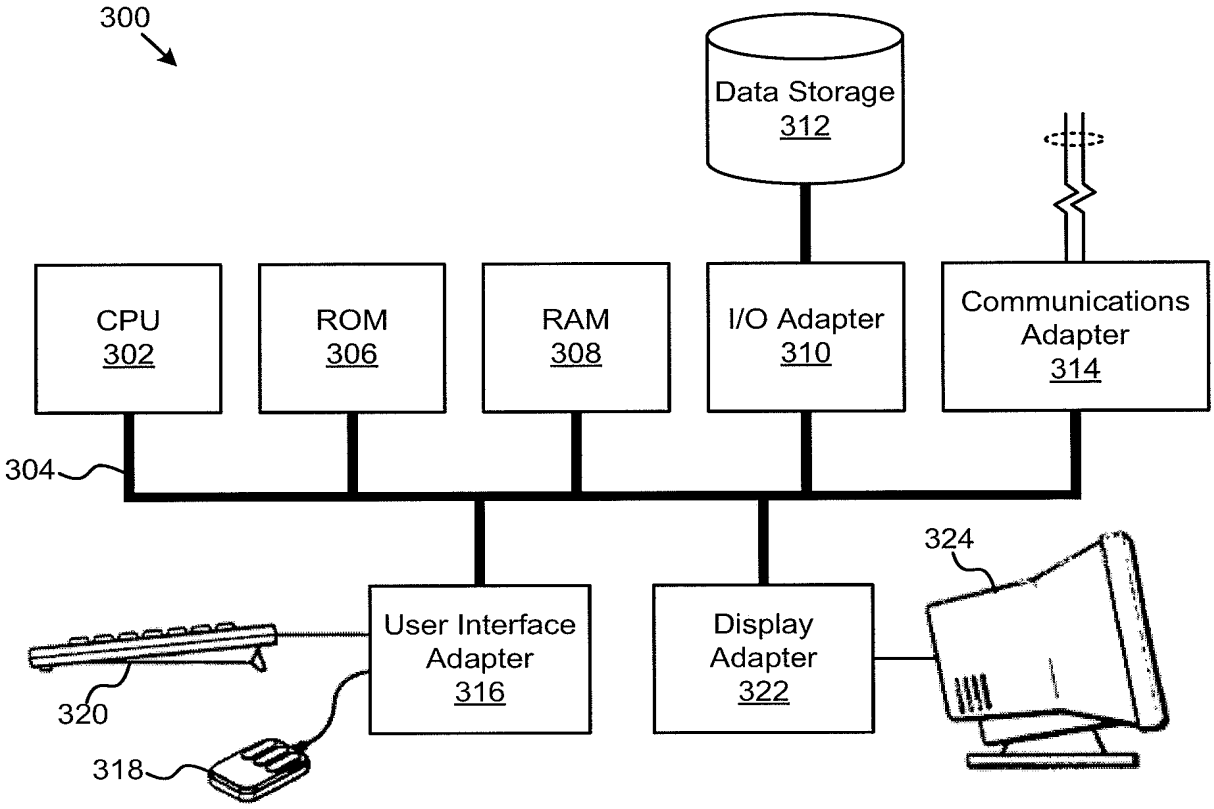

300
Data Storage
312
CPU
302
ROM
306
RAM
308
I/O Adapter
310
Communications
Adapter
314
304
324
User Interface
Adapter
316
Display
Adapter
322
320
318

FIG. 3

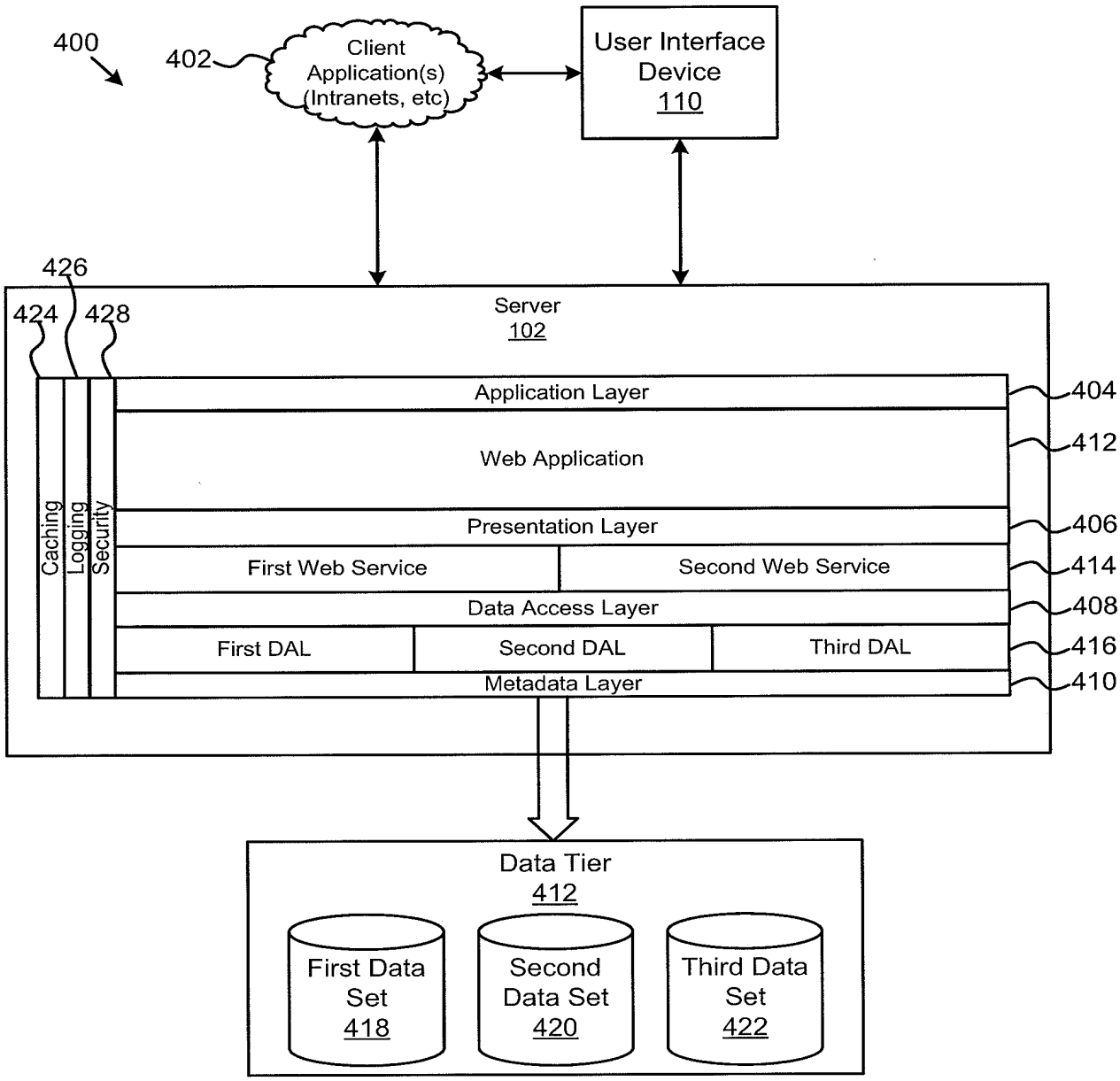

400
402
Client Application(s) (Intranets, etc)
User Interface Device 110
426
424
428
Server 102
Application Layer
404
Web Application
412
Caching
Logging
Security
Presentation Layer
406
First Web Service
Second Web Service
414
Data Access Layer
408
First DAL
Second DAL
Third DAL
416
Metadata Layer
410
Data Tier 412
First Data Set 418
Second Data Set 420
Third Data Set 422

FIG. 4

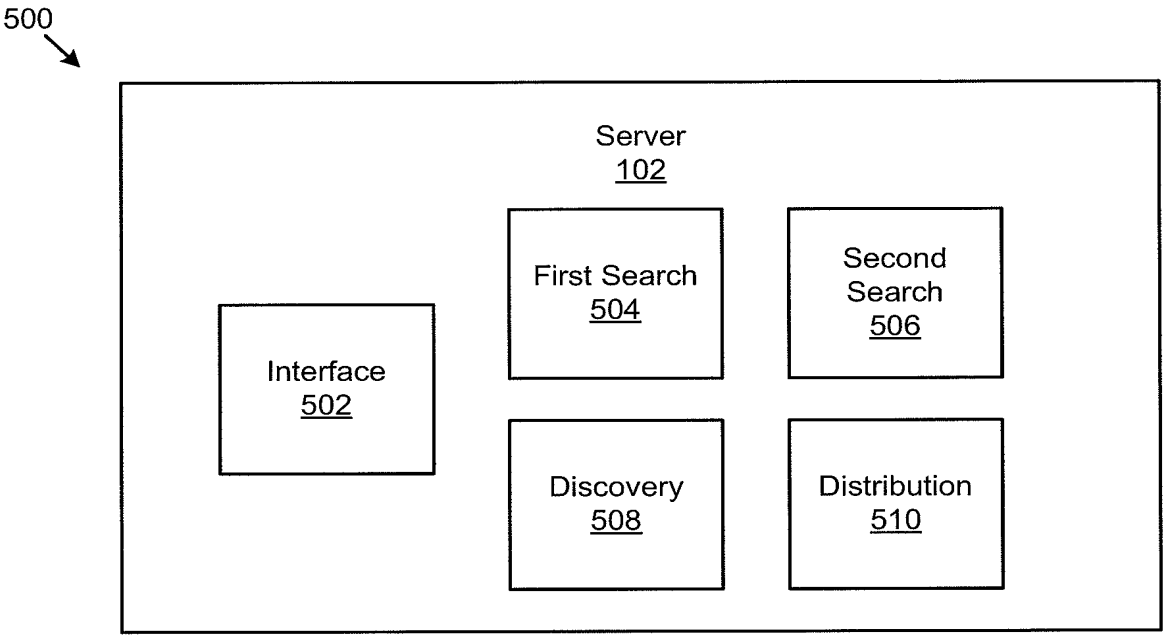

500
Server
102
First Search
504
Second
Search
506
Interface
502
Discovery
508
Distribution
510

FIG. 5

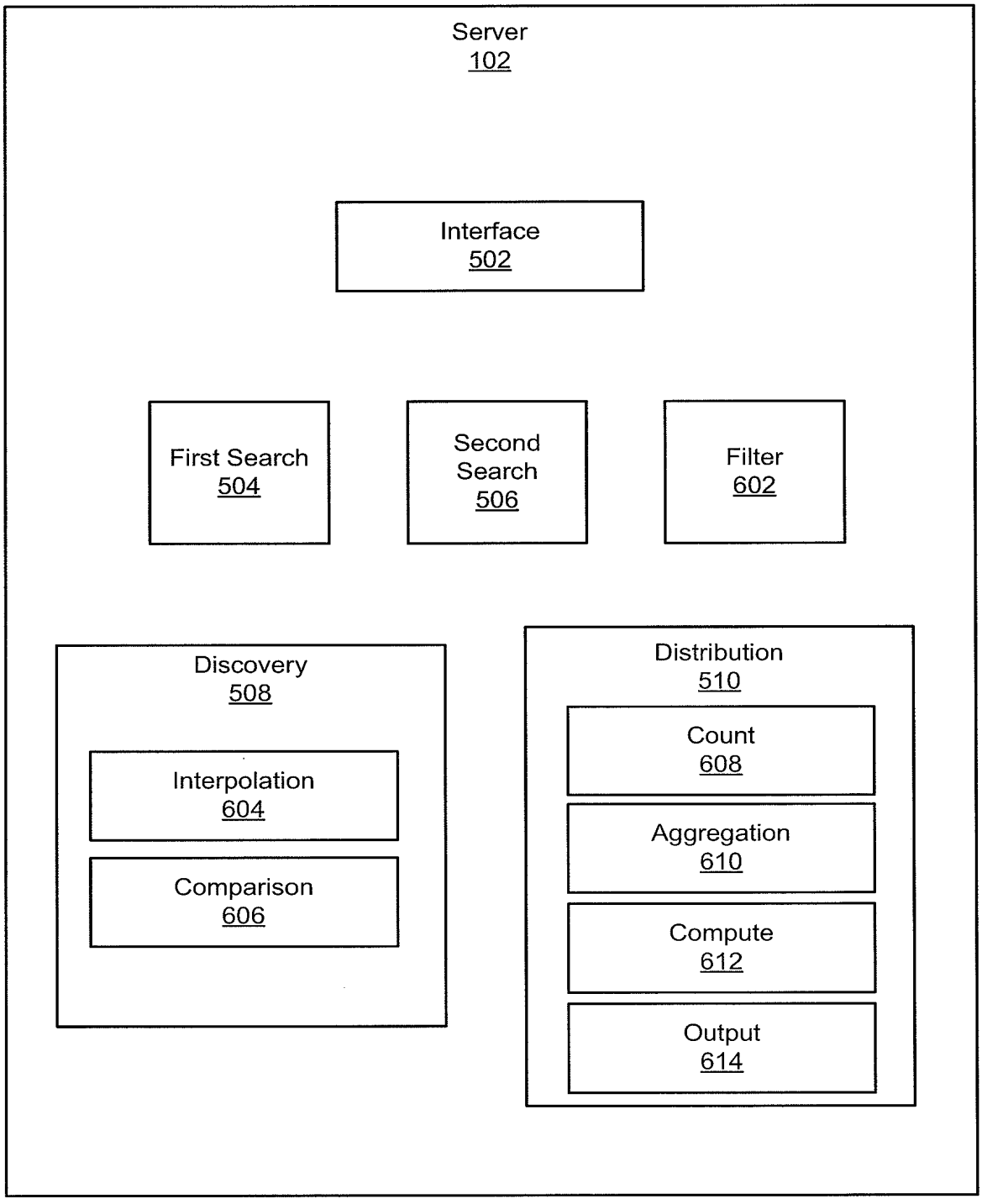

Server
102
Interface
502
First Search
504
Second
Search
506
Filter
602
Discovery
508
Interpolation
604
Comparison
606
Distribution
510
Count
608
Aggregation
610
Compute
612
Output
614

FIG. 6

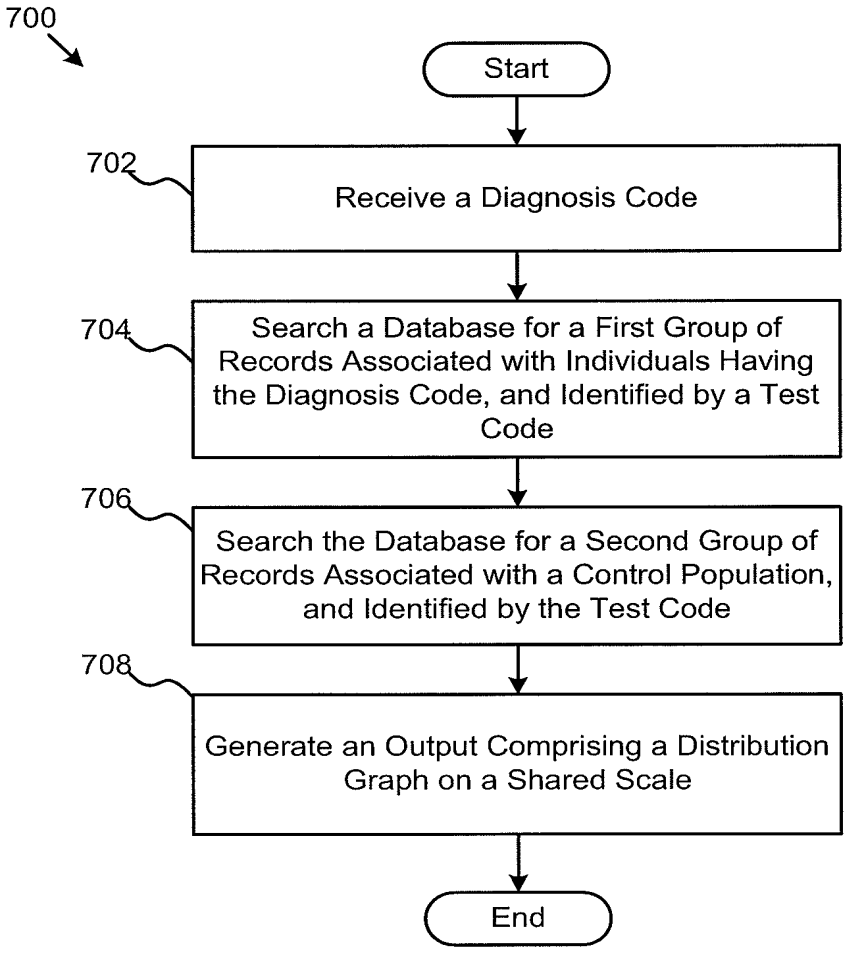

700
Start
702
Receive a Diagnosis Code
704
Search a Database for a First Group of Records Associated with Individuals Having the Diagnosis Code, and Identified by a Test Code
706
Search the Database for a Second Group of Records Associated with a Control Population, and Identified by the Test Code
708
Generate an Output Comprising a Distribution Graph on a Shared Scale
End

FIG. 7

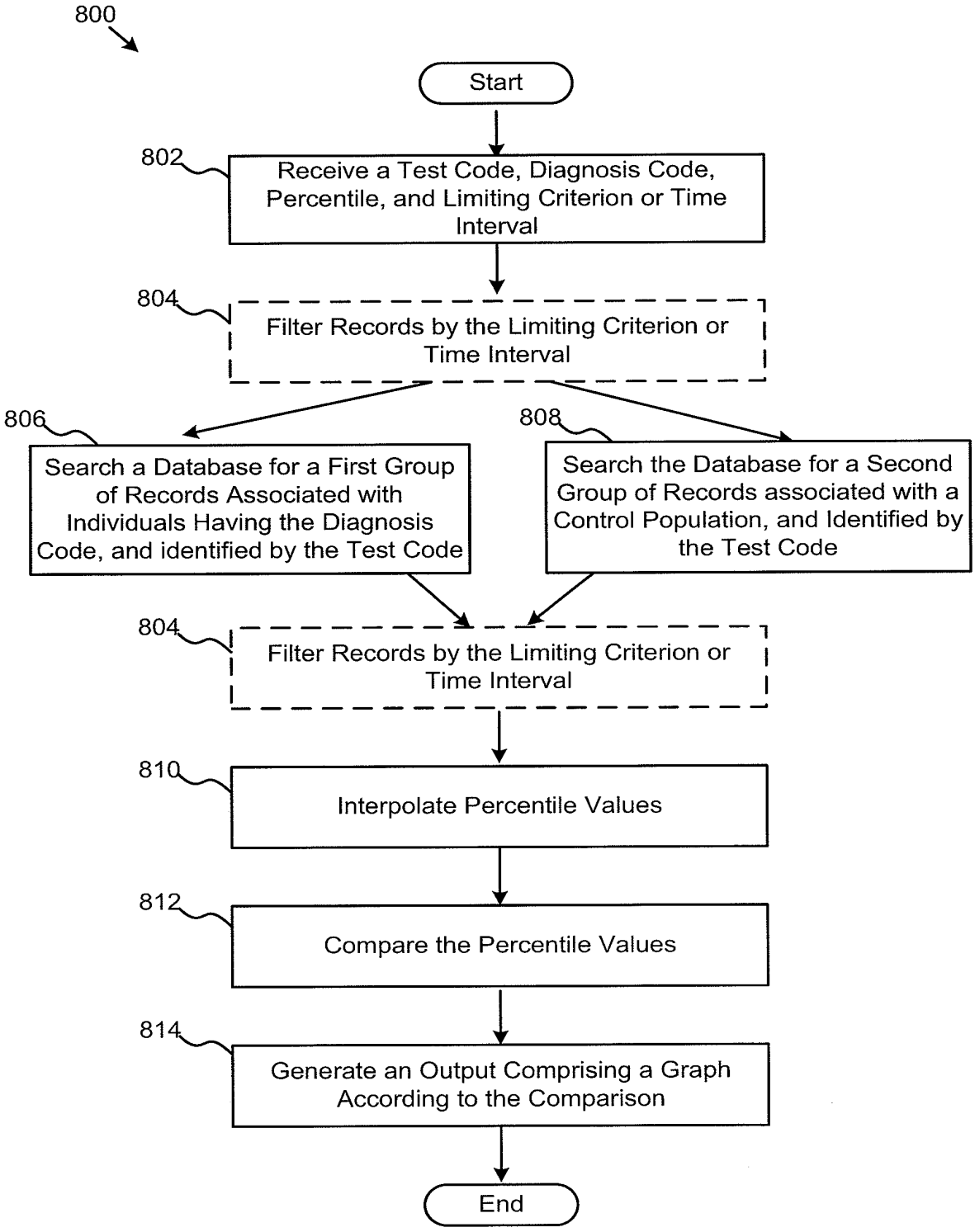

800
Start
802
Receive a Test Code, Diagnosis Code, Percentile, and Limiting Criterion or Time Interval
804
Filter Records by the Limiting Criterion or Time Interval
806
Search a Database for a First Group of Records Associated with Individuals Having the Diagnosis Code, and identified by the Test Code
808
Search the Database for a Second Group of Records associated with a Control Population, and Identified by the Test Code
804
Filter Records by the Limiting Criterion or Time Interval
810
Interpolate Percentile Values
812
Compare the Percentile Values
814
Generate an Output Comprising a Graph According to the Comparison
End

