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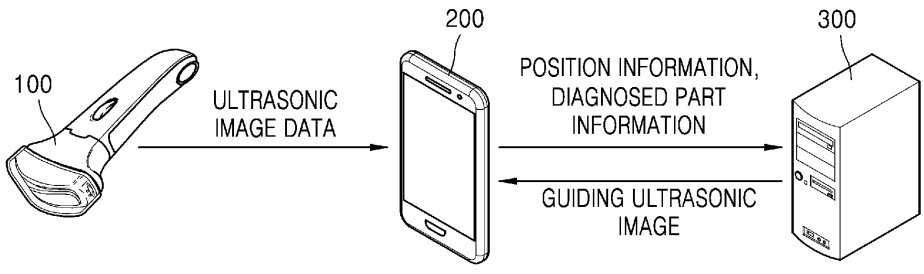
(54) **PORTABLE ULTRASONIC DIAGNOSTIC SYSTEM PROVIDING GUIDING ULTRASONIC IMAGE**

(57) A portable ultrasonic diagnostic system, according to the present invention, comprises: a portable ultrasonic diagnostic device; an ultrasonic diagnostic application installed in a portable terminal and for receiving ultrasonic image data from the portable ultrasonic diagnostic device and displaying an ultrasonic image by means of a display screen of the portable terminal; and an ultrasonic image server for storing a guiding ultrasonic image for each diagnosis area and each body part to be diagnosed, wherein the ultrasonic diagnostic application transmits the location information of the portable terminal and the information of the body part to be diagnosed to the ultrasonic image server, the ultrasonic image server provides the ultrasonic diagnosis application with a guiding ultrasonic image of a diagnosis area and a body part to be diagnosed which correspond to the location information and the information of the body part to be diagnosed, and the ultrasonic diagnosis application displays the guiding ultrasonic image provided from the ultrasonic image server with the ultrasonic image.

FIG. 1



EP 3 456 264 A1

Description

Technical Field

[0001] The present invention relates to an ultrasonic diagnostic system, and more particularly, to a potable ultrasonic diagnostic system which connects a portable ultrasonic diagnostic device and a portable terminal to each other through wireless communication and performs an ultrasonic diagnosis.

Background Art

[0002] Ultrasonic diagnoses are generally used in the medical field for obtaining information on an inside of an object to be inspected due to noninvasive and nondestructive properties thereof. Since ultrasonic diagnoses can provide a high-resolution image of internal organs of an object to be inspected, to a practitioner without a surgical operation of directly incising and observing the object, ultrasonic diagnostic systems are very significantly used.

[0003] An ultrasonic diagnostic system is a system which obtains images concerning tomography of soft tissue or blood flows without invasion by emitting an ultrasonic signal from a body surface of an object to be inspected toward a target part in a body and extracting information from the reflected ultrasonic signal.

[0004] Such ultrasonic diagnostic systems are generally used for diagnosing a heart, abdominal organs, urinary organs, and genital organs due to a small size, a low price, a capability of displaying in real time, and high security thereof without radiation exposure of X-rays or the like in comparison to an X-ray inspection device, a computerized tomography (CT) scanner, a magnetic resonance image (MRI) scanner, a nuclear medicine inspection device, and the like.

[0005] Recently, attempts have been made to embody a portable ultrasonic diagnostic device and connect a portable terminal such as a smart phone and a tablet personal computer (PC) to the ultrasonic diagnostic device through wireless communications so as to perform ultrasonic diagnoses.

Disclosure of Invention

Technical Problem

[0006] In obtaining of a diagnostic image by using an ultrasonic diagnostic device, a skilled expert such as a general practitioner may easily obtain a diagnostic image but an unskilled user may have trouble in obtaining a desired diagnostic image. That is, when a diagnosis is performed by using an ultrasonic diagnostic device, to obtain an adequate ultrasonic image, it is necessary but difficult for an unskilled user to perform scanning at a precise angle.

[0007] In addition, due to freely movable properties, a portable ultrasonic diagnostic device may be generally used by an unskilled user and may be usefully used, out of clinics, in an actual practice, and additionally, weak health-care countries which lack of medical facilities or medical teams.

[0008] The present invention is directed to providing a portable ultrasonic diagnostic system capable of easily performing a diagnosis and helping obtaining a desired diagnostic image when an unskilled user performs a diagnosis by using a portable ultrasonic diagnostic device.

Technical Solution

[0009] One aspect of the present invention provides a portable ultrasonic diagnostic system including a portable ultrasonic diagnostic device, an ultrasonic diagnostic application which is installed in a portable terminal, receives ultrasonic image data from the portable ultrasonic diagnostic device, and displays an ultrasonic image through a display screen of the portable terminal, and an ultrasonic image server which stores guiding ultrasonic images for each diagnosis location and diagnosed part. Here, the ultrasonic diagnostic application transmits position information of the portable terminal and diagnosed part information to the ultrasonic image server. Also, the ultrasonic image server provides guiding ultrasonic images of a diagnosis location and a diagnosed part corresponding to the position information and the diagnosed part information to the ultrasonic diagnostic application. Also, the ultrasonic diagnostic application displays the ultrasonic image with the guiding ultrasonic image provided from the ultrasonic image server.

