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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 December 2010 (23.12.2010)

PCT

(10) International Publication Number
WO 2010/146484 A1

(51) International Patent Classification:
A61B 6/00 (2006.01) *G06F 19/00* (2006.01)

(21) International Application Number:
PCT/IB2010/052126

(22) International Filing Date:
12 May 2010 (12.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/218,090 18 June 2009 (18.06.2009) US
61/237,334 27 August 2009 (27.08.2009) US

(71) Applicant *(for all designated States except US)*: **KONINKLIJKE PHILIPS ELECTRONICS, N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **VIRMANI, Sunny** [IN/US]; 595 Miner Road, Cleveland, Ohio 44143 (US). **NAYPAUER, Thomas, John** [US/US]; 595 Miner Road, Cleveland, Ohio 44143 (US). **MCKNIGHT, Douglas, B.** [US/US]; 595 Miner Road, Cleveland, Ohio 44143 (US).

(74) Agent: **DAMEN, Daniel, M.**; Philips Intellectual Property & Standards, High Tech Campus 44, P.O. Box 220, NL-5600 AE Eindhoven (NL).

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

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

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

(54) Title: SINGLE SCAN MULTI-PROCEDURE IMAGING

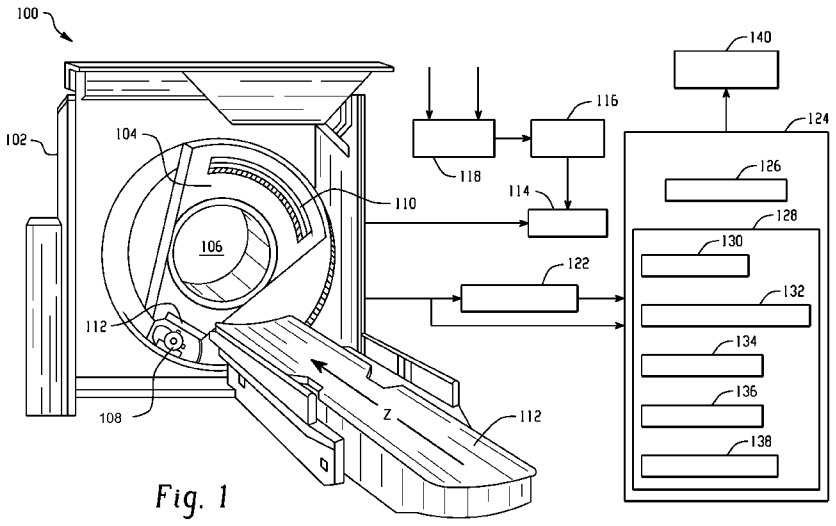

Fig. 1

(57) Abstract: A method includes receiving imaging data generated by an imaging system (100) for a scan performed utilizing an imaging protocol with parameters that are based on a plurality of different imaging procedures; processing the imaging data using at least one algorithm corresponding to at least one of the plurality of different imaging procedures; and presenting the processed imaging data.

WO 2010/146484 A1

SINGLE SCAN MULTI-PROCEDURE IMAGING

DESCRIPTION

The following generally relates to imaging, and finds particular application to computed tomography (CT) imaging, and more particularly to a single scan with a protocol that is based on a plurality of different imaging procedures, and processing the imaging data and/or presenting and/or reporting on the processed imaging data. However, it is also amenable to other medical imaging applications and to non-medical imaging applications.

A computed tomography (CT) scanner generally includes an x-ray tube that emits radiation that traverses an examination region and a patient supported therein via a patient support. A detector array detects radiation traversing the examination region and the patient. The detector array generates a signal indicative of the detected radiation. A reconstructor reconstructs the signal and generates volumetric image data indicative of the patient. The volumetric image data can be processed to generate one or more images of the patient. The one or more images can be displayed on a monitor and/or printed to film.

Generally, one or more anatomy specific scanning protocols are generated for a plurality of different anatomical structures. By way of example, one or more protocols are designed specifically for bone scans while one or more other protocols are designed for soft tissue scans such as a scan of liver or brain. Each protocol is configured with scan parameters values based on the particular anatomical structure. Examples of such scan parameters include mA, kVp, slice thickness, resolution, number of slices, etc.

