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(54) **DIAGNOSTIC IMAGING SYSTEM AND METHOD**

DIAGNOSTISCHES BILDGEBUNGSSYSTEM UND VERFAHREN

SYSTEME ET METHODE DE DIAGNOSTIC PAR IMAGERIE

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the diagnostic imaging arts. It finds particular application in conjunction with diagnostic imaging systems in which raw diagnostic image data from MRI, CT, or PET scanners are reconstructed into an image representation of an examined object.

[0002] Furthermore, the invention relates to a method for diagnostic imaging as well as to a computer program for diagnostic imaging.

BACKGROUND OF THE INVENTION

[0003] Today, in the field of diagnostic imaging, diagnostic scanning apparatuses such as MRI, CT, PET or ultrasound scanners are widely used to generate images of the interior of an object. Typically, medical diagnostic scanners comprise suitable scanning hardware for non-invasively examining the interior of the object with radiation, electromagnetic fields, ultrasound, and the like. A data acquisition system (DAS) is used to convert the data received via the scanning hardware into digital signals that can be further processed. Each scanning apparatus has its own host computer that controls the examination and the data acquisition, and each scanning apparatus uses its own reconstruction unit that reconstructs the resultant data to generate human-readable images of interior regions of the object. In modem scanners the reconstruction unit is a separate computer, for example a high-performance personal computer (PC), which is connected to the host computer and to the DAS via an Ethernet connection.

[0004] The reconstruction process is typically a multi-threaded application in which multiple reconstruction processes can take place in parallel. The acquired raw image data is first decomposed into subsets that can be processed independently. Each subset is then processed by an independent reconstruction process after which the processed subsets are re-combined into clinical image data and sent to a database for storage. It is already known in the art that this architecture lends itself to speed improvements by utilizing a distributed processing approach (see for example US 2006/0116567 A1). Nevertheless, the process of reconstruction is often still very time consuming, and can last for hours after the data is gathered, depending on factors such as the modality, method of reconstruction, the size of the imaging region, resolution, and selected image quality and filtering, among other factors.

[0005] US 2003/0206609 A1 describes a computed tomography (CT) imaging apparatus including a CT imaging scanner that acquires projection data. Data acquisition electronics communicate with the CT scanner, and an acquisition computer receives the projection data via the data acquisition electronics. A communication network communicates with the acquisition computer and with at least one additional computer. The at least one additional computer cooperates with the data acquisition computer and the communication network to define a computational pipeline that reconstructs selected projection data into a selected image representation.

[0006] It is an object of the invention to provide a diagnostic imaging system that minimizes reconstruction time.

SUMMARY OF THE INVENTION

[0007] In accordance with the present invention, a diagnostic imaging system according to claim 1 is disclosed.

[0008] The invention describes a software and hardware architecture that allows multiple scanning apparatuses, that are connected by a communication link (for example a computer network), to utilize the total available reconstruction resources in order to minimize reconstruction time. Reconstruction tasks from each single scanner installation are distributed amongst all the scanning apparatuses on the network. In this way, idle CPU time on the reconstruction units of one scanner can be used by another scanner operating at a physically different location.

[0009] On a larger scale, the pool of reconstruction units can be extended to systems in the world-wide installed base (for example via the Internet). A single scanning apparatus in a hospital can use the reconstruction pool from scanning apparatuses installed at other sites in the world. An efficient use of their data reconstruction capacity is enabled by the approach of the invention.

[0010] With the approach of the invention it becomes attractive to transport raw image data from all scanners on the network to a central shared image database such as it is used by a PACS system. The need to store image data locally on each scanning apparatus as well as the need to provide hardware for this purpose is eliminated.

[0011] In addition to running the parallel reconstruction processes on a single reconstruction unit supplied with each scanning apparatus as it is known in the art (see above), the invention proposes to enable distribution of the image data subsets and reconstruction processes between the reconstruction hardware of a plurality of scanning apparatuses. On a local scale, a hospital that installs multiple diagnostic scanners (for example MRI, CT, or PET scanners) would benefit from the possibility that each scanner is able to use the reconstruction resources from all other scanners available on the network.

[0012] The subsets of the raw imaging data processed by the remote reconstruction units can be transferred back either to the same scanning apparatus or to a central image database, i.e. the PACS system. When transferred to the PACS system, the images could be viewed on the console of the scanner used for examination by accessing the PACS database. The images can also be viewed at any location that has access to the PACS system.

[0013] Management and configuration of the distributed reconstruction and archiving functionality is implemented according to the invention by a separate reconstruction server connected to the network. The reconstruction server is used to distribute and coordinate the pending reconstruction jobs and to conduct an effective 'load balancing' for the reconstruction units within the diagnostic imaging system of the invention. The overall reconstruction performance can be further optimized in this way.