FIG. 8

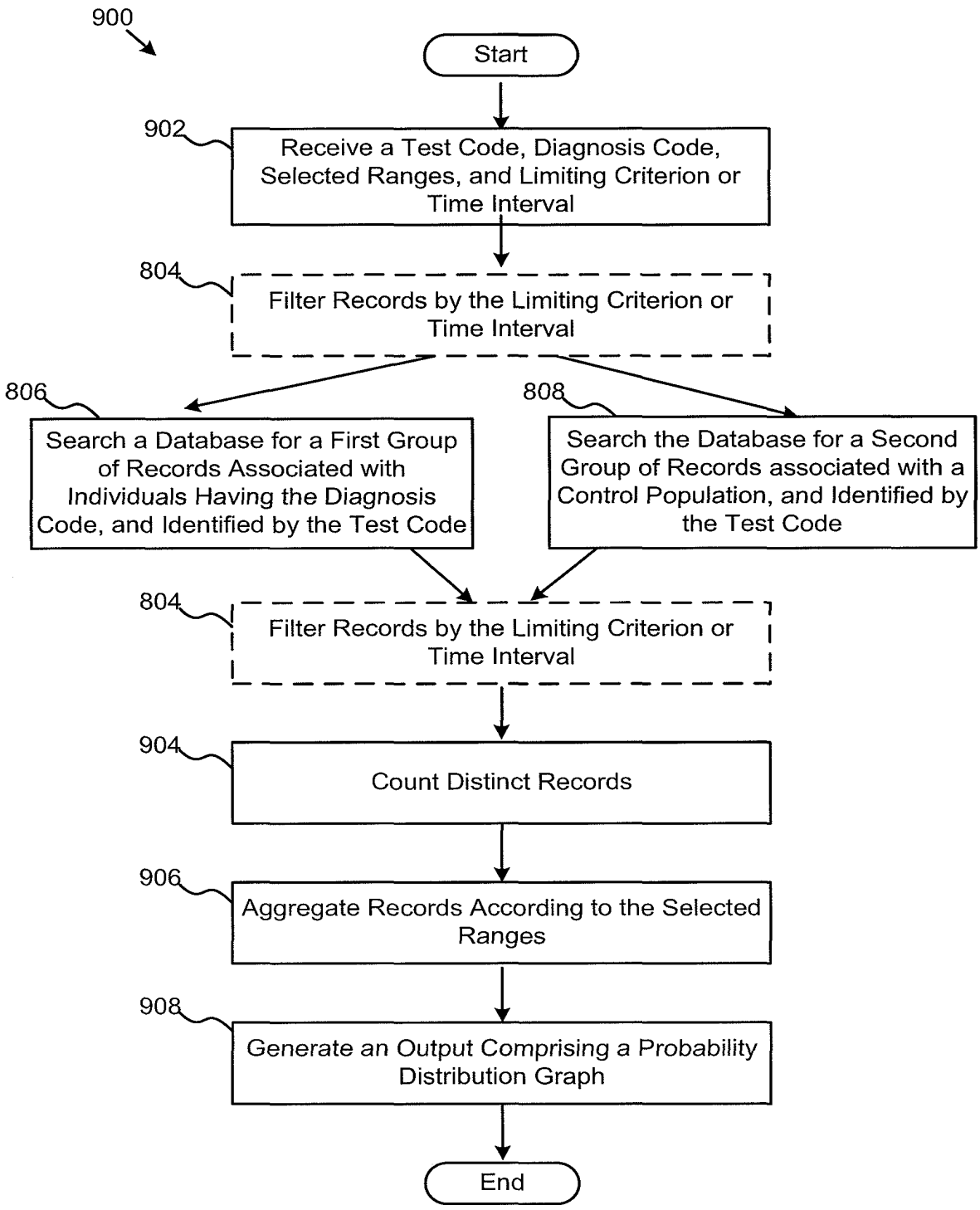

900
Start
902
Receive a Test Code, Diagnosis Code, Selected Ranges, and Limiting Criterion or Time Interval
804
Filter Records by the Limiting Criterion or Time Interval
806
Search a Database for a First Group of Records Associated with Individuals Having the Diagnosis Code, and Identified by the Test Code
808
Search the Database for a Second Group of Records associated with a Control Population, and Identified by the Test Code
804
Filter Records by the Limiting Criterion or Time Interval
904
Count Distinct Records
906
Aggregate Records According to the Selected Ranges
908
Generate an Output Comprising a Probability Distribution Graph
End

FIG. 9

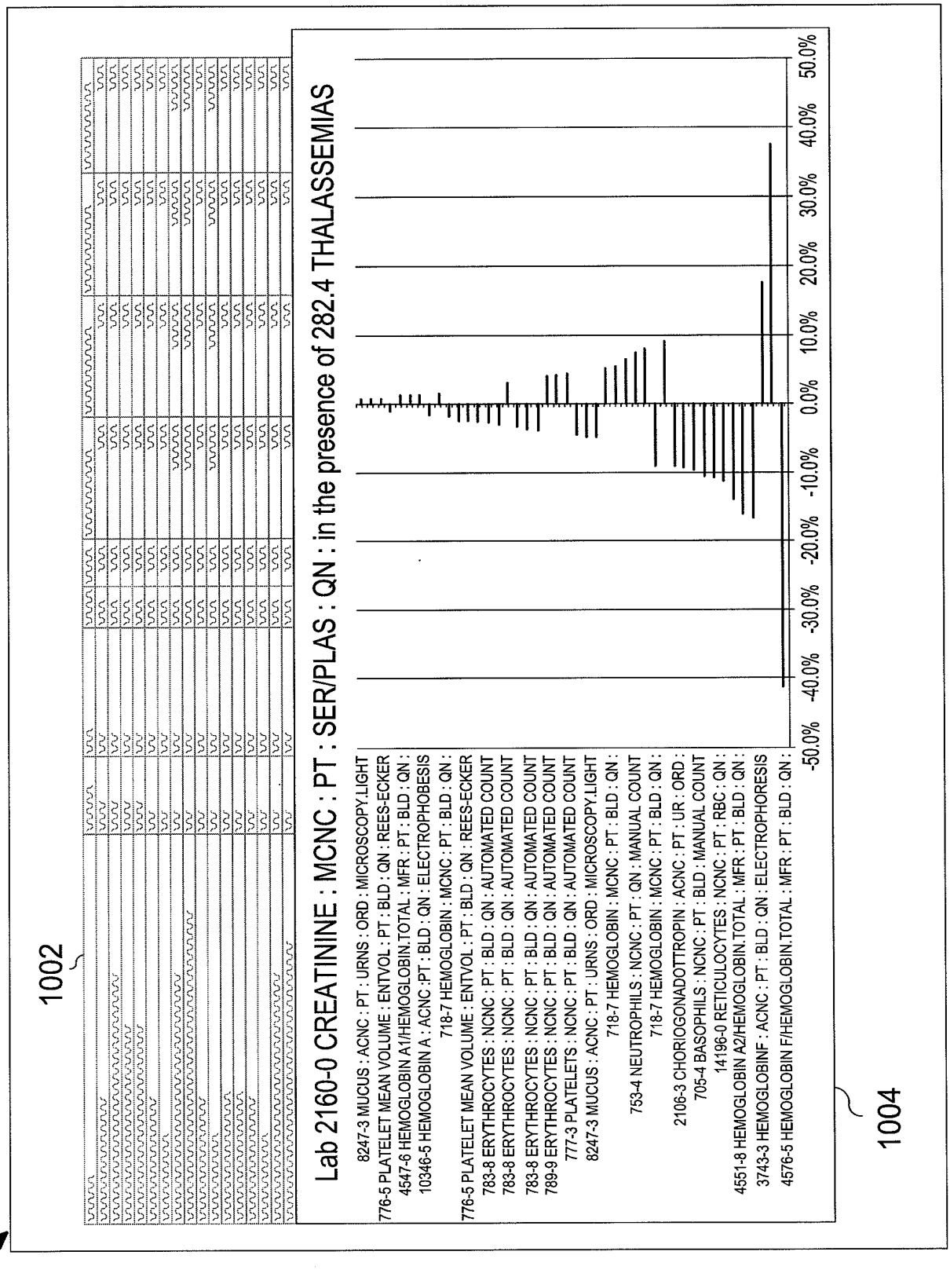

1000
1002
1004
Lab 2160-0 CREATININE : MCNC : PT : SER/PLAS : QN : in the presence of 282.4 THALASSEMIAS
8247-3 MUCUS : ACNC : PT : URNS : ORD : MICROSCOPY.LIGHT
776-5 PLATELET MEAN VOLUME : ENTVOL : PT : BLD : QN : REES-ECKER
4547-6 HEMOGLOBIN A1/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
10346-5 HEMOGLOBIN A : ACNC :PT : BLD : QN : ELECTROPHOBESIS
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
776-5 PLATELET MEAN VOLUME : ENTVOL : PT : BLD : QN : REES-ECKER
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
783-8 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
789-9 ERYTHROCYTES : NCNC : PT : BLD : QN : AUTOMATED COUNT
777-3 PLATELETS : NCNC : PT : BLD : QN : AUTOMATED COUNT
8247-3 MUCUS : ACNC : PT : URNS : ORD : MICROSCOPY.LIGHT
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
753-4 NEUTROPHILS : NCNC : PT : QN : MANUAL COUNT
718-7 HEMOGLOBIN : MCNC : PT : BLD : QN :
2106-3 CHORIOGONADOTTROPIN : ACNC : PT : UR : ORD :
705-4 BASOPHILS : NCNC : PT : BLD : MANUAL COUNT
14196-0 RETICULOCYTES : NCNC : PT : RBC : QN :
4551-8 HEMOGLOBIN A2/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
3743-3 HEMOGLOBINF : ACNC : PT : BLD : QN : ELECTROPHORESIS
4576-5 HEMOGLOBIN F/HEMOGLOBIN.TOTAL : MFR : PT : BLD : QN :
-50.0% -40.0% -30.0% -20.0% -10.0% 0.0% 10.0% 20.0% 30.0% 40.0% 50.0%

FIG. 10

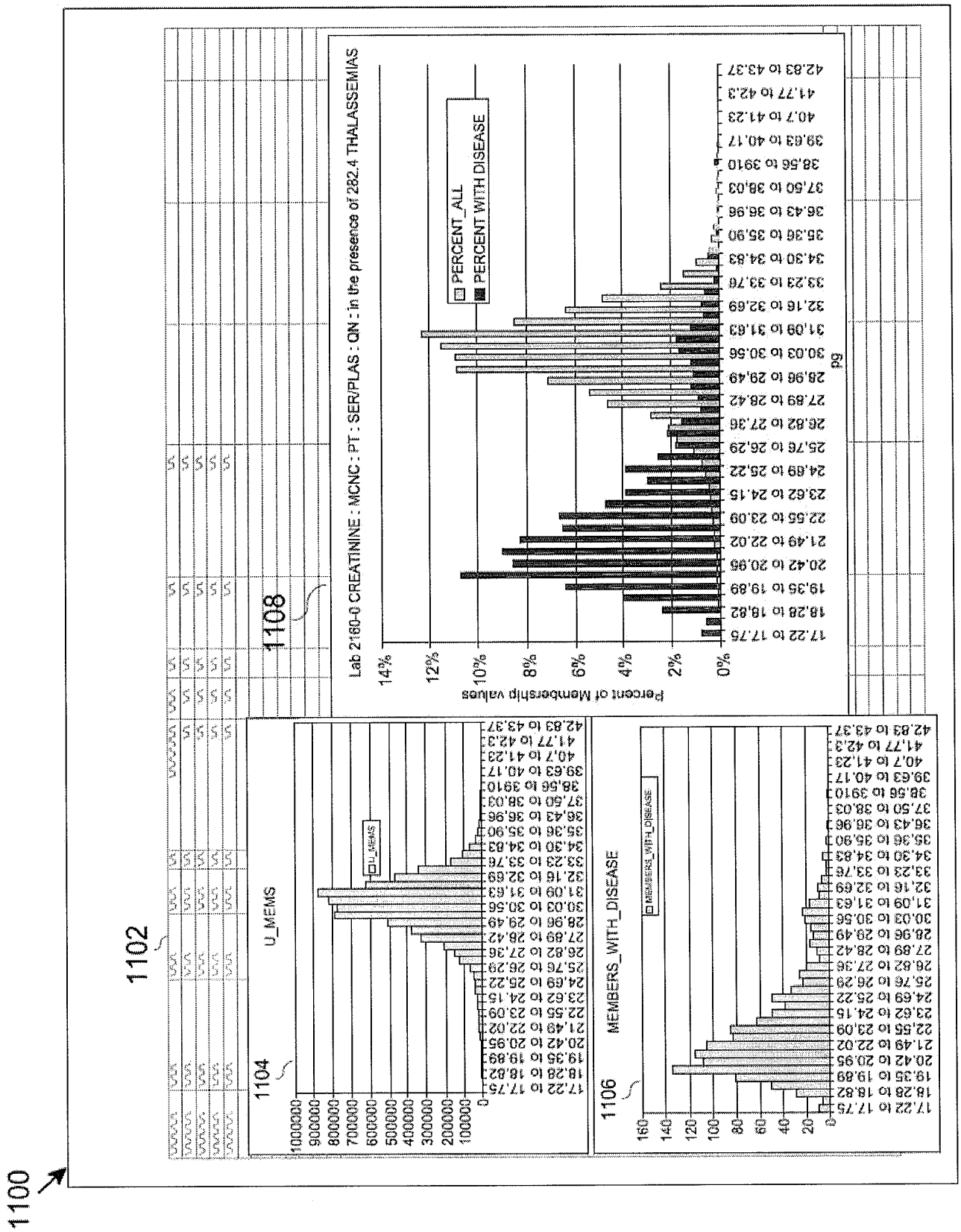
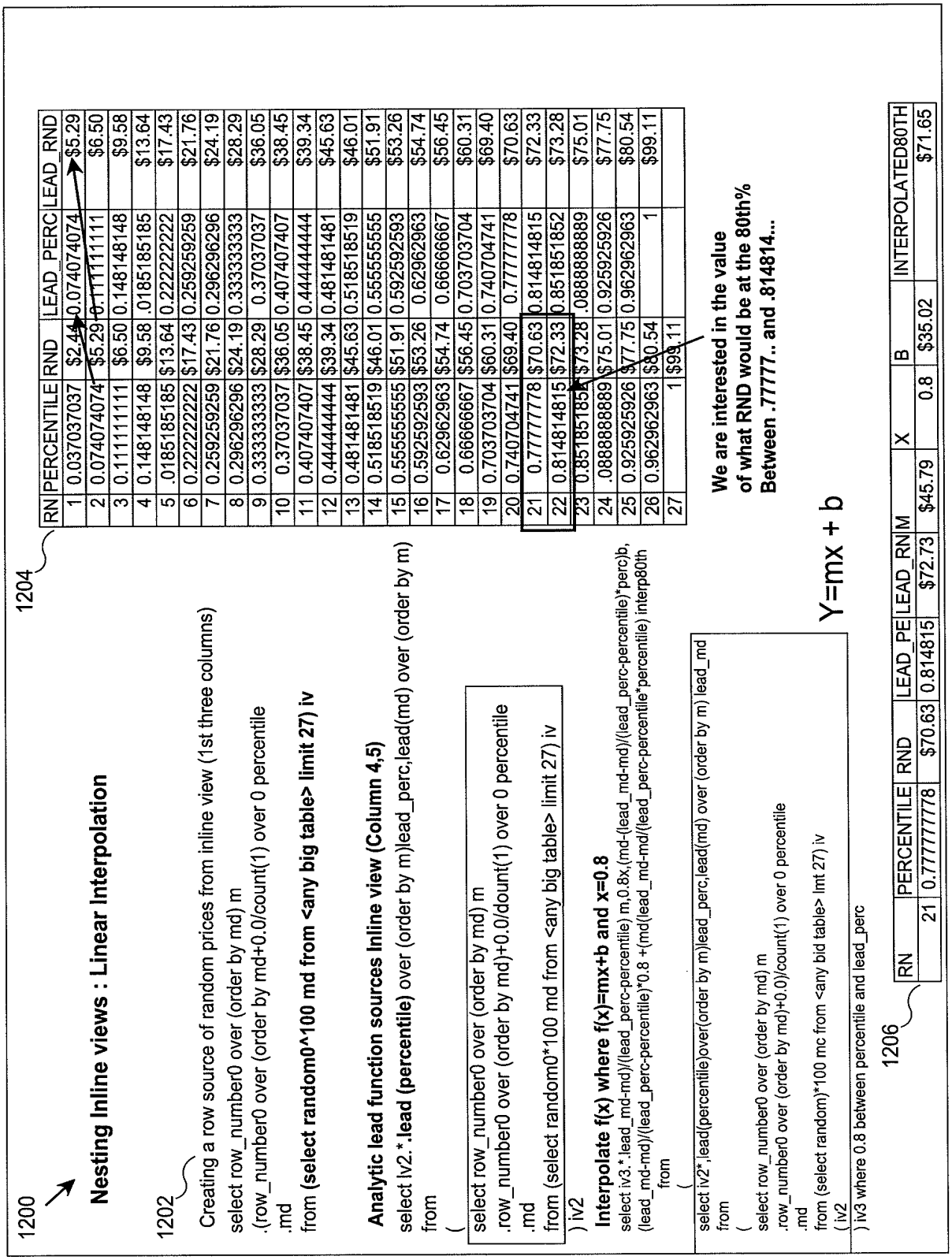

1100
1102
1104
U_MEMS
1106
MEMBERS_WITH_DISEASE
1108
Lab 2160-0 CREATININE : MCNC : PT : SER/PLAS : QN : in the presence of 282.4 THALASSEMIAS
Percent of Membership values
PERCENT_ALL
PERCENT WITH DISEASE
pg

FIG. 11



RN	PERCENTILE	RND	LEAD_PERC	LEAD_RND
1	0.037037037	$2.44	0.074074074	$5.29
2	0.074074074	$5.29	0.111111111	$6.50
3	0.111111111	$6.50	0.148148148	$9.58
4	0.148148148	$9.58	.0185185185	$13.64
5	.0185185185	$13.64	0.222222222	$17.43
6	0.222222222	$17.43	0.259259259	$21.76
7	0.259259259	$21.76	0.296296296	$24.19
8	0.296296296	$24.19	0.333333333	$28.29
9	0.333333333	$28.29	0.37037037	$36.05
10	0.37037037	$36.05	0.407407407	$38.45
11	0.407407407	$38.45	0.444444444	$39.34
12	0.444444444	$39.34	0.481481481	$45.63
13	0.481481481	$45.63	0.518518519	$46.01
14	0.518518519	$46.01	0.555555555	$51.91
15	0.555555555	$51.91	0.592592593	$53.26
16	0.592592593	$53.26	0.62962963	$54.74
17	0.62962963	$54.74	0.66666667	$56.45
18	0.66666667	$56.45	0.703703704	$60.31
19	0.703703704	$60.31	0.740704741	$69.40
20	0.740704741	$69.40	0.77777778	$70.63
21	0.77777778	$70.63	0.814814815	$72.33
22	0.814814815	$72.33	0.851851852	$73.28
23	0.851851852	$73.28	.0888888889	$75.01
24	.0888888889	$75.01	0.925925926	$77.75
25	0.925925926	$77.75	0.962962963	$80.54
26	0.962962963	$80.54	1	$99.11
27	1	$99.11		

RN	PERCENTILE	RND	LEAD_PE	LEAD_RN	M	X	B	INTERPOLATED80TH
21	0.777777778	$70.63	0.814815	$72.73	$45.79	0.8	$35.02	$71.65

FIG. 12

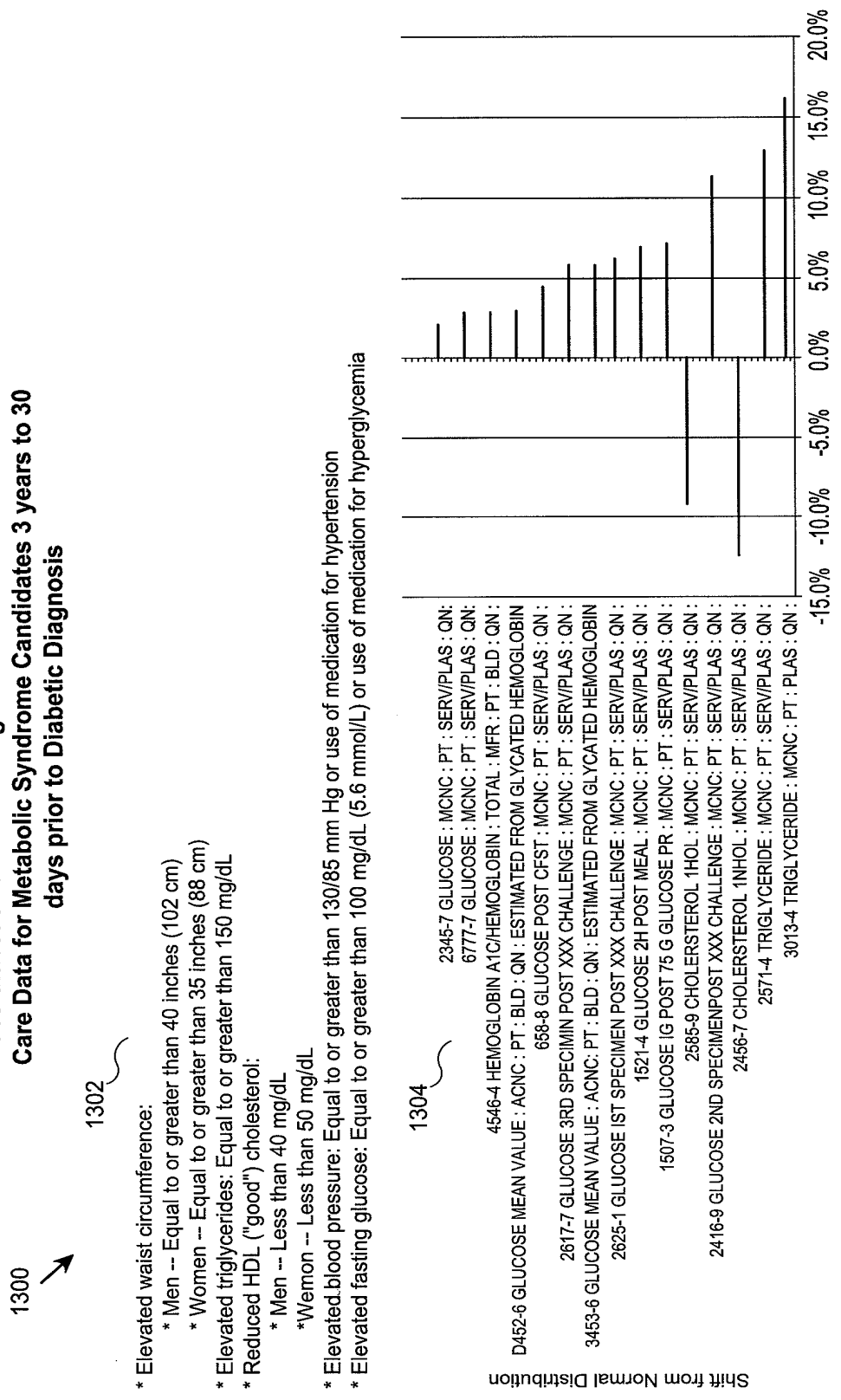

Pre-diabetic Lab Value Ranges as seen in United Health
Care Data for Metabolic Syndrome Candidates 3 years to 30
days prior to Diabetic Diagnosis
1300
1302
* Elevated waist circumference:
* Men -- Equal to or greater than 40 inches (102 cm)
* Women -- Equal to or greater than 35 inches (88 cm)
* Elevated triglycerides: Equal to or greater than 150 mg/dL
* Reduced HDL ("good") cholesterol:
* Men -- Less than 40 mg/dL
*Wemon -- Less than 50 mg/dL
* Elevated blood pressure: Equal to or greater than 130/85 mm Hg or use of medication for hypertension
* Elevated fasting glucose: Equal to or greater than 100 mg/dL (5.6 mmol/L) or use of medication for hyperglycemia
1304
Shift from Normal Distribution
2345-7 GLUCOSE : MCNC : PT : SERV/PLAS : QN:
6777-7 GLUCOSE : MCNC : PT : SERV/PLAS : QN:
4546-4 HEMOGLOBIN A1C/HEMOGLOBIN : TOTAL : MFR : PT : BLD : QN :
D452-6 GLUCOSE MEAN VALUE : ACNC : PT : BLD : QN : ESTIMATED FROM GLYCATED HEMOGLOBIN
658-8 GLUCOSE POST CFST : MCNC : PT : SERV/PLAS : QN :
2617-7 GLUCOSE 3RD SPECIMIN POST XXX CHALLENGE : MCNC : PT : SERV/PLAS : QN :
3453-6 GLUCOSE MEAN VALUE : ACNC: PT : BLD : QN : ESTIMATED FROM GLYCATED HEMOGLOBIN
2625-1 GLUCOSE IST SPECIMEN POST XXX CHALLENGE : MCNC : PT : SERV/PLAS : QN :
1521-4 GLUCOSE 2H POST MEAL : MCNC : PT : SERV/PLAS : QN :
1507-3 GLUCOSE IG POST 75 G GLUCOSE PR : MCNC : PT : SERV/PLAS : QN :
2585-9 CHOLERSTEROL 1HOL : MCNC : PT : SERV/PLAS : QN :
2416-9 GLUCOSE 2ND SPECIMENPOST XXX CHALLENGE : MCNC: PT : SERV/PLAS : QN :
2456-7 CHOLERSTEROL 1NHOL : MCNC : PT : SERV/PLAS : QN :
2571-4 TRIGLYCERIDE : MCNC : PT : SERV/PLAS : QN :
3013-4 TRIGLYCERIDE : MCNC : PT : PLAS : QN :
-15.0% -10.0% -5.0% 0.0% 5.0% 10.0% 15.0% 20.0%