Unfortunately, when using such anatomy specific protocols a patient undergoing a soft tissue scan and a bone scan is often scanned and irradiated twice, once for the soft tissue scan and once for the bone scan, with each scan increasing the patient's lifetime radiation dose. In addition, the scans may be performed at two different times and/or locations with scan results from the first scan not readily accessible and separate from the results from the other scan. Moreover, an ordered scan such as some screening type scans (e.g., CT colonography) may not be performed due to the scan not being included on a pre-approved procedure list. In one instance, this may be due to a concern with irradiating patients with no symptoms.

Aspects of the present application address the above-referenced matters and others.

According to one aspect, a method includes receiving imaging data generated by an imaging system for a scan performed utilizing an imaging protocol with parameters that are based on a plurality of different imaging procedures. The method further includes processing the imaging data using at least one algorithm corresponding to at least one of the plurality of different imaging procedures. The method further includes presenting the processed imaging data.

According to another aspect, a system includes protocol bank for storing one or more imaging protocols. At least one of the protocols is based on a plurality of different imaging procedures. The system further includes an imaging system utilized to scan a patient based on the at least one protocol, wherein the imaging system generates imaging data indicative thereof. The system further includes an imaging data processor that processes the generated imaging data using at least one algorithm corresponding to at least one of the plurality of different imaging procedures. The system further includes a presentation component that presents the processed imaging data.

According to another aspect, a computer readable storage medium containing instructions which, when executed by a computer, cause the computer to perform the steps of: receiving imaging data acquired with an imaging protocol that is based on colonography, bone mineral density, fat assessment, and vascular calcium score imaging procedures; processing the imaging data using at least one algorithm corresponding to at least one of the imaging procedures, and presenting the processed imaging data.

According to another aspect, a method includes performing an imaging procedure using a protocol optimized for a plurality of different imaging procedures and generating imaging data, determining that the protocol satisfies at least one other imaging procedure, associating the imaging data with first indicia indicating that the imaging data satisfies the at least one other imaging procedure, and storing the imaging data and the first indicia in a first data repository.

The invention may take form in various components and arrangements of components, and in various steps and arrangements of steps. The drawings are only for

purposes of illustrating the preferred embodiments and are not to be construed as limiting the invention.

FIGURE 1 illustrates an example imaging data analysis system in connection with an imaging system.

FIGURE 2 illustrates an example graphical user interface for presenting the imaging data and/or information derived therefrom.

FIGURE 3 illustrates an example method.

FIGURE 1 illustrates an imaging system 100 such as a computed tomography (CT) scanner. The imaging system 100 includes a stationary gantry 102 and a rotating gantry 104, which is rotatably supported by the stationary gantry 102. The rotating gantry 104 rotates around an examination region 106 about a longitudinal or z-axis.

A radiation source 108, such as an x-ray tube, is supported by and rotates with the rotating gantry 104 around the examination region 106. The radiation source 108 emits radiation, and a collimator collimates the emitted radiation and produces a generally fan, wedge, or cone shaped radiation beam that traverses the examination region 106.

A radiation sensitive detector array 110 is also supported by the rotating gantry 104 and subtends an angular arc across from the radiation source 108, opposite the examination region 106. The detector array 110 detects radiation that traverses the examination region 106 and generates projection data indicative thereof.

A patient support 112, such as a couch, supports the patient in the examination region 106.

A general purpose computing system 114 serves as an operator console. The console includes at least one processor and software or computer executable instructions resident on a computer readable medium. The software, when executed by the processor or other processor, allows the operator to control operation of the system 100, including selecting an imaging protocol, creating an imaging protocol, modifying an imaging protocol, initiating scanner, transferring imaging data, etc.

A protocol bank 116 stores one or more scanning or imaging protocols for use by the system 100. At least one of the protocols in the protocol bank 116 is tailored for a set of different imaging procedures. For example, in one instance, at least one of the protocols is optimized for four (4) different imaging procedures, including colonography, bone mineral density, fat assessment, and vascular (e.g., aortic) calcium imaging

procedures. In one instance, the protocol is optimized on the aggregate scan requirements of the different imaging procedures, as opposed to the scan requirements of an individual specific protocol. In another instance, a weighting factor (e.g., from 0 to 1) is used to focus or center the protocol on a subset of one or more of the different imaging procedures. Yet another protocol may be optimized for one or more different imaging procedures.

An example colonography scan includes an abdomen-pelvis scan with the patient's colon insufflated for interpretation of intra-colon abnormalities. An example bone mineral density scan includes an abdomen-pelvis scan with the results used to measure the bone density of a patient, for example, for osteoporosis screening/diagnosis. A fat assessment scan is used to measure visceral and/or subcutaneous fat. A vascular calcium scan is used to generate a vascular calcium score which indicates a presence and/or degree of vascular calcification.