[0014] The invention not only relates to a diagnostic imaging system but also to a method of diagnostic imaging according to claim 6.

[0015] A computer program adapted for carrying out the method of the invention can advantageously be implemented on any common computer hardware, which is presently in clinical use for the control of medical scanning apparatuses. The computer program can be provided on suitable data carriers, such as DVD, CD-ROM or diskette. Alternatively, it can also be downloaded by a user from an Internet server.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The enclosed drawings disclose preferred embodiments of the present invention. It should be understood, however, that the drawings are designed for the purpose of illustration only and not as a definition of the limits of the invention. In the drawings

Fig. 1 shows a conventional MR scanner constituting a scanning apparatus within the meaning of the present invention;

Fig. 2 shows a block diagram of a first embodiment of a diagnostic imaging system according to the invention;

Fig. 3 shows a block diagram of a second embodiment of a diagnostic imaging system according to the invention

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] With reference to FIGURE 1, a main magnetic field control 10 controls superconducting or resistive magnets 12 such that a substantially uniform, temporally constant main magnetic field is created along a z axis through an examination region 14. A magnetic resonance generation and manipulation system applies a series of radio frequency (RF) and magnetic field gradient pulses to invert or excite magnetic spins, induce magnetic resonance, refocus magnetic resonance, manipulate magnetic resonance, spatially and otherwise encode the magnetic resonance, to saturate spin, and the like to generate magnetic resonance imaging and spectroscopy sequences.

[0018] More specifically, gradient pulse amplifiers 20 apply current pulses to selected ones or pairs of whole-body gradient coils 22 to create magnetic field gradients along x, y and z-axes of the examination region 14. A digital radio frequency transmitter 24 transmits radio frequency pulses or pulse packets to a whole-body RF coil 26 to transmit RF pulses into the examination region. A typical radio frequency pulse is composed of a packet of immediately contiguous pulse segments of short duration which taken together with each other and any applied gradients achieve a selected magnetic resonance manipulation. The RF pulses are used to saturate, excite resonance, invert magnetization, refocus resonance, or manipulate resonance in selected portions of the examination region. For whole-body applications, the resonance signals are commonly picked up by the whole-body RF coil 26.

[0019] For generating images of limited regions of the subject, local coils (not shown) are commonly placed contiguous to the selected region. For example, a receive-only local radio frequency coil can be used to receive resonance signals introduced by body-coil RF transmissions.

[0020] The resultant radio frequency signals are picked up by the whole-body RF coil 26 or other specialized RF coils and demodulated by a receiver 32 preferably including a preamplifier (not shown).

[0021] A host computer 40 controls the gradient pulse amplifiers 20 and the transmitter 24 to generate any of a plurality of multiple echo sequences such as echo planar imaging, echo volume imaging, gradient and spin echo imaging, fast spin echo imaging, and the like. For the selected sequence, the receiver 32 receives a plurality of data lines in rapid succession following each RF excitation pulse. A data acquisition system (DAS) 42 performs analog-to-digital conversion of the received signals and converts each data line to a digital format suitable for further processing. In modem MRI scanners the DAS 42 is a separate computer which is specialized in acquisition of raw image data.

[0022] Ultimately, the digital raw image data is reconstructed into an image representation by a reconstruction processor 50 which applies a Fourier transform or other appropriate reconstruction algorithm. The image may represent a planar slice through the patient, an array of parallel planar slices, a three-dimensional volume, or the like. The image is then stored in an image-memory 52 of the host computer 40 where it may be accessed for converting slices, projections, or other portions of the image representation into appropriate format for a display, such as a video monitor 56 which provides a manreadable display of the resultant image.

[0023] With reference to FIGURE 2, a first embodiment of a diagnostic imaging system according to the invention comprises three MR scanners 60, 70, 80 of the type depicted in FIGURE 1. The data acquisition systems 42 and the reconstruction units 50 of each MR scanner 60, 70, 80 are connected directly to a dedicated high-speed local area network 90. If, for example, scanner 60 is used for examination of a patient, the host computer 40 of scanner 60 decomposes the raw image data generated by its data

acquisition systems 42 into subsets that can be processed independently. A reconstruction server 100, which is also connected to the network 90, manages and coordinates the distribution of the subsets of the raw image data via the network 90 among the scanners 60, 70, 80 for parallel processing by the reconstruction units 50 of the respective scanners 60, 70, 80. Thereafter, the subsets processed by the reconstruction units 50 of the scanners 70 and 80 are transferred via the network 90 back to the reconstruction unit 50 of the scanner 60 where the processed subsets are re-combined into clinical image data. From scanner 60 this image data is sent via a regular hospital network 110, which is separate from the dedicated high-speed network 90, to a hospital PACS database server 120 where the image is stored under the corresponding patient ID. The medical images can be viewed via each video console 56 of the MR scanners 60, 70, 80 by accessing the PACS database server 120.