FIG. 13

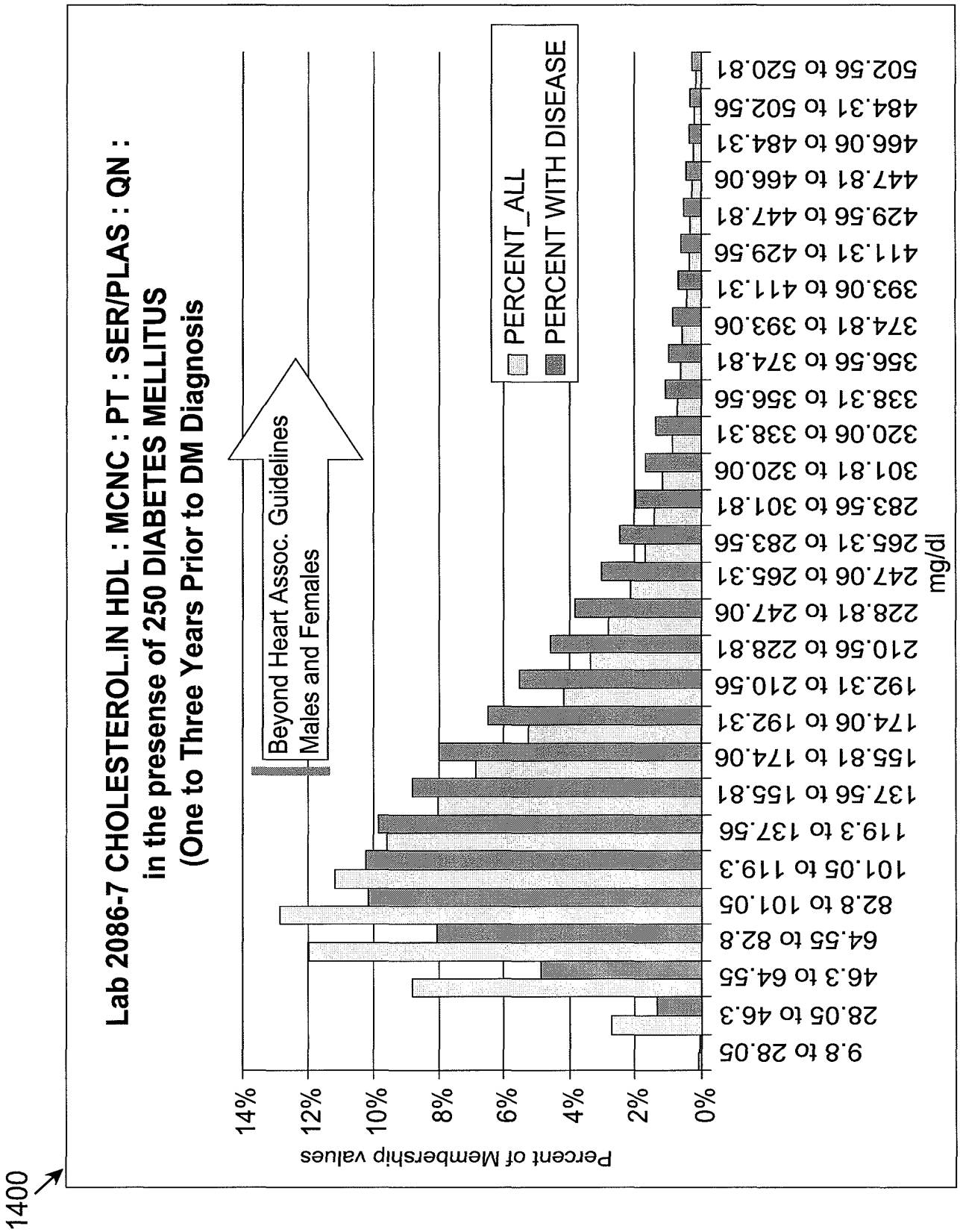

1400
Lab 2086-7 CHOLESTEROL.IN HDL : MCNC : PT : SER/PLAS : QN :
in the presense of 250 DIABETES MELLITUS
(One to Three Years Prior to DM Diagnosis
Beyond Heart Assoc. Guidelines
Males and Females
PERCENT_ALL
PERCENT WITH DISEASE
Percent of Membership values
14%
12%
10%
8%
6%
4%
2%
0%
9.8 to 28.05
28.05 to 46.3
46.3 to 64.55
64.55 to 82.8
82.8 to 101.05
101.05 to 119.3
119.3 to 137.56
137.56 to 155.81
155.81 to 174.06
174.06 to 192.31
192.31 to 210.56
210.56 to 228.81
228.81 to 247.06
247.06 to 265.31
265.31 to 283.56
283.56 to 301.81
301.81 to 320.06
320.06 to 338.31
338.31 to 356.56
356.56 to 374.81
374.81 to 393.06
393.06 to 411.31
411.31 to 429.56
429.56 to 447.81
447.81 to 466.06
466.06 to 484.31
484.31 to 502.56
502.56 to 520.81
mg/dl

FIG. 14

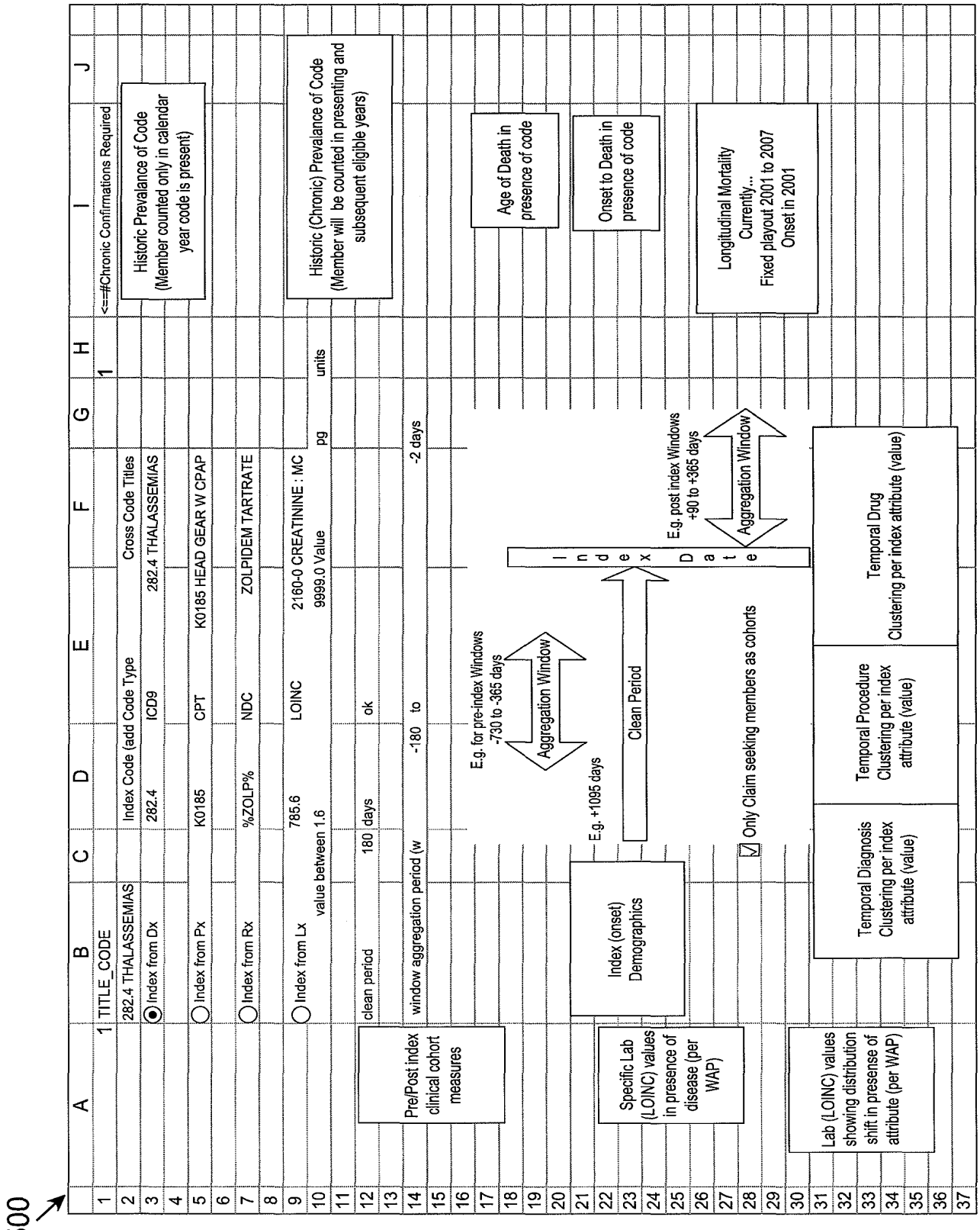

1500
1 TITLE_CODE
282.4 THALASSEMIAS
Index from Dx
Index from Px
Index from Rx
Index from Lx
value between 1.6
clean period
180 days
window aggregation period (w
-180 to
-2 days
ok
Index Code (add Code Type
Cross Code Titles
282.4
ICD9
282.4 THALASSEMIAS
K0185
CPT
K0185 HEAD GEAR W CPAP
%ZOLP%
NDC
ZOLPIDEM TARTRATE
785.6
LOINC
2160-0 CREATININE : MC
9999.0 Value
pg
units
1
<==#Chronic Confirmations Required
Historic Prevalance of Code
(Member counted only in calendar
year code is present)
Historic (Chronic) Prevalance of Code
(Member will be counted in presenting and
subsequent eligible years)
Pre/Post index
clinical cohort
measures
E.g. for pre-index Windows
-730 to -365 days
Aggregation Window
Age of Death in
presence of code
Onset to Death in
presence of code
Longitudinal Mortality
Currently...
Fixed playout 2001 to 2007
Onset in 2001
Specific Lab
(LOINC) values
in presence of
disease (per
WAP)
Index (onset)
Demographics
E.g. +1095 days
Clean Period
Index
Date
E.g. post index Windows
+90 to +365 days
Aggregation Window
Only Claim seeking members as cohorts
Lab (LOINC) values
showing distribution
shift in presense of
attribute (per WAP)
Temporal Diagnosis
Clustering per index
attribute (value)
Temporal Procedure
Clustering per index
attribute (value)
Temporal Drug
Clustering per index attribute (value)

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 10/33695

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61B 5/00 (2010.01)
USPC - 705/3
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)
USPC:705/3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 705/2; 707/941, 999.107 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Electronic Database Searched: PubWEST(PGPB, USPT, EPAB, JPAB)
Search Terms Used: medical, clinical, health, studies, diagnosis, database, repository, control, comparison, reference, group, population, data, record, history, set, subset, cohort, data, information, result, input, enter, search, retrieve, filter, find, locate, code, key, numbe

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/0076845 A1 (Bellin et al.) 19 March 2009 (19.03.2009), see entire document; especially para [0004]-[0005],[0007], [0012], [0018], [0022]-[0036], [0096]-[0098], [0109]-[0115], [0118]-[0123], [0125]-[0130], [0151]-[0152], Fig. 1-2, 5, 15-18, 20-22, 50-51	1-25
A	US 2009/0080734 A1 (Moriya et al.) 26 March 2009 (26.03.2009), see entire document	1-25
A	US 2008/0294692 A1 (Angell et al.) 27 November 2008 (27.11.2008), see entire document	1-25
A	US 2008/0201172 A1 (McNamar) 21 August 2008 (21.08.2008), see entire document	1-25
A	US 2006/0234196 A1 (Novatzky et al.) 19 October 2006 (19.10.2006), see entire document	1-25
A	US 2003/0046114 A1 (Davies et al.) 06 March 2003 (06.03.2003), see entire document	1-25

☐ Further documents are listed in the continuation of Box C. ☐

* 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 but 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	Date of mailing of the international search report
08 June 2010 (08.06.2010)	28 JUN 2010
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. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Application No.	:	16/131,094	Examiner	:	Evans Desrosiers
Filed	:	September 14, 2018	Conf. No.	:	9792
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

INFORMATION DISCLOSURE STATEMENT

Please consider the documents listed on the disclosure form submitted with this statement. Copies of the documents are being submitted with this statement to the extent required under 37 C.F.R. § 1.98(a)(2).

This statement is being filed after a first action on the merits, but before receipt of a final action or a notice of allowance.

Apply any necessary charges or credits applicable under 37 C.F.R. § 1.17(p) to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this statement.

Respectfully submitted,

Date: 10 June 2020

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay
Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

24026305.doc

PTO/AIA/26 (04-14)
Approved for use through 11/30/2020. 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.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 25412-0002003

In re Application of: Vigilytics LLC

Application No.: 16/131,094

Filed: September 14, 2018

For: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

The applicant, Vigilytics LLC, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 10,109,375 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 48,950

/Jeffrey J. Barclay, Reg. No. 48,950/ — Signature
10 June 2020 — Date

Jeffrey J. Barclay — Typed or printed name

Agent of record — Title
617-542-5070 — Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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.

This collection of information is required by 37 CFR 1.321. 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2491
Application No.	:	16/131,094	Examiner	:	Evans Desrosiers
Filed	:	September 14, 2018	Conf. No.	:	9792
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

REPLY TO ACTION OF FEBRUARY 13, 2020

Please consider the following reply.

Listing of Claims (replacing prior versions):

1 – 20. (Canceled)

21. (Currently Amended) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group;

sending the request message to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information ~~based on a minimum number of matched tokens~~; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

22. (Previously Presented) The user computing device implemented method of claim 1, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (Canceled).

24. (Currently Amended) The user computing device implemented method of claim 1, in which to produce ~~producing~~ the requested healthcare information, the server encrypts ~~includes encrypting~~ respective data that identifies each individual.

25. (Previously Presented) The user computing device implemented method of claim 1, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (Previously Presented) The user computing device implemented method of claim 1, in which the healthcare data represents medical related information associated with the individuals of the group.

27. (Currently Amended) A system comprising:

a user computing device that produces a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the request message to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information ~~based on a minimum number of matched tokens~~, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

28. (Previously Presented) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (Canceled).

30. (Previously Presented) The system of claim 27, in which the data that identifies each individual is encrypted.

31. (Previously Presented) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (Currently Amended) The system of claim 27, in which the [[data]] server provides the requested healthcare information if the group includes at least a minimum number of individuals.

33. (Previously Presented) The system of claim 27, in which the healthcare data represents medical related information associated with the individuals of the group.

34. (Currently Amended) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group;

sending the request message to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information ~~based on a minimum number of matched tokens~~; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

35. (Previously Presented) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (Canceled).

37. (Currently Amended) The computer readable storage devices of claim 34, in which to produce ~~producing~~ the requested healthcare information, the server encrypts ~~includes encrypting~~ respective data that identifies each individual.

38. (Previously Presented) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (Previously Presented) The computer readable storage devices of claim 34, in which the healthcare data represents medical related information associated with the individuals of the group.

40. (Currently Amended) The computer readable storage devices of claim 34, in which to produce ~~producing~~ the requested healthcare information includes, the server determines ~~determining~~ if the group includes at least a minimum number of individuals.

REMARKS

The Applicant appreciates and would like to thank Examiner Evans Desrosiers for taking time out of his schedule to discuss the subject application on 27 February 2020 with Applicant's representatives, Jeffrey J. Barclay (Reg. No. 48,950). Along with discussing the current action, the pending claims and art references cited in the action were also discussed. Both the Examiner and the Applicant discussed potential amendments that are reflected in the listing of claims above. Additionally, the Examiner kindly indicated that he would call Applicant's representative when the response was filed and considered.

Claims 21-40 are pending in this application, with claims 21, 27, and 34 being independent. Claims 23, 29, and 26 are canceled. Independent claims 21, 27, and 34 along with claims 24, 32, 37, and 40 are presently amended. Support for the claim amendments can be found throughout the application as filed, for example at paragraphs [020], [022], [031], and [034]. No new matter is added.

Rejections Under 35 U.S.C. § 103

Claims 21-40 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over McLaughlin (US 2009/0024416) in view of Pugh (US 2006/0229919). Applicant respectfully traverses this rejection for the reasons listed below.

Amended independent claim 21 is directed to a user computing device-implemented method that includes producing, by a processor of the user computing device, a request message for healthcare information that characterizes a group composed of multiple individuals, the request message including a unique token produced by the user device for each individual included in the group. The method also includes sending the request message to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the healthcare information being produced based on a minimum number of matched tokens and the identity of the individuals being unattainable from the produced healthcare information. The method also

includes receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group.

McLaughlin is understood to describe a system for allowing access to patient information. Each patient has "one or more database records in which his or her medical information is stored…indexed by a unique alphanumeric identifier", where the "identifier can be randomly generated or generated using a hash algorithm such that it does not reveal the patient's identity" (please see paragraph [0044]). McLaughlin's system "scans the patient's finger image, reads and decrypts the corresponding finger image information…and if they match, permits encrypted data to thereafter be transferred between base unit 26 and database system 12" (please see paragraph [0047]). To access the medical information McLaughlin's system requires the patient to provide biometric information, e.g., finger images, voice print, etc. (please also see paragraph [0024]) which is a form of authorizing access.

Although the information is stored in database records in such a way that it does not reveal the patient's identity, for the patient or another party to access the information the patient must authorize the access using his or her biometric data. In fact, this authorization from the patient (i.e., the individual associated with the information) is so integral to McLaughlin's system that McLaughlin describes a situation in which medical personnel would have to take a finger scan from an unconscious patient arriving by ambulance (please see paragraph [0052]). Thus, McLaughlin does not disclose or suggest receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group, as required by independent claim 21. McLaughlin appears to suggest the opposite.

In addition, independent claim 1 is directed to a method that includes producing information that characterizes *a group* of individuals. McLaughlin does not teach such matter. By contrast, McLaughlin teaches producing information for a *single individual* only after authenticating his or her identity by comparing biometric information of the individual (please see paragraph [0024]). Although many patients' medical information may be stored in McLaughlin's database 12, it is provided for only a single patient.

Pugh is understood to describe a system for creating, maintaining and selectively accessing medical histories (please see abstract). In Pugh's system, the patient has sole control

over his or her medical information and the patient must grant permission to a third person such as a medical provider before any information can be accessed and viewed.

Page 8 of the Office Action states that "information that characterizes a group of individuals" has been interpreted as a "patient's medical history." Thus, the claimed producing "healthcare information that characterizes a group composed of individuals" has been equated to producing a single patient's medical history. However, the MPEP states that:

> "[u]der a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification. The plain meaning of a term means the ordinary and customary meaning given to the term by those of ordinary skill in the art at the time of the invention. The ordinary and customary meaning of a term may be evidenced by a variety of sources, including the words of the claims themselves, the specification, drawings, and prior art." See MPEP 2111.01.

One of ordinary skill in the art would not interpret "information that characterizes a group composed of multiple individuals" to be a single person's medical history, as the plain meaning of the word "group" means more than one individual (see, e.g., American Heritage Dictionary, definition of group: 1. An assemblage of persons or objects gathered or located together; 2. A set of two or more figures that make up a unit or design, as in sculpture. 3. A number of individuals or things considered or classed together because of similarities). Further, the specification itself makes clear that the claimed "group" is more than one person. For example, the specification states that "[i]f such a minimum number of matches has not occurred in comparing the request tokens…action may be taken…until the predefined number of matches has been detected (e.g., so as not to increase the probability of one or more individuals being identified)" (please see paragraph [034]). The skilled person would therefore understand that in the context of the claim, the characteristics of the group cannot be equated to a single person's history.

Page 8 of the Office Action points out that Pugh states that his system "can be accessed in the event of an emergency without *further* consent of the patient *as they have authorized such access when they first created their patient file*…" (See Pugh, paragraph [0045]). As both Pugh and the Office Action state, Pugh's system explicitly requires that the patient gives access/authorization/permission when the patient's file is created. Applicant is unaware of any

interpretation that the claimed "absent authorization from the individual in the group" can be interpreted as "authorized when they created their patient file".