By using a protocol generated based on a set of different imaging procedures for scanning, imaging data from a single scan be used for all four (colonography, bone mineral density, fat assessment, and vascular calcium) of the imaging procedures. As noted above, such a protocol may be optimized based on the aggregate of all of the imaging procedures, a weighted aggregate, a subset of the imaging procedures, or otherwise.

In one embodiment, the protocol bank 116 is a database (or the information therein may additionally be provided to a database), which is located locally or remotely to the console 114. In this embodiment, at least one protocol in the protocol bank 116 includes or is associated with information (e.g., metadata, flags, indicia, a look-up-table, etc.) that indicates which imaging procedure(s) it satisfies. This information is accessible to authorized personnel (e.g., refereeing physicians, radiologists, technicians, etc.) and can be used (as is or modified) for subsequent scanning. An executing console, web or other application can be used to search the database for candidate protocols for an imaging procedure based on various criteria such as patient information, imaging procedure(s) of interest, etc.

Similarly, the imaging data (and/or information derived therefom and/or processed imaging data) from the scans performed using such protocols can be tagged or associated with information that indicates which imaging procedure(s) it satisfies. The imaging data can be stored in a data repository such a Picture Archiving and

Communication System (PACS), a Radiology Information System (RIS), a Hospital Information System (HIS), and/or data repository. Likewise, an executing console, web or other application can be used to search the data repository for prior imaging procedures based on criteria such as patient information, imaging procedure(s) of interest, imaging procedure(s) satisfied, etc. In one instance, this allows a physician to input a request for a new scanning procedure and determine if prior imaging scans include the data needed for the new scanning procedure. This may eliminate or replace the new scan procedure, or provide data for historical comparison.

A protocol generator 118 generates imaging protocols, including protocols stored in the protocol bank 116. The illustrated protocol generator 118 includes a processor that generates protocols based on a particular set of imaging procedures, such as those noted above, and user or other input. Where the set of imaging procedures includes colonography, bone mineral density, fat assessment, and vascular calcium imaging procedures, the protocol generator 118 can generate an imaging protocol that is optimized based on an aggregate, a weighted aggregate, a subset, etc. of the colonography, bone mineral density, fat assessment, and vascular calcium imaging procedures.

The input provided to the protocol generator 118 may include information such as which, if any, of the imaging procedures are for diagnostic purposes and/or which, if any, of the imaging procedures are for screening purposes. The protocol generator 118 can then take this information into account when generating a protocol. For example, such information may correlate to a particular weighting scheme where diagnostic imaging procedures are weighted higher than non-diagnostics imaging procedures. In another example, the protocol generator 118 may use a look up table or other predefined list to determined whether an imaging procedure is a diagnostic or screening imaging procedure.

A reconstructor 122 reconstructs the projection data and generates volumetric image data indicative thereof.

An imaging data processor 124 includes a microprocessor 126 and a computer readable storage medium such as memory 128. The memory 128 stores computer executable instructions, which are executable by the microprocessor 126. The imaging data processor 124 is shown separate from the system 100. As such, it can be part of a dedicated workstation, a desk computer, a server, and/or other computing system. In another embodiment, the imaging data processor 124 is part of the console 114.

The instructions include one or more algorithms for processing reconstructed and/or raw imaging data from the system 100 and/or deriving information therefrom. The illustrated memory 128 includes a colonography algorithm 130, a bone mineral density algorithm 132, a fat assessment algorithm 134, an vascular calcium score algorithm 136 and one or more other algorithms 138.

A presentation component 140 presents the processed and/or derived information and/or other information. This may include presenting raw imaging data, reconstructed imaging data, scores, and/or other information. As described in greater detail next, the presentation component 140 can present such information in a graphical user interface (GUI) displayed on a monitor. The computer executable instructions for the GUI 200 can be stored in the memory 128 and/or other storage.

FIGURE 2 illustrates an example GUI 200. The GUI includes one or more user-activated regions 202 that invoke one or more of the algorithms stored in the memory 128. The user-activated regions 202 can be activated via various input devices such as a mouse, a digital pen, a keyboard, a touch screen and/or other input device.