[0024] With reference to FIGURE 3, only a single network 90 is used for connecting the MR scanners 60, 70, 80 as well as the reconstruction server 100 and the PACS database server 120. The image data subsets processed by the reconstruction units 50 of the scanner 60, 70, 80 are transferred directly via the network 90 to the central PACS database server 120. This version of the invention eliminates the need to store images locally at each scanner 60, 70, 80. The video consoles 56 of the scanners are connected directly to the network 90 for enabling them to access the image data stored in the PACS database 120.

Claims

1. Diagnostic imaging system comprising:

a plurality of scanning apparatuses (60, 70, 80) each comprising scanning hardware, a data acquisition system (42) connected to the scanning hardware for generating raw image data representative of an object disposed in an imaging region of the scanning apparatus (60, 70, 80), a reconstruction unit (50) processing the raw image data for reconstructing an image representation therefrom, and a host computer (40) controlling the scanning hardware and the reconstruction unit (50);
a communication link (90) distributing subsets of the raw image data generated by the data acquisition system (42) of one of the scanning apparatuses (60, 70, 80) for parallel processing by the reconstruction units (50) of the scanning apparatuses (60, 70, 80) connected via the communication link (90);

the imaging system being **characterised by**
a reconstruction server (100) connected to the communication link (90), which reconstruction server (100) is separate from the host computers (40) of the scanning apparatuses (60, 70, 80) and which coordinates the distribution of the subsets of the raw image data among the available reconstruction units (50) of the scanning apparatuses (60, 70, 80) connected via the communication link (90).

2. Diagnostic imaging system of claim 1, wherein the communication link (90) transfers the processed subsets to one of the scanning apparatuses (60, 70, 80) or to a central image data base (120).

3. Diagnostic imaging system of claim 1 or 2, wherein the host computer (40) of each scanning apparatus (60, 70, 80) is arranged to perform at least one of:

decomposing the raw image data generated by the data acquisition system (42) of the scanning apparatus (60, 70, 80) into subsets;
sending at least one of the subsets of the raw image data via the communication link (90) to another scanning apparatus (60, 70, 80);
recombining the subsets processed in parallel by the reconstruction units (50) of the scanning apparatuses (60, 70, 80) into an image representation of the object.

4. Diagnostic imaging system of any one of claims 1-3, wherein the communication link (90) is a local area network connection or an Internet connection.

5. Diagnostic imaging system of any one of claims 1-4, wherein the scanning apparatuses (60, 70, 80) are MRI scanners, CT scanners, PET scanners or ultrasound scanners.

6. Method of diagnostic imaging comprising:

generating raw image data representative of an object disposed in an imaging region of one of a plurality of scanning apparatuses (60, 70, 80), each of the scanning apparatuses (60, 70, 80) comprising scanning hardware, a data acquisition system (42) connected to the scanning hardware for generating the raw image data, a reconstruction unit (50) for processing the raw image data for reconstructing an image representation therefrom, and a host computer (40) controlling the scanning hardware and the reconstruction unit (50);
decomposing the raw image data generated by the data acquisition system (42) into subsets;
distributing the subsets of the raw image data via a communication link (90) among the plurality of scanning apparatuses (60, 70, 80) for parallel processing by the reconstruction units (50) of the respective scanning apparatuses (60, 70, 80), wherein the distribution of the subsets of

the raw image data among the available reconstruction units (50) of the scanning apparatuses (60, 70, 80) connected via the communication link (90) is coordinated by a reconstruction server (100), which is separate from the host computers (40) of the scanning apparatuses (60, 70, 80);
recombining the subsets processed by the reconstruction units (50) of the scanning apparatuses (60, 70, 80) into an image representation of the object.

7. Method of claim 6, wherein the processed subsets are transferred via the communication link (90) to one of the scanning apparatuses (60, 70, 80) or to a central image data base (120).

8. Computer program for diagnostic imaging comprising instructions for:

decomposing raw image data generated by a data acquisition system (42) of one of a plurality of scanning apparatuses (60, 70, 80) into subsets;
distributing the subsets of the raw image data via a communication link (90) among the plurality of scanning apparatuses (60, 70, 80) for parallel processing by reconstruction units (50) of the respective scanning apparatuses (60, 70, 80);
recombining the subsets processed by the reconstruction units (50) of the scanning apparatuses (60, 70, 80) into an image representation of the object,
wherein the distribution of the subsets of the raw image data among the available reconstruction units (50) of the scanning apparatuses (60, 70, 80) connected via the communication link (90) is coordinated by a reconstruction server (100), which is separate from host computers (40) controlling the scanning hardware and the reconstruction units (50) of the scanning apparatuses (60, 70, 80).