Applicant submits that Pugh does not disclose or suggest producing information that characterizes a group of individuals from a set of private data representing characteristics of the individuals absent authorization from the group of individuals, and receiving at a user computing device, the produced healthcare information to report characteristics of a group of individuals absent authorization from the individuals in the group, as required by independent claim 21.

For at least these reasons, independent claim 21 is believed to be patentable over any combination of Pugh and McLaughlin. Additionally, to expedite prosecution, Applicant has amended independent claim 21 to include sending a request to a server to produce healthcare information, the server configured to compare unique request tokens to unique tokens associated with healthcare data to find matching tokens, **the healthcare being produced based on a minimum number of matched tokens** and the identity of the individuals being unattainable from the produced healthcare information. Similarly, amended independent claims 27 and 34 are also believed to be allowable for at least the same reasons noted above. The dependent claims respectively partake of the novelty of their parent independent claims and, as such, have not been addressed specifically herein.

Provisional Double Patenting Rejection

Claims 21-40 are provisionally rejected on grounds of nonstatutory obviousness-type double patenting, over claims 1-22 of US Patent No. 10,109,375 and over claims 1-19 of US Patent No. 9,118,641.

To expedite prosecution, and without conceding the obviousness-type double patenting rejection, a terminal disclaimer to Patent No. 9,118,641 and a terminal disclaimer to US Patent No. 10,109,375 are being filed herewith in compliance with 37 CFR §1.321 to overcome the non-statutory double patenting rejection.

CONCLUSION

Applicant respectfully asserts that the claims under examination are in condition for allowance. Accordingly, Applicant requests the timely issuance of a Notice of Allowance. If a discussion would be helpful, the Examiner is invited to call the undersigned at the telephone number provided below.

Apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: 10 June 2020

/Jeffrey J. Barclay, Reg. No. 48,950/
Jeffrey J. Barclay
Reg. No. 48,950

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23993435.doc

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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 16/131,094	Filing Date 09/14/2018	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ 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	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	06/10/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/BRENDA V HARRISON/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

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.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

26161 7590 03/04/2020
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	

ART UNIT	PAPER NUMBER
2491	

NOTIFICATION DATE	DELIVERY MODE
03/04/2020	ELECTRONIC

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

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

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

PATDOCTC@fr.com

Datavant Exhibit 1002

Applicant-Initiated Interview Summary	**Application No.** 16/131,094	**Applicant(s)** Paris, Andrew L.	
	Examiner EVANS DESROSIERS	**Art Unit** 2491	**AIA (FITF) Status** No

All participants (applicant, applicants representative, PTO personnel):

(1) EVANS DESROSIERS. (3) _____.

(2) Jeffrey Barclay. (4) _____.

Date of Interview: 27 February 2020.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 21.

Identification of prior art discussed: McLaughlin: US 20090024416 A1 in view of Pugh US 20060229919 A1..

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant initiated the interview to discuss cited art. Claim 21 was discussed. Applicant provided the analysis of the independent claims. Further, Applicant argued that the cited reference does not disclose the claimed limitations as presented. Examiner explained how the claims have been interpreted with respect to cited references. Applicant agreed to amend the claims in order to make the record clearer. Finally, Applicant will submit an official amendment. Examiner will conduct a further search and/or consideration in light of the amendment when received..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/EVANS DESROSIERS/ Primary Examiner, Art Unit 2491	

Datavant Exhibit 1002

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Datavant Exhibit 1002

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.
16/131,094	09/14/2018	Andrew L. Paris III	25412-0002003	9792

26161 7590 02/13/2020
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DESROSIERS, EVANS	

ART UNIT	PAPER NUMBER
2491	

NOTIFICATION DATE	DELIVERY MODE
02/13/2020	ELECTRONIC

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

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

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

PATDOCTC@fr.com

Datavant Exhibit 1002

Office Action Summary	Application No. 16/131,094	Applicant(s) Paris, Andrew L.	
	Examiner EVANS DESROSIERS	Art Unit 2491	AIA (FITF) Status No

-- 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 MONTHS 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 09/14/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ 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*

5) ☑ Claim(s) 21-40 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 21-40 is/are rejected.

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

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

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

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

11)☑ The drawing(s) filed on 09/14/2018 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).

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).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

** 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) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Datavant Exhibit 1002

Notice of Pre-AIA or AIA Status

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

Detailed Action

2. This communication is in response to the application filed on 09/14/2018. In which Claims 21-40 are presented for examination.

Drawings

3. The applicant's drawings submitted on 09/14/2018 are acceptable for examination purposes.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ

644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 21-40 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of US patent No. 10109375. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

6. **Claims 21-40** recite similar limitations as claims 1-22 of US patent serial No. 10109375as follows:

Instant application	US patent No. 10109375
Claim 21. A user computing device-implemented method comprising: producing, by a processor of the user computing device, a request for healthcare information that characterizes a group	**Claim 1.** A computer-implemented method comprising: receiving a request message for healthcare information that characterizes a group composed of a number of individuals, wherein the

composed of multiple individuals, the request including a unique token produced by the user device for each individual included in the group; sending the request to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group. .	request message for healthcare information is sent to an encryption server that is configured to determine if the number of individuals in the request is at least a defined minimum number of individuals, and wherein the request message includes a batch number and at least one report option; producing, by a processor of an encryption server, a unique request token from identifying data for each individual included in the group, wherein the request tokens are encrypted before being transmitted over a network; comparing the request tokens to tokens associated with healthcare data that includes de-identified information to find matching tokens; producing the healthcare information with the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and providing the produced healthcare information to report the

	characteristics of the group absent authorization from the individuals in the group.

7. The table above shows that, although the corresponding claims are directed to different statutory categories, the US patent No. 10109375 implemented on a computer would render the claims in the instant application obvious.

It is clearly obvious that the (U.S. patent No. 10109375**)** substantially discloses the subject matter of claim 21 of the instant Application.

The Applicant merely broadens the scope of the instant application by deleting a few elements from the (U.S. patent No. 10109375**).**

This is a provisional obviousness-type double patenting rejection.

The claims 22-40 included in the statement of rejection but not specifically addressed in the body of the rejection have inherited the deficiencies of their parent claim and have not resolved the deficiencies. Therefore, they are rejected based on the same rationale as applied to their parent claims above.

8. **Claims 21-40 are provisionally** rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of US patent No. **9,118,641**. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

Claim Rejections - 35 USC § 103

9. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

> A 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.

10. Claim 21-40 rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over McLaughlin: US 20090024416 A1in view of Pugh US 20060229919 A1.

11. As to claim 21, **McLaughlin** teaches a user computing device-implemented method comprising: producing, by a processor of the user computing device, a request for healthcare information that characterizes a group composed of multiple individuals **(McLaughlin Pa. [0024]) [to access patient records in the database system and information stored in the token]**, the request including a unique token produced by the user device for each individual included in the group **(McLaughlin pa. [0287]) [a plurality of patient tokens, each token associable with an individual patient] [0023] [Each patient is issued an electronic token, which can be card-like, pendant-like or have any other suitably portable shape or structure]**; sending the request to a server to produce the healthcare information **(McLaughlin Pa. [0030-**

0031]) [Healthcare information database system 12 is a server computer system that can include suitable non-volatile storage media…medical information pertaining to patients is stored in database system 12], the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens(McLaughlin pa. [0024]) [At the healthcare professional's site or other place at which the patient receives services, an electronic base unit that can communicate with the database system via a wide-area network such as the Internet verifies the patient's identity by obtaining a biometric from the patient and comparing it to corresponding information stored in the token memory] [0085] [The identification number is compared 806 to a stored number corresponding to the patient, and the patient's identity is authenticated 808 when the comparing results in a match between the identification number and the stored number. Electronic access of remote healthcare records of the patient is controlled 810 in response to the authenticating of the patient, wherein the access of the healthcare records is initiated from the point of treatment], the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens (McLaughlin pa. [0024]) [healthcare professional's site or other place at which the patient receives services, an electronic base unit that can communicate with the database system via a wide-area network such as the Internet verifies the patient's identity by obtaining a biometric from the patient and comparing it to corresponding information stored in the token memory. The biometric is one known to uniquely identify a person and can be] [0044] [The vault is indexed by a unique alphanumeric identifier; no

two patients' vaults have the same identifier. The identifier can be randomly generated or generated using a hash algorithm such that it does not reveal the patient's identity]

It is noted that **McLaughlin** does not appear explicitly disclose receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group.

However, **Pugh** discloses receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group **(Pugh pa. [0044-0045]) [access to the patient's medical history… IMED database(s) may provide patent information to an emergency room that ends up saving the patient's life... IMED can be accessed in the event of an emergency without further "consent"** *(read authorization or permission)* **of the patient as they have authorized such access when they first created their patient file in the IMED system: note, "information that characterizes a group of individuals" has been interpreted as "patient's medical history"]**

McLaughlin and **Pugh** are analogous art because they are from the same field of endeavor; especially they are from the field of securing patients' medical records. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, having the teachings of **McLaughlin** and **Pugh** before him or her to modify and configure the computing environment of **McLaughlin** to an electronic healthcare record storage and retrieval in which security of the patient's records to be controlled as

taught by **Pugh.** Thus, the motivation for doing so would have been to controlling access to sensitive electronic files such as a person's medical history **(Pugh pa. [0002])**

12. **As to claim 22**, **McLaughlin** and **Pugh** teaches wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA) **(McLaughlin pa. [0073]) [capture and printing of a signature on a standardized form such as a Health Insurance Portability and Accountability Act of 1996 (HIPAA)]**

13. **As to claim 23**, **McLaughlin** and **Pugh** teaches wherein receiving the request for healthcare information that characterizes the group of individuals includes receiving personally identifiable information associated with the individuals of the group (**Pugh pa. [0017]) [The patient profile information may include the patient's name, address and telephone numbers, picture, the patient's contact information, insurance information, immunization records, birth certificate, information related to the person]**

14. **As to claim 24**, **McLaughlin** and **Pugh** teaches in which producing the requested healthcare information includes encrypting respective data that identifies each individual **(McLaughlin pa. [00287-0288]) [healthcare information**

entries for the patient…include biometric that to be uniquely identifiable with the patient… Information is stored in the memory of the token of an embodiment in encrypted format]

15. **As to claim 25**, **McLaughlin** and **Pugh** teaches in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted **(McLaughlin pa. [00288]) [tokens in encrypted format]**

16. **As to claim 26**, **McLaughlin** and **Pugh** teaches in which the healthcare data represents medical related information associated with the individuals of the group **(Pugh pa. [0042]) [IMED capabilities may include entering, storing and retrieving the detail medical history of the patient]**

17. **As to claims 27-33**, claims 27-33 recite respectively substantial the same limitations as claims 21-26, therefore, they are rejected under the same rationale.

18. **As to claims 34-39**, claims 34-39 recite respectively substantial the same limitations as claims 21-26, therefore, they are rejected under the same rationale.

19. As to claim 40, **McLaughlin** and **Pugh** teaches in which producing the requested healthcare information includes determining if the group includes at least a minimum number of individuals **(McLaughlin pa. [0222-0223]) [matching server compares the identification number to the stored number and generates a token in response to the match]**

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EVANS DESROSIERS whose telephone number is (571)270-5438. The examiner can normally be reached on Monday -Thursday 7:00 am - 5:30 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ashok B. Patel can be reached on 5712723972. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EVANS DESROSIERS/
Primary Examiner, Art Unit 2491

Notice of References Cited	Application/Control No. 16/131,094	Applicant(s)/Patent Under Reexamination Paris, Andrew L.	
	Examiner EVANS DESROSIERS	Art Unit 2491	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20090024416-A1	01-2009	McLaughlin; Mark R.	G06Q50/22	705/3
*	B	US-20060229919-A1	10-2006	Pugh; Timothy	G06Q50/22	705/3
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

Datavant Exhibit 1002

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	Art Unit
	EVANS DESROSIERS	2491

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

CLAIMS

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

CLAIM		DATE								
Final	Original	02/10/2020								
	1	-								
	2	-								
	3	-								
	4	-								
	5	-								
	6	-								
	7	-								
	8	-								
	9	-								
	10	-								
	11	-								
	12	-								
	13	-								
	14	-								
	15	-								
	16	-								
	17	-								
	18	-								
	19	-								
	20	-								
	21	✓								
	22	✓								
	23	✓								
	24	✓								
	25	✓								
	26	✓								
	27	✓								
	28	✓								
	29	✓								
	30	✓								
	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								
	37	✓								
	38	✓								
	39	✓								
	40	✓								

Datavant Exhibit 1002

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/131,094	Paris, Andrew L.
	Examiner	Art Unit
	EVANS DESROSIERS	2491

CPC - Searched*		
Symbol	Date	Examiner
H04L63/08 H04L63/08 H04L9/08	02/10/2020	ED

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
713	168	02/10/2020	ED

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST	02/10/2020	ED
INVENTORS	02/10/2020	ED
GOOGLE	02/10/2020	ED

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

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. 9792

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
16/131,094	09/14/2018	713	2491	25412-0002003

APPLICANTS
Vigilytics LLC, Victor, NY;

INVENTORS
Andrew L. Paris III, Victor, NY;

**** CONTINUING DATA ***************************
This application is a CON of 14/732,358 06/05/2015 PAT 10109375
which is a CON of 12/827,745 06/30/2010 PAT 9118641
which claims benefit of 61/222,428 07/01/2009

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
10/16/2018

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged /EVANS DESROSIERS/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NY	7	20	3

ADDRESS

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022
UNITED STATES

TITLE

DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

FILING FEE RECEIVED		
785	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

Datavant Exhibit 1002

Sheet 1 of 1

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2855

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2010/0114607	05/06/2010	Kress et al.			
	2.	2017/0316530	11/02/2017	Kress et al.			
	3.	9,141,758	09/22/2015	Kress et al.			
	4.	9,355,273	05/31/2016	Stevens et al.			
	5.	10,109,375	10/23/2018	Paris, III			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
		---	---	---				

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document

Examiner Signature	Date Considered
/EVANS DESROSIERS/	02/10/2020

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	5	("10109375" | "20100114607" | "20170316530" | "9141758" | "9355273").PN.	US-PGPUB; USPAT	OR	OFF	2020/02/10 19:21
L2	35	("20020188869" | "20040143403" | "20050234739" | "20050261941" | "20060004772" | "20060020611" | "20060184524" | "20060229919" | "20070043594" | "20070192140" | "20070219824" | "20080010254" | "20080120296" | "20080133273" | "20080147554" | "20080306872" | "20090024416" | "20090070146" | "20090112769" | "20090287502" | "20100162355" | "20100287190" | "20110184748" | "20110191767" | "20110191822" | "20110225007" | "20110258000" | "20130246334" | "20140053252" | "20150046192" | "7900245" | "9118641" | "9323892" | "9665685" | "9965651").PN.	US-PGPUB; USPAT	OR	OFF	2020/02/10 19:23
L3	43958	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/02/10 19:23
L4	336	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5 (data record history information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/02/10 19:25
L5	3374	(healthcare medica) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2020/02/10 19:25
L6	81231	(H04L63/08 H04L63/08 H04L9/08).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2020/02/10 19:25
L7	16	3 and 5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2020/02/10 19:25

Datavant Exhibit 1002

			IBM_TDB			
L8	2573	3 and 6	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2020/02/10 19:26
L9	2	8 and 5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2020/02/10 19:26
L10	0	4 and 9	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2020/02/10 19:26
S1	3	"11567577"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:15
S2	744	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:18
S3	208	S2 and ((data information) with group with (individual patient person people))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:20
S4	19	S3 and (encrypt$ with (individual patient person people) with (identity ID identification identifier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:22
S5	30884	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:25
S6	0	S3 and S5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:25
S7	0	S4 and S5	US-PGPUB; USPAT;	OR	OFF	2012/05/30 15:25

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S8	2	S2 and S5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:26
S9	1099	(healthcare medica) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:30
S10	10	S5 and S9	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:31
S11	8319	(healthcare medical) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 15:58
S12	278	S11 and (encrypt$5) near5 (individual patient) near5 (information data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 16:18
S13	32	S11 and (encrypt$5) near5 (individual patient) near5 (identity identification ID)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 16:20
S14	62	S11 and (token key) with (group several plurality) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 16:28
S15	55	S14 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 16:29
S16	2	("10825352").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 17:21
S17	69	group$5 near5 (patient individual) with (medical) with (data	US-PGPUB; USPAT;	OR	OFF	2012/05/30 17:56

		information) near5 history	USOCR; FPRS; EPO; JPO; IBM_TDB			
S18	60	S17 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 17:57
S19	2	S18 and (compar$5 match$5) near5 (token key)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/30 17:58
S20	69	group$5 near5 (patient individual) with (medical) with (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:24
S21	60	S20 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:24
S22	38	S21 and (number with (patient individual))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:25
S23	8	S21 and (number near5 (patient individual) with (group set))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:27
S24	5838	(medical record) with (categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:52
S25	180	S24 and (compar$5 or match$5) near5 (token or key)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:53
S26	3325	S25 (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 16:54
S27	6	S25 and (number near5 (patient individual) near5 group)	US-PGPUB; USPAT;	OR	OFF	2012/05/31 16:55

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S28	222	S24 and (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:04
S29	346	S24 and (number near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:04
S30	6	S24 and ((minimum maximum) near5 number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:05
S31	352	S24 and ((number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:07
S32	119	S31 and ("705".clas.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:10
S33	112	S32 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:10
S34	5528	S24 and ((determin$5 comput$5) (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:12
S35	28	S24 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:12
S36	26	S35 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:12
S37	180811	(categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT;	OR	OFF	2012/05/31 17:16

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S38	379	(categoriz$5 group grouping grouped) with (patient individual) same (medical near5 record)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:16
S39	236	(categoriz$5 group grouping grouped) near5 (patient individual) same (medical near5 record)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:17
S40	0	S39 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:17
S41	30	S39 and ((number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:17
S42	28	S41 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:17
S43	109322	"705".clas.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:41
S44	144	S43 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:42
S45	31843	S43 and (minimum number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:42
S46	31843	S43 and (minimum nera5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:42
S47	2	S43 and (minimum near5 number near5 patient near5 group)	US-PGPUB; USPAT;	OR	OFF	2012/05/31 17:43

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S48	97352	S43 and (determin$5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:43
S49	6	S43 and (determin$5 near5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:43
S50	144	S43 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:50
S51	138	S50 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:51
S52	30901	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:59
S53	0	S42 and S52	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 17:59
S54	3	(("7304852") or ("6041347") or ("20040205540")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 18:03
S55	207	(medical near5 record) same (group near5 (patient individual))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 18:06
S56	36	S55 and (number quantity) near5 (patient individual) with group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2012/05/31 18:07
S57	33	S56 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT;	OR	OFF	2012/05/31 18:07

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S58	556	(health near5 care) near5 (record data information) same (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:47
S59	36721	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:48
S60	4	S58 and S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:48
S61	45185	713/168-174,182-186,202.ccls. 709/225,229.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:50
S62	7	S58 and S61	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:51
S63	5	S62 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 10:52
S64	127	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5 (data record history information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:03
S65	65	S64 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:05
S66	65	S64 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:12
S67	61	S66 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT;	OR	OFF	2013/12/06 11:12

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S68	0	S67 and (absent near5 authoriz$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:22
S69	33	S67 and (un$1authoriz$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:23
S70	4	S61 and S67	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/06 11:32
S71	556	(health near5 care) near5 (record data information) same (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:28
S72	467	(produc$5 output) near5 (information data record) same (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:50
S73	1	S71 and S72	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:51
S74	40	(produce producing produced output) near5 (information data record) same (patient individual) near5 un$1authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:54
S75	0	S71 and S74	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:54
S76	35	S74 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:54
S77	0	S71 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT;	OR	OFF	2013/12/12 11:57

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S78	985	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:57
S79	0	S78 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:58
S80	5	(report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 11:58
S81	188	((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:06
S82	10137562	(produc$5 display) ((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:07
S83	2	(produc$5 display) near5 ((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:07
S84	167	S81 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:08
S85	2	(((information data record)) same without near5 (patient individual) near5 authoriz$5).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:08
S86	128	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5 (data record history information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:46
S87	0	S86 and un$1attainab$5	US-PGPUB; USPAT;	OR	OFF	2013/12/12 12:46

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S88	45317	713/168-174,182-186,202.ccls. 709/225,229.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:48
S89	8	S86 and S88	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:48
S90	8	S89 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 12:49
S91	4	(("2007033405") or ("2003123668") or ("2001046291")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 15:31
S92	3	(("20070033405") or ("20030123668") or ("20010046291")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2013/12/12 15:31
S93	4	US-20040143403-$.DID. OR US-20060020611-$.DID. OR US-20080133273-$.DID. OR US-20090287502-$.DID.	US-PGPUB; USPAT	OR	OFF	2014/05/02 10:47
S94	2	("20030037054").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 13:40
S95	1	("6988075").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 14:30
S96	3	(("20110225007") or ("20090070146")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:01
S97	5248	(Extending adj the adj Health adj Insurance adj Portability adj Accountability adj Act) (HIPAA)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2014/08/22 15:05

			EPO; JPO; IBM_TDB			
S98	209	(((information data record)) same without near5 (patient individual) near5 authoriz$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:06
S99	209	(((information data record)) same without near5 (patient individual) near5 (authoriz$5 permision))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:07
S100	264	(((information data record)) same without near5 (patient individual group) near5 (authoriz$5 permision))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:07
S101	52	S97 and S100	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:07
S102	43	S101 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:08
S103	2934	705/1,5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:37
S104	19817	705/1,2,3,4,5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:37
S105	3	(Internet adj medical adj information adj system (IMED)) same (access$5 near5 (patient individual group) near5 medical near5 (information data record))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:39
S106	1594	S104 and (access$5 near5 (patient individual group) near5 medical near5 (information data record))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:41
S107	7891	S104 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same without (permision authoriz$5))	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2014/08/22 15:43

