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[Continued on next page]

(54) Title: PERSONALIZED MEDICAL MANAGEMENT SYSTEM, NETWORKS, AND METHODS

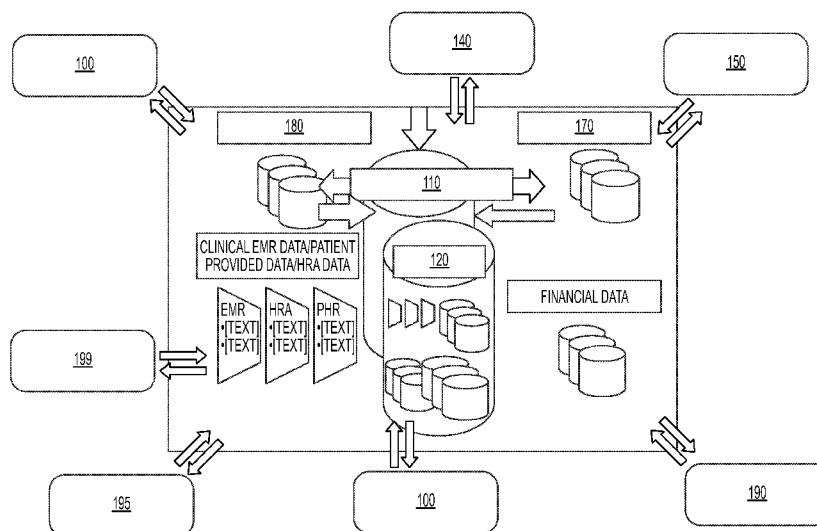


FIG. 1

(57) Abstract: Systems and methods assign therapeutic pathways to members of a network of oncology. The systems and methods allow for storage of disparate information in a database and determine a uniform semantics for all of the stored information. The systems and methods allow for the calculation of treatment pathways based on patient information as well as publicly-available information relating to particular diseases, and for the refinement of those treatment pathways as new information is added. Robot-assisted genomic labs permit automated genetic testing, which is integrated with the system.



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1 November 2012

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/27777

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06Q 50/00 (2012.01)

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)

IPC(8)- G06Q 50/00 (2012.01);

USPC- 705/3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IPC(8)- G06N 3/12, G06N 07/02, G06K 9/62 (2012.01);

USPC- 705/1.1-3; 700/1, 89, 90; Patents and NPL (classification, keyword; search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWest (US Pat, PgPub, EPO, JPO), GoogleScholar (PL, NPL), FreePatentsOnline (US Pat, PgPub, EPO, JPO, WIPO, NPL);

search terms: oncology, cancer, chemotherapy, radiation, tumor, treat, therapy, decision, recommend, assign, recognize, pathway, diagnose, prognosis, therapy, pattern, public, library, data, trial, calculate, outcome...

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2002/0168664 A1 (MURRAY et al.) 14 November 2002 (14.11.2002), Table 1; para [0012], [0039], [0042]-[0047], [0051]-[0067], [0072], [0077], [0083], [0089], [0096], [0102], [0110], [0113], [0116], [0119], [0122]-[0134], [0134]-[0148]	1-3, 5-8, 15, 40, 41 ----- 4, 9-14, 16-39, 42-46 4, 9-14, 16-39, 42-46
Y	US 2006/0058966 A1 (BRUCKNER) 16 March 2006 (16.03.2006), para [0030], [0037]-[0040], [0053], [0056], [0090], [0093], [0098]-[0103], [0108]-[0118], [0125], [0127], [0133], [0138]-[0144], [0161], [0170], [0172], [0181], [0204], [0206], [0208], [0214], [0226], [0245], [0246]	
Y, P	US 2012/0041773 A1 (KUNZ et al.) 16 February 2012 (16.02.2012), para [0006]-[0042]	1-46
Y	US 2010/0324936 A1 (VISHNUBHATLA et al.) 23 December 2010 (23.12.2010), para [0012]-[0490]	1-46
Y	TANG et al. "Data Matching for Physical Integration of Biochemical Pathway Databases." Ninth IEEE International Conference on Bioinformatics and BioEngineering (BIBE) [online], 22-24 June 2009 [Retrieved on 2012-06-11], pp. 216-220, Retrieved from the Internet: <URL: http://dl.acm.org/citation.cfm?id=1602839 >, see entire document, especially Figs. 1-3	1-46
Y	US 2005/0136438 A1 (RALPH et al.) 23 June 2005 (23.06.2005), para [0012]-[0142]	1-46
Y	US 2003/0233218 A1 (SCHILLING) 18 December 2003 (18.12.2003), para [0007]-[0210]	1-46