9. Computer program of claim 8, further comprising instructions for transferring the processed subsets to one of the scanning apparatuses (60, 70, 80) or to a central image data base (120).

Patentansprüche

1. Diagnostisches Bildgebungssystem, das Folgendes umfasst:

eine Vielzahl von Scannern (60, 70, 80), die jeweils Scanhardware, ein Datenerfassungssystem (42), das zur Erzeugung von Rohbilddaten, die ein in einer Abbildungsregion des Scanners (60, 70, 80) befindliches Objekt darstellen, mit der Scanhardware verbunden ist, eine Rekonstruktionseinheit (50), die die Rohbilddaten zur Rekonstruktion einer entsprechenden Bilddarstellung verarbeitet, und einen Hostcomputer (40) umfassen, der die Scanhardware und die Rekonstruktionseinheit (50) steuert,
eine Übertragungsverbindung (90), die Teilsätze der von dem Datenerfassungssystem (42) eines der Scanner (60, 70, 80) erzeugten Rohbilddaten zur Parallelverarbeitung durch die Rekonstruktionseinheiten (50) der Scanner (60, 70, 80) weiterleitet, die über die Übertragungsverbindung (90) verbunden sind,

wobei das Bildgebungssystem **gekennzeichnet ist durch**
einen Rekonstruktionsserver (100), der mit der Übertragungsverbindung (90) verbunden ist, wobei der Rekonstruktionsserver (100) von den Hostcomputem (40) der Scanner (60, 70, 80) getrennt ist und die Weiterleitung der Teilsätze mit Rohbilddaten zwischen den verfügbaren Rekonstruktionseinheiten (50) der Scanner (60, 70, 80), die über die Übertragungsverbindung (90) verbunden sind, koordiniert.

2. Diagnostisches Bildgebungssystem nach Anspruch 1, wobei die Übertragungsverbindung (90) die verarbeiteten Teilsätze zu einem der Scanner (60, 70, 80) oder zu einer zentralen Bilddatenbank (120) weiterleitet.

3. Diagnostisches Bildgebungssystem nach Anspruch 1 oder 2, wobei der Hostcomputer (40) jedes Scanners (60, 70, 80) für die Durchführung zumindest eines der folgenden Schritte ausgelegt ist:

Zerlegen der von dem Datenerfassungssystem (42) des Scanners (60, 70, 80) erzeugten Rohbilddaten in Teilsätze,
Senden zumindest eines der Teilsätze mit Rohbilddaten über die Übertragungsverbindung (90) an einen anderen Scanner (60, 70, 80),
Rekombinieren der durch die Rekonstruktionseinheiten (50) der Scanner (60, 70, 80) parallel verarbeiteten Teilsätze zu einer Bilddarstellung des Objekts.

4. Diagnostisches Bildgebungssystem nach einem der Ansprüche 1 bis 3, wobei die Übertragungsverbindung (90) eine LAN-Verbindung oder eine Internetverbindung ist.

5. Diagnostisches Bildgebungssystem nach einem der Ansprüche 1 bis 4, wobei die Scanner (60, 70, 80) MRT-Scanner, CT-Scanner, PET-Scanner oder Ultraschall-Scanner sind.

6. Verfahren zur diagnostischen Bildgebung, das Folgendes umfasst:

Erzeugen von Rohbilddaten, die ein in einer Abbildungsregion eines einer Vielzahl von Scannern (60, 70, 80) befindliches Objekt darstellen, wobei jeder der Scanner (60, 70, 80) Scanhardware, ein Datenerfassungssystem (42), das mit der Scanhardware verbunden ist, zur Erzeugung der Rohbilddaten, eine Rekonstruktionseinheit (50), die die Rohbilddaten zur Rekonstruktion einer entsprechenden Bilddarstellung verarbeitet, und einen Hostcomputer (40) umfasst, der die Scanhardware und die Rekonstruktionseinheit (50) steuert,
Zerlegen der von dem Datenerfassungssystem (42) erzeugten Rohbilddaten in Teilsätze,
Weiterleiten der Teilsätze der Rohbilddaten über eine Übertragungsverbindung (90) zwischen der Vielzahl von Scannern (60, 70, 80) zur Parallelverarbeitung durch die Rekonstruktionseinheiten (50) der entsprechenden Scanner (60, 70, 80), wobei die Weiterleitung der Teilsätze mit Rohbilddaten zwischen der verfügbaren Rekonstruktionseinheiten (50) der Scanner (60, 70, 80), die über die Übertragungsverbindung (90) verbunden sind, von einem Rekonstruktionsserver (100) koordiniert wird, der von den Hostcomputem (40) der Scanner (60, 70, 80) getrennt ist,
Rekombinieren der durch die Rekonstruktionseinheiten (50) der Scanner (60, 70, 80) parallel verarbeiteten Teilsätze zu einer Bilddarstellung des Objekts.