Datavant Exhibit 1002

			EPO; JPO; IBM_TDB			
S108	7	S104 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same without near5 (permision authoriz$5))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:43
S109	6	S108 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:43
S110	146	S104 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same emergency)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:45
S111	123	S110 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:45
S112	32	S97 and S111	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 15:48
S113	2	S112 and (without near5 (patient individual) near5 (authoriz$5 permision))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2014/08/22 16:07
S118	3	US-20060004772-$.DID. OR US-20080147554-$.DID. OR US-20110184748-$.DID.	US-PGPUB; USPAT	OR	OFF	2015/04/18 08:27
S119	3	US-20060004772-$.DID. OR US-20080147554-$.DID. OR US-20110184748-$.DID.	US-PGPUB; USPAT	OR	OFF	2015/04/18 08:49
S120	2	US-20090070146-$.DID. OR US-20110225007-$.DID.	US-PGPUB; USPAT	OR	OFF	2015/04/18 09:27
S121	6	"11567577"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S122	1322	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S123	347	S122 and ((data information) with group with (individual patient person	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

Datavant Exhibit 1002

		people))	USOCR; FPRS; EPO; JPO; IBM_TDB			
S124	27	S123 and (encrypt$ with (individual patient person people) with (identity ID identification identifier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S125	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S126	0	S123 and S125	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S127	0	S124 and S125	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S128	2	S122 and S125	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S129	1861	(healthcare medica) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S130	14	S125 and S129	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S131	13377	(healthcare medical) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S132	455	S131 and (encrypt$5) near5 (individual patient) near5 (information data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S133	64	S131 and (encrypt$5) near5 (individual patient) near5 (identity	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

		identification ID)	USOCR; FPRS; EPO; JPO; IBM_TDB			
S134	97	S131 and (token key) with (group several plurality) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S135	72	S134 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S136	2	("10825352").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S137	99	group$5 near5 (patient individual) with (medical) with (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S138	70	S137 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S139	2	S138 and (compar$5 match$5) near5 (token key)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S140	99	group$5 near5 (patient individual) with (medical) with (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S141	70	S140 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S144	8730	(medical record) with (categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S145	268	S144 and (compar$5 or match$5) near5 (token or key)	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S146	4439	S145 (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S148	308	S144 and (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S149	502	S144 and (number near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S151	512	S144 and ((number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S152	199	S151 and ("705".clas.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S154	8127	S144 and ((determin$5 comput$5) (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S155	39	S144 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S157	260216	(categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S158	626	(categoriz$5 group grouping grouped) with (patient individual) same (medical near5 record)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S159	377	(categoriz$5 group grouping grouped) near5 (patient individual)	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

		same (medical near5 record)	USOCR; FPRS; EPO; JPO; IBM_TDB			
S160	0	S159 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S161	38	S159 and ((number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S163	162742	"705".clas.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S164	209	S163 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S165	47956	S163 and (minimum number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S166	47956	S163 and (minimum nera5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S168	147536	S163 and (determin$5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S170	209	S163 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S172	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S173	0	S162 and S172	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S175	326	(medical near5 record) same (group near5 (patient individual))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S176	52	S175 and (number quantity) near5 (patient individual) with group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S178	725	(health near5 care) near5 (record data information) same (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S179	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S181	55246	713/168-174,182-186,202.ccls. 709/225,229.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S184	170	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5 (data record history information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S185	78	S184 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S186	78	S184 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S188	0	S187 and (absent near5 authoriz$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S191	725	(health near5 care) near5 (record data information) same (group multi	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

		plurality several) near5 (patient individual)	USOCR; FPRS; EPO; JPO; IBM_TDB			
S192	586	(produc$5 output) near5 (information data record) same (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S194	47	(produce producing produced output) near5 (information data record) same (patient individual) near5 un$1authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S195	0	S191 and S194	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S197	0	S191 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S198	1322	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S199	0	S198 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S201	229	((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S202	17144346	(produc$5 display) ((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S204	181	S201 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S206	170	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

		(data record history information))	USOCR; FPRS; EPO; JPO; IBM_TDB			
S207	0	S206 and un$1attainab$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S208	55246	713/168-174,182-186,202.ccls. 709/225,229.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S209	10	S206 and S208	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S217	5888	(Extending adj the adj Health adj Insurance adj Portability adj Accountability adj Act) (HIPAA)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S218	229	(((information data record)) same without near5 (patient individual) near5 authoriz$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S219	229	(((information data record)) same without near5 (patient individual) near5 (authoriz$5 permision))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S220	301	(((information data record)) same without near5 (patient individual group) near5 (authoriz$5 permision))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S221	56	S217 and S220	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S223	3151	705/1,5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S224	21400	705/1,2,3,4,5.ccls.	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:42

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S226	1722	S224 and (access$5 near5 (patient individual group) near5 medical near5 (information data record))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S227	8495	S224 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same without (permision authoriz$5))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S228	8	S224 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same without near5 (permision authoriz$5))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S230	156	S224 and (access$5 near5 (patient individual group) near5 medical near5 (information data record) same emergency)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:42
S238	1322	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S239	347	S122 and ((data information) with group with (individual patient person people))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S240	27	S123 and (encrypt$ with (individual patient person people) with (identity ID identification identifier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S241	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S242	0	S123 and S125	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S243	0	S124 and S125	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:44

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S245	1861	(healthcare medica) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S247	13377	(healthcare medical) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S248	455	S131 and (encrypt$5) near5 (individual patient) near5 (information data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S250	97	S131 and (token key) with (group several plurality) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S253	99	group$5 near5 (patient individual) with (medical) with (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S254	70	S137 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S256	99	group$5 near5 (patient individual) with (medical) with (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S257	70	S140 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S260	8730	(medical record) with (categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S261	268	S144 and (compar$5 or match$5) near5 (token or key)	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:44

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S262	4439	S145 (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S264	308	S144 and (number near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S265	502	S144 and (number near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S267	512	S144 and ((number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S268	199	S151 and ("705".clas.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S270	8127	S144 and ((determin$5 comput$5) (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S271	39	S144 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) with group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S273	260216	(categoriz$5 group grouping grouped) with (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S274	626	(categoriz$5 group grouping grouped) with (patient individual) same (medical near5 record)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S275	377	(categoriz$5 group grouping grouped) near5 (patient individual)	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:44

		same (medical near5 record)	USOCR; FPRS; EPO; JPO; IBM_TDB			
S276	0	S159 and ((determin$5 comput$5) near5 (number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S277	38	S159 and ((number quantity) near5 (patient individual) near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S279	162742	"705".clas.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S280	209	S163 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S281	47956	S163 and (minimum number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S282	47956	S163 and (minimum nera5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S284	147536	S163 and (determin$5 number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S286	209	S163 and (number near5 patient near5 group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S288	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S289	0	S162 and S172	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:44

			USOCR; FPRS; EPO; JPO; IBM_TDB			
S291	326	(medical near5 record) same (group near5 (patient individual))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S292	52	S175 and (number quantity) near5 (patient individual) with group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S294	725	(health near5 care) near5 (record data information) same (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S295	42268	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S297	55246	713/168-174,182-186,202.ccls. 709/225,229.ccls. 726/2-8.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S300	170	(de$5identif$5 un$1identif$5) near5 (((health near5 care) medical) near5 (data record history information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S301	78	S184 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S302	78	S184 and (group multi plurality several) near5 (patient individual)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S304	0	S187 and (absent near5 authoriz$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S307	725	(health near5 care) near5 (record data information) same (group multi	US-PGPUB; USPAT;	OR	OFF	2015/04/19 14:44

		plurality several) near5 (patient individual)	USOCR; FPRS; EPO; JPO; IBM_TDB			
S308	586	(produc$5 output) near5 (information data record) same (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S310	47	(produce producing produced output) near5 (information data record) same (patient individual) near5 un$1authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S311	0	S191 and S194	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S313	0	S191 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S314	1322	(healthcare medica) with (data information) with history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S315	0	S198 and (report) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S317	229	((information data record)) same without near5 (patient individual) near5 authoriz$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 14:44
S322	4	(("20070083744") or ("20070217614") or ("20040193873")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/04/19 15:31
S325	20	US-20040143403-$.DID. OR US-20050234739-$.DID. OR US-20050261941-$.DID. OR US-20060004772-$.DID. OR US-20060020611-$.DID. OR US-20060184524-$.DID. OR US-20060229919-$.DID. OR US-20070043594-$.DID. OR US-20070219824-$.DID. OR US-	US-PGPUB; USPAT	OR	OFF	2015/10/30 08:10

		20080010254-$.DID. OR US-20080120296-$.DID. OR US-20080133273-$.DID. OR US-20080147554-$.DID. OR US-20090024416-$.DID. OR US-20090070146-$.DID. OR US-20090287502-$.DID. OR US-20100162355-$.DID. OR US-20110184748-$.DID. OR US-20110225007-$.DID. OR US-20110258000-$.DID.				
S326	3	("9118641").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:18
S327	369	(health$1care near5 (information data)) with ((group multiple several) near5 (individual patient))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:48
S328	21	(health$1care near5 (information data)) with ((group multiple several) near5 (token identifier) near5 (individual patient))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:50
S329	17	S328 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:50
S330	49	((health$1care near5 (information data)) with ((group multiple several) near5 (individual patient))).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:59
S331	39	S330 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 08:59
S332	6	(request$2 near5 health$1care near5 (information data)) with ((group multiple several) near5 (individual patient))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:40
S333	3	S332 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:40
S334	35	(request$2 near5 health$1care near5 (information data)) with ((group	US-PGPUB; USPAT;	OR	OFF	2015/10/30 15:41

		multiple several))	USOCR; FPRS; EPO; JPO; IBM_TDB			
S335	20	S334 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:41
S336	1	("20020128871").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:45
S337	22	(request$2 near5 health$1care near5 (information data)) same ((group multiple several) near5 (individual patient))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:47
S338	7	S337 and (@pd or @ptad or @prad or @ad or @rlad)<"20090701"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:47
S339	0	(health$1care near5 (information data)) same ((group multiple several) near5 (individual patient)) same (de$1identif$3 near5 information with token)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:58
S340	0	(health$1care near5 (information data)) same ((group multiple several) near5 (individual patient)) and (de$1identif$3 near5 information with token)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:59
S341	3	(de$1identif$3 near5 information same token)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2015/10/30 15:59
S342	7	("20090112769" | "20100287190" | "20110191767" | "20110191822" | "20130246334" | "20140053252" | "20150046192").PN.	US-PGPUB; USPAT	OR	OFF	2017/07/11 16:15
S343	20	("20040143403" | "20050234739" | "20050261941" | "20060004772" | "20060020611" | "20060184524" | "20060229919" | "20070043594" | "20070219824" | "20080010254" | "20080120296" | "20080133273" | "20080147554" | "20090024416" | "20090070146" | "20090287502" | "20100162355" | "20110184748" | "20110225007" | "20110258000").PN.	US-PGPUB; USPAT	OR	OFF	2017/07/11 16:15

S344	2	("20150295895").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/13 09:50
S345	10	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 remote near5 access)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 10:55
S346	238	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 access)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 10:57
S347	0	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 access) same ((relay near5 system) with censor$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 10:59
S348	0	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 access) and ((relay near5 system) with censor$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 10:59
S349	0	((virtual adj private adj network) VPN) same ((relay near5 system) with censor$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 10:59
S350	0	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 access) and ((relay) with censor$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:00
S351	0	((virtual adj private adj network) VPN) same ((convert$5 modif$5) near5 access) and ((relay) near5 censor$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:00
S352	140	((virtual adj private adj network) VPN) and ((convert$5 modif$5) near5 remote near5 access)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:00
S353	0	S352 and censor$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:01
S354	3	(((virtual adj private adj network) VPN) and ((convert$5 modif$5)	US-PGPUB; USPAT;	OR	OFF	2017/07/13 11:01

Datavant Exhibit 1002

		near5 remote near5 access)).ab.	USOCR; FPRS; EPO; JPO; IBM_TDB			
S355	140	(((virtual adj private adj network) VPN) and ((convert$5 modif$5) near5 remote near5 access))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:02
S356	2	(((virtual adj private adj network) VPN) and ((convert$5 modif$5) near5 remote near5 access)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:02
S357	0	(((virtual adj private adj network) VPN) and ((convert$5) near5 remote near5 access)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:04
S358	2	("20120066670").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 11:11
S359	2	(("20150207633") or ("20140289325")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 14:33
S360	2	("20170149747").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/13 14:37
S361	2	(comput$5 calcul$5 determin$5) near5 (symmetric adj key) same (original near5 (name identi$5)) same nonce	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 14:42
S362	7	(comput$5 calcul$5 determin$5) near5 (key) same (original near5 (name identi$5)) same nonce	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/13 14:43
S363	4	(("20150040229") or ("20110107153")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/15 13:43
S364	1	("8276202").PN.	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2017/07/15 14:18

			EPO; JPO; IBM_TDB			
S365	2	("20170093586").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2017/07/15 14:29
S366	4	(("5099715") or ("5662188")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/16 16:35
S367	10	("9602277").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/16 19:00
S368	3	(("20100020972") or ("20090307142")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/07/16 19:02
S369	1	("9237146").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/11/09 16:45
S370	5	("20020188869" | "20070192140" | "20080306872" | "7900245" | "9665685").PN.	US-PGPUB; USPAT	OR	OFF	2017/11/10 06:12
S371	43926	380/28-30,255-283.ccls. 713/150-154,160-167,189-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/11/10 06:14
S372	4544	(encrypt$ with (individual patient person people) with (identity ID identification identifier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/11/10 06:14
S373	2582	(healthcare medica) same (data information) near5 history	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/11/10 06:15
S374	3	S371 and S372 and S373	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2017/11/10 06:15
S375	2	S374 and (@pd or @ptad or @prad or @ad or @rlad)< "20090701"	US-PGPUB; USPAT; USOCR;	OR	OFF	2017/11/10 06:15

			FPRS; EPO; JPO; IBM_TDB			

2/ 10/ 2020 7:26:35 PM
C:\ Users\ edesrosiers\ Documents\ EAST\ Workspaces\ 16131094N.wsp

Substitute Disclosure Form (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
		Filing Date	Group Art Unit

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2002/0188869	12/2002	Patrick			
	2.	2004/0143403	07/2004	Brandon et al.			
	3.	2005/0234739	10/2005	Schoenberg			
	4.	2005/0261941	11/2005	Scarlat			
	5.	2006/0004772	01/2006	Hagan et al.			
	6.	2006/0020611	01/2006	Gilbert et al.			
	7.	2006/0184524	08/2006	Pollanz			
	8.	2006/0229919	10/2006	Pugh			
	9.	2007/0043594	02/2007	Lavergne			
	10.	2007/0192140	08/2007	Gropper			
	11.	2007/0219824	09/2007	Rawlings et al.			
	12.	2008/0010254	01/2008	Settimi			
	13.	2008/0120296	05/2008	Kariathungal et al.			
	14.	2008/0133273	06/2008	Marshall			
	15.	2008/0147554	06/2008	Stevens et al.			
	16.	2008/0306872	12/2008	Felsher			
	17.	2009/0024416	01/2009	McLaughlin et al.			
	18.	2009/0070146	03/12/2009	Haider et al.			
	19.	2009/0112769	04/2009	Dicks			
	20.	2009/0287502	11/2009	Roberts et al.			
	21.	2010/0162355	06/2010	Zimmerman et al.			
	22.	2010/0287190	11/2010	Anderson			
	23.	2011/0184748	07/2011	Fierro et al.			
	24.	2011/0191767	08/2011	Pinsky			
	25.	2011/0191822	08/2011	Pinsky			
	26.	2011/0225007	09/15/2011	Theis			

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.L./

Datavant Exhibit 1002

Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b))	Attorney Docket No. 25412-0002003	Application No.
	Applicant Vigilytics LLC	
	Filing Date	Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	27.	2011/0258000	10/2011	Green et al.			
	28.	2013/0246334	09/2013	Ahuja			
	29.	2014/0053252	02/2014	Kelsey			
	30.	2015/0046192	02/2015	Raduchel			
	31.	7,900,245	03/2011	Geddes			
	32.	9,118,641	08/25/2015	Paris, III			
	33.	9,323,892	04/26/2016	Paris, III			
	34.	9,665,685	05/30/2017	Paris, III			
	35.	9,965,651	05/08/2018	Paris, III			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
		---	---	---				

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	36.	"Group," The American Heritage Dictionary, 2014 Houghton Mifflin Harcourt, Retrieved online: https://ahdictionary.com/word/search.html?q=group (accessed 10/23/2014), 3 pages.
	37.	"Health Information Privacy: Business Associates," U.S. Department of Health and Human Services, April 3, 2003, Retrieved online: http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/businessassociates.html, (accessed 10/09/2014), 2 pages.

Examiner Signature	Date Considered
/EVANS DESROSIERS/	02/10/2020

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.D./

Datavant Exhibit 1002

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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 16/131,094	Filing Date 09/14/2018	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ 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	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	01/24/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LDRC
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/EVA V GILLIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

Datavant Exhibit 1002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2855
Serial No.	:	16/131,094	Examiner	:	Unknown
Filed	:	September 14, 2018	Conf. No.	:	9792
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as indicated on the following pages.

Amendments to the Claims:

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

Listing of Claims:

1 – 20. (Canceled)

21. (New) A user computing device-implemented method comprising:

producing, by a processor of the user computing device, a request for healthcare information that characterizes a group composed of multiple individuals, the request including a unique token produced by the user device for each individual included in the group;

sending the request to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group.

22. (New) The user computing device implemented method of claim 1, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

23. (New) The user computing device implemented method of claim 1, wherein receiving the request for healthcare information that characterizes the group of individuals includes receiving personally identifiable information associated with the individuals of the group.

24. (New) The user computing device implemented method of claim 1, in which producing the requested healthcare information includes encrypting respective data that identifies each individual.

25. (New) The user computing device implemented method of claim 1, in which the unique tokens associated with healthcare data and the unique request tokens are similarly encrypted.

26. (New) The user computing device implemented method of claim 1, in which the healthcare data represents medical related information associated with the individuals of the group.

27. (New) A system comprising:

a user computing device that produces a request for healthcare information that characterizes a group composed of multiple individuals, the request including a unique token produced by the user device for each individual included in the group, wherein the user computing device is configured to send the request to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens, wherein the user computing device is further configured to receive the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group.

28. (New) The system of claim 27, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

29. (New) The system of claim 27, wherein the request for healthcare information that characterizes a group of individuals includes personally identifiable information associated with the individuals of the group.

30. (New) The system of claim 27, in which the data that identifies each individual is encrypted.

31. (New) The system of claim 27, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

32. (New) The system of claim 27, in which the data server provides the requested healthcare information if the group includes at least a minimum number of individuals.

33. (New) The system of claim 27, in which the healthcare data represents medical related information associated with the individuals of the group.

34. (New) One or more computer readable storage devices storing instructions that are executable by one or more processors, and upon such execution cause the one or more processors to perform operations comprising:

producing, at a user computing device, a request for healthcare information that characterizes a group composed of multiple individuals, the request including a unique token produced by the user device for each individual included in the group;

sending the request to a server to produce the healthcare information, the server configured to compare the unique request tokens to unique tokens associated with healthcare data to find matching tokens, the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and

receiving, at the user computing device, the produced healthcare information to report the characteristics of the group absent authorization from the individual in the group.

35. (New) The computer readable storage devices of claim 34, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

36. (New) The computer readable storage devices of claim 34, wherein receiving the request for healthcare information that characterizes the group of individuals includes receiving personally identifiable information associated with the individuals of the group.

37. (New) The computer readable storage devices of claim 34, in which producing the requested healthcare information includes encrypting respective data that identifies each individual.

38. (New) The computer readable storage devices of claim 34, in which the unique tokens associated with the healthcare data and the unique request tokens are similarly encrypted.

39. (New) The computer readable storage devices of claim 34, in which the healthcare data represents medical related information associated with the individuals of the group.

40. (New) The computer readable storage devices of claim 34, in which producing the requested healthcare information includes determining if the group includes at least a minimum number of individuals.

REMARKS

Applicant asks that all claims be examined in view of the amendment to the claims. No new matter has been added.

Apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: January 24, 2020

/Christopher Reilly/
Christopher L. Reilly
Reg. No. 74,063

Customer Number 26161
Fish & Richardson P.C.
Telephone: +1 (617) 956-5911
Facsimile: (877) 769-7945

23981634.docx

Electronic Acknowledgement Receipt

EFS ID:	38390813
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Christopher Leo Reilly/Cathy O'Brien
Filer Authorized By:	Christopher Leo Reilly
Attorney Docket Number:	25412-0002003
Receipt Date:	24-JAN-2020
Filing Date:	14-SEP-2018
Time Stamp:	13:13:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		PreliminaryAmendment.pdf	79001 c952d79c0199760ea74f834654b1c5d3ef1449a3	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	6
Warnings:			
Information:			
	Total Files Size (in bytes):	79001	

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.

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No. 16/131,094
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date September 14, 2018	Group Art Unit 2855

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2010/0114607	05/06/2010	Kress et al.			
	2.	2017/0316530	11/02/2017	Kress et al.			
	3.	9,141,758	09/22/2015	Kress et al.			
	4.	9,355,273	05/31/2016	Stevens et al.			
	5.	10,109,375	10/23/2018	Paris, III			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
		---	---	---				

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Datavant Exhibit 1002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III	Art Unit	:	2855
Serial No.	:	16/131,094	Examiner	:	Unknown
Filed	:	September 14, 2018	Conf. No.	:	9792
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING			

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

INFORMATION DISCLOSURE STATEMENT

Please consider the documents listed on the disclosure form submitted with this statement. Copies of the documents are being submitted with this statement to the extent required under 37 C.F.R. § 1.98(a)(2).

This statement is being filed before the receipt of a first action on the merits. Apply any necessary charges or credits applicable under 37 C.F.R. § 1.17(p) to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this statement.

Respectfully submitted,

Date: 11/14/18

/Natalie K Galley/
Natalie K. Galley, Ph.D.
Reg. No. 77,020

Customer Number 26161
Fish & Richardson P.C.
Telephone: +1 (617) 956-5911
Facsimile: (877) 769-7945

23833160.doc

Electronic Acknowledgement Receipt

EFS ID:	34303321
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris
Customer Number:	26161
Filer:	Natalie K. Galley/Cathy O'Brien
Filer Authorized By:	Natalie K. Galley
Attorney Docket Number:	25412-0002003
Receipt Date:	14-NOV-2018
Filing Date:	14-SEP-2018
Time Stamp:	09:51:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		25412-0002003_IDS.pdf	135821 988f1a066e2bd607cf1539fb56cffcb516dca767	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	2	2
	Transmittal Letter	1	1
Warnings:			
Information:			
	Total Files Size (in bytes):	135821	

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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/131,094	09/14/2018	2855	785	25412-0002003	20	3

CONFIRMATION NO. 9792

26161
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

FILING RECEIPT



Date Mailed: 10/17/2018

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

Inventor(s)

Andrew L. Paris III, Victor, NY;

Applicant(s)

Vigilytics LLC, Victor, NY;

Power of Attorney: The patent practitioners associated with Customer Number 26161

Domestic Priority data as claimed by applicant

This application is a CON of 14/732,358 06/05/2015 PAT 10109375
which is a CON of 12/827,745 06/30/2010 PAT 9118641
which claims benefit of 61/222,428 07/01/2009

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/16/2018

Datavant Exhibit 1002

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/131,094**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No
**** SMALL ENTITY ****
Title

DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

Preliminary Class

073

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

Datavant Exhibit 1002

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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Datavant Exhibit 1002

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/131,094

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	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

		(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($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	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 found in the appropriate box in column 1.