[0010] The diagnosed part information may be set by a user in the ultrasonic diagnostic application.

[0011] The ultrasonic image server may receive recommendation information of a guiding ultrasonic image to be recommended among guiding ultrasonic images for each diagnosed part from an ultrasonic diagnostic application whose user is a general practitioner, may record a recommendation number for each guide image, and may provide a guiding ultrasonic image whose recommendation number is greatest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

[0012] The ultrasonic image server may provide a plurality of guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to each of ultrasonic diagnostic applications of a plurality of users, may allow the users to select the guiding ultrasonic image to be displayed with the ultrasonic image through the ultrasonic diagnostic application, may record a selection number for each guide image according to selections of the users, and may provide a guiding ultrasonic image whose selection number is greatest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

[0013] The ultrasonic image server may record a signal to ratio (SNR) for each guiding ultrasonic image and may provide a guiding ultrasonic image whose SNR is highest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

[0014] The ultrasonic diagnostic application may transmit gender information or age information of an object to be diagnosed to the ultrasonic image server, and the ultrasonic image server may provide a guiding ultrasonic image corresponding to the gender information or the age information among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

Advantageous Effects

[0015] According to the present invention, an unskilled user may easily perform a diagnosis by using a portable ultrasonic diagnostic device, may obtain a desired diagnostic image, and may obtain a more accurate diagnostic image by using a guiding ultrasonic image on which a diagnosis location is reflected.

Brief Description of Drawings

[0016]

FIG. 1 illustrates components of a portable ultrasonic diagnostic system according to one embodiment of the present invention.

FIG. 2 illustrates a screen of an ultrasonic diagnostic application according to one embodiment of the present invention.

FIG. 3 illustrates additional components of a portable ultrasonic diagnostic system according to one embodiment of the present invention.

FIG. 4 illustrates additional components of a portable ultrasonic diagnostic system according to another embodiment of the present invention.

FIG. 5 illustrates one example of a list of guiding ultrasonic images which are stored in an ultrasonic image server.

Mode for Invention

[0017] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the attached drawings. In the following description and the attached drawings, substantially like elements are referred to as like reference numerals such that a repetitive description will be omitted. In the description of the present invention, a detailed description on well-known functions or components of the related art will be omitted when it is deemed to obscure the essence of the present invention.

[0018] FIG. 1 illustrates components of a portable ultrasonic diagnostic system according to one embodiment of the present invention.

[0019] Referring to FIG. 1, a portable ultrasonic diagnostic system according to the embodiment includes an ultrasonic diagnostic device 100, a portable terminal 200, and an ultrasonic diagnostic application installed thereon, and an ultrasonic image server 300.

[0020] The portable ultrasonic diagnostic device 100 includes an ultrasonic probe, which transmits an ultrasonic signal to an object to be inspected and receives an ultrasonic echo signal reflected by the object and transmits ultrasonic image data (for example, scan line data or frame data) obtained from the ultrasonic echo signal to the portable terminal 200. The portable ultrasonic diagnostic device 100 includes a communication module for transmitting and receiving data with the portable terminal 200. Data transmission and reception may be performed between the portable ultrasonic diagnostic device 100 and the portable terminal 200 by using a wired or wireless method. As the wired communication method, a cable such as a USB cable and the like may be used. As the wireless communication method, Bluetooth, wireless USB, wireless LAN, WiFi, Zigbee, IrDA and the like may be used.

[0021] The portable terminal 200 is a mobile user terminal and includes any terminals which have an operating system and are capable of accessing the Internet and in which a variety of applications are installable. The portable terminal 200 may be, for example, a smart phone, a tablet PC, a laptop PC, and the like. In the portable terminal 200, an ultrasonic diagnostic application, which interworks with the portable ultrasonic diagnostic device 100 and performs an ultrasonic diagnostic function, is installed. Ultrasonic diagnostic application receives ultrasonic image data from the portable ultrasonic diagnostic device 100, converts the received ultrasonic image data into an ultrasonic image adequate for resolution of a display screen of the portable terminal 200, and displays the ultrasonic image through the display screen.

[0022] The ultrasonic image server 300 stores guiding ultrasonic images for each diagnosis location and diagnosed part. FIG. 5 illustrates one example of a list of guiding ultrasonic images which are stored in an ultrasonic image server. As shown in FIG. 5, diagnosis locations may be classified into, for example, Southeast Asia, Europe, Africa, North/South America, and the like, and diagnosed parts may include, for example, a liver, abdomen, pancreas, nephron, a fetus, and the like. The ultrasonic image server 300 may record, in addition to a diagnosis location and a diagnosed part for each guiding ultrasonic image, gender information and age information of the corresponding guiding ultrasonic image.