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

08 June 2012 (08.06.2012)

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Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/27777

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

-- Please see Extra Sheet --

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-46

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Continued from Box No. III, Observations where unity of invention is lacking:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: claims 1-46: directed to a method of assigning therapeutic pathways to members of a network of oncology treatment provider comprising compiling patient data from a network of oncology providers into one or more databases; and monitoring outcomes.

Group II: Claims 47-79: directed to a genomic analysis and therapy knowledge management system comprising one or more robot-assisted genomic labs and logic configured to display the calculated pathway to a healthcare provider.

Group III: Claims 80-93: directed to a method of calculating a therapeutic pathway for a patient suffering from a disease, the method comprising generating a genetic profile of the patient or a tissue source obtained from a patient and the therapeutic pathway guiding treatment of the disease.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Group I does not require a genomic analysis and therapy knowledge management system comprising one or more robot-assisted genomic labs or logic configured to display the calculated pathway to a healthcare provider as recited by Group II; or generating a genetic profile of the patient or a tissue source obtained from a patient and the therapeutic pathway guiding treatment of the disease as recited by Group III.

Group II does not require compiling patient data from a network of oncology providers into one or more databases; and monitoring outcomes as recited by Group I; or generating a genetic profile of the patient or a tissue source obtained from a patient and the therapeutic pathway guiding treatment of the disease as recited by Group III.

Group III does not require compiling patient data from a network of oncology providers into one or more databases; and monitoring outcomes as recited by Group I; or a genomic analysis and therapy knowledge management system comprising one or more robot-assisted genomic labs and logic configured to display the calculated pathway to a healthcare provider as recited by Group II.

Groups I-III share the technical feature of compiling data into one or more databases; compiling publicly available information into the one or more databases; identifying a pattern from a comparison of the patient data to the publicly available information; calculating a therapeutic pathway based on the pattern, and providing the therapeutic pathway. However, this shared technical feature does not represent a contribution over the prior art of US 2002/0168664 A1 to Murray et al. (14 November 2002), which teaches compiling data into one or more databases (para [0042], [0072], [0123], [0129], [0147]); compiling publicly available information into the one or more databases (para [0043], [0123], [0129], [0147] and Table 1); identifying a pattern from a comparison of the patient data to the publicly available information (para [0012], [0045], [0046], [0072], and [0110]; calculating a therapeutic pathway based on the pattern (para [0139]-[0147], and providing the therapeutic pathway (abstract, para [0139]-[0147]).

Groups I-II further share the technical feature of the data set having normalized semantics. With respect to Groups I and II, Murray further teaches a data set having normalized semantics (para [0044], expression pattern of genes. Gene expression may be described e.g. at ratios, normalized ratios, absolute values, or normalized values, etc.; para [0110], normalized data).

As the above compiling data into one or more databases; compiling publicly available information into the one or more databases; identifying a pattern from a comparison of the patient data to the publicly available information; calculating a therapeutic pathway based on the pattern, and providing the therapeutic pathway remote shopping was known at the time with respect to Groups I-III, and the normalized semantics with respect to Groups I-II, as evidenced by the teaching of Murray et al, this cannot be considered a special technical feature that would otherwise unify the groups.

Groups I-III therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.