

(19)



(11)

EP 2 624 741 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
20.09.2017 Bulletin 2017/38

(51) Int Cl.:
A61B 6/00 (2006.01) **A61B 6/14** (2006.01)
H04W 4/00 (2009.01) **H04W 4/04** (2009.01)
H04W 84/12 (2009.01) **A61B 5/00** (2006.01)

(21) Application number: **10793038.0**

(86) International application number:
PCT/IB2010/002952

(22) Date of filing: **07.10.2010**

(87) International publication number:
WO 2012/046092 (12.04.2012 Gazette 2012/15)

(54) **ASSOCIATION OF WIRELESS DETECTOR WITH AN IMAGING APPARATUS**

ZUORDNUNG EINES DRAHTLOSDETEKTORS ZU EINER BILDGEBENDEN VORRICHTUNG
ASSOCIATION D'UN DÉTECTEUR SANS FIL ET D'UN APPAREIL D'IMAGERIE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

- **BOTHOREL, Sylvie**
75013 Paris (FR)
- **JEANNEAU, Caroline**
07400 Rochemaure (FR)

(43) Date of publication of application:
14.08.2013 Bulletin 2013/33

(74) Representative: **Santarelli**
49, avenue des Champs-Élysées
75008 Paris (FR)

(73) Proprietor: **Trophy**
77435 Marne La Vallée Cedex 2 (FR)

(56) References cited:
EP-A1- 1 959 588 **US-A1- 2005 054 369**
US-A1- 2009 022 276 **US-A1- 2010 104 065**
US-A1- 2010 169 423 **US-B2- 7 463 813**

(72) Inventors:
 • **LEMAIRE, Alain**
 77860 Quincy-Voisins (FR)

EP 2 624 741 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**FIELD OF THE INVENTION**

[0001] This invention relates generally to digital imaging applications, and in particular to methods and apparatus for associating a digital detector with an imaging apparatus.

BACKGROUND OF THE INVENTION

[0002] Wireless image transfer offers a number of benefits in diagnostic imaging applications. The capability to position a digital image detector at an appropriate position relative to the subject that is to be imaged and to obtain an image without the complication of routing a connecting cable between the image detector and a computer or other host processor, has a number of advantages. For example, this capability helps to simplify operator procedures and workflow and to reduce patient discomfort. The wireless transfer feature provides advantages for various types of radiography imaging, in which an image is formed according to exposure energy directed through a tooth or other structure, as well as for image capture using visible or near-visible light.

[0003] Dental imaging is one area where wireless image transfer has particular value. The technologist or other practitioner who is performing the image capture function can work more quickly and encounters fewer constraints when positioning an intra-oral camera or radiography detector that is wireless.

[0004] As acceptance and use of wireless digital image detectors grows, a number of new problems have been encountered. A small dental practice, for example, may have only one wireless radiography detector or intra-oral camera using wireless image transmission. In such an environment, there is little chance for confusion about which device transmits and which receives the image data. In contrast, a larger practice may use multiple wireless digital image detectors, such as one assigned to each dental treatment chair or grouping of chairs. With two or more detectors at a single location, the likelihood of confusion increases dramatically. Where there are two detectors, for example, each must be assigned to a specific receiving system or problems could result. Sharing the same detector or intra-oral camera between multiple treatment chairs is risky and care must be taken to properly coordinate how these devices and their data are deployed. In an extreme case, image data for a patient could be sent to the wrong receiving system, leading to incorrect diagnosis or even improper treatment.

[0005] Conventional wireless data transfer typically uses a wireless networking technology based on the Institute of Electrical and Electronics Engineers (IEEE) 802.11 standard, generally termed WiFi, or some other wireless local area network (LAN) standard. With such a system, radio frequency (RF) signals are encoded with the data to be transmitted. Because these signals are at

low power levels, IEEE 802.11 and similar networks operate reliably over only a limited distance, so that the transmitter and a receiving access apparatus are usually no further than about 10 m apart. Thus, for a larger practice or clinic, further complexity and confusion in transmission of wireless images is possible, since multiple wireless routers may be needed in order to serve all of the treatment rooms.

[0006] US patent applications published as US2010/0104065 A1 and US2009/0022276 A1 disclose workflow management system for shared and portable X-ray imaging devices. These documents disclose maintaining of a list of imaging tasks to be performed along with identity of on whom it is to be performed and what type of imaging to be performed. After taking the X-ray images, the images are manually correlated against the outstanding tasks which are marked as completed. These documents also disclose a user-friendly manner of identifying an X-ray machine by attaching an RF-ID tag to it and reading the tag before wheeling in the machine inside a particular room.

SUMMARY OF THE INVENTION

[0007] It is an object of the present invention to provide wireless image data communication in an environment that uses multiple wireless access points. A further object of the present invention is to provide a method for configuring the wireless image data acquisition device for use in any treatment site within an environment with multiple access points.

[0008] It is a feature of the present invention that it uses an RFID tag that is programmed with identifying information for a specific treatment or imaging site in an environment with multiple sites and potentially using more than one wireless access point.

[0009] An advantage of the apparatus and methods of the present invention relates to the capability to readily share wireless imaging devices between multiple treatment sites, such as between multiple treatment rooms in a larger dental practice, for example.

[0010] These objects are given only by way of illustrative example, and such objects may be exemplary of one or more embodiments of the invention. Other desirable objectives and advantages inherently achieved by the disclosed invention may occur or become apparent to those skilled in the art. The invention is defined by the appended claims.

[0011] According to one aspect of the invention, there is provided a method for directing image data to a dental treatment site, the method executed at least in part on a computer system and comprising: positioning a sensor controller near a programmed radio-frequency identification device at the dental treatment site; entering a command that configures the sensor controller to encode and transmit image data content for delivery to a receiving address, according to information obtained from the radio-frequency identification device; positioning a digital

sensor that is associated with the sensor controller in proximity to a subject; acquiring image data from the digital sensor and transmitting the acquired image data from the sensor controller to a wireless access point; transmitting the data from the wireless access point to a host computer at the receiving address; and storing the acquired transmitted image data in a computer-accessible electronic memory.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The foregoing and other objects, features, and advantages of the invention will be apparent from the following more particular description of the embodiments of the invention, as illustrated in the accompanying drawings. The elements of the drawings are not necessarily to scale relative to each other.

FIG. 1 is a block diagram showing a wireless network arrangement with multiple wireless access points.

FIG. 2 is a block diagram that shows the use of a wireless digital image detector apparatus where there is a single wireless access point.

FIG. 3 is a block diagram showing a wireless digital image detector with associated elements in one embodiment of the present invention.

FIG. 4 is a block diagram showing a wireless network arrangement with multiple wireless access points configured according to an embodiment of the present invention.

FIG. 5 is a procedural flow diagram that shows RFID tag configuration for a site.