Datavant Exhibit 1002

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date	Group Art Unit

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2002/0188869	12/2002	Patrick			
	2.	2004/0143403	07/2004	Brandon et al.			
	3.	2005/0234739	10/2005	Schoenberg			
	4.	2005/0261941	11/2005	Scarlat			
	5.	2006/0004772	01/2006	Hagan et al.			
	6.	2006/0020611	01/2006	Gilbert et al.			
	7.	2006/0184524	08/2006	Pollanz			
	8.	2006/0229919	10/2006	Pugh			
	9.	2007/0043594	02/2007	Lavergne			
	10.	2007/0192140	08/2007	Gropper			
	11.	2007/0219824	09/2007	Rawlings et al.			
	12.	2008/0010254	01/2008	Settimi			
	13.	2008/0120296	05/2008	Kariathungal et al.			
	14.	2008/0133273	06/2008	Marshall			
	15.	2008/0147554	06/2008	Stevens et al.			
	16.	2008/0306872	12/2008	Felsher			
	17.	2009/0024416	01/2009	McLaughlin et al.			
	18.	2009/0070146	03/12/2009	Haider et al.			
	19.	2009/0112769	04/2009	Dicks			
	20.	2009/0287502	11/2009	Roberts et al.			
	21.	2010/0162355	06/2010	Zimmerman et al.			
	22.	2010/0287190	11/2010	Anderson			
	23.	2011/0184748	07/2011	Fierro et al.			
	24.	2011/0191767	08/2011	Pinsky			
	25.	2011/0191822	08/2011	Pinsky			
	26.	2011/0225007	09/15/2011	Theis			

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25412-0002003	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Vigilytics LLC	
(37 CFR §1.98(b))		Filing Date	Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	27.	2011/0258000	10/2011	Green et al.			
	28.	2013/0246334	09/2013	Ahuja			
	29.	2014/0053252	02/2014	Kelsey			
	30.	2015/0046192	02/2015	Raduchel			
	31.	7,900,245	03/2011	Geddes			
	32.	9,118,641	08/25/2015	Paris, III			
	33.	9,323,892	04/26/2016	Paris, III			
	34.	9,665,685	05/30/2017	Paris, III			
	35.	9,965,651	05/08/2018	Paris, III			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
		---	---	---				

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	36.	"Group," The American Heritage Dictionary, 2014 Houghton Mifflin Harcourt, Retrieved online: https://ahdictionary.com/word/search.html?q=group (accessed 10/23/2014), 3 pages.
	37.	"Health Information Privacy: Business Associates," U.S. Department of Health and Human Services, April 3, 2003, Retrieved online: http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/businessassociates.html, (accessed 10/09/2014), 2 pages.

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

Application Number	
Filing Date	
First Named Inventor	Andrew L. Paris III
Title	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
Art Unit	
Examiner Name	
Attorney Docket Number	25412-0002003

SIGNATURE of Applicant or Patent Practitioner

Signature	/Natalie K Galley/	Date (Optional)	9/14/18
Name	Natalie K. Galley, Ph.D.	Registration Number	77,020
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.

23805832.doc

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

(Note: The boxes above may be left blank if information is provided on the Transmittal.)

☒ 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, which may be an application filed after the date of this power of attorney, or identified above:

26161

OR

☐ I hereby appoint Practitioner(s) named in the attached list 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, which may be an application filed after the date of this power of attorney, or identified above.

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

☐ The address associated with the above-mentioned Customer Number

OR

☒ The address associated with Customer Number: **26161**

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):

Vigilytics 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	Andrew L Paris III	Date (Optional)	
Name	Andrew L. Paris, III		
Title	President		

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 1 forms are submitted.

23770783.doc

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Andrew	L.	Paris	III

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Victor	State/Province	NY	Country of Residence	US

Mailing Address of Inventor:

Address 1	559 Fox Hunt Drive
Address 2	

City	Victor	State/Province	NY
Postal Code	14564	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	26161		
Email Address	apsi@fr.com	Add Email	Remove Email

Application Information:

Title of the Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING		
Attorney Docket Number	25412-0002003	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Datavant Exhibit 1002

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

Filing By Reference:

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

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

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

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

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

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	26161		

Domestic Benefit/National Stage Information:

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14732358	2015-06-05

Datavant Exhibit 1002

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

Prior Application Status	Patented	Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14732358	Continuation of	12827745	2010-06-30	9118641	2015-08-25

Prior Application Status	Expired	Remove

Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12827745	Claims benefit of provisional	61222428	2009-07-01

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

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

Remove

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

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

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

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

Datavant Exhibit 1002

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

Applicant Information:

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

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Vigilytics LLC		
Mailing Address Information For Applicant:			
Address 1	659 Fox Hunt Drive		
Address 2			
City	Victor	**State/Province**	NY
Country	US	Postal Code	14564
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

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

Datavant Exhibit 1002

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

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

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

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

Signature	/Natalie K Galley/			Date (YYYY-MM-DD)	2018-09-14
First Name	Natalie K.	Last Name	Galley	Registration Number	77020

Additional Signature may be generated within this form by selecting the Add button. Add

Datavant Exhibit 1002

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	25412-0002003
	Application Number	
Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING	

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

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 CooperationTreaty.

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.

Datavant Exhibit 1002

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris III
Filer:	Natalie K. Galley/Cathy O'Brien
Attorney Docket Number:	25412-0002003

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Datavant Exhibit 1002

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**785**

Electronic Acknowledgement Receipt

EFS ID:	33714359
Application Number:	16131094
International Application Number:	
Confirmation Number:	9792
Title of Invention:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING
First Named Inventor/Applicant Name:	Andrew L. Paris III
Customer Number:	26161
Filer:	Natalie K. Galley/Lisa Peterson
Filer Authorized By:	Natalie K. Galley
Attorney Docket Number:	25412-0002003
Receipt Date:	14-SEP-2018
Filing Date:	
Time Stamp:	09:03:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$785
RAM confirmation Number	091418INTEFSW00007656061050
Deposit Account	
Authorized User	

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

Datavant Exhibit 1002

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	Transmittal.pdf	112215 bfc918d285240f332d712a380dbb76596de589fe	no	2
Warnings:					
Information:					
2		Application.pdf	172090 61ef5f76648aaf7aa4017d2dd1aab486f1417b4e	yes	20

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	16
Claims	17	19
Abstract	20	20

Warnings:					
Information:					
3	Drawings-only black and white line drawings	Drawings.pdf	845459 e8fe81dfc376c8d583a07bf4e56296a9a90e8c97	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	Declaration.pdf	113780 b12bc15cf6be191cc60b3565897f9cc0c8749984	no	1
Warnings:					
Information:					
5		IDS.pdf	144008 648fcf2af7f733ecfebde0670cc9b32ab17de2cc	yes	3

Datavant Exhibit 1002

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	3	
Warnings:					
Information:					
6	Non Patent Literature	HealthInfo.pdf	88594 952104cd7fcff78c50b9c0993937f47290770eda	no	2
Warnings:					
Information:					
7	Non Patent Literature	Group.pdf	439009 4a0cbb4fc083f4883f5fb894ad9629f79378d7b5	no	3
Warnings:					
Information:					
8	Power of Attorney	POA.pdf	152832 6e7d39ba178479c46a58538e70fa178594766c5b	no	2
Warnings:					
Information:					
9	Application Data Sheet	ADS.pdf	1822799 ac70800e872059d58cb7ad81f8ce105b794cedfb	no	8
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	34989 963b4e8ce18a8176bcc079f21b83bcdb50334fb5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3925775		

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.

FISH.
FISH & RICHARDSON

Street Address
Fish & Richardson P.C.
One Marina Park Drive
Boston, MA 02210-1878

Mail Address
P.O. Box 1022
Minneapolis, MN 55440-1022

617 542 5070 main
877 769 7945 fax

September 14, 2018

Attorney Docket No.: 25412-0002003

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

Inventor: ANDREW L. PARIS III

Title: DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

This application is a continuation application and claim priority under 35 USC §120 to U.S. Application Serial No. 14/732,358, filed on June 5, 2015, which is a continuation application of U.S. Application Serial No. 12/827,745, filed on June 30, 2010, which claims benefit to U.S. Provisional Application Serial No. 61/222,428, filed on July 1, 2009.

Enclosed are the following papers, including those required to receive a filing date under 37 CFR 1.53(b):

	Pages
Specification	16
Claims	3
Abstract	1
Declaration	1
Drawings	7

Enclosures:

— Application Data Sheet, 8 pages.
— Information disclosure statement, 1 page.
PTO-1449, 2 pages.
References, 37 items.
— Power of Attorney, 2 pages.

The applicant claims small entity status under 37 CFR 1.27.

Basic Filing Fee	$75
Search Fee	$330
Examination Fee	$380

Total Claims 20	0 over 20	**0 x $50**	$0
Independent Claims 3	0 over 3	**0 x $230**	$0
Fee for Multiple Dependent claims			$0
Application size fee for each 50 pages over 100 Total Sheets: 26x .75 - 100/50 = 0x			$0
Total Filing fee			$785

The total filing fee is being paid concurrently on the Electronic Filing System by deposit account authorization. Apply any other required fees or any credits to Deposit Account No. 06-1050, referencing the attorney docket number shown above.

I hereby authorize the USPTO to communicate in response to email communications from the undersigned and practitioners under Customer No. 26161 in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via email. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03).

If this application is considered to be incomplete, or if a telephone conference would otherwise be helpful, call the undersigned at +1 (617) 956-5911.

Send all correspondence to:

26161
Customer Number

Respectfully submitted,

/Natalie K Galley/

Natalie K. Galley, Ph.D.

Registration No. 77,020
Enclosures
NKG/cao
23805844.doc

De-identifying Medical History Information for Medical Underwriting

CLAIM OF PRIORITY

[001] This application is a continuation application and claim priority under 35 USC §120 to U.S. Application Serial No. 14/732,358, filed on June 5, 2015, which is a continuation application of U.S. Application Serial No. 12/827,745, filed on June 30, 2010, which claims benefit to U.S. Provisional Application Serial No. 61/222,428, filed on July 1, 2009, the entire contents of which are incorporated herein by reference.

BACKGROUND

[002] The present disclosure relates to processing and transmitting personal data, the dissemination of which is restricted by federal law.

[003] Due to federal privacy laws, companies that offer health insurance to small and midsize groups (containing 10 – 1000 individuals) are often unable to obtain the health history data they need to estimate the risk of insuring such groups commonly referred to as "experience rating". This frequently leads to less than optimal pricing for the companies, the groups, or both. Healthcare providers such as pharmacies and hospitals generate private healthcare data about patients, including medical and prescription drug history, and administrative healthcare claims data. Data that associates patient identity with health information is known as protected health information (PHI). Healthcare providers can store protected health information in electronic databases for future use in patient care and insurance claims processing. Insurance companies have developed techniques to estimate their risk from insuring a group of people by processing the protected health information about the group. Federal privacy laws, however, prevent the insurance companies from obtaining protected health information without individual authorizations from the each person in the group.

SUMMARY

[004] The systems and techniques described here relate to de-identifying medical history information.

[005] In one aspect, a computer-implemented method includes producing information that characterizes a group of individuals from a set of private data representing characteristics of the individuals. The identity of the individuals is unattainable from the produced information. The method also includes providing the produced information to report the characteristics of the group.

[006] Implementations may include any of all of the following features. Producing information that characterizes the group may include producing a request token for each individual included in the group. Producing such a request token for each individual may include encrypting respective data that identifies each individual. Producing information that characterizes the group may include comparing the request tokens to tokens associated with the information to be produced. The tokens associated with the information to be produced and the request tokens may be similarly encrypted. Producing information that characterizes the group may includes determining if the comparison provides at least a minimum number of matches. Producing information that characterizes the group may include requesting a predefined portion of the information. Additionally, producing information that characterizes the group may include determining if the group includes at least a minimum number of individuals. The private data may represent medical related information associated with the individuals of the group.

[007] In another aspect a system includes an encryption server for producing a request token of each individual included in a group identified in a request for information that characterizes the group. The system may also include a data server for producing the information that characterizes the group from a set of private data representing characteristics of the individuals. The identity of the individuals is unattainable from the produced information. The data server is also configured to provide the produced information to report the characteristics of the group.

[008] Implementations may include any of all of the following features. The data server may provide a request token for each individual included in the group to produce the information that characterizes the group. The request token for each individual may

represent encrypted data that identifies the corresponding individual. The data server may be configured to compare the request tokens to tokens associated with the information to be produced. The tokens associated with the information to be produced and the request tokens may be similarly encrypted. The data server may be configured to determine if the comparison provides at least a minimum number of matches. The request may represent a predefined portion of information to use for producing the information that characterizes the group. The encryption server may be configured to determine if the group includes at least a minimum number of individuals. The private data may represent medical related information associated with the individuals of the group.

[009] In another aspect, one or more computer readable media storing instructions that are executable by a processing device, and upon such execution cause the processing device to perform operations that include producing information that characterizes a group of individuals from a set of private data representing characteristics of the individuals. The identity of the individuals is unattainable from the produced information. The operations also include providing the produced information to report the characteristics of the group.

[010] Implementations may include any of all of the following features. Producing information that characterizes the group may include producing a request token for each individual included in the group. Producing such a request token for each individual may include encrypting respective data that identifies each individual. Producing information that characterizes the group may include comparing the request tokens to tokens associated with the information to be produced. The tokens associated with the information to be produced and the request tokens may be similarly encrypted. Producing information that characterizes the group may includes determining if the comparison provides at least a minimum number of matches. Producing information that characterizes the group may include requesting a predefined portion of the information. Additionally, producing information that characterizes the group may include determining if the group includes at least a minimum number of individuals. The private

data may represent medical related information associated with the individuals of the group.

[011] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

FIG. 1 illustrates exemplary circumstances in which protected health information is stored by healthcare providers, claims clearing houses, and other source sites, and requested by an insurer.

FIG. 2 illustrates an exemplary method and system that enables an insurer to obtain medical information about a group of people without violating the privacy of persons in the group.

FIG. 3 illustrates an exemplary system incorporating an encryption server and a de-identified data server to enable a user who is not permitted to obtain the private data of a group of people to instead obtain a report that characterizes the group as a whole.

FIG. 4 illustrates an exemplary message requesting de-identified data about a group of people.

FIG. 5 is a flowchart that represents exemplary operations of a token generator.

FIG. 6 is a flowchart that represents exemplary operations of a token matcher.

FIG. 7 represents a computer system and related components.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[012] Referring to FIG. 1, when a doctor treats Jack 102 for high blood pressure, a surgeon removes Jack's gallstones, and a pharmacist fills Jack's prescription for insulin, Jack leaves a trail of electronic records 104 with healthcare professionals (e.g., healthcare profession 106), in their offices (e.g., doctor's office, nurse's station, etc.), in healthcare facilities (e.g., a hospital 108, a pharmacy 110, a nursing home, etc.) and the like. The electronic records 104 contain medical data 112 about Jack, for example his illnesses 114 and treatments 116. Each piece of medical data 112 is associated with personally identifiable information 118 that identifies Jack and distinguishes him from all other patients, such as his first name 120, last name 122, date of birth 124, gender 126, and zip code 128. Together, the pieces of medical data 112 and the personally identifiable information 118 make up Jack's protected health information (PHI) 130.

[013] Each of Jack's healthcare providers may submit health insurance claims 105 containing PHI 130, as well as additional PHI 130, to a claims clearing house 137. The claims clearing house 137 may store the PHI 130 of many patients 134, including Jack, in a PHI database 136. A de-identifier 142 can process the PHI 136 to generate irreversibly de-identified data 140 by removing all personally identifiable information 118 or otherwise transforming the PHI 130 so that it cannot be associated with a particular person. A claims warehouse 139 stores de-identified data 140 about many patients 134. Claims clearing houses 137 and claims warehouses 139 are optimized for retrieving and providing PHI 136 and de-identified data 140 for use in further processing, but health care providers such as healthcare professional 106 and pharmacies 110 may also serve as source sites 138 for de-identified data in a distributed system.

[014] By searching for Jack's personally identifiable information 118 in its electronic records 104, the pharmacy 110 is able to look up the various drugs in Jack's PHI 130 and, for example, check for bad interactions among them. Jack does not object to this use of his PHI 130 because it improves the quality of his healthcare. On the other hand, Jack would object to the pharmacy 110 giving his PHI 130 to third parties without

his permission because that would disclose personal, private information about him that Jack's potential employers, for example, might use to discriminate against him.

[015] Federal laws, such as the Health Insurance Portability and Accountability Act (HIPAA), protect Jack by prohibiting the source sites 138 possessing Jack's PHI 130 from releasing it to third parties without Jack's permission. Under HIPAA, the source sites 138 can release only irreversibly de-identified data 140 without Jack's permission.

[016] A health insurer 150, for example, may be interested in the medical history information contained in Jack's PHI 130. Jack's employer 152 may like to buy a group health insurance policy for the group 154 made up of Jack 102 and his coworkers 156. If the group 154 is too small, the insurance company 150 will not have the knowledge to fully understand the potential risk from future medical claims for the group 154 and need to set the rate to cover this unknown risk. In that case, the insurer 150 would like to use the PHI 136 from the group 154 to assess the risk of claims and set the group health insurance premium appropriately. Unfortunately, the group 154 may also be too large for the insurance company 150 to practically obtain permission from each person in the group, without which HIPAA prohibits the healthcare providers 138 from releasing the PHI 136 to the insurer 150. The de-identified data 140, which the healthcare providers or other source sites 138 could release without permission, is not useful to the insurer 150 because the insurer has no way to know whether it corresponds to the people in the group 154. With no way to obtain medical history data for the group, the insurer 150 cannot set the group insurance premium acceptably.

[017] Referring to FIG. 2, to provide the insurer 150 with the medical history information necessary to calculate the insurance premium for the group 154, without revealing the protected health information of persons in the group 154, the exemplary system 200 associates unique tokens 202 with the irreversibly de-identified data 140. The tokens 202 correspond to persons treated by healthcare providers but do not reveal the identities of the treated individuals. The insurer 150 can send a data request 203 to a third party 205, who in turn can generate request tokens 204, one for each person in the group 154. The third party 205 can send the request tokens 204 to a data aggregator 206.

The data aggregator 206 stores de-identified data 140 and associated tokens 202. By searching for the request tokens 204 among the stored tokens 202, the data aggregator 206 can process the de-identified data to generate requested de-identified data 208 that corresponds to the group 154. A data processor 210 can process the requested de-identified data 208 to generate a report 212 containing metrics such as underwriting scores that are useful to the insurer 150 in assessing the overall risk of insuring the group 154.

[018] By using the tokens 202 and request tokens 204, no parties other than the authorized source sites 138 can associate de-identified data 140 with the identity of any person in the group of patients 134 or insureds (e.g., the group 154). The insurer 150 requesting the report 212 can never receive data associated with individuals. Further, the information in the report 212 may be processed into metrics that characterize a large group and cannot be used to infer information about individuals. De-identified data records may be provided to the data processor 210 (e.g., a third part data processor), but that third party may not have access to any personally identifiable information 118 about the group 154. Nor may any party with access to the de-identified data 140, other than the healthcare providers 138, also have access to the de-identifier 142. These features of the system 200 maintain the privacy of the protected health information 130.

[019] While we describe a system in which an insurer 150 needs to estimate the risk of insuring a group of potential customers, the system 200 can work for applications in which information characterizing a group needs to be generated from the private data of group members. In one arrangement, the system may implement Microsoft Windows-based computers in connection with internet-based components. However, other implementations may use other types of components that support the processing of medical history information from healthcare databases.

[020] Referring to FIG. 3, in an exemplary system 300, a user 302 specifies a group of people using identifying data for each group member. Referring briefly to FIG. 4, an exemplary set of identifying data 404 is illustrated. Returning to FIG. 3, the user may obtain the personally identifiable information from a database 304 by retrieving it in

the form of a group file 330. The user 302 generates a request message, which may be a computer file, which uniquely identifies each member of the group using the identifying data 304. Typically, the group contains at least a minimum number of unique members. A request message 306 may be generated at a remote computer operated by the user 302.

[021] The request message 306 contains a set of identifying data 404 (see FIG. 4) for each group member, as well as data that identifies a user 402 (see FIG. 4), such as the user's name, email address, phone number and facsimile number, and a batch number that identifies the request. The group members' identifying data 404 (see FIG. 4) may include first name, last name, date of birth, gender, and zip code as well as other identifiers, such as social security number, that may be added to ensure that members are uniquely identified. In some examples, fewer identifiers may be used. The request message 306 may also include optional indications that the user 302 requests a particular type of report 212 or requests additional processing to enhance the value of the report.

[022] The request message 306 is sent over a communications network 310 (e.g., the Internet, a LAN, etc.) to an encryption server 312. If the request message 306 contains a minimum number of group members, the encryption server 312 creates a unique token, or identifier, for each person in the message 306. The encryption server creates each token by applying a token generator 314 that encrypts the personally identifiable information of each group member. The set of tokens corresponding to all the group members constitutes a batch of request tokens 204. The minimum number of group members, for example ten, is chosen to make it effectively impossible to associate individual group members with individual tokens in the batch of request tokens 204.

[023] The encryption server 312 provides the request tokens 204 to the de-identified data server 318. The de-identified data server 318 stores records of de-identified data and corresponding tokens 320 obtained from source sites 138 such as pharmacies, healthcare professionals and electronic claims clearing houses. Each token obtained from the source sites 138 may have been created using the same token generator 314 used by the encryption server 312, or using any other means that generates the identical token for the same personally identifiable information.