[0023] The guiding ultrasonic image is, for example, a so-called properly obtained ultrasonic image of the corresponding diagnosed part in the corresponding diagnosis location by an expert such as a general practitioner. To collect a guiding ultrasonic image, the ultrasonic image server 300 may collect ultrasonic images of each diagnosed part which are possessed by general practi-

tioners in a variety of areas. According to an embodiment, when a user of the ultrasonic diagnostic application is an expert such as a general practitioner, authority to upload an ultrasonic image obtained using the ultrasonic diagnostic application on the ultrasonic image server 300 is given to the user such that guiding ultrasonic images are collected through the portable ultrasonic diagnostic device 100 and the ultrasonic diagnostic application of the portable terminal 200. Here, a diagnosis location may be obtained using position information of the portable terminal 200, and information such as a diagnosed part, a gender, an age, and the like may be information input by the user through the ultrasonic diagnostic application or information already included in an ultrasonic image.

[0024] The portable terminal 200 and the ultrasonic image server 300 are connected through a general wired or wireless network. When the user of the portable ultrasonic diagnostic device 100 selects of viewing a guiding ultrasonic image with setting a diagnosed part to be currently diagnosed through the ultrasonic diagnostic application of the portable terminal 200, the ultrasonic diagnostic application transmits a request for a guiding ultrasonic image including position information of the portable terminal 200 and diagnosed part information to the ultrasonic image server 300. Here, the position information of the portable terminal 200 is a information basically provided by the portable terminal 200 and may be obtained through, for example, a global position system (GPS), WiFi, or a base station. When the ultrasonic diagnostic application transmits the request for a guiding ultrasonic image to the ultrasonic image server 300, the ultrasonic diagnostic application may transmit gender information or age information of an object to be diagnosed. Here, the gender information or age information may be information input through the ultrasonic diagnostic application or may be information already included in an ultrasonic image being diagnosed.

[0025] The ultrasonic image server 300, which receives the request for a guiding ultrasonic image from the portable terminal 200, extracts, among guiding ultrasonic images, requested position information, a diagnosis location corresponding to diagnosed part information, and a guiding ultrasonic image corresponding to a diagnosis location, and provides the extracted guiding ultrasonic image to the ultrasonic diagnostic application through the wired or wireless communication network. When the request for a guiding ultrasonic image includes gender information or age information, the ultrasonic image server 300 may provide a guiding ultrasonic image corresponding to the requested gender or age among the guiding ultrasonic images of the corresponding diagnosis location and the diagnosed part.

[0026] The ultrasonic image server 300 may include several guiding ultrasonic images of each diagnosis location and diagnosed part. In this case, the ultrasonic image server 300 may provide one or more guiding ultrasonic images which are randomly selected among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part. According to an embodiment, the ultrasonic image server 300 may calculate and record a signal to ratio (SNR) for each guiding ultrasonic image, may provide a guiding ultrasonic image which has a highest SNR among guiding ultrasonic images of the corresponding diagnosis location and diagnosed part (according to circumstances, additionally, corresponding to a requested gender or age), or may provide several guiding ultrasonic images in a sequence of high SNR.

[0027] The ultrasonic diagnostic application displays a guiding ultrasonic image provided from the ultrasonic image server 300 with an ultrasonic image being currently diagnosed. Since the user may perform an ultrasonic diagnosis while comparing the ultrasonic image being currently diagnosed with the guiding ultrasonic image through the ultrasonic diagnostic application, the diagnosis may be easily performed and a desired diagnostic image may be more easily obtained.

[0028] In the embodiment of the present invention, storing guiding ultrasonic images classified for each diagnosis location and providing a guiding ultrasonic image in an area in which the user performs a diagnosis are in consideration of features of ultrasonic images which are different according to the diagnosis location since a race or a body shape generally varies according to an area. Accordingly, according to the embodiment of the present invention, a guiding ultrasonic image, on which a diagnosis location is reflected, may help obtaining a more accurate diagnostic image. For example, when an ultrasonic diagnosis is performed on a fetus in Africa, since an ultrasonic image of a fetus diagnosed (by a general practitioner) in Africa is used as a guiding ultrasonic image, it is possible to obtain a more accurate diagnostic image than when general ultrasonic images or guiding ultrasonic images which are diagnosed in other areas are used.

[0029] FIG. 2 illustrates a screen of the ultrasonic diagnostic application according to one embodiment of the present invention.

[0030] Screens of the ultrasonic diagnostic application according to the embodiment may include an area A in which an ultrasonic image being currently diagnosed is displayed, an area B in which a diagnosis location is displayed, an area C in which a diagnosed part is displayed, and an area D in which a guiding ultrasonic image is displayed. As shown in the area D in which a guiding ultrasonic image is displayed, a guiding ultrasonic image G may be displayed.

[0031] FIG. 3 illustrates additional components of a portable ultrasonic diagnostic system according to one embodiment of the present invention.