A load data region 204 allows a user to select stored imaging data, including raw and/or reconstructed imaging data, for analysis. Such data can be stored local or remote to the system running the GUI application. By way of example, the data may be stored on a local hard drive, portable storage medium, or a remote data storage repository. Examples of a remote data storage repository include a Picture Archiving and Communication System (PACS), a Radiology Information System (RIS), a Hospital Information System (HIS), and/or other storage, database, and/or archival system. Remotely located data can be received over a network, a bus, or the like.

The illustrated GUI 200 also includes a colonography algorithm invoking region 206, a bone mineral density algorithm invoking region 208, a fat assessment algorithm invoking region 210, and a vascular calcium algorithm invoking region 212. The algorithm invoking region 206-212 are individually selectable by a user. This allows a user the ability to select one or more the type(s) of analysis to perform on the selected raw and/or reconstructed imaging data. For example, if the user desires to perform colonography, bone mineral density, fat assessment and vascular calcium analyses, then the user activates all four to the regions 206-212. If the user desires to perform a subset of colonography, bone mineral density, fat assessment and vascular calcium analyses, then the

user activates the regions 206-212 corresponding to the subset. If the user desires to perform another analysis, the user does not activate any of the regions 206-212.

A presentation format region 214 provides options that allow the user to pre-select how and what results of the analysis will be displayed. For instance, the GUI 200 or other window presented on a display can be split into four different windows or screens, one for the results for each of the colonography, bone mineral density, fat assessment and vascular calcium analyses. In another instance, the analysis results for one or more of the algorithms also be presented in a same window. The analysis results may include various information such as, but are not limited to, images (2D, 3D, 4D and/or movie), scores, a combination of images and scores, and/or other information. The GUI 200 may also my associated with a default preference file, which may provide a default presentation format. In this instance, the region 214 can be omitted.

A report user activated region 216 allows the user to indicate whether a report should be generated, what information to include on the report, where to send the report, etc. In one instance, activating the report user activated region 216 generates a window with a list of report options, which are selectable by the user. In another instance, a comprehensive single report that includes results and/or other information about each of the different imaging procedures from the single scan is generated. As such, the imaging data processor 124 can consolidate and integrate the different imaging procedures into a single comprehensive report.

An execute user activated region 218 allows the user to invoke the processor 126 to execute the computer readable instructions corresponding to the selected application regions 206-212.

FIGURE 3 illustrates an example workflow.

At 302, an imaging protocol is generated based on a plurality of different imaging procedures. As discussed above, in one instance a protocol is generated and optimized based on a set of imaging procedures including colonography, bone mineral density, fat assessment, and vascular calcium score imaging procedures. In one instance, the imaging protocol includes an abdomen-pelvis scan with parameters optimized for the foregoing imaging procedures. As noted herein, the generated protocol can be associated with information regarding the imaging procedure(s) it satisfies (e.g., for diagnostics, screening or other purposes), stored, and accessible by authorized personnel.

At 304, the imaging protocol is selected for scanning a patient. The selected protocol may be protocol generated for the particular patient and imaging procedure to be performed, a previous scan of the patient, a previous scan of a different patient, or other protocol, as discussed herein.

At 306, the patient is scanned using the selected protocol. Likewise, the resulting imaging data and/or data derived therefrom can be tagged or otherwise associated with information regarding the imaging procedure(s) it satisfies, stored, and accessible by authorized personnel.

At 308, a user selects one or more analysis algorithms, including one or more of colonography, bone mineral density, fat assessment, and vascular calcium score algorithms.

At 310, the imaging data from the scan is processed using the selected one or more analysis algorithms. Likewise, the processed imaging data can be tagged or otherwise associated with information regarding the imaging procedure(s) it satisfies, stored, and accessible by authorized personnel.

At 312, the processing results are presented. As described herein, this may include concurrently presenting information (e.g., images, scores, etc.) for one or more of the different applications in separate or a same sub-windows on the display.

As noted herein, such a protocol allows for analyzing imaging data from a single scan to obtain colonography, bone mineral density, fat assessment, and vascular calcium information.

The above may be implemented by way of computer readable instructions, which, when executed by a computer processor(s), causes the processor(s) to carry out the acts described herein. In such a case, the instructions are stored in a computer readable storage medium such as memory associated with and/or otherwise accessible to the relevant computer.

Although the illustrated example is discussed in the context of using CT colonography data for bone mineral density, aortic calcification, and fat analysis, it is to be appreciated that other data can be used additionally or alternatively for bone mineral density, aortic calcification, and fat analysis and/or the CT colonography data captured using the approaches herein can be used for other types of analysis.