[024] For example, a pharmacy tracks the prescription histories of the patients being served. De-identified prescription histories and corresponding tokens are sent to the de-identified data server 318. At the request of a user 302, such as an insurance company, the encryption server 312 generates tokens identical to the patients' tokens using the same personally identifiable information. A unique token corresponding to the same personally identifiable information permits the pharmacy and the insurance company to refer to the same anonymous people without the insurance company ever associating protected health information with a particular person. To produce tokens and request tokens, one or more encryption techniques may be utilized, for example, hash functions and other methodologies may be implemented.

[025] A token matcher 326, executed by the de-identified data server 318, performs a look-up in the de-identified database 320 to find all tokens in the database that match the tokens sent from the encryption server 312. All available data for matched tokens, the requested de-identified data 208, is retrieved for use in the report generator 328. The de-identified data may include, for example, prescription history, medical claims, and hospital claims. The de-identified data server 318, or the data processor 210 may use the report generator 328 to process the requested de-identified data 208 in a way that leaves it irreversibly de-identified. An example of such processing is an underwriting algorithm that transforms the data into an underwriting assessment. The report generator formats the processed data into an electronic or hardcopy report 212 that is returned to the user.

[026] While the report 212 is described as generated on a computer system, it may also be generated in part or entirely outside the computer system. For example, the report 212 could be conveyed to the user via regular mail or other similar technique. In particular, the report may be generated and printed at the site of the de-identified data server 318 and subsequently communicated to the user 302 without using the computer network. The report generator 328 may also reside in the data processor 210 separate from the de-identified data server 318.

[027] In one arrangement, once the relevant information and options have been selected, the user 302 submits the request by clicking a submit button. The request message 306 may be encrypted prior to being transmitted over a computer network 310. At the encryption server 312, the request message 306 is unencrypted and stored. The encryption server 312 may send an optional confirmation message to the user 302. The confirmation message may include the time and date that the message was received, and may indicate the service level and options selected by the user 302.

[028] Referring to FIG. 4, the user 302 can input the user's identifying information 402, including name, email address, phone number and/or facsimile number, in the first record, or set of fields, of the request message 306. The user can then input the personally identifiable information 404 for each of the group members, including first name, last name, gender, date of birth, and zip code. Equivalently, the user can incorporate the group file 330 into the request message 306. Information about the insurance policy 408 for which the group has applied, or other insurance purpose for which the report 212 is being requested may also be included in the request message 306. The format of the request message 306 may be adjusted based on the user's 302 needs.

[029] The request message 306 may also include information about the level of service 410 requested by the user 302, for example the quantity, quality or type of information. A first level of service may request up to six months of medical history; a second level may request up to twelve months of history; and a third level may request a two year medical history. Alternatively, instead of providing the user 302 with a variety of service level options 410, the system 300 may simply retrieve all of the medical history information available for the group.

[030] The user 302 may also request additional, optional information 412. For example, the user 302 may request information regarding the drug categories and drug indications associated with the drugs in the de-identified data. Drug indications include the medical conditions associated with each drug. Drug categories include the type of drug. This data can be passed to the data processor 210 to include in the report 212. Alternatively, this data may be returned as part of every report 212.

[031] Referring to FIG. 5, a flowchart 500 represents a particular arrangement of operations of a token generator (e.g., the token generator 314 shown in FIG. 3). Operations include receiving 502 the request message (e.g., request message 306) containing the personally identifiable information of each person in the group (e.g., such as the group 154 shown in FIG. 1). Upon receiving the request message, operations may also include determining 504 whether the message includes the minimum number of persons. If the message does not include the minimum number of persons, the token generator returns to receive 502 a request message. A limit on the minimum number of persons ensures that a report (e.g., the report 212) covers enough people such that it is difficult (if not impossible) to infer any association between particular persons and the information in the report. If the message does include the minimum number of people, operations of the token generator include producing 508 tokens from the identifying data of each person. Producing the tokens may include applying an encryption algorithm to the identifying data of each person. The tokens uniquely identify each person in the group 154.

[032] Operations also include determining 510 if the request message includes a batch number. If the message does not include a batch number, operations include generating 512 a batch number. Operations also include providing 516 the tokens, batch number and report options. The individual tokens are placed in a batch file and may be encrypted before being transmitted over the network.

[033] Each batch file of request tokens 204 also specifies the information needed for the report 212. The request tokens are transmitted to the de-identified data server 318, unencrypted and processed using rules for searching, matching, and retrieving healthcare data.

[034] Referring to FIG. 6, a flowchart 600 represents a particular arrangement of operations of a token matcher (e.g., the token matcher 326 shown in FIG. 3). Operations include receiving 602 request tokens (e.g., such as the request tokens 204 shown in FIG. 2). Operations may also include receiving 604 a token (e.g., such as the token 202) and associated de-identified data (e.g., such as the de-identified data 140), typically from

source sites (e.g., such as the source site 138 shown in FIG. 1). Upon receiving a request token, de-identified data and a token, operations include determining 606 whether the request token matches the token. If no match is found, operations include returning to receive 604 more tokens and de-identified data. If a match is found, operations include processing 608 the de-identified data. Processing may include storage for later retrieval. In some arrangements, operations may also include determining whether a minimum number of matches has been detected. If such a minimum number of matches has not occurred in comparing the request tokens and the tokens, action may be taken (e.g., pause or restart processing) until the predefined number of matches has been detected (e.g., so as not to increase the probability of one or more individuals being identified by a process of elimination).

[035] The de-identified data (e.g., such as the de-identified data 140) may include a list of drugs prescribed over the requested period for the members of the group (e.g., such as the group 154). The list of drugs prescribed may include the drug name, form, strength, days supplied, and date dispensed. As part of processing 608 the de-identified data, operations may include determining the drug category and drug indications for each drug prescribed. Operations may also include accessing a database relating the drug category and indications to each possible drug. The database may be maintained within the de-identified data server 318 database, or may be accessed on a remote server maintained by a third party.

[036] Upon processing the de-identified data, operations also include determining 610 if additional tokens remain in the batch of request tokens (e.g., such as the request tokens 204). If additional tokens remain, operations include receiving 602 more request tokens. If there are no additional request tokens, operations may include outputting 612 the processed, de-identified data.

[037] Operations may also include providing the number of tokens submitted, the number matched, and the overall match rate. The collected data covers the interval of historical data according to the level of service requested (e.g., as represented by the level of service 410 in FIG. 4). De-identified diagnosis and procedures data may also be

included from administrative medical claims from a doctor's office (e.g., office 106) or a healthcare facility (e.g., the hospital 108).

[038] In addition to accessing and incorporating drug indication information for each drug prescribed to persons in the group (e.g., such as group 154), operations may include further processing of the requested de-identified data. For instance, operations may include determining the probability that a particular drug indicates a particular condition. In this example, in addition to providing the possible indications, the requested de-identified data would include the likelihood that anonymous individuals associated with the request tokens (e.g., such as request tokens 204) have each of the conditions indicated by the prescribed drugs. Operations may also include using expert rule systems to provide health status information based on the prescription drug history information. Alternatively, operations may include using diagnosis codes from medical claims data to assess health status.

[039] The requested de-identified data 208 may be sent for further processing to a third party data processor (e.g., data processor 210) who may apply proprietary algorithms, modify the data format, or generate additional reports, provided that no re-identifiable information is transmitted to the user 302. Third parties may not have access to the request message 306 and the group file 330 so that no association may be inferred between the de-identified data 140 and particular persons in the group 154.

[040] The report 212 provides the insurer 150 with information for making an immediate, informed decision about the insurance related risks. In particular, the insurer 150 may accept, reject or adjust the group's insurance rating depending on the information in the report 212. Actuarial tables and formulas may be used to determine which of the insurance actions are taken. The report 212 may be used alone to make decisions about the insurability of the group 154, or may simply indicate that additional investigation is needed.

[041] FIG. 7 is a schematic diagram of a generic computer system 700. The system 700 can be used for the operations described in association with any of the computer-implemented methods described previously, according to one implementation.

The system 700 includes a processor 710, a memory 720, a storage device 730, and an input/output device 740. Each of the components 710, 720, 730, and 740 are interconnected using a system bus 750. The processor 710 is capable of processing instructions for execution within the system 700. In one implementation, the processor 710 is a single-threaded processor. In another implementation, the processor 710 is a multi-threaded processor. The processor 710 is capable of processing instructions stored in the memory 720 or on the storage device 730 to display graphical information for a user interface on the input/output device 740.

[042] The memory 720 stores information within the system 700. In some implementations, the memory 720 is a computer-readable medium. The memory 720 is a volatile memory unit in some implementations and is a non-volatile memory unit in other implementations.

[043] The storage device 730 is capable of providing mass storage for the system 700. In one implementation, the storage device 730 is a computer-readable medium. In various different implementations, the storage device 730 may be a floppy disk device, a hard disk device, an optical disk device, or a tape device.

[044] The input/output device 740 provides input/output operations for the system 700. In one implementation, the input/output device 740 includes a keyboard and/or pointing device. In another implementation, the input/output device 740 includes a display unit for displaying graphical user interfaces.

[045] The features described can be implemented in digital electronic circuitry, or in computer hardware, firmware, software, or in combinations of them. The apparatus can be implemented in a computer program product tangibly embodied in an information carrier, e.g., in a machine-readable storage device, for execution by a programmable processor; and method steps can be performed by a programmable processor executing a program of instructions to perform functions of the described implementations by operating on input data and generating output. The described features can be implemented advantageously in one or more computer programs that are executable on a programmable system including at least one programmable processor coupled to receive

data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. A computer program is a set of instructions that can be used, directly or indirectly, in a computer to perform a certain activity or bring about a certain result. A computer program can be written in any form of programming language, including compiled or interpreted languages, and it can be deployed in any form, including as a stand-alone program or as a module, component, subroutine, or other unit suitable for use in a computing environment.

[046] Suitable processors for the execution of a program of instructions include, by way of example, both general and special purpose microprocessors, and the sole processor or one of multiple processors of any kind of computer. Generally, a processor will receive instructions and data from a read-only memory or a random access memory or both. The essential elements of a computer are a processor for executing instructions and one or more memories for storing instructions and data. Generally, a computer will also include, or be operatively coupled to communicate with, one or more mass storage devices for storing data files; such devices include magnetic disks, such as internal hard disks and removable disks; magneto-optical disks; and optical disks. Storage devices suitable for tangibly embodying computer program instructions and data include all forms of non-volatile memory, including by way of example semiconductor memory devices, such as EPROM, EEPROM, and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and CD-ROM and DVD-ROM disks. The processor and the memory can be supplemented by, or incorporated in, ASICs (application-specific integrated circuits).

[047] To provide for interaction with a user, the features can be implemented on a computer having a display device such as a CRT (cathode ray tube) or LCD (liquid crystal display) monitor for displaying information to the user and a keyboard and a pointing device such as a mouse or a trackball by which the user can provide input to the computer.

[048] The features can be implemented in a computer system that includes a back-end component, such as a data server, or that includes a middleware component,

such as an application server or an Internet server, or that includes a front-end component, such as a client computer having a graphical user interface or an Internet browser, or any combination of them. The components of the system can be connected by any form or medium of digital data communication such as a communication network. Examples of communication networks include, e.g., a LAN, a WAN, and the computers and networks forming the Internet.

[049] The computer system can include clients and servers. A client and server are generally remote from each other and typically interact through a network, such as the described one. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

[050] A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the following claims.

WHAT IS CLAIMED IS:

1. A computer-implemented method comprising:

receiving a request for healthcare information that characterizes a group composed of multiple individuals;

producing, by a processor, a request token for each individual included in the group;

comparing the request tokens to tokens associated with healthcare data that includes de-identified information to find matching tokens;

producing the healthcare information with the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and

providing the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

2. The computer-implemented method of claim 1, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

3. The computer-implemented method of claim 1, wherein receiving the request for healthcare information that characterizes the group of individuals includes receiving personally identifiable information associated with the individuals of the group.

4. The computer-implemented method of claim 1, in which producing the requested healthcare information includes encrypting respective data that identifies each individual.

5. The computer-implemented method of claim 1, in which the tokens associated with healthcare data and the request tokens are similarly encrypted.

6. The computer-implemented method of claim 1, in which the healthcare data represents medical related information associated with the individuals of the group.

7. A system comprising:

a data server for producing healthcare information that characterizes a group of multiple individuals identified in a request for the healthcare information that

characterizes the group, wherein a request token is produced for each individual included in the group, the data server is configured to compare the request tokens to tokens associated with healthcare data that includes de-identified information to find matching tokens, the produced healthcare information is absent personally identifiable information and is based on a minimum number of matched tokens, the data server is also configured to provide the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

8. The system of claim 7, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

9. The system of claim 7, wherein the request for healthcare information that characterizes a group of individuals includes personally identifiable information associated with the individuals of the group.

10. The system of claim 7, in which the data that identifies each individual is encrypted.

11. The system of claim 7, in which the tokens associated with the healthcare data and the request tokens are similarly encrypted.

12. The system of claim 7, in which the data server provides the requested healthcare information if the group includes at least a minimum number of individuals.

13. The system of claim 7, in which the healthcare data represents medical related information associated with the individuals of the group.

14. One or more computer readable storage devices storing instructions that are executable by a processing device, and upon such execution cause the processing device to perform operations comprising:

receiving a request for healthcare information that characterizes a group composed of multiple individuals;

producing, by a processor, a request token for each individual included in the group;

comparing the request tokens to tokens associated with healthcare data that includes de-identified information to find matching tokens;

producing the healthcare information with the identity of the individuals being unattainable from the produced healthcare information based on a minimum number of matched tokens; and

providing the produced healthcare information to report the characteristics of the group absent authorization from the individuals in the group.

15. The computer readable storage devices of claim 14, wherein the provided healthcare information is in conformity with the Health Insurance Portability and Accountability Act (HIPAA).

16. The computer readable storage devices of claim 14, wherein receiving the request for healthcare information that characterizes the group of individuals includes receiving personally identifiable information associated with the individuals of the group.

17. The computer readable storage devices of claim 14, in which producing the requested healthcare information includes encrypting respective data that identifies each individual.

18. The computer readable storage devices of claim 14, in which the tokens associated with the healthcare data and the request tokens are similarly encrypted.

19. The computer readable storage devices of claim 14, in which the healthcare data represents medical related information associated with the individuals of the group.

20. The computer readable storage devices of claim 14, in which producing the requested healthcare information includes determining if the group includes at least a minimum number of individuals.

ABSTRACT

A computer-implemented method includes producing information that characterizes a group of individuals from a set of private data representing characteristics of the individuals. The identity of the individuals is unattainable from the produced information. The method also includes providing the produced information to report the characteristics of the group.

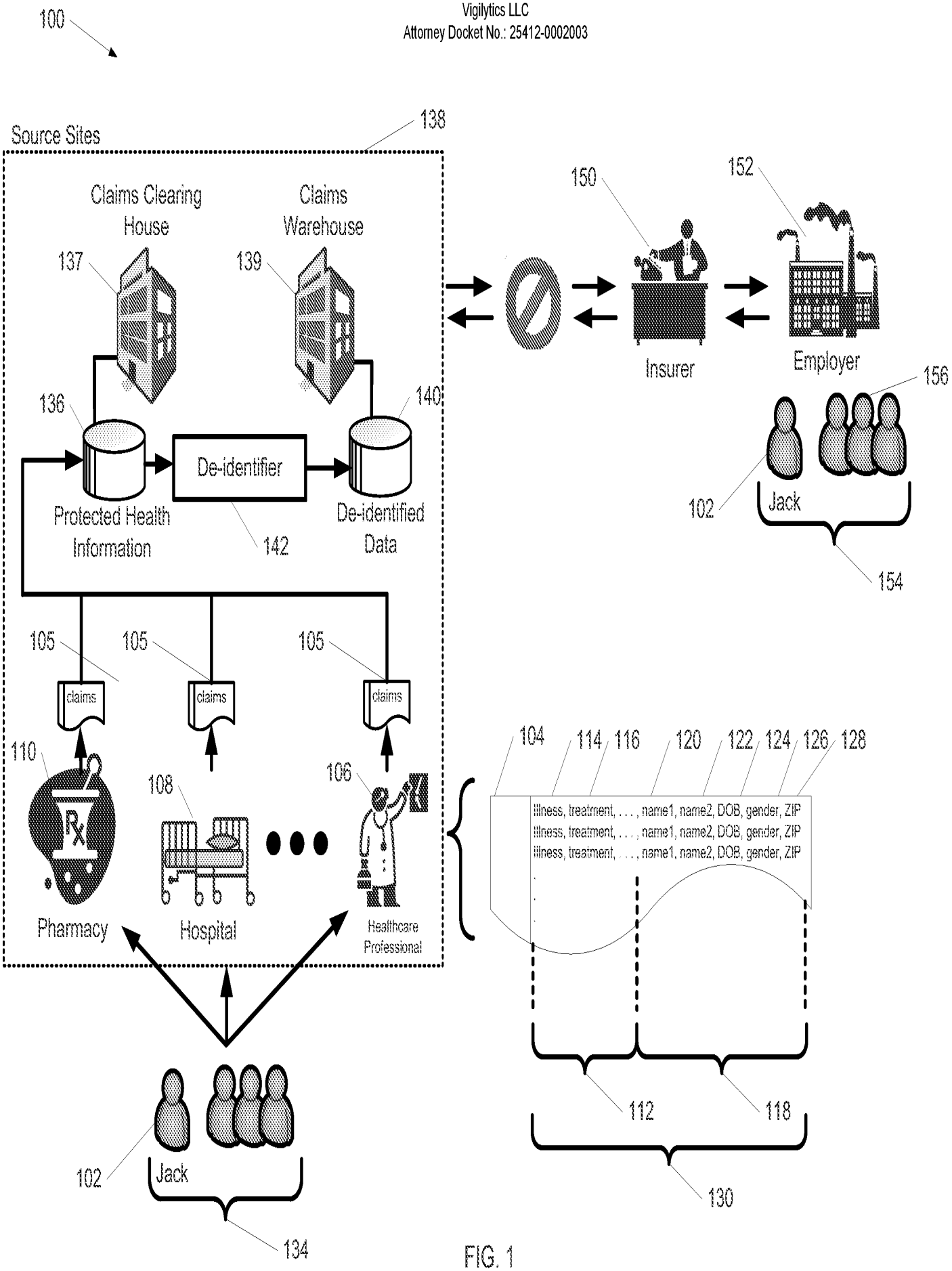

100
Source Sites
138
Claims Clearing House
Claims Warehouse
137
139
136
140
De-identifier
Protected Health Information
142
De-identified Data
150
152
Insurer
Employer
156
102
Jack
154
105
105
105
claims
claims
claims
110
108
106
Pharmacy
Hospital
Healthcare Professional
104
114
116
120
122
124
126
128
illness, treatment, . . . , name1, name2, DOB, gender, ZIP
illness, treatment, . . . , name1, name2, DOB, gender, ZIP
illness, treatment, . . . , name1, name2, DOB, gender, ZIP
112
118
130
102
Jack
134

FIG. 1

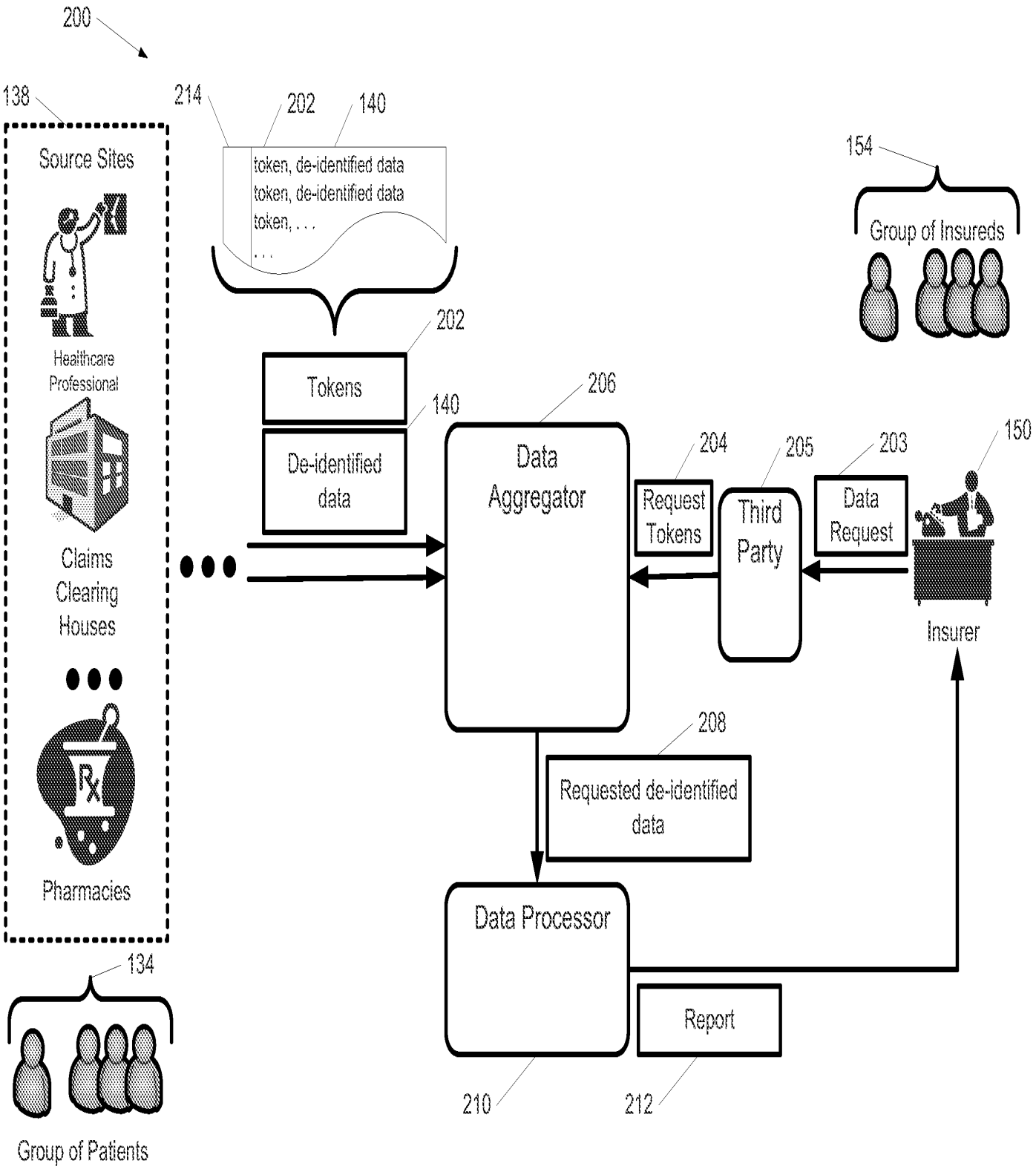

200
138
214
202
140
Source Sites
token, de-identified data
token, de-identified data
token, . . .
. . .
154
Group of Insureds
Healthcare Professional
202
Tokens
140
De-identified data
206
Data Aggregator
204
Request Tokens
205
Third Party
203
Data Request
150
Insurer
Claims Clearing Houses
208
Requested de-identified data
Pharmacies
Data Processor
134
Report
210
212
Group of Patients