[0032] Referring to FIG. 3, the portable ultrasonic diagnostic system according to the embodiment further includes portable terminals 210_1 to 210_M whose users are experts, for example, general practitioners and ultrasonic diagnostic applications installed therein in the portable ultrasonic diagnostic system of FIG. 1.

[0033] The users of the portable terminals 210_1 to

210_M may access and refer to the ultrasonic image server 300 through the ultrasonic diagnostic application for guiding ultrasonic images for each diagnosed part and may recommend guiding ultrasonic images, which are determined by the users to be more adequate. Then, the ultrasonic diagnostic application may transmit recommendation information (that is, identification information of a recommended guiding ultrasonic image) to the ultrasonic image server 300, and the ultrasonic image server 300 may record the number of recommendations for each guide image as shown in FIG. 5 on the basis of recommendation information collected through the ultrasonic diagnostic application of each of the portable terminals 210_1 to 210_M.

[0034] When a guiding ultrasonic image is provided to the ultrasonic diagnostic application of the portable terminal 200, the ultrasonic image server 300 may provide a guiding ultrasonic image whose recommendation number is greatest or several guiding ultrasonic images in a sequence of higher recommendation number among guiding ultrasonic images of a corresponding diagnosis location and a diagnosed part (according to circumstances, additionally, corresponding to a requested gender or age).

[0035] FIG. 4 illustrates additional components of a portable ultrasonic diagnostic system according to another embodiment of the present invention.

[0036] Referring to FIG. 4, the portable ultrasonic diagnostic system according to the embodiment further includes portable terminals 120_1 to 120_M of a plurality of users, portable terminals 220_1 to 220_N, and ultrasonic diagnostic applications installed therein in the portable ultrasonic diagnostic system of FIG. 1.

[0037] The ultrasonic diagnostic applications of the portable terminals 220_1 to 220_N, like the portable terminal 200, transmit a request for a guiding ultrasonic image to the ultrasonic image server 300 and display a guiding ultrasonic image provided by the ultrasonic image server 300. Here, the ultrasonic image server 300 may provide a plurality of guiding ultrasonic images of a corresponding diagnosis location and a diagnosed part to the ultrasonic diagnostic applications of the portable terminals 220_1 to 220_N. One of the users may select a guiding ultrasonic image to be displayed with an ultrasonic image being currently diagnosed through the ultrasonic diagnostic application, among the provided guiding ultrasonic images. Then, the ultrasonic diagnostic application may transmit selection information (that is, identification information of a selected guiding ultrasonic image) to the ultrasonic image server 300, and the ultrasonic image server 300 may record the number of selections for each guide image as shown in FIG. 5 on the basis of selection information collected through the ultrasonic diagnostic application of each of the portable terminals 220_1 to 220_N.

[0038] When a guiding ultrasonic image is provided to the ultrasonic diagnostic application of the portable terminal 200, the ultrasonic image server 300 may provide a guiding ultrasonic image whose selection number is greatest or several guiding ultrasonic images in a sequence of higher selection number among guiding ultrasonic images of a corresponding diagnosis location and a diagnosed part (according to circumstances, additionally, corresponding to a requested gender or age). The user of the portable terminal 200 may also select a guiding ultrasonic image, among several provided guiding ultrasonic images, to be displayed with an ultrasonic image being currently diagnosed, corresponding selection information may be transmitted to the ultrasonic image server 300 and may be reflected on a selection number.

[0039] Meanwhile, the above-described embodiments of the present invention may be written as a program, which is executable by a computer, and may be embodied in a universal digital computer which operates the program using a computer-readable recording medium. The computer-readable recording medium includes a storage medium such as a magnetic storage medium (for example, a read-only memory (ROM), a floppy disk, a hard disk, and the like) and an optical-readable medium (for example, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD), and the like).

[0040] The exemplary embodiments of the present invention have been described above. It will be understood by one of ordinary skill in the art that modifications may be made without departing from the essential features of the present invention. Therefore, the disclosed embodiments should be considered in a descriptive point of view not in a limitative one. The scope of the present invention is defined by the claims not by the above description, and it should be understood that all differences within the equivalent scope thereof are included in the present invention.

Claims

1. A portable ultrasonic diagnostic system comprising:

a portable ultrasonic diagnostic device;
an ultrasonic diagnostic application which is installed in a portable terminal, receives ultrasonic image data from the portable ultrasonic diagnostic device, and displays an ultrasonic image through a display screen of the portable terminal; and
an ultrasonic image server which stores guiding ultrasonic images for each diagnosis location and diagnosed part,
wherein the ultrasonic diagnostic application transmits position information of the portable terminal and diagnosed part information to the ultrasonic image server,
wherein the ultrasonic image server provides guiding ultrasonic images of a diagnosis location and a diagnosed part corresponding to the position information and the diagnosed part infor-

mation to the ultrasonic diagnostic application, and

wherein the ultrasonic diagnostic application displays the ultrasonic image with the guiding ultrasonic image provided from the ultrasonic image server.