The invention has been described herein with reference to the various embodiments. Modifications and alterations may occur to others upon reading the description herein. It is intended that the invention be construed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

CLAIMS

What is claimed is:

1. A method, comprising:

receiving imaging data generated by an imaging system (100) for a scan performed utilizing an imaging protocol with parameters that are based on a plurality of different imaging procedures;

processing the imaging data using an algorithm corresponding to at least one of the plurality of different imaging procedures; and

presenting the processed imaging data.

2. The method of claim 1, wherein the plurality of different imaging procedures are based on colonography, bone mineral density, fat assessment, and vascular calcium score imaging procedure.

3. The method of any of claims 1 to 2, wherein the algorithm includes at least one of a colonography, a bone mineral density, a fat assessment, and vascular calcium score processing algorithm.

4. The method of claim 3, wherein processed imaging data processed with at least two different algorithms is concurrently presented in separate sub-regions of a presentation window.

5. The method of any of claims 1 to 4, further comprising generating a single report that includes information corresponding to at least two of the plurality of different imaging procedures.

6. The method of any of claims 1 to 5, wherein the imaging protocol is optimized based on one of an aggregate or a weighted aggregate of the colonography, bone mineral density, fat assessment, and vascular calcium score imaging procedures.

7. The method of any of claims 3 to 6, further comprising presenting a user interface (200) with one or more user-activated regions (202) respectively corresponding to the colonography, bone mineral density, fat assessment, and vascular calcium score algorithms (206-212).

8. The method of claim 7, further comprising receiving an input identifying one or more the user-activated regions (202) for processing the imaging data.

9. The method of any of claims 1 to 8, further comprising: generating the imaging protocol based on the plurality of different imaging procedures.

10. The method of any of claims 1 to 9, further comprising:

generating the imaging protocol based on a plurality of different imaging procedures;

associating the imaging protocol with information indicating one or more imaging procedures satisfied by the imaging protocol; and

storing the imaging protocol with the association in a searchable data repository.

11. The method of any of claims 1 to 10, wherein at least one of the imaging procedures is a diagnostic imaging procedure.

12. The method of any of claims 1 to 11, wherein at least one of the imaging procedures is a screening imaging procedure.

13. The method of any of claims 1 to 9, wherein the imaging protocol is identified and obtained from a data repository based on one or more imaging procedures satisfied by the imaging protocol.

14. The method of any of claims 1 to 11, further comprising:

associating at least one of the imaging data or the processed imaging data with information indicating that the data satisfies one or more imaging procedures in addition to the plurality of different imaging procedures.

15. The method of claim 14, wherein the data with the association is stored in a data repository, and wherein the data repository is searchable based at least in part on a type of imaging procedure satisfied by the imaging protocol.

16. A system, comprising:

a protocol bank (116) for storing one or more imaging protocols, wherein at least one of the protocols is based on a plurality of different imaging procedures;

an imaging system (100) utilized to scan a patient based on the at least one protocol, wherein the imaging system (100) generates imaging data indicative thereof;

an imaging data processor (124) that processes the generated imaging data using at least one algorithm corresponding to at least one of the plurality of different imaging procedures; and

a presentation component (140) that presents the processed imaging data.

17. The system of claim 16, wherein the at least one algorithm includes at least one of a colonography, a bone mineral density, a fat assessment, and vascular calcium score processing algorithm (206-212).

18. The system of any of claims 16 to 17, wherein the imaging data processor (124) comprising:

a microprocessor (126); and

a storage medium (128) that stores at least one algorithm corresponding to at least one of the plurality of different imaging procedures, wherein the microprocessor (126) processes the imaging data based on the at least one of the plurality of different imaging procedures.

19. The system of any of claims 16 to 18, wherein the presentation component (140) concurrently presents imaging data processed with two or more of the colonography, a bone mineral density, a fat assessment, and vascular calcium score algorithms (206-212).

20. The system of any of claims 16 to 19, wherein the imaging data processor (124) generates a single report based on two or more of the different imaging procedures.

21. The system of any of claims 16 to 20, further comprising: a protocol generator (118) that generates the imaging protocol based on the different imaging procedures.

22. The system of claim 21, where the protocol generator (118) associates the imaging protocol in the bank (116) with information indicating one or more imaging procedures satisfied by the imaging protocol.