FIG. 2

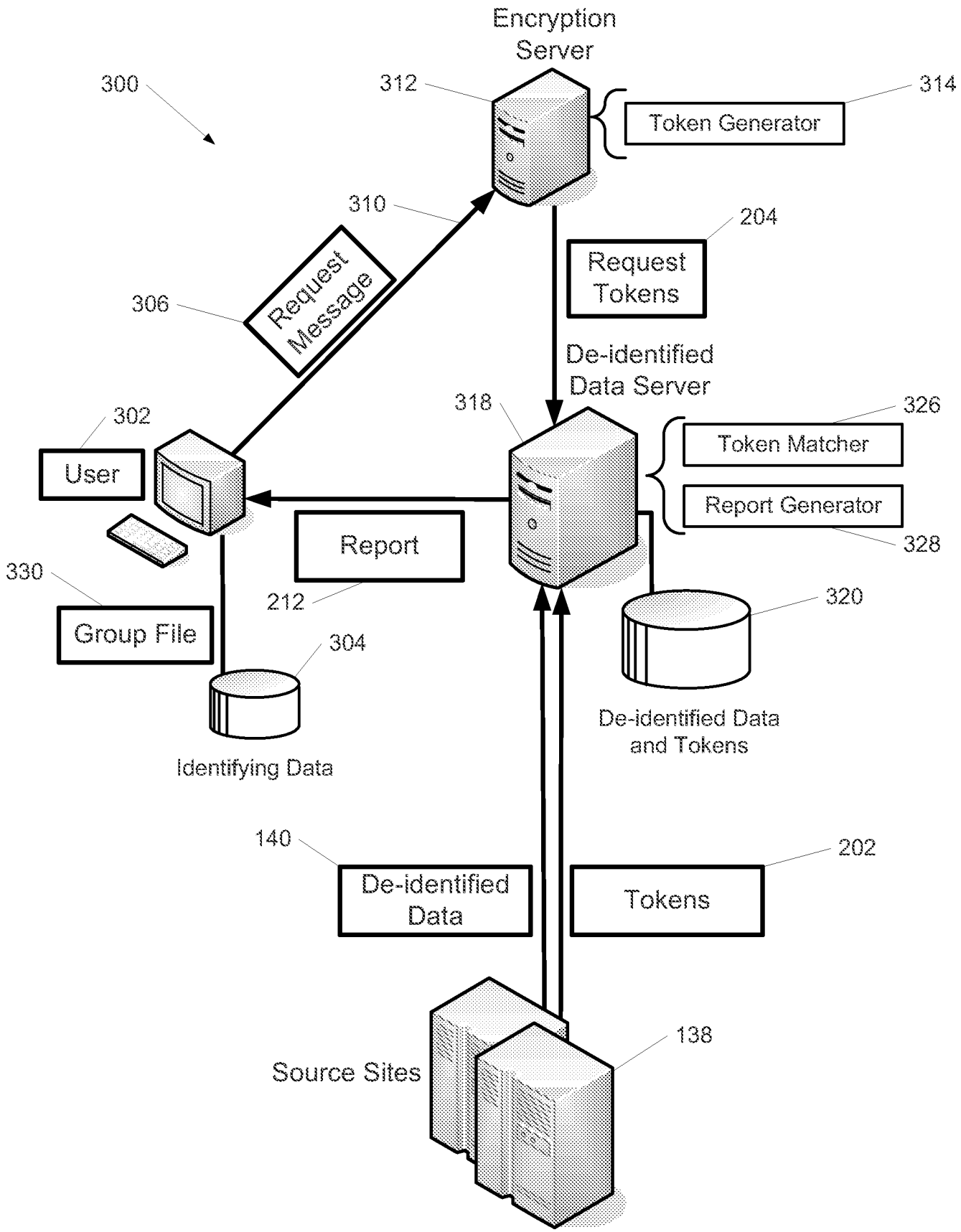

Encryption Server
300
312
314
Token Generator
310
204
Request Tokens
306
Request Message
De-identified Data Server
318
326
Token Matcher
302
User
Report Generator
328
Report
330
212
320
Group File
304
De-identified Data and Tokens
Identifying Data
140
202
De-identified Data
Tokens
Source Sites
138

FIG. 3

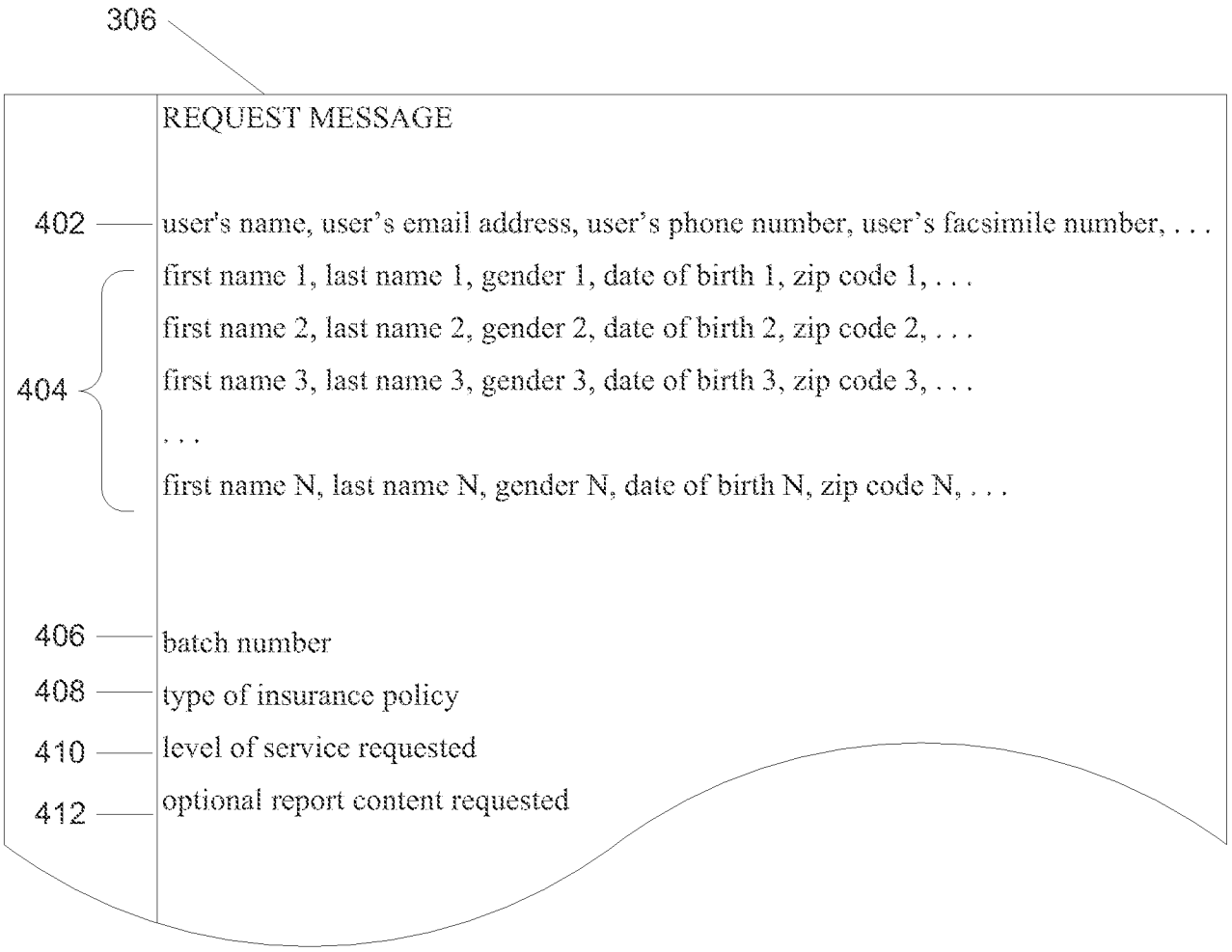

306
REQUEST MESSAGE
402
user's name, user's email address, user's phone number, user's facsimile number, . . .
404
first name 1, last name 1, gender 1, date of birth 1, zip code 1, . . .
first name 2, last name 2, gender 2, date of birth 2, zip code 2, . . .
first name 3, last name 3, gender 3, date of birth 3, zip code 3, . . .
. . .
first name N, last name N, gender N, date of birth N, zip code N, . . .
406
batch number
408
type of insurance policy
410
level of service requested
412
optional report content requested

FIG. 4

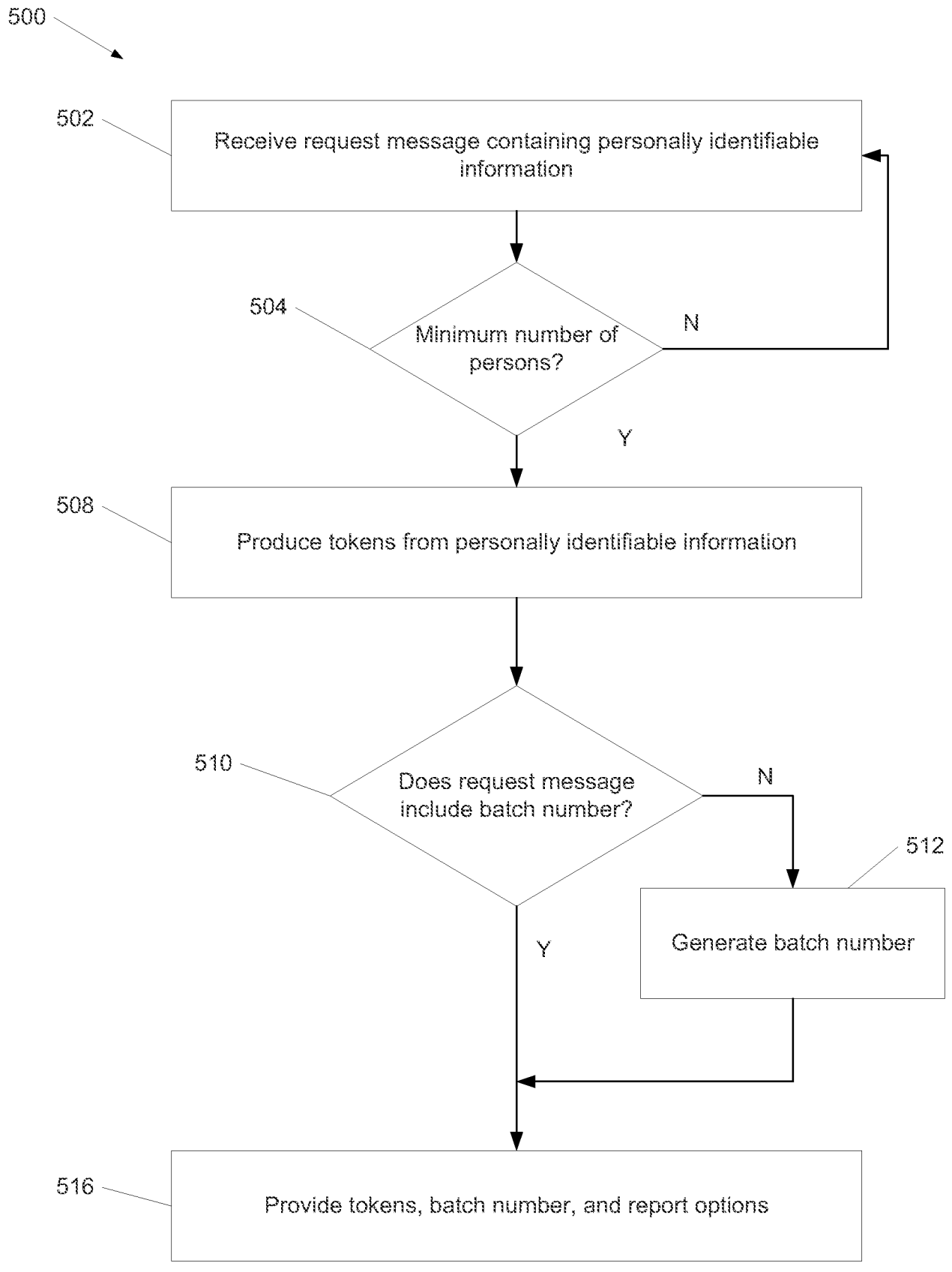

500
502
Receive request message containing personally identifiable information
504
Minimum number of persons?
N
Y
508
Produce tokens from personally identifiable information
510
Does request message include batch number?
N
512
Generate batch number
Y
516
Provide tokens, batch number, and report options

FIG. 5

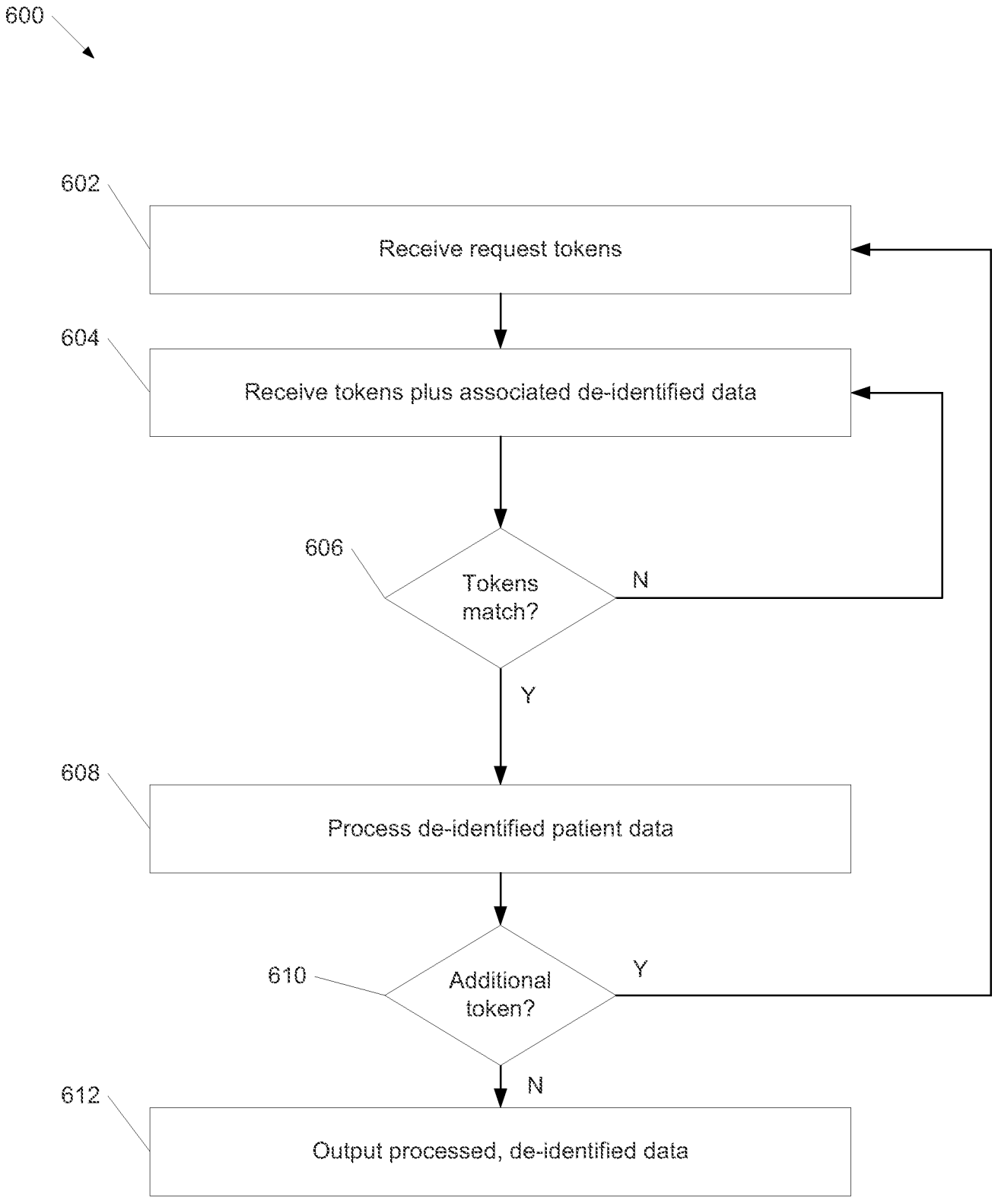

600
602
Receive request tokens
604
Receive tokens plus associated de-identified data
606
Tokens match?
N
Y
608
Process de-identified patient data
610
Additional token?
Y
N
612
Output processed, de-identified data

FIG. 6

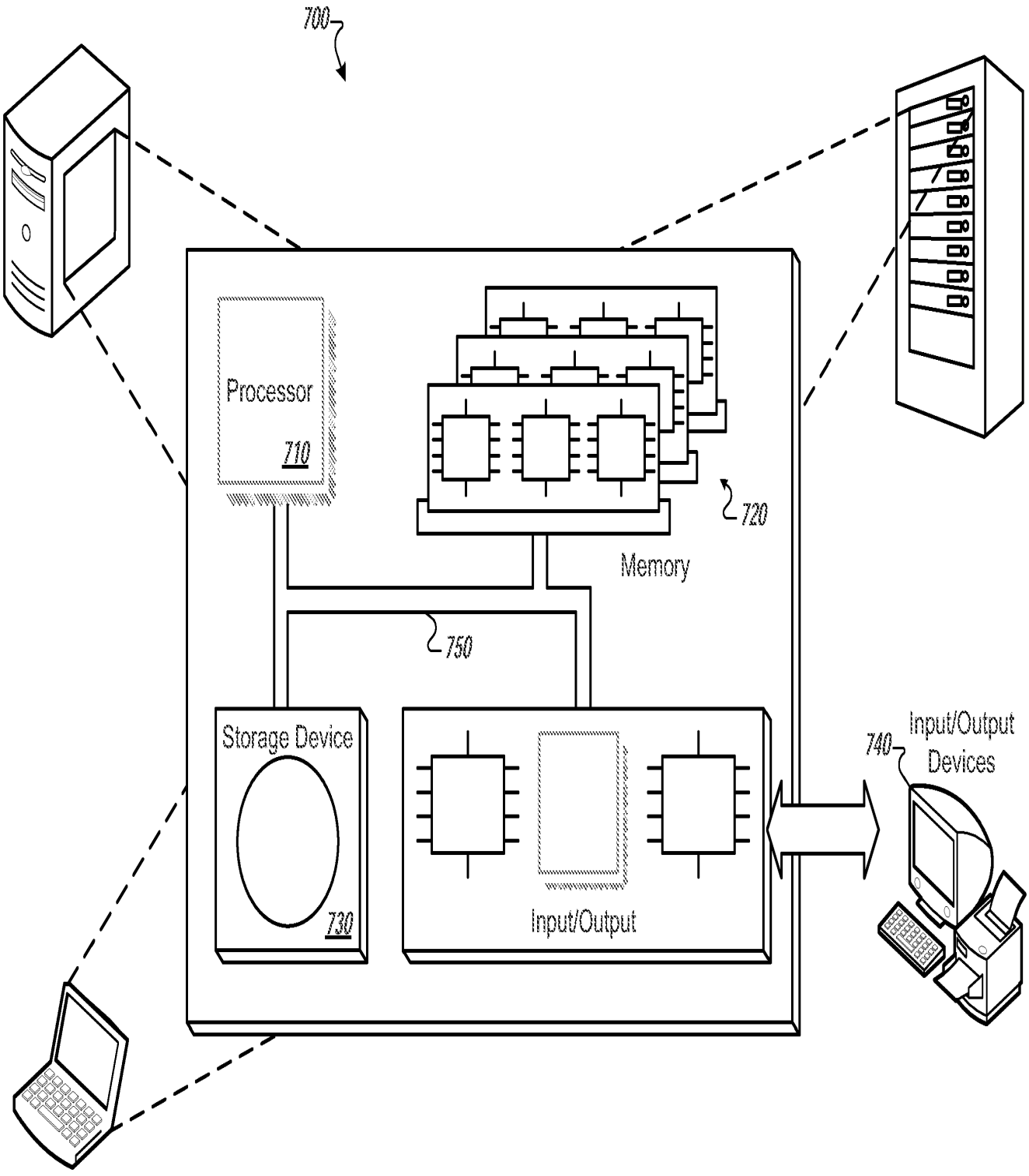

700
Processor
710
720
Memory
750
Storage Device
730
Input/Output
740
Input/Output
Devices

FIG. 7

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. 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.

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

Title of Invention	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

As the below named inventor, I hereby declare that:

This declaration is directed to:

[ ] The attached application, or

[X] United States application or PCT international application number 14/732,358

filed on June 5, 2015.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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

LEGAL NAME OF INVENTOR

Inventor: Andrew L. Paris III Date (Optional) : _____

Signature: Andrew L. Paris III

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

American LegalNet, Inc.
www.FormsWorkflow.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Andrew L. Paris III
Serial No.	:	
Filed	:	Herewith
Title	:	DE-IDENTIFYING MEDICAL HISTORY INFORMATION FOR MEDICAL UNDERWRITING

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

INFORMATION DISCLOSURE STATEMENT

Please consider the documents listed on the disclosure form submitted with this statement. Copies of the documents are being submitted with this statement to the extent required under 37 C.F.R. § 1.98(a)(2).

This statement is being filed with the application. Apply any necessary charges or credits applicable under 37 C.F.R. § 1.17(p) to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this statement.

Respectfully submitted,

Date: 9/14/18

/Natalie K Galley/
Natalie K. Galley, Ph.D.
Reg. No. 77,020

Customer Number 26161
Fish & Richardson P.C.
Telephone: +1 (617) 956-5911
Facsimile: (877) 769-7945

23805793.doc

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 16131094 Document Date: 09/14/2018

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

Form Revision Date: August 26, 2013