2. The portable ultrasonic diagnostic system of claim 1, wherein the diagnosed part information is set by a user in the ultrasonic diagnostic application.

3. The portable ultrasonic diagnostic system of claim 1, wherein the ultrasonic image server receives recommendation information of a guiding ultrasonic image to be recommended among guiding ultrasonic images for each diagnosed part from an ultrasonic diagnostic application whose user is a general practitioner, records a recommendation number for each guide image, and provides a guiding ultrasonic image whose recommendation number is greatest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

4. The portable ultrasonic diagnostic system of claim 1, wherein the ultrasonic image server provides a plurality of guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to each of ultrasonic diagnostic applications of a plurality of users, allows the users to select the guiding ultrasonic image to be displayed with the ultrasonic image through the ultrasonic diagnostic application, records a selection number for each guide image according to selections of the users, and provides a guiding ultrasonic image whose selection number is greatest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

5. The portable ultrasonic diagnostic system of claim 1, wherein the ultrasonic image server records a signal to ratio (SNR) for each guiding ultrasonic image and provides a guiding ultrasonic image whose SNR is highest among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

6. The portable ultrasonic diagnostic system of claim 1, wherein the ultrasonic diagnostic application transmits gender information or age information of an object to be diagnosed to the ultrasonic image server, and

wherein the ultrasonic image server provides a guiding ultrasonic image corresponding to the gender information or the age information among the guiding ultrasonic images of the corresponding diagnosis location and diagnosed part to the ultrasonic diagnostic application.