23. The system of any of the claims 21 to 22, where the protocol generator (118) generates the protocol based on an aggregate or a weighted aggregate of the imaging procedures.

24. The system of any of claims 21 to 23, wherein the bank (116) is searchable for imaging protocols based on a type of imaging procedure satisfied by the protocol.

25. The system of any of claims 15 to 24, wherein at least one of the imaging data or the processed imaging data is stored in a searchable data repository and associated with information indicating one or more imaging procedures satisfied by the corresponding imaging protocol.

26. The system of claim 25, wherein the data repository is at least part of the imaging system (100).

27. The system of claim 25, wherein the data repository is at least part of patient medical information system.

28. A computer readable storage medium containing instructions which, when executed by a computer, cause the computer to perform the steps of:

receiving imaging data acquired with an imaging protocol that is based on colonography, bone mineral density, fat assessment, and vascular calcium score imaging procedures;

processing the imaging data using at least one algorithm corresponding to at least one of the imaging procedures; and

presenting the processed imaging data.

29. The computer readable storage medium of claim 28, wherein imaging data processed with at least two of the algorithms is concurrently presented.

30. The computer readable storage medium of any of claims 28 to 29, the instructions further including instructions that when executed by the computer cause the computer to perform the step of: generating a report that includes processing results corresponding to at least two of the plurality of different imaging procedures.

31. The computer readable storage medium of any of claims 28 to 30, the instructions further including instructions that when executed by the computer cause the computer to perform the step of: presenting one or more user-activated regions (202) respectively corresponding to the different algorithms.

32. The computer readable storage medium of claim 28, the instructions further including instructions that when executed by the computer cause the computer to perform the step of: receiving an input identifying one or more the user-activated regions (202) for processing the imaging data.

33. A method, comprising:

performing an imaging procedure using a protocol optimized for a plurality of different imaging procedures and generating imaging data;

determining that the protocol satisfies at least one other imaging procedure;

associating the imaging data with first indicia indicating that the imaging data satisfies the at least one other imaging procedure; and

storing the imaging data and the first indicia in a first data repository.

34. The method of claim 33, further comprising:

associating the protocol with second indicia indicating that the protocol satisfies the at least one other imaging procedure;

storing the protocol and the second indicia in a second data repository.

35. The method of any of claims 33 to 34, wherein at least one of the first or second data repository is searchable based at least in part on at least one of the first or second indicia.

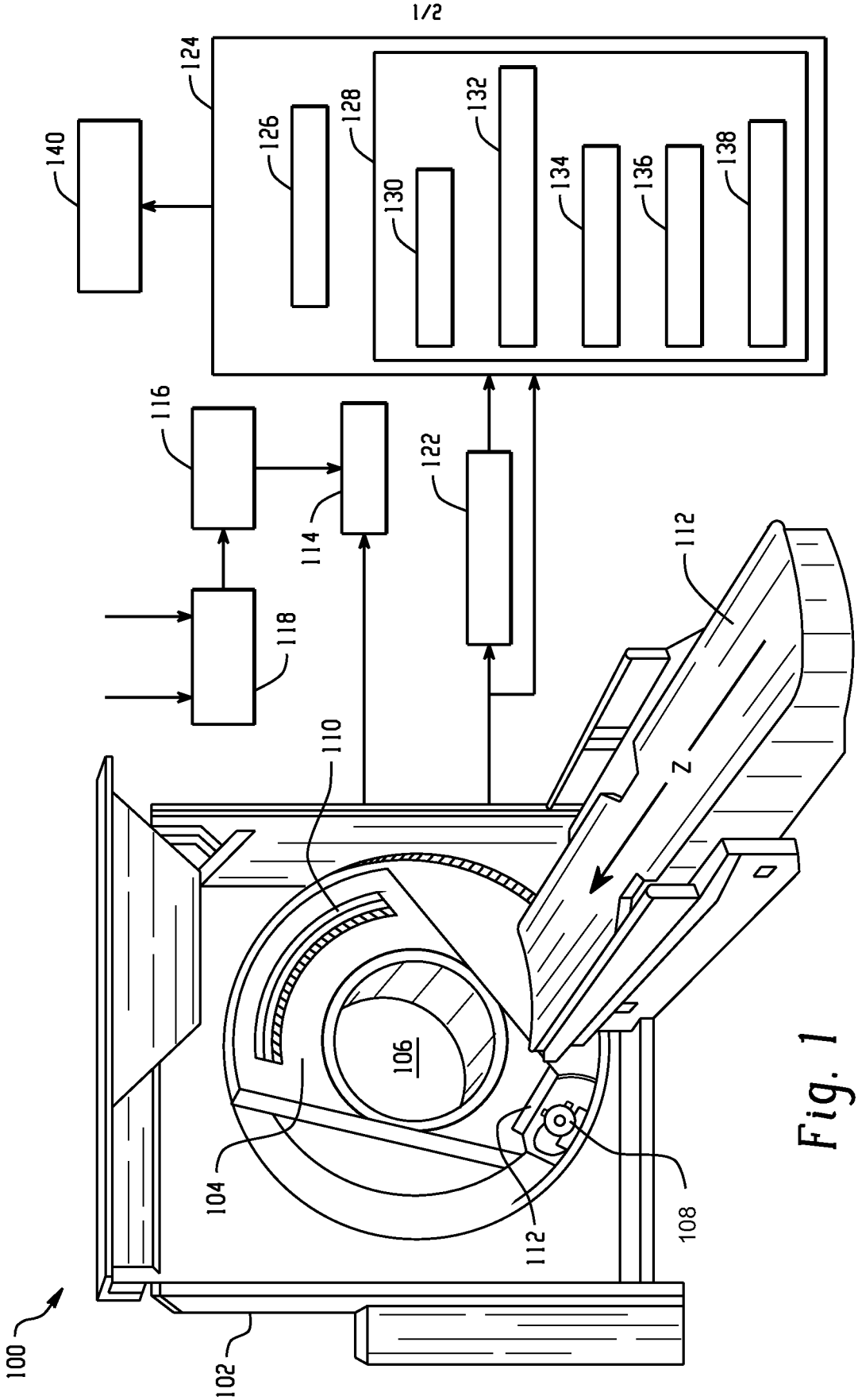
100
102
104
106
108
110
112
114
116
118
122
124
126
128
130
132
134
136
138
140
Z