FIG. 6 is a procedural flow diagram for daily operation of a wireless imaging detector system.

FIG. 7 is a block diagram showing a wireless digital image detector with associated elements for transmitting data wirelessly to a host computer at the treatment site in an alternate embodiment of the present invention.

FIG. 8 is a block diagram showing a wireless digital image detector with associated elements for transmitting data to a host computer at the treatment site in another alternate embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0013] The following is a detailed description of the preferred embodiments of the invention, reference being made to the drawings in which the same reference numerals identify the same elements of structure in each of the several figures.

[0014] The description of embodiments of the present invention that follows is primarily directed to applications using dental diagnostic images. However, it should be noted that the apparatus and methods of the present invention can be more broadly applied to other applications in which multiple diagnostic images are obtained at dif-

ferent sites that are within the same location.

[0015] The block diagram of Figure 1 shows an example network configuration in which multiple wireless access points 30a and 30b serve multiple dental treatment rooms or sites, labeled A1, A2, B1, and B2. In the arrangement shown, access point 30a serves treatment sites A1 and A2 in area A; access point 30b serves treatment sites B1 and B2 in area B. This type of arrangement can be typical of a larger dental practice, for example, in which distances between treatment rooms are significant or where higher data throughput is desired.

[0016] It is noted that distance may not be a factor in determining the number or locations of access points 30a and 30b relative to the number of treatment rooms. If only small amounts of data were transferred, for example, a single access point might serve 4 or more treatment sites that originate images in a suitable manner, with acceptable response time for uploading and transferring the image data. However, since captured dental images can represent a sizable amount of data and because prompt image information delivery is most desirable, bandwidth considerations may dictate that only a few treatment rooms or sites be associated with a specific access point.

[0017] The block diagram of Figure 2 shows the configuration of image acquisition and display apparatus and path of image data for one of the treatment rooms, site A2 of Figure 1. An x-ray system 20 uses a digital sensor 22 as its detector element for receiving the exposure. This detector element is energizable for generating or acquiring the resulting image data. The acquired image data goes to a controller 24 that then transmits the data wirelessly to access point 30a, connected on a network 28. Access point 30a is also in communication with a host computer 32 that acts as a control monitor for operator command entry and also provides a display 34 in treatment site A2. Connection from access point 30a to host computer 32 is wireless in the example of Figure 2; alternately, a wired network connection, such as an Ethernet connection, for example, could be used for this data transfer link between the access point 30a and computer 32. A wireless connection is provided between controller 24 and access point 30a.

[0018] Host computer 32 stores the received image data in a computer-accessible electronic memory 62 for subsequent display and processing. It should be noted that the term "memory", in the context of the present disclosure, can refer to any type of temporary or longer-lasting data storage workspace used for storing and operating upon image data in a computer system. The memory could be, for example, a long-term storage medium such as magnetic or optical storage. Alternately, the memory could be an electronic circuit, such as random-access memory (RAM) that is used as a temporary buffer or workspace by a microprocessor or other control logic processor device. Display data, for example, is typically stored in a temporary buffer and refreshed as needed in order to provide displayed data. This temporary storage buffer can also be considered to be a memory in this

context.

[0019] The general arrangement of Figure 2 is suitable when there is a single detector element, digital sensor 22, and a single controller 24 for a dental office or clinic. However, the use of multiple digital sensors 22 and multiple treatment sites at which images can be acquired complicates the data communication problem, making it necessary to assign the digital sensor 22 to a particular site, such as a treatment room, dental chair, or other specific location.

[0020] Referring to the block diagram of Figure 3, there is shown a site configuration according to one embodiment of the present invention. A wireless identifier element such as a Radio-Frequency Identification (RFID) tag T is provided, assigned specifically to treatment site A2, such as attached to the wall of the room, to the treatment chair, or to the host computer 32 at that site, for example. RFID tag T is configured to communicate with a wireless communication device 26 that is provided in or associated with controller 24, as indicated by the antenna schematic symbol in Figure 3 and subsequent figures. RFID tag T identifies itself so that controller 24 can determine where to send the acquired image data from sensor 22. With this arrangement, the image data sent wirelessly to access point 30a from this location is then automatically directed to host computer 32 at treatment site A2. Using a similar arrangement, any of the treatment sites that are assigned to access point 30a as part of area A have the corresponding assignment to a specific host computer that is installed at or near the treatment site. Additionally, images could also be transferred on the network to a host processor that serves the treatment site, including a host processor that is at a remote location and provides services such as short- or long-term image storage, for example.

[0021] RFID devices, such as RFID tags and RFID transponders, are well-known to those skilled in various device identification and tracking arts and are available in a number of types from a range of manufacturers. In the context of the present disclosure, an RFID device or RFID "tag" is a programmable device that, upon excitation by the proper RFID signal, emits encoded data previously stored thereon. An RFID transponder is a device that provides two-way communication, writing identifying data to nearby RFID tags or other devices and interrogating these devices and reading stored data received from other sources. In the system of the present invention, an RFID transponder in controller 24 transmits the obtained image data from sensor 22 to the corresponding access point 30a or 30b.

[0022] The block diagram of Figure 4 shows a network arrangement used at a dental clinic in which two access points 30a and 30b each handle data transfer from two treatment sites, A1 and A2 for area A and B1 and B2 for area B. With such an arrangement, data acquisition at any site can be unambiguously handled and transferred to the appropriate host computer.

Initial Site Setup

[0023] Each access point has a unique Service Set Identifier (SSID) that is known to the host computers that use that access point. In order to encode the image data with the proper SSID for delivery to the correct site, the RFID tag T must be programmed to provide the SSID to the sensor 22 and controller 24 used at that site.

[0024] An initial setup procedure is required in order to provide the SSID information that correlates the RFID tag T at any site to its corresponding access point. The workflow diagram of Figure 5 shows basic steps used as part of an initial setup procedure 40. Setup begins with a connection step 42 in which the user links or connects controller 24 to the host computer 32 at the site. Then, in an execution step 44, a software application running on host computer 32 acknowledges the controller connection and reports the SSID and any needed security key information to controller 24. In a write step 46, controller 24 then broadcasts the SSID, security key, and any other useful information for linking with the access point to RFID tag T. This programs RFID tag T with identifier information.

[0025] Once the RFID tag T at a site is programmed, it can communicate with any nearby controller to provide assignment information so that the correct data is directed to host computer 32 at that site.

[0026] The software application that is accessed at the site can be installed or downloaded to host computer 32 and configured to obtain the needed information for communication with that computer. The configuration can be automated or may require system administrator or user interaction for setup. In an alternate embodiment, described subsequently, RFID tag T is associated with controller 24 and wireless communication to this identifier element is provided from host computer 32.