FIG. 1

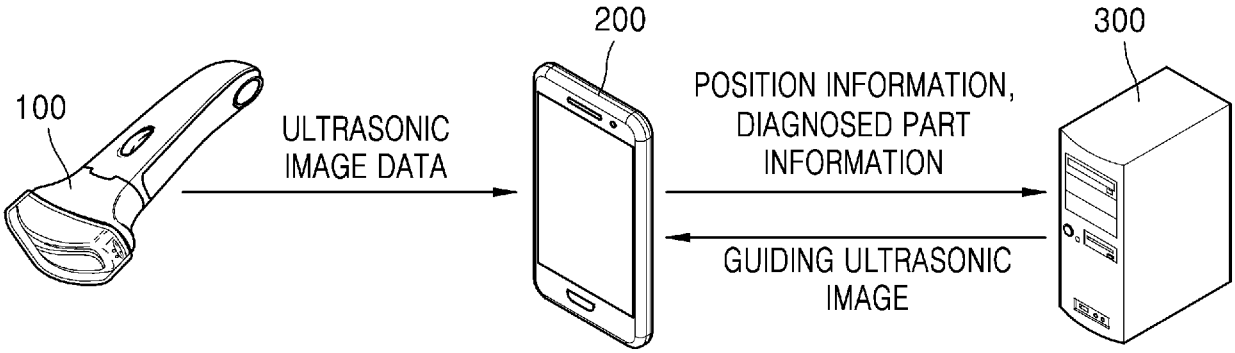

100
200
300
ULTRASONIC IMAGE DATA
POSITION INFORMATION, DIAGNOSED PART INFORMATION
GUIDING ULTRASONIC IMAGE

FIG. 2

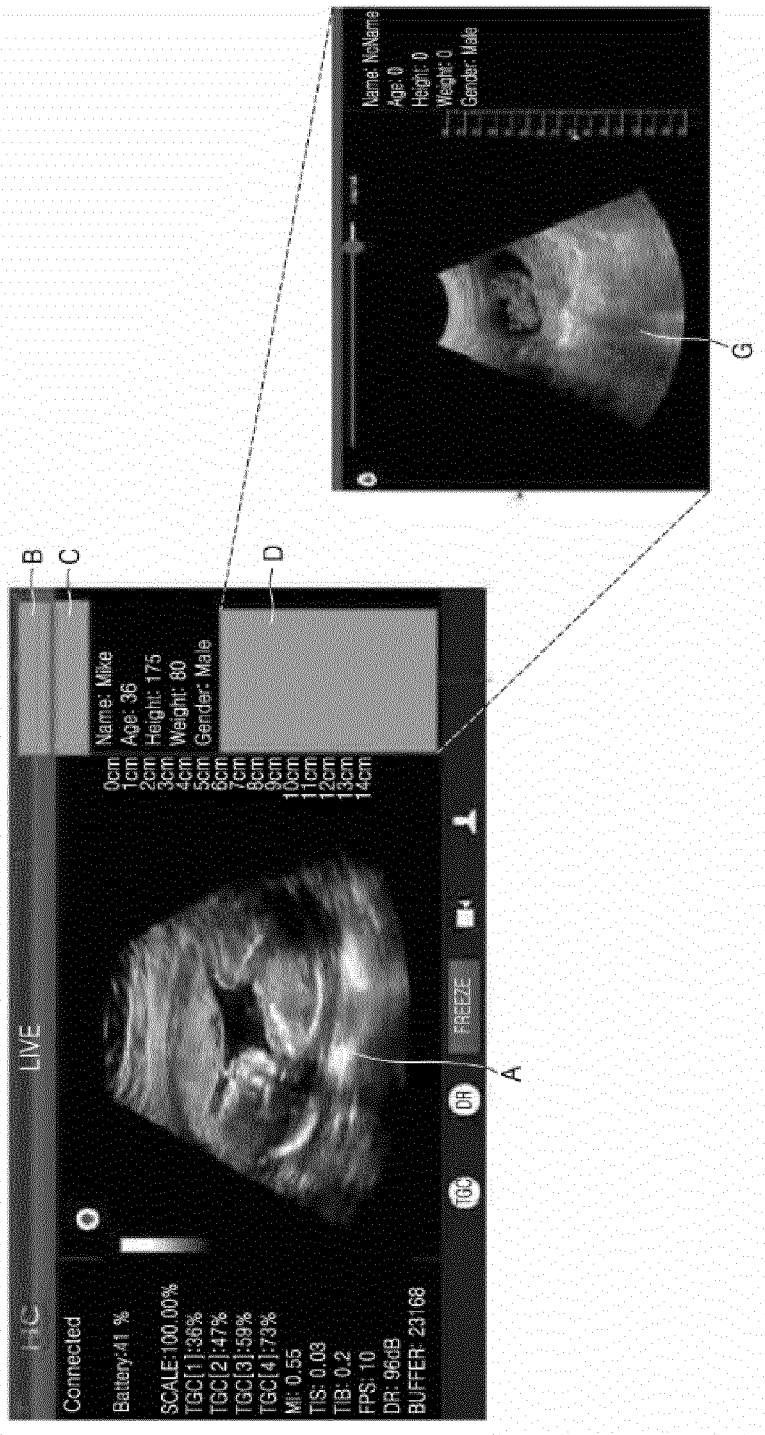

B
C
D
A
G
LIVE
Connected
Battery:41 %
SCALE:100.00%
TGC[1]:36%
TGC[2]:47%
TGC[3]:59%
TGC[4]:73%
MI: 0.55
TIS: 0.03
TIB: 0.2
FPS: 10
DR: 96dB
BUFFER: 23168
Name: Mike
Age: 36
Height: 175
Weight: 80
Gender: Male
0cm
1cm
2cm
3cm
4cm
5cm
6cm
7cm
8cm
9cm
10cm
11cm
12cm
13cm
14cm
TGC
OR
FREEZE
Name: NoName
Age: 0
Height: 0
Weight: 0
Gender: Male