Fig. 1

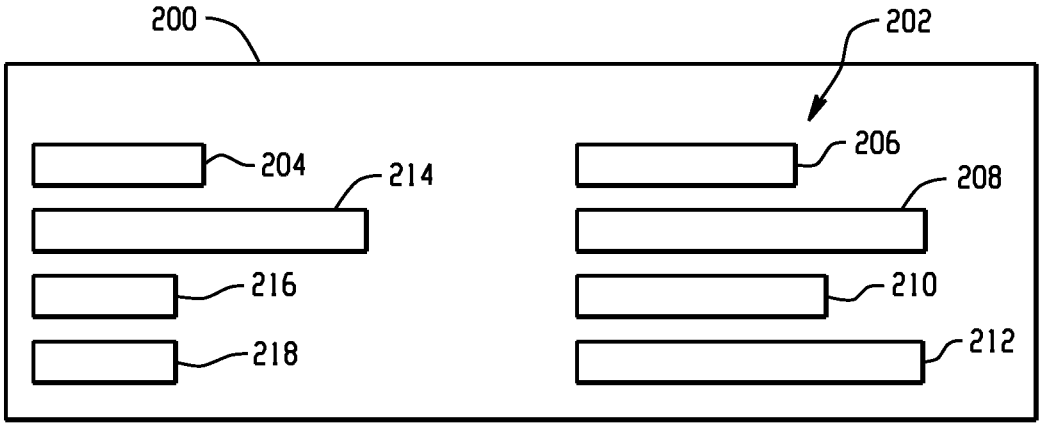

Fig. 2

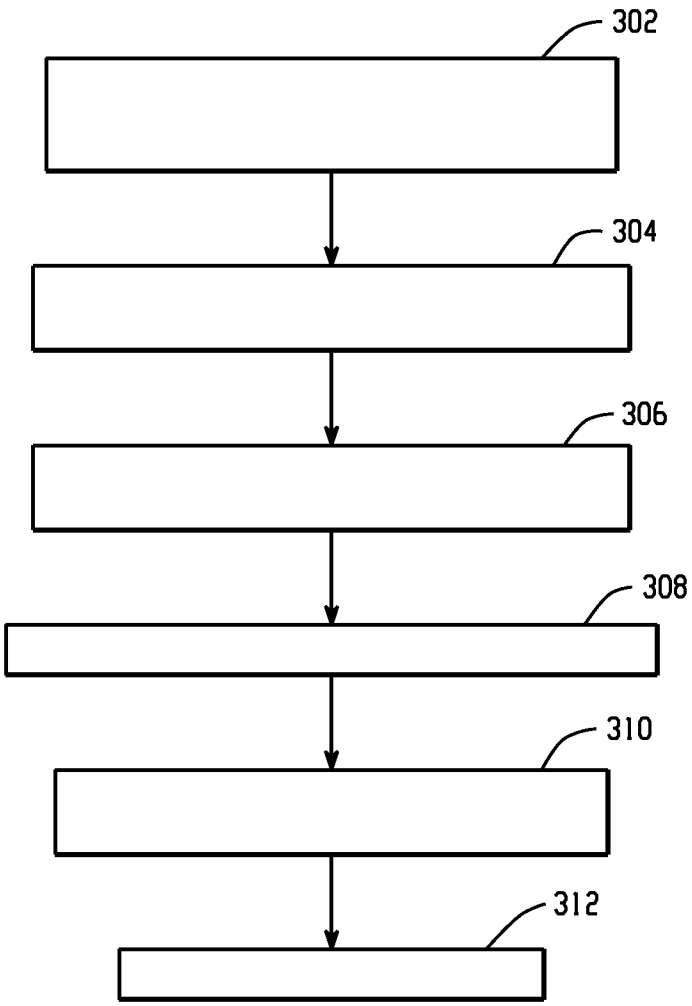

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/052126

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B6/00 G06F19/00
ADD.

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)
A61B 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 387 320 A2 (GE MED SYS GLOBAL TECH CO LLC [US]) 4 February 2004 (2004-02-04)	1,16
A	the whole document	2-15, 17-35
X	US 2003/194120 A1 (UNGER CHRISTOPHER D [US] ET AL) 16 October 2003 (2003-10-16) the whole document	13,14,33
X	JP 2004 208715 A (GE MED SYS GLOBAL TECH CO LLC) 29 July 2004 (2004-07-29) the whole document	1
X	US 2007/041490 A1 (JHA SANJAY K [US] ET AL JHA SANJAY KUMAR [US] ET AL) 22 February 2007 (2007-02-22) paragraph [0059]	1

-/--

[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
7 September 2010	16/09/2010

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, Fax: (+31-70) 340-3016	Anscombe, Marcel

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/052126

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 736 102 A2 (GE MED SYS GLOBAL TECH CO LLC [US]) 27 December 2006 (2006-12-27) the whole document	1
X	EP 0 985 379 A1 (YOKOGAWA MEDICAL SYST [JP]) 15 March 2000 (2000-03-15) the whole document	1