7. Verfahren nach Anspruch 6, wobei die verarbeiteten Teilsätze über die Übertragungsverbindung (90) zu einem der Scanner (60, 70, 80) oder zu einer zentralen Bilddatenbank (120) weitergeleitet werden.

8. Computerprogramm für die diagnostische Bildgebung, das Befehle für folgende Schritte umfasst:

Zerlegen der von einem Datenerfassungssystem (42) eines einer Vielzahl von Scannern (60, 70, 80) erzeugten Rohbilddaten in Teilsätze,
Weiterleiten der Teilsätze der Rohbilddaten über eine Übertragungsverbindung (90) zwischen der Vielzahl von Scannern (60, 70, 80) zur Parallelverarbeitung durch die Rekonstruktionseinheiten (50) der entsprechenden Scanner (60, 70, 80),
Rekombinieren der durch die Rekonstruktionseinheiten (50) der Scanner (60, 70, 80) parallel verarbeiteten Teilsätze zu einer Bilddarstellung des Objekts,
wobei die Weiterleitung der Teilsätze der Rohbilddaten zwischen den verfügbaren Rekonstruktionseinheiten (50) der Scanner (60, 70, 80), die über die Übertragungsverbindung (90) verbunden sind, von einem Rekonstruktionsserver (100) koordiniert wird, der von den Hostcomputem (40) der Scanner (60, 70, 80) getrennt ist, die die Scanhardware und die Rekonstruktionseinheiten (50) der Scanner (60, 70, 80) steuern.

9. Computerprogramm nach Anspruch 8, das ferner Befehle zur Weiterleitung der verarbeiteten Teilsätze an einen der Scanner (60, 70, 80) oder an eine zentrale Bilddatenbank (120) umfasst.

Revendications

1. Système de diagnostic par imagerie comprenant :

une pluralité d'appareils de balayage (60, 70, 80) comprenant chacun un matériel de balayage, un système d'acquisition de données (42) connecté au matériel de balayage pour générer des données d'image brute représentant un objet disposé dans une région d'imagerie de l'appareil de balayage (60, 70, 80), une unité de reconstruction (50) traitant les données d'image brute pour reconstruire une représentation d'image à partir de celles-ci et un ordinateur hôte (40) commandant le matériel de balayage et l'unité de reconstruction (50) ;
un lien de communication (90) distribuant des sous-ensembles des données d'image brute générées par le système d'acquisition de données (42) d'un des appareils de balayage (60, 70, 80) pour effectuer un traitement en parallèle par les unités de reconstruction (50) des appareils de balayage (60, 70, 80) connectés par l'intermédiaire du lien de communication (90) ;
le système d'imagerie étant **caractérisé par** un serveur de reconstruction (100) connecté au lien de communication (90), ledit serveur de reconstruction (100) étant séparé des ordinateurs hôtes (40) des appareils de balayage (60, 70, 80) et coordonnant la distribution des sous-ensembles des données d'image brute parmi les unités de reconstruction (50) disponibles des appareils de balayage (60, 70, 80) connectés par l'intermédiaire du lien de communication (90).

2. Système de diagnostic par imagerie selon la revendication 1, dans lequel le lien de communication (90) transfert les sous-ensembles traités à un des appareils de balayage (60, 70, 80) ou à une base centrale de données d'images (120).

3. Système de diagnostic par imagerie selon la revendication 1 ou 2, dans lequel l'ordinateur hôte (40) de

chaque appareil de balayage (60, 70, 80) est conçu pour effectuer au moins une des actions suivantes :

la décomposition des données d'image brute générées par le système d'acquisition de données (42) de l'appareil de balayage (60, 70, 80) en sous-ensembles ;
l'envoi d'au moins un des sous-ensembles des données d'image brute par l'intermédiaire du lien de communication (90) à un autre appareil de balayage (60, 70, 80) ;
la recombinaison des sous-ensembles traités en parallèle par les unités de reconstruction (50) des appareils de balayage (60, 70, 80) en une représentation d'image de l'objet.

4. Système de diagnostic par imagerie selon l'une quelconque des revendications 1 à 3, dans lequel le lien de communication (90) est une connexion à un réseau local ou une connexion Internet.