FIG. 3

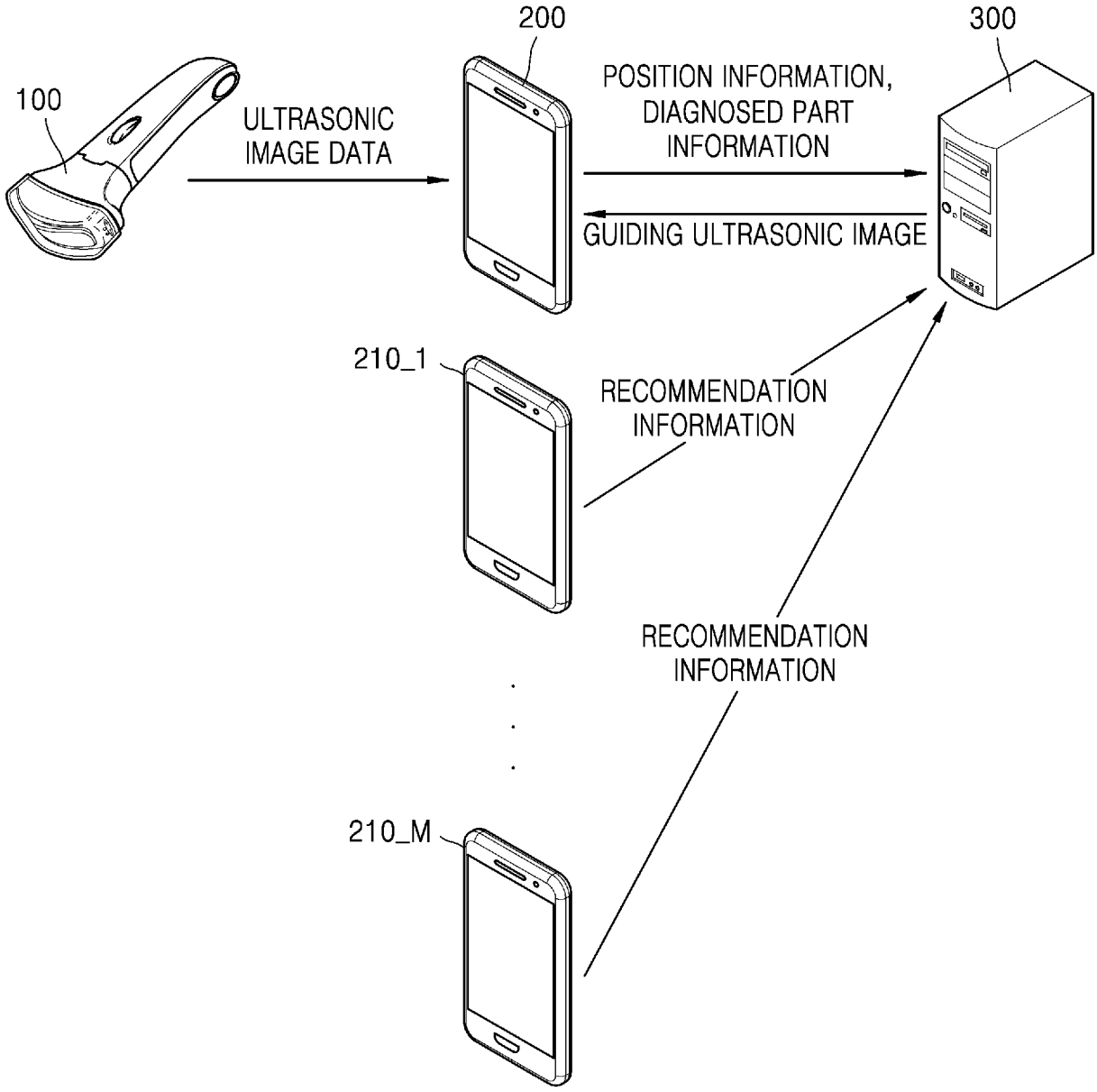

100
ULTRASONIC IMAGE DATA
200
POSITION INFORMATION, DIAGNOSED PART INFORMATION
GUIDING ULTRASONIC IMAGE
300
210_1
RECOMMENDATION INFORMATION
RECOMMENDATION INFORMATION
210_M