X	RSNA 2008: "Assessment of Bone Mineral Density on CT" INTERNET CITATION 2 December 2008 (2008-12-02), pages 1-2, XP007914706 RSNA 2008 Retrieved from the Internet: URL:http://rsna2008.rsna.org/customcf/conference/event_display.cfm?em_id= 6014550&pr [retrieved on 2010-09-06] the whole document	1-3,16, 17,28
X	"CT Colonography Offers One-Stop Screening for Cancer and Osteoporosis" INTERNET CITATION 2 December 2008 (2008-12-02), pages 1-2, XP007914707 Retrieved from the Internet: URL:http://www.rsna.org/media/pressreleases/PDF/pressreleasePDF.cfm?ID=387 [retrieved on 2010-09-06] the whole document	1-3,16, 17,28
A	WO 2006/101993 A2 (CORNELL RES FOUNDATION INC [US]) 28 September 2006 (2006-09-28) page 7, line 22 - page 8, line 8	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2010/052126

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1387320 A2	04-02-2004	JP 2004065975 A	04-03-2004
		US 2004022359 A1	05-02-2004
US 2003194120 A1	16-10-2003	NONE	
JP 2004208715 A	29-07-2004	JP 4448654 B2	14-04-2010
US 2007041490 A1	22-02-2007	NONE	
EP 1736102 A2	27-12-2006	CN 1969760 A	30-05-2007
		JP 2007000406 A	11-01-2007
		KR 20060135569 A	29-12-2006
		US 2006291612 A1	28-12-2006
EP 0985379 A1	15-03-2000	JP 3313611 B2	12-08-2002
		JP 10305027 A	17-11-1998
		US 6137858 A	24-10-2000
WO 2006101993 A2	28-09-2006	CA 2600158 A1	28-09-2006
		EP 1858408 A2	28-11-2007
		JP 2008537691 T	25-09-2008
		US 2006239544 A1	26-10-2006