5. Système de diagnostic par imagerie selon l'une quelconque des revendications 1 à 4, dans lequel les appareils de balayage (60, 70, 80) sont des appareils d'imagerie par résonance magnétique, des tomodensimètres, des tomographes par émission de positions ou des dispositifs de balayage à ultrasons.

6. Procédé de diagnostic par imagerie comprenant :

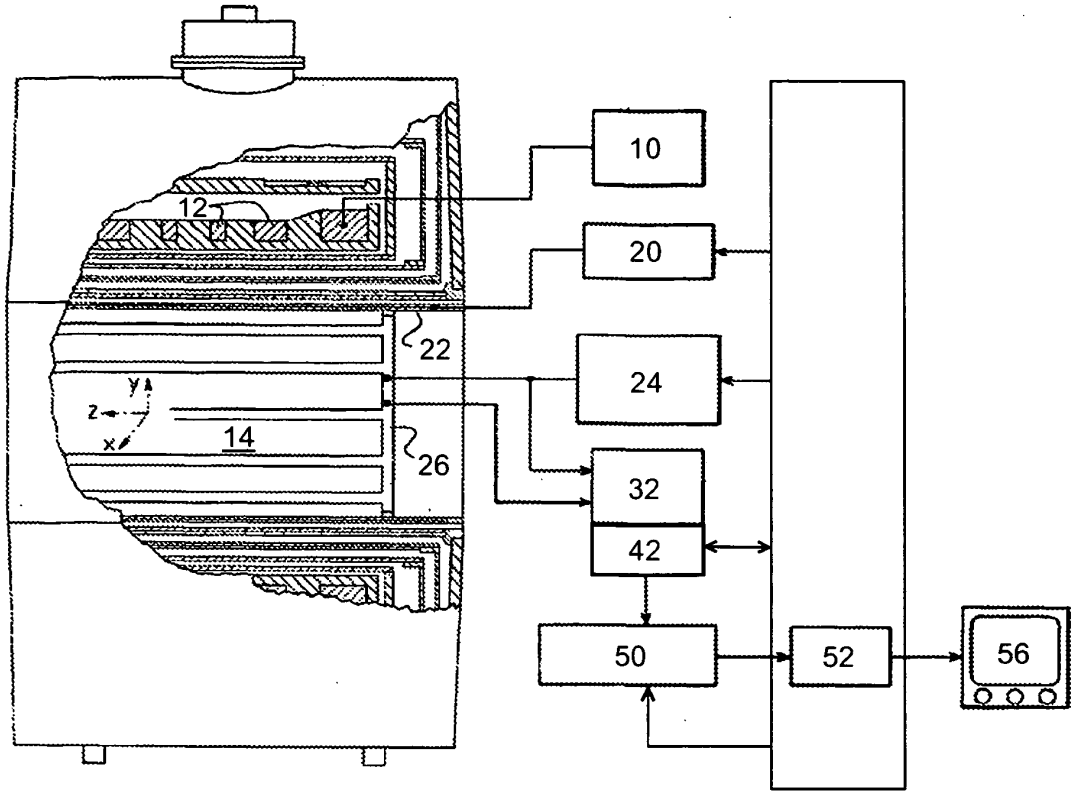
la génération de données d'image brute représentant un objet disposé dans une région d'imagerie d'un appareil de balayage d'une pluralité d'appareils de balayage (60, 70, 80), chacun des appareils de balayage (60, 70, 80) comprenant un matériel de balayage, un système d'acquisition de données (42) connecté au matériel de balayage pour générer des données d'image brute, une unité de reconstruction (50) pour traiter les données d'image brute afin de reconstruire une représentation d'image à partir de celles-ci et un ordinateur hôte (40) commandant le matériel de balayage et l'unité de reconstruction (50) ;
la décomposition des données d'image brute générées par le système d'acquisition de données (42) en sous-ensembles ;
la distribution des sous-ensembles des données d'image brute par l'intermédiaire d'un lien de communication (90) parmi la pluralité d'appareils de balayage (60, 70, 80) pour effectuer un traitement en parallèle par les unités de reconstruction (50) des appareils de balayage (60, 70, 80) respectifs, dans lequel la distribution des sous-ensembles des données d'image brute parmi les unités de reconstruction (50) disponibles des appareils de balayage (60, 70, 80) connectés par l'intermédiaire du lien de communication (90) est coordonnée par un serveur de reconstruction (100) qui est séparé des ordinateurs hôtes (40) des appareils de balayage (60, 70, 80) ;
la recombinaison des sous-ensembles traités par les unités de reconstruction (50) des appareils de balayage (60, 70, 80) en une représentation d'image de l'objet.

7. Procédé selon la revendication 6, dans lequel les sous-ensembles traités sont transférés par l'intermédiaire du lien de communication (90) à un des appareils de balayage (60, 70, 80) ou à une base centrale de données d'images (120).

8. Programme informatique de diagnostic par imagerie comprenant des instructions pour :

décomposer des données d'image brute générées par un système d'acquisition de données (42) d'un appareil de balayage d'une pluralité d'appareils de balayage (60, 70, 80) en sous-ensembles ;
distribuer les sous-ensembles des données d'image brute par l'intermédiaire d'un lien de communication (90) parmi la pluralité d'appareils de balayage (60, 70, 80) pour effectuer un traitement en parallèle par des unités de reconstruction (50) des appareils de balayage (60, 70, 80) respectifs ;
recombiner les sous-ensembles traités par les unités de reconstruction (50) des appareils de balayage (60, 70, 80) en une représentation d'image de l'objet,
dans lequel la distribution des sous-ensembles des données d'image brute parmi les unités de reconstruction (50) disponibles des appareils de balayage (60, 70, 80) connectés par l'intermédiaire du lien de communication (90) est coordonnée par un serveur de reconstruction (100) qui est séparé des ordinateurs hôtes (40) contrôlant le matériel de balayage et les unités de reconstruction (50) des appareils de balayage (60, 70, 80).

9. Programme informatique selon la revendication 8, comprenant en outre des instructions pour transférer les sous-ensembles traités à un des appareils de balayage (60, 70, 80) ou à une base centrale de données d'images (120).


10
12
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42
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56

FIG. 1

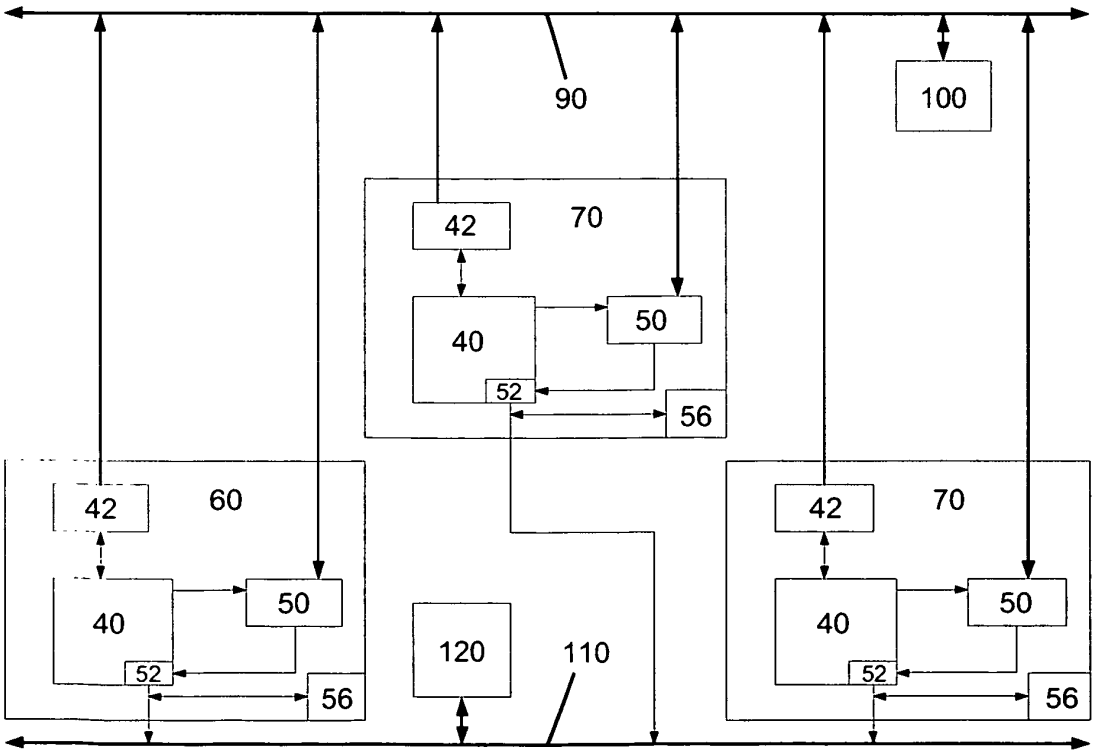
90
100
42
70
40
50
52
56
42
60
40
50
52
56
120
110
42
70
40
50
52
56

FIG. 2

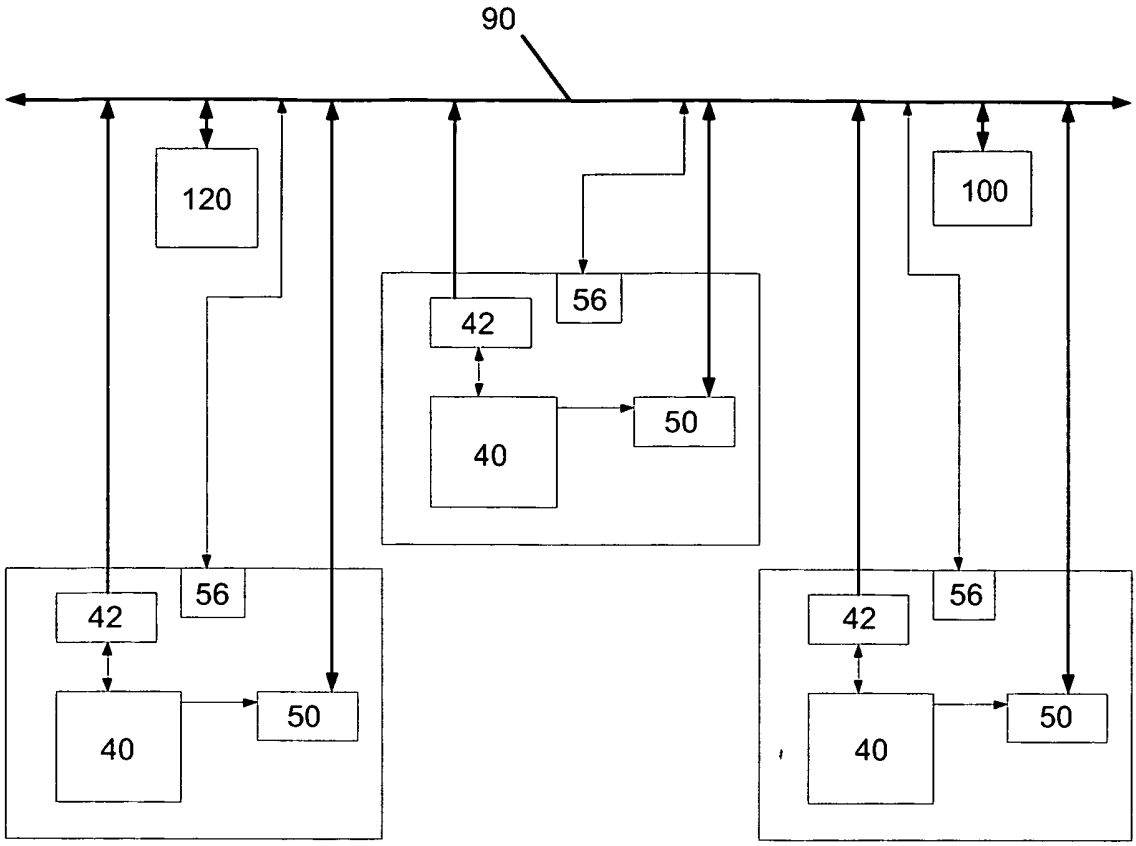

FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20060116567 A1 **[0004]**
- US 20030206609 A1 **[0005]**

专利名称(译)	诊断成像系统和方法		
公开(公告)号	EP2341819B1	公开(公告)日	2013-12-04
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优先权	2008165188 2008-09-26 EP		
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外部链接	Espacenet		

摘要(译)

本发明涉及一种诊断成像系统。该系统包括多个扫描装置（60,70,80）。每个扫描装置（60,70,80）包括扫描硬件，连接到扫描硬件的数据采集系统（42），用于产生表示设置在扫描装置（60,70,80）的成像区域中的物体的原始图像数据。 ）和处理原始图像数据的重建单元（50），用于从其重建图像表示。本发明提出由扫描装置（60,70,80）之一的数据获取系统（42）产生的原始图像数据的子集通过扫描装置（60,70）之间的通信链路（90）分发。 80）用于由各扫描装置（60,70,80）的重建单元（50）进行并行处理。

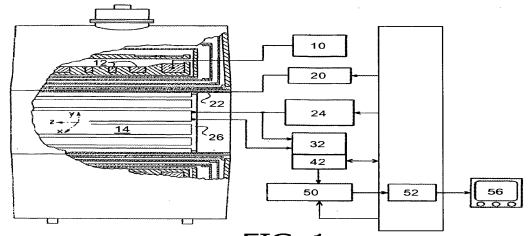

FIG. 1

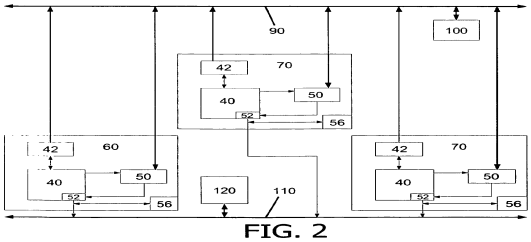

FIG. 2