FIG. 4

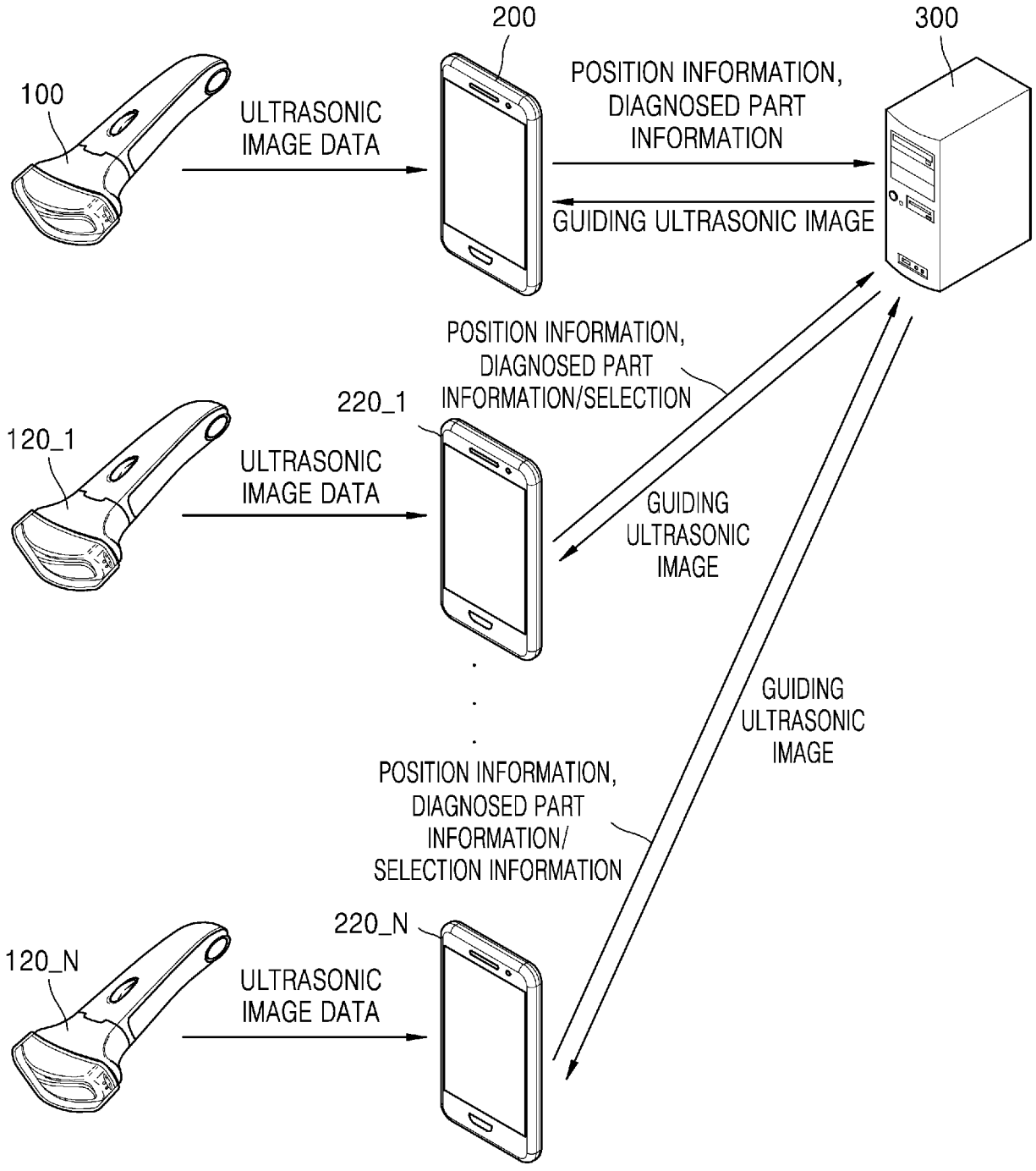

100
200
300
ULTRASONIC IMAGE DATA
POSITION INFORMATION, DIAGNOSED PART INFORMATION
GUIDING ULTRASONIC IMAGE
120_1
220_1
POSITION INFORMATION, DIAGNOSED PART INFORMATION/SELECTION
ULTRASONIC IMAGE DATA
GUIDING ULTRASONIC IMAGE
GUIDING ULTRASONIC IMAGE
POSITION INFORMATION, DIAGNOSED PART INFORMATION/ SELECTION INFORMATION
120_N
220_N
ULTRASONIC IMAGE DATA

FIG. 5

GUIDING ULTRASONIC IMAGE	DIAGNOSIS LOCATION	DIAGNOSED PART	GENDER	AGE	RECOMMENDATION NUMBER	SELECTION NUMBER
1	SOUTHEAST ASIA	Liver	Male	10~19	12	23
2	SOUTHEAST ASIA	Abdomen	Male	20~29	13	15
3	EUROPE	Pancreas	Female	20~29	4	6
4	EUROPE	Nephron	Male	50~59	1	4
5	AFRICA	Fetus	Female	20~29	0	3
6	AFRICA	Liver	Female	30~39	14	25
7	NORTH/SOUTH AMERICA	Abdomen	Female	20~29	3	6
8	NORTH/SOUTH AMERICA	Abdomen	Male	20~29	15	21
⋮						

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2017/004744

A. CLASSIFICATION OF SUBJECT MATTER

A61B 8/00(2006.01)i, A61B 8/08(2006.01)i

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 8/00; G06F 15/62; A61B 8/14; G01N 29/24; A61B 8/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: ultrasound, guide, image, server, application, location information

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2006-326003 A (MATSUSHITA ELECTRIC IND. CO., LTD.) 07 December 2006 See paragraphs [11], [12], [17], [18], claims 1, 4 and figures 1, 5.	1-6
Y	JP 2002-136512 A (TOSHIBA CORP.) 14 May 2002 See paragraphs [15], [16], [26], [28], [29] and claim 1.	1-6
Y	KR 10-2010-0053071 A (SAMSUNG MEDISON CO., LTD.) 20 May 2010 See claims 1, 4, 5 and figures 1, 2.	5
A	JP 06-274582 A (FUJITSU LTD.) 30 September 1994 See claims 1-5 and figures 1, 2.	1-6
A	KR 10-2013-0084467 A (SAMSUNG ELECTRONICS CO., LTD.) 25 July 2013 See claims 1-8 and figures 1-6.	1-6

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent 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
05 JULY 2017 (05.07.2017)	**06 JULY 2017 (06.07.2017)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. +82-42-481-8578	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2017/004744

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		US 2013-0184587 A1	18/07/2013
		WO 2013-109044 A1	25/07/2013

Form PCT/ISA/210 (patent family annex) (January 2015)

专利名称(译)	提供超声图像指南的便携式超声诊断系统		
公开(公告)号	EP3456264A4	公开(公告)日	2019-12-18
申请号	EP2017796330	申请日	2017-05-08
[标]申请(专利权)人(译)	和赛仑有限公司		
申请(专利权)人(译)	HEALCERION CO.，LTD.		
当前申请(专利权)人(译)	HEALCERION CO.，LTD.		
[标]发明人	RYU JEONG WON CHOUNG YOU CHAN		
发明人	RYU, JEONG WON CHOUNG, YOU CHAN		
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摘要(译)

根据本发明的便携式超声诊断系统，包括：便携式超声诊断装置；以及一种安装在便携式终端中的超声诊断应用程序，用于从便携式超声诊断设备接收超声图像数据，并通过便携式终端的显示屏显示超声图像； 超声图像服务器，其用于存储针对每个诊断区域和每个要诊断的身体部位的指导超声图像，其中，超声诊断应用将便携式终端的位置信息和要诊断的身体部位的信息发送给超声图像。 服务器，超声图像服务器向超声诊断应用提供与位置信息和待诊断身体部位信息相对应的诊断区域和待诊断身体部位的指导超声图像，超声诊断应用显示 从超声图像服务器提供的超声图像与超声图像。