Configuration for Daily Use

[0027] The block diagram of Figure 6 shows the procedural steps that can be used to set up the controller 24 and its digital sensor for use at a specific treatment site. These steps are used when the digital sensor 22 is first assigned to a treatment site or when sensor 22 is moved from one treatment site to another.

[0028] In an activation step 50, the operator initiates controller 24 configuration by pressing a control button or by some other action that sends a command prompting a response from the nearby RFID tag T at the site. In one embodiment, for example, the action of moving controller 24 to within a predetermined proximity of RFID tag T enters the command for configuration. In such an embodiment, for example, a periodic polling signal emitted by wireless communication circuitry on controller 24 automatically initiates configuration activity. RFID tag T responds to this configuration command by providing its preprogrammed WiFi configuration information, such as the assigned SSID and any stored security keys that re-

late to the site, for example. Controller 24 reads this information in a tag ID receipt step 54. Upon receipt of this information, controller 24 reboots, or is rebooted or otherwise suitably re-configured in a configuration step 56. From this point until its next subsequent re-configuration, controller 24 now encodes the image data that it uploads using the obtained SSID in each obtain data step 60, thereby directing the image data to the appropriate treatment site.

[0029] In an alternate embodiment, as shown in Figure 7, the obtained image data from digital sensor 22 is wirelessly transmitted directly to host computer 32 at the treatment site A2. This arrangement may be useful, for example, where problems in wireless communication or with the network require that the access point be bypassed. Alternately, controller 24 can be instructed by commands stored in RFID tag T or entered by the technician to provide image data directly to the site. This alternate mode of operation may be selectable using a selector switch 36 provided on controller 24 or sensor 22, for example. Operating the switch generates a command to redirect image data. Figure 8 shows an alternate embodiment in which RFID tag T is associated with controller 24 and wireless communication device 26 is linked to host computer 32. With this alternate arrangement, host computer 32 may have multiple wireless links, as shown. This alternate embodiment may be advantageous, for example, where it is desirable to send information from controller 24 and detector 22 both locally to host computer 32 for immediate use and to a remotely connected server for archival.

[0030] Embodiments of the present invention allow a flexible network arrangement, so that additional treatment sites, host computers, and other equipment can be readily added to the system without undue complexity. Access point assignments can be modified with minimal setup time or risk of lost data. Image data can also be uploaded to a central host or server that provides storage or archival, allowing the dental practitioner to access a library of stored images obtained from a patient, for example.

[0031] Embodiments of the present invention can be used to advantage for obtaining x-ray images for a patient, wherein the images can be displayed only moments after the exposure has been terminated. In addition to x-ray image sensing, embodiments of the present invention may also serve other imaging applications, such as use of an intra-oral camera with a wireless interface, for example. An intra-oral camera can collect still or video images, using white light or other modality images, such as images from fluorescence or optical coherence tomography for example. In addition, a conventional digital camera may be used with this system, such as to obtain intra-oral images or images of external facial features. A sensor for dental ultrasound apparatus could also be used.

[0032] Embodiments of the present invention employ software in the form of stored, preprogrammed instruc-

tions that are executed by a computer or other type of control logic processor. Stored instructions can be executed at any suitable host processor that is associated with the networked arrangement, such as on host computer 32 or on a processor that is associated with a digital camera, for example.

[0033] The invention has been described in detail with particular reference to certain preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the scope of the invention. For example, instructions for uploading SSID and other information from the stored data in RFID tag T may be initiated using a user interface utility, such as a mouse-based selection, typed command entry, or touch screen contact.

[0034] Thus, there is provided a method and apparatus for directing image data from a wireless image acquisition apparatus to a dental treatment site.

Claims

1. A method for directing acquired image data to a host computer (32) installed at or near a dental treatment site (A2) in an environment comprising multiple wireless access points (30a, 30b), wherein the host computer (32) comprises a receiving address and is configured to store image data in a computer-accessible electronic memory (62), and wherein the dental treatment site is associated with a specific one of the multiple wireless access points and comprises:

- a digital sensor (22),
- a sensor controller (24) associated with the digital sensor (22),
- a wireless communication device (26) provided in or associated with the controller (24), and
- a radio-frequency identification device (T), programmed to communicate with any nearby controller (24) to provide assignment information so that the acquired image data is directed to the host computer (32),

the method comprising the steps of:

- positioning the sensor controller (24) near the programmed radio-frequency identification device (T) at the dental treatment site;
- providing (50) a command that configures the sensor controller (24) to encode and transmit image data content for delivery to the receiving address of the host computer according to the assignment information which is obtained (54), by means of the wireless communication device (26), from the programmed radio-frequency identification device (T);
- positioning the digital sensor (22) in proximity to a subject;

- acquiring (60) image data from the digital sensor (22);
 - wirelessly transmitting the acquired image data from the sensor controller (24) to the wireless access point (30a);
 - transmitting the acquired image data from the wireless access point (30a) to the host computer (32) at the receiving address; and
 - storing the acquired transmitted image data in the computer-accessible electronic memory (62).
2. The method of claim 1 wherein the digital sensor is an x-ray sensor.
 3. The method of claim 1 wherein the digital sensor is taken from the group consisting of an intra-oral camera, a digital camera, a video camera, or a sensor for an ultrasound imaging apparatus.
 4. The method of any one of claims 1 to 3 wherein providing the command to configure the sensor controller comprises pressing a control button on the controller.
 5. The method of any one of claims 1 to 3 wherein providing the command to configure the sensor controller comprises entering an instruction on a control monitor.
 6. The method of any one of claims 1 to 3 wherein providing the command to configure the sensor controller comprises moving the sensor controller to within a predetermined proximity to the programmed radio-frequency identification device.
 7. The method of any one of claims 1 to 6, further comprising displaying the acquired image data.
 8. A system for directing acquired image data to a host computer (32) installed at or near a dental treatment site (A2) in an environment comprising multiple wireless access points (30a, 30b), wherein the dental treatment site is associated with a specific one of the multiple wireless access points, the system comprising:
 - the host computer (32), wherein the host computer comprises a receiving address and is configured to store image data in a computer-accessible electronic memory (62),
 - the wireless access point (30a) associated with the dental treatment site (A2), wherein the wireless access point (30a) is configured to transmit the acquired image data to the host computer (32) at the receiving address,
 - a digital sensor (22), wherein the digital sensor (22) is configured to be positioned in proximity

to a subject such that image data may be acquired from the digital sensor (22),

- a sensor controller (24) associated with the digital sensor (22), wherein the sensor controller (24) is configured to wirelessly transmit the acquired image data to a wireless access point (30a, 30b),
- a wireless communication device (26) provided in or associated with the controller (24), and
- a radio-frequency identification device (T) programmed to communicate with any nearby controller (24) to provide assignment information so that the acquired image data is directed to the host computer (32),

wherein the sensor controller (24) is configured such that, after being positioned near the programmed radio-frequency identification device (T) at the dental treatment site, and after a command is provided, the controller encodes and transmits image data content for delivery to the receiving address of the host computer according to the assignment information obtained, by means of the wireless communication device (26), from the programmed radio-frequency identification device (T).

9. The system of claim 8 further comprising a display for displaying the received digital image data.
10. The system of any one of claims 8 or 9, wherein the digital sensor is taken from the group consisting of a digital x-ray detector, an intra-oral camera, a digital camera, a video camera, or a sensor for an ultrasound imaging apparatus.

Patentansprüche

1. Verfahren zum Lenken aufgenommener Bilddaten an einen Hostcomputer (32), der an oder nahe einem Dentalbehandlungsort (A2) in einer Umgebung installiert ist, die mehrere Drahtloszugriffspunkte (30a, 30b) umfasst, wobei der Hostcomputer (32) eine Empfangsadresse umfasst und so konfiguriert ist, Bilddaten in einem computerzugreifbaren elektronischen Speicher (62) zu speichern, und wobei der Dentalbehandlungsort einem spezifischen der mehreren Drahtloszugriffspunkte zugeordnet ist und umfasst:
 - einen Digitalsensor (22),
 - einen Sensorcontroller (24), der dem Digitalsensor (22) zugeordnet ist,
 - eine Drahtloskommunikationsvorrichtung (26), die in dem Controller (24) vorgesehen oder diesem zugeordnet ist, und
 - eine Hochfrequenzidentifikationsvorrichtung (T), die so programmiert ist, dass sie mit jedem

in der Nähe befindlichen Controller (24) kommunizieren kann, um Zuordnungsinformation bereitzustellen, so dass die aufgenommenen Bilddaten an den Hostcomputer (32) geführt werden,

wobei das Verfahren die Schritte umfasst:

- Positionieren des Sensorcontrollers (24) nahe der programmierten Hochfrequenzidentifikationsvorrichtung (T) an dem Dentalbehandlungsort;
 - Bereitstellen (50), mittels der Drahtloskommunikationsvorrichtung (26), einer Anweisung, die den Sensorcontroller (24) konfiguriert, um den Bilddateninhalt zur Lieferung an die Empfangsadresse des Hostcomputers gemäß der Zuordnungsinformation, die von der programmierten Hochfrequenzidentifikationsvorrichtung (T) erhalten (54) ist, zu codieren und zu übertragen;
 - Positionieren des Digitalsensors (22) in der Nähe eines Subjektes;
 - Aufnehmen (60) von Bilddaten von dem Digitalsensor (22);
 - drahtloses Übertragen der aufgenommenen Bilddaten von dem Sensorcontroller (24) an den Drahtloszugriffspunkt (30a);
 - Übertragen der aufgenommenen Bilddaten von dem Drahtloszugriffspunkt (30a) zu dem Hostcomputer (32) an der Empfangsadresse; und
 - Speichern der aufgenommenen übertragenen Bilddaten in dem computerzugreifbaren elektronischen Speicher (62).
2. Verfahren nach Anspruch 1, wobei der Digitalsensor ein Röntgensensor ist.
 3. Verfahren nach Anspruch 1, wobei der Digitalsensor aus der Gruppe gewählt ist, die aus einer intraoralen Kamera, einer Digitalkamera, einer Videokamera oder einem Sensor für eine Ultraschallbildgebungs- vorrichtung besteht.
 4. Verfahren nach einem der Ansprüche 1 bis 3, wobei das Bereitstellen der Anweisung, um den Sensorcontroller zu konfigurieren, das Drücken eines Steuerknopfes an dem Controller umfasst.
 5. Verfahren nach einem der Ansprüche 1 bis 3, wobei das Bereitstellen der Anweisung, um den Sensorcontroller zu konfigurieren, eine Eingabe einer Instruktion an einem Steuermonitor umfasst.
 6. Verfahren nach einem der Ansprüche 1 bis 3, wobei das Bereitstellen der Anweisung, um den Sensorcontroller zu konfigurieren, das Bewegen des Sensorcontrollers innerhalb einer vorbestimmten Nähe

zu der programmierten Hochfrequenzidentifikationsvorrichtung umfasst.

7. Verfahren nach einem der Ansprüche 1 bis 6, ferner mit einem Anzeigen der aufgenommenen Bilddaten.
8. System zum Lenken aufgenommenener Bilddaten an einen Hostcomputer (32), der an oder nahe einem Dentalbehandlungsort (A2) in einer Umgebung installiert ist, die mehrere Drahtloszugriffspunkte (30a, 30b) umfasst, wobei der Dentalbehandlungsort einem spezifischen der mehreren Drahtloszugriffspunkte zugeordnet ist, wobei das System umfasst:
 - den Hostcomputer (32), wobei der Hostcomputer eine Empfangsadresse umfasst und so konfiguriert ist, Bilddaten in einem computerzugreifbaren elektronischen Speicher (62) zu speichern,
 - den Drahtloszugriffspunkt (30a), der dem Dentalbehandlungsort (A2) zugeordnet ist, wobei der Drahtloszugriffspunkt (30a) so konfiguriert ist, die aufgenommenen Bilddaten an den Hostcomputer (32) an der Empfangsadresse zu übertragen,
 - einen Digitalsensor (22), wobei der Digitalsensor (22) zur Positionierung in der Nähe eines Subjektes konfiguriert ist, so dass Bilddaten von dem Digitalsensor (22) aufgenommen werden können,
 - einen Sensorcontroller (24), der dem Digitalsensor (22) zugeordnet ist, wobei der Sensorcontroller (24) derart konfiguriert ist, die aufgenommenen Bilddaten an einen Drahtloszugriffspunkt (30a, 30b) drahtlos zu übertragen,
 - eine Drahtloskommunikationsvorrichtung (26), die in dem Controller (24) vorgesehen oder diesem zugeordnet ist, und
 - eine Hochfrequenzidentifikationsvorrichtung (T), die so programmiert ist, dass sie mit jedem in der Nähe befindlichen Controller (24) kommuniziert, um Zuordnungsinformation bereitzustellen, so dass die aufgenommenen Bilddaten an den Hostcomputer (32) gelenkt werden,
 wobei der Sensorcontroller (24) so konfiguriert ist, dass nach Positionierung nahe der programmierten Hochfrequenzidentifikationsvorrichtung (T) an dem Dentalbehandlungsort und nachdem eine Anweisung mittels der Drahtloskommunikationsvorrichtung (26) bereitgestellt ist, der Controller den Bilddateninhalt zur Lieferung an die Empfangsadresse des Hostcomputers gemäß der Zuordnungsinformation, die von der programmierten Hochfrequenzidentifikationsvorrichtung (T) erhalten ist, codiert und überträgt.
9. System nach Anspruch 8, ferner mit einem Display

zum Anzeigen der empfangenen digitalen Bilddaten.

10. System nach einem der Ansprüche 8 oder 9, wobei der Digitalsensor aus der Gruppe gewählt ist, die aus einem digitalen Röntgendetektor, einer intraoralen Kamera, einer Digitalkamera, einer Videokamera oder einem Sensor für eine Ultraschallbildgebungsvorrichtung besteht.

Revendications

1. Procédé pour diriger des données d'image acquises vers un ordinateur hôte (32) installé au niveau ou à proximité d'un site de traitement dentaire (A2) dans un environnement comprenant de multiples points d'accès sans fil (30a, 30b), l'ordinateur hôte (32) comprenant une adresse de réception et étant configuré pour mémoriser des données d'image dans une mémoire électronique accessible par ordinateur (62), et le site de traitement dentaire étant associé à un point d'accès spécifique parmi les multiples points d'accès sans fil et comprenant :

- un capteur numérique (22),
- un contrôleur de capteur (24) associé au capteur numérique (22),
- un dispositif de communication sans fil (26) disposé dans le contrôleur (24) ou associé à ce dernier, et
- un dispositif d'identification radiofréquence (T), programmé pour communiquer avec un quelconque contrôleur (24) se trouvant à proximité de façon à fournir des informations d'attribution pour diriger les données d'image acquises vers l'ordinateur hôte (32),

le procédé comprenant les étapes consistant à :

- placer le contrôleur de capteur (24) à proximité du dispositif d'identification radiofréquence programmé (T) au niveau du site de traitement dentaire ;
- fournir (50) une commande qui configure le contrôleur de capteur (24) pour coder et transmettre un contenu de données d'image à des fins de délivrance à l'adresse de réception de l'ordinateur hôte conformément aux informations d'attribution qui ont été obtenues (54), au moyen du dispositif de communication sans fil (26), à partir du dispositif d'identification radiofréquence programmé (T) ;
- placer le capteur numérique (22) à proximité d'un sujet ;
- acquérir (60) des données d'image du capteur numérique (22) ;
- transmettre sans fil les données d'image acquises, du contrôleur de capteur (24) au point

d'accès sans fil (30a) ;

- transmettre les données d'image acquises, du point d'accès sans fil (30a) à l'ordinateur hôte (32) à l'adresse de réception ; et
- mémoriser les données d'image acquises transmises dans la mémoire électronique accessible par ordinateur (62) .

2. Procédé selon la revendication 1, dans lequel le capteur numérique est un capteur de rayons X.

3. Procédé selon la revendication 1, dans lequel le capteur numérique est choisi à partir du groupe constitué d'un appareil de prise de vues intra-oral, d'un appareil de prise de vues numérique, d'une caméra vidéo, ou d'un capteur destiné à un appareil d'imagerie par ultrasons.

4. Procédé selon l'une quelconque des revendications 1 à 3, dans lequel la fourniture de la commande pour configurer le contrôleur de capteur comprend l'appui sur un bouton de commande du contrôleur.

5. Procédé selon l'une quelconque des revendications 1 à 3, dans lequel la fourniture de la commande pour configurer le contrôleur de capteur comprend la saisie d'une instruction sur un écran de commande.

6. Procédé selon l'une quelconque des revendications 1 à 3, dans lequel la fourniture de la commande pour configurer le contrôleur de capteur comprend le déplacement du contrôleur de capteur à une certaine proximité prédéterminée du dispositif d'identification radiofréquence programmé.

7. Procédé selon l'une quelconque des revendications 1 à 6, comprenant en outre l'affichage des données d'image acquises.

8. Système pour diriger des données d'image acquises vers un ordinateur hôte (32) installé au niveau ou à proximité d'un site de traitement dentaire (A2) dans un environnement comprenant de multiples points d'accès sans fil (30a, 30b), le site de traitement dentaire étant associé à un point d'accès spécifique parmi les multiples points d'accès sans fil, le système comprenant :

- l'ordinateur hôte (32), l'ordinateur hôte comprenant une adresse de réception et étant configuré pour mémoriser des données d'image dans une mémoire électronique accessible par ordinateur (62),
- le point d'accès sans fil (30a) associé au site de traitement dentaire (A2), le point d'accès sans fil (30a) étant configuré pour transmettre les données d'image acquises, à l'ordinateur hôte (32) à l'adresse de réception,

- un capteur numérique (22), le capteur numérique (22) étant configuré pour être placé à proximité d'un sujet de façon à pouvoir acquérir des données d'image à partir du capteur numérique (22), 5
- un contrôleur de capteur (24) associé au capteur numérique (22), le contrôleur de capteur (24) étant configuré pour transmettre sans fil les données d'image acquises, à un point d'accès sans fil (30a, 30b), 10
- un dispositif de communication sans fil (26) disposé dans le contrôleur (24) ou associé à ce dernier, et
- un dispositif d'identification radiofréquence (T) programmé pour communiquer avec un quelconque contrôleur (24) se trouvant à proximité, de façon à fournir des informations d'attribution pour diriger les données d'image acquises, vers l'ordinateur hôte (32), 15

20

dans lequel le contrôleur de capteur (24) est configuré de sorte que, après avoir été placé à proximité du dispositif d'identification radiofréquence programmé (T) au niveau du site de traitement dentaire, et après la fourniture d'une commande, le contrôleur code et transmette un contenu de données d'image à des fins de délivrance à l'adresse de réception de l'ordinateur hôte conformément aux informations d'attribution obtenues, au moyen du dispositif de communication sans fil (26), à partir du dispositif d'identification radiofréquence programmé (T). 25

30

9. Système selon la revendication 8, comprenant en outre un afficheur pour afficher les données d'image numériques reçues. 35
10. Système selon l'une quelconque des revendications 8 ou 9, dans lequel le capteur numérique est choisi à partir du groupe constitué d'un détecteur de rayons X numérique, d'un appareil de prise de vues intra-oral, d'un appareil de prise de vues numérique, d'une caméra vidéo, ou d'un capteur destiné à un appareil d'imagerie par ultrasons. 40

45

50

55

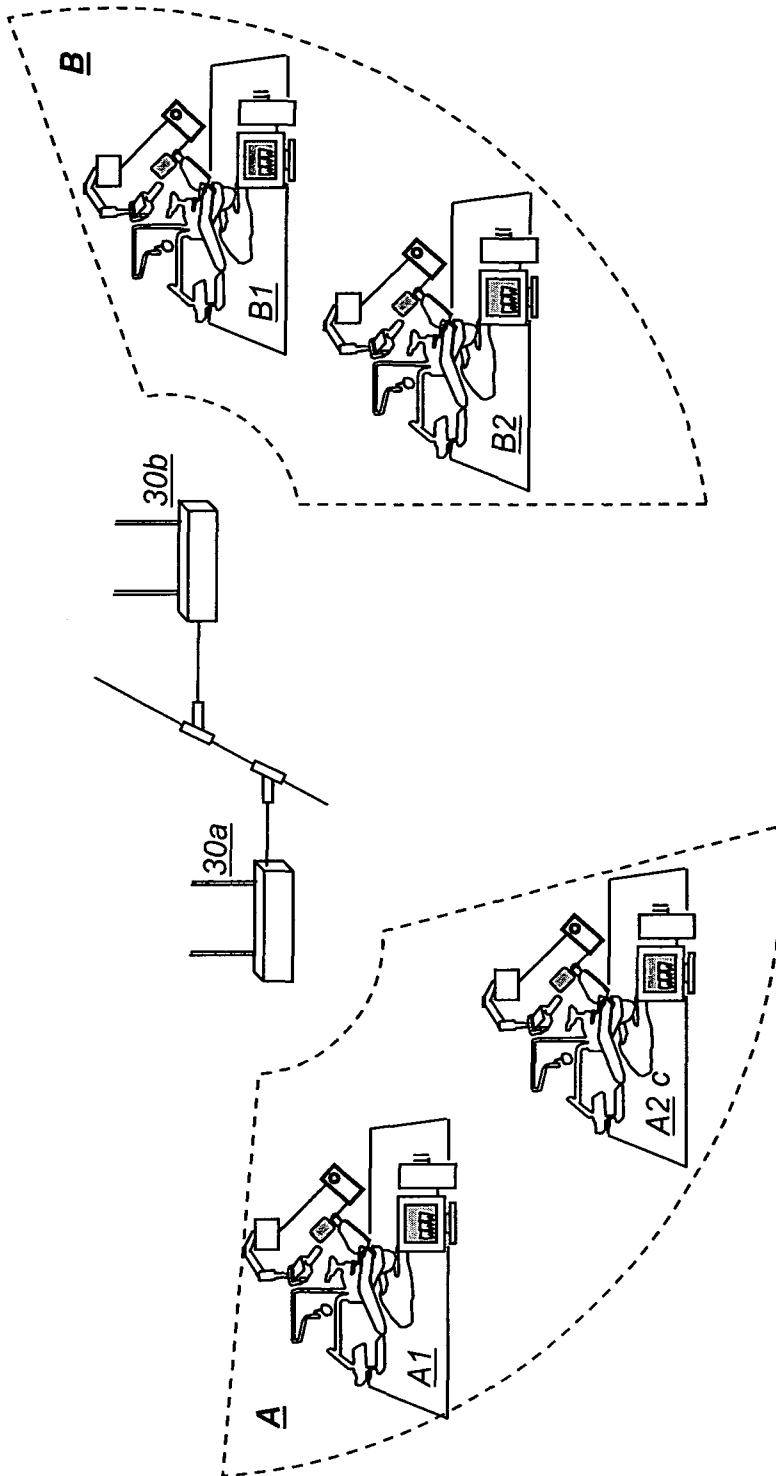


FIG. 1

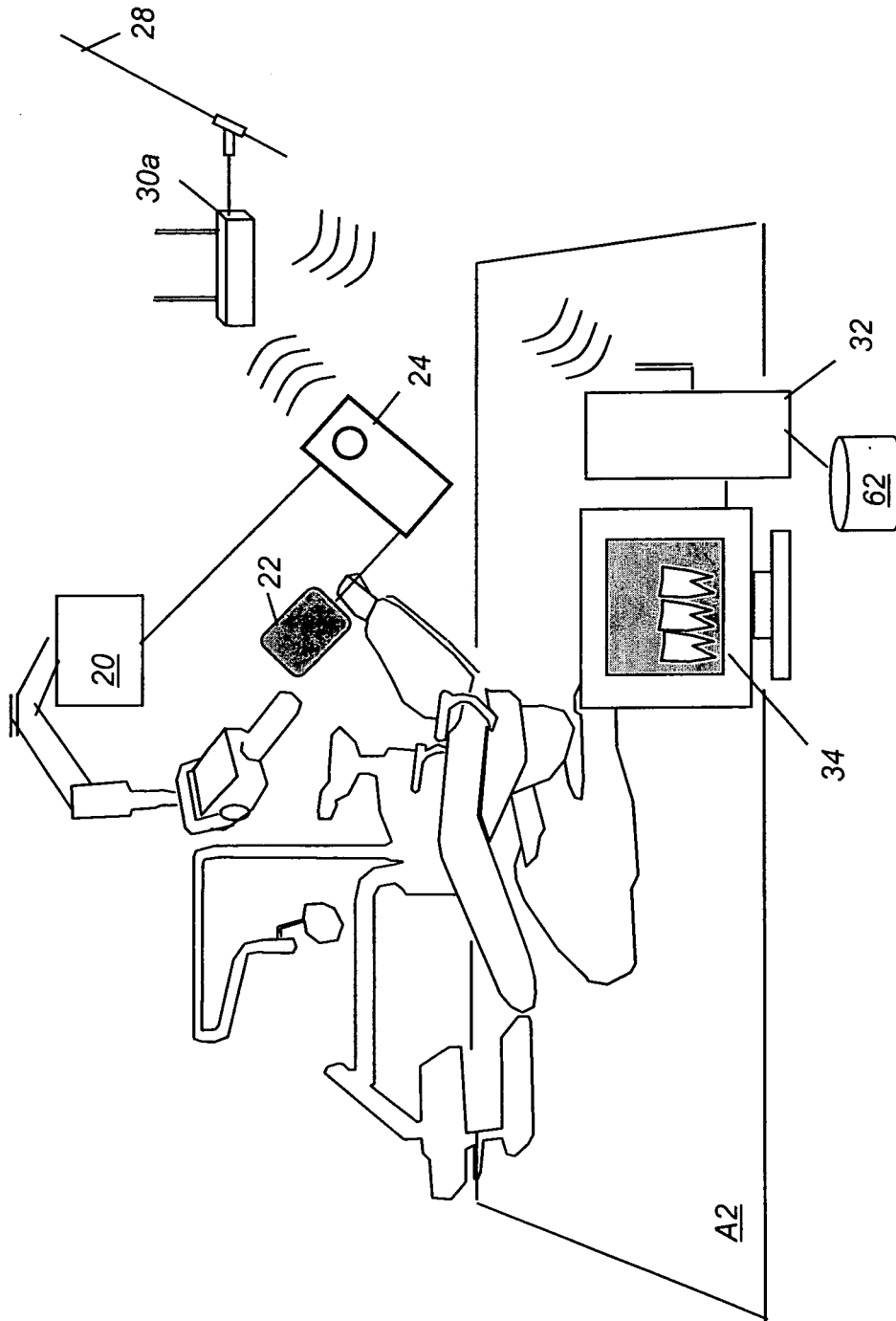


FIG. 2

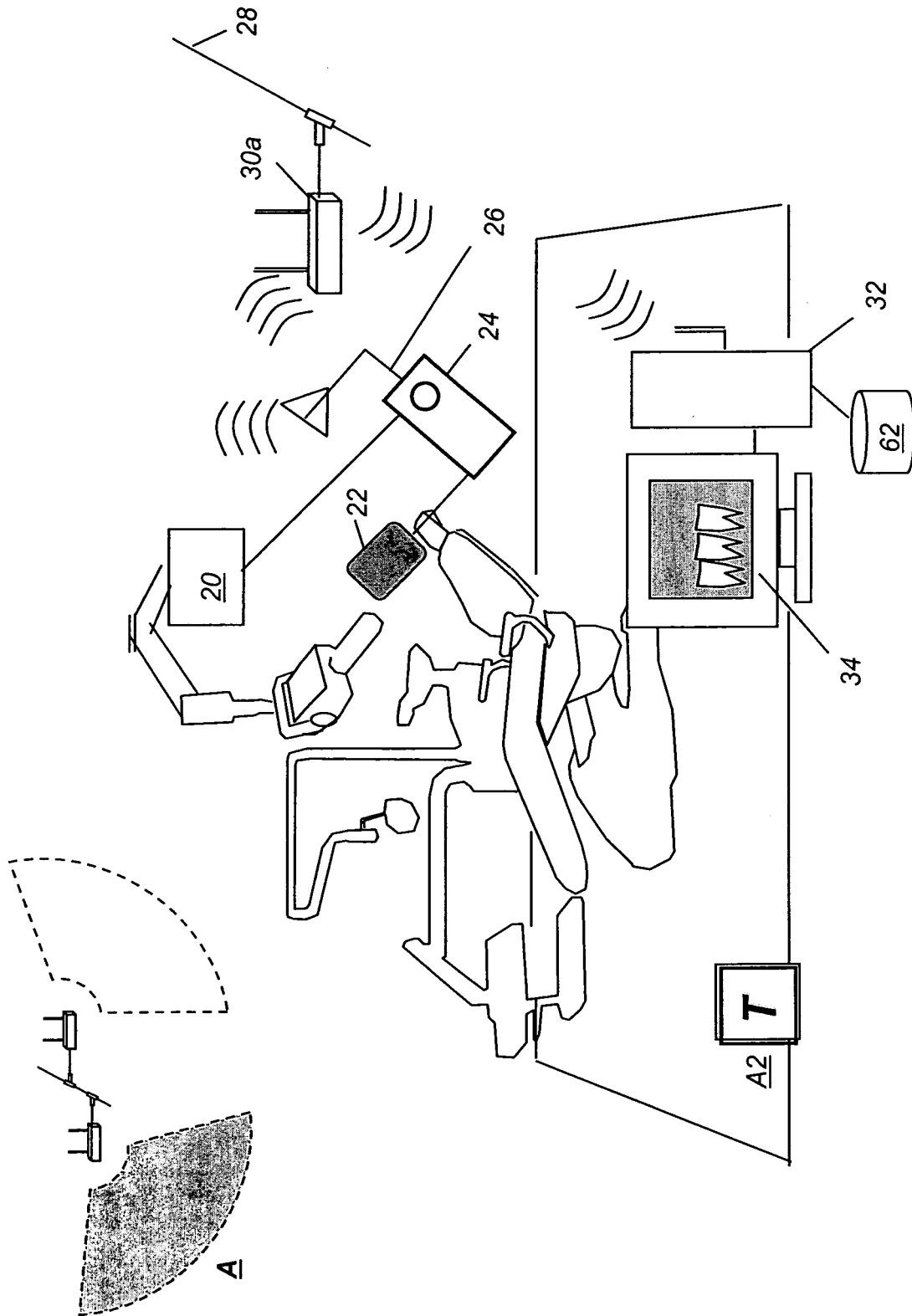


FIG. 3

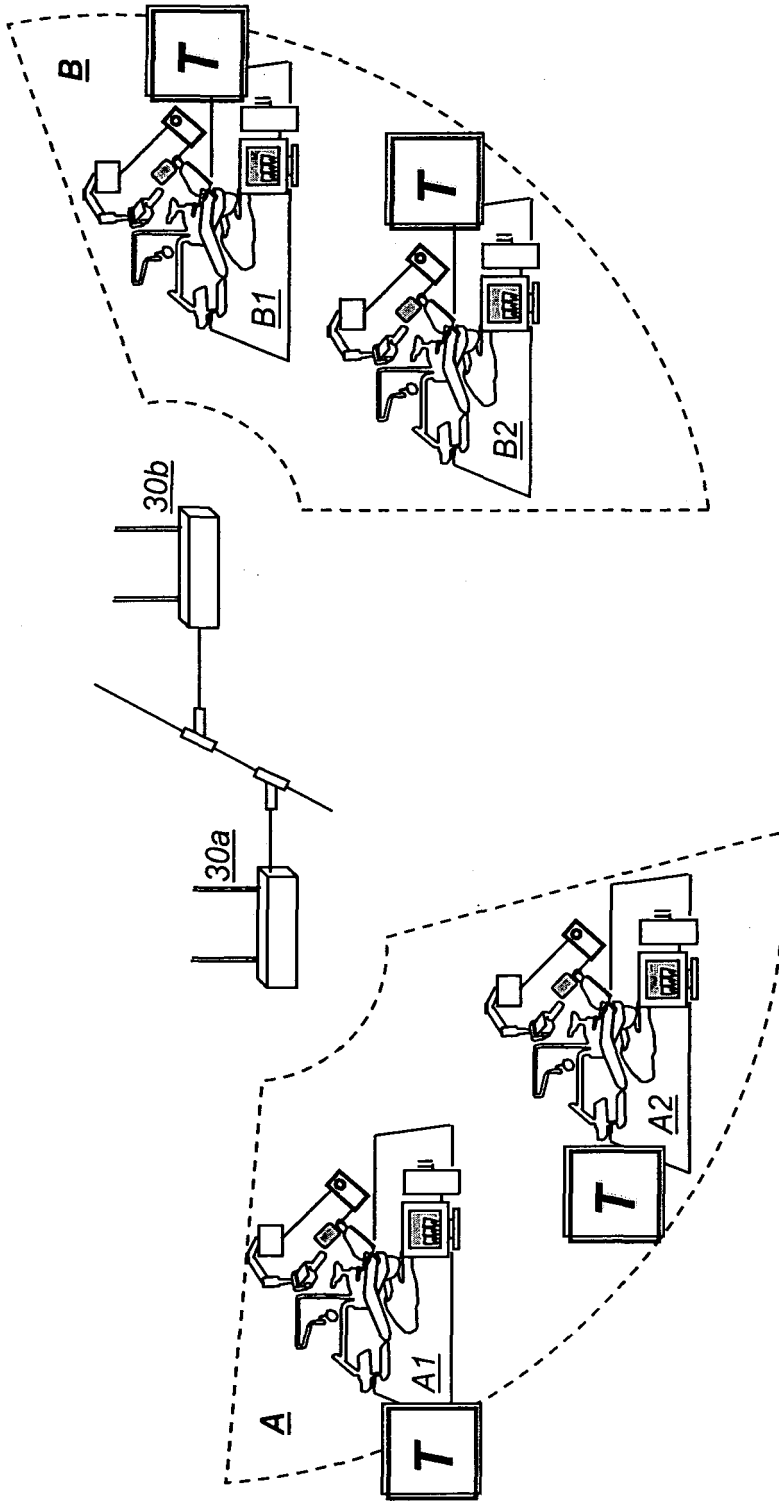
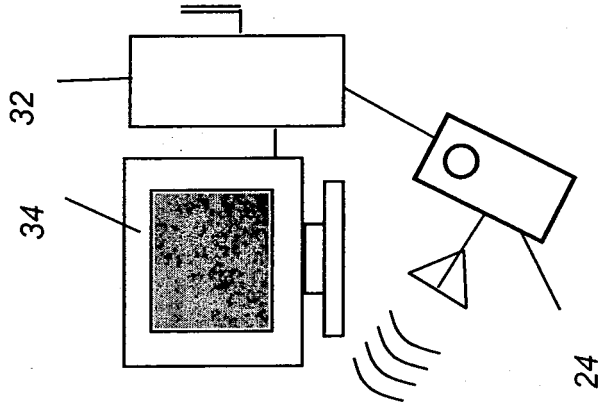


FIG. 4



40

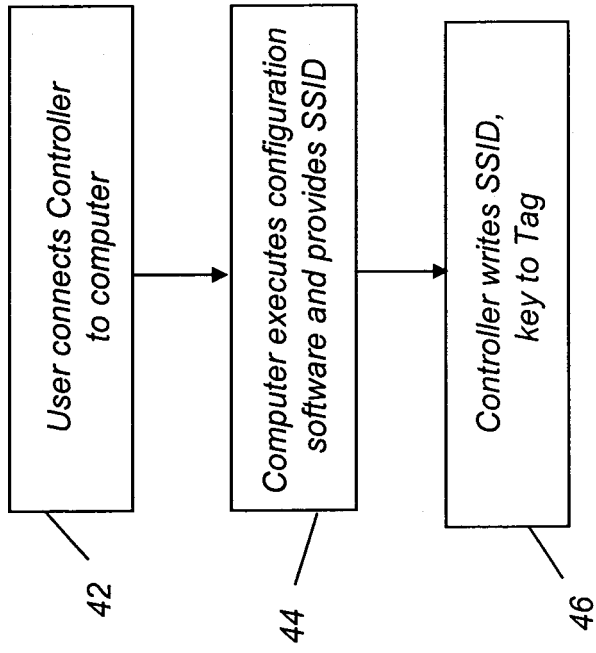


FIG. 5

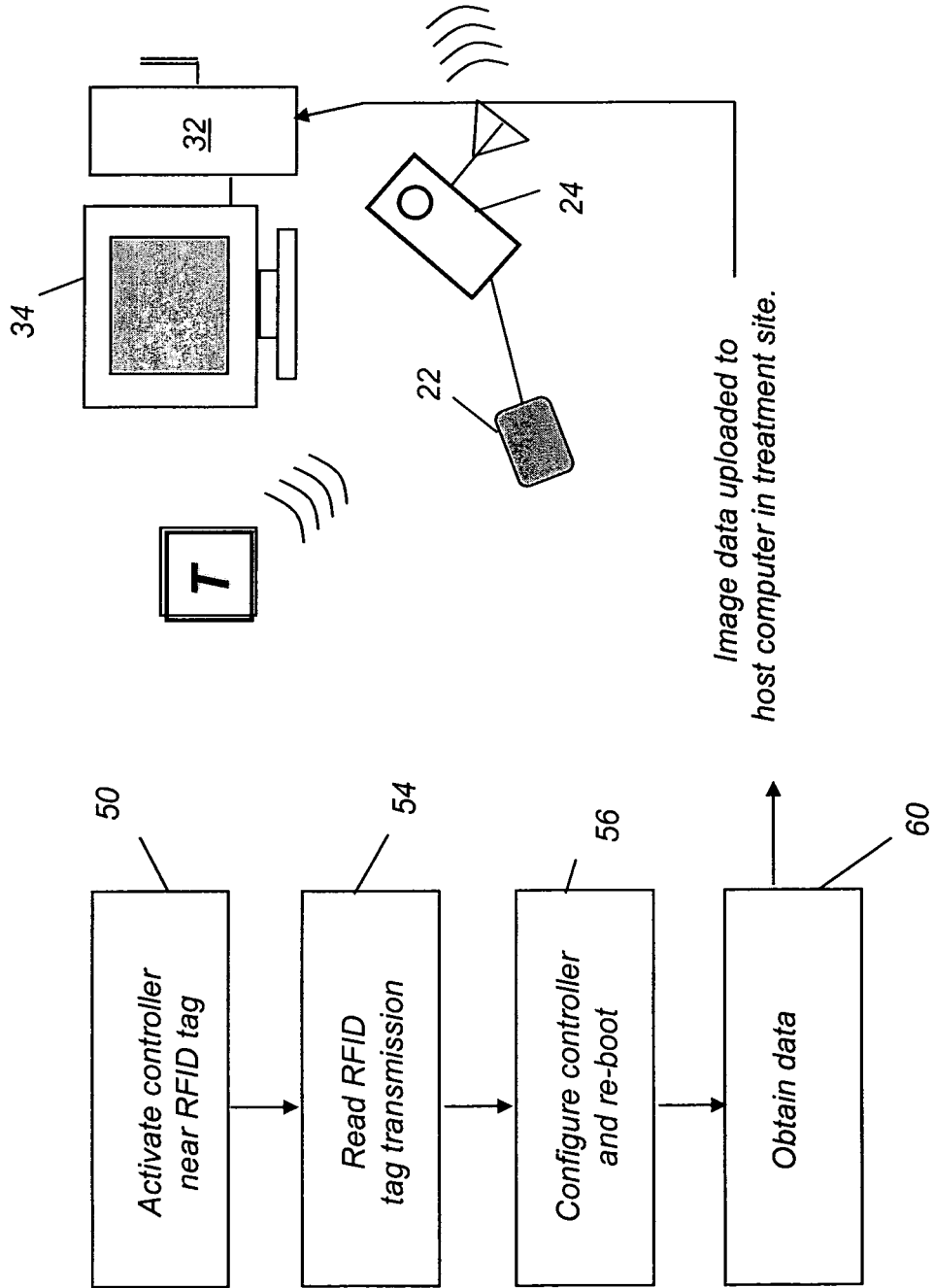


FIG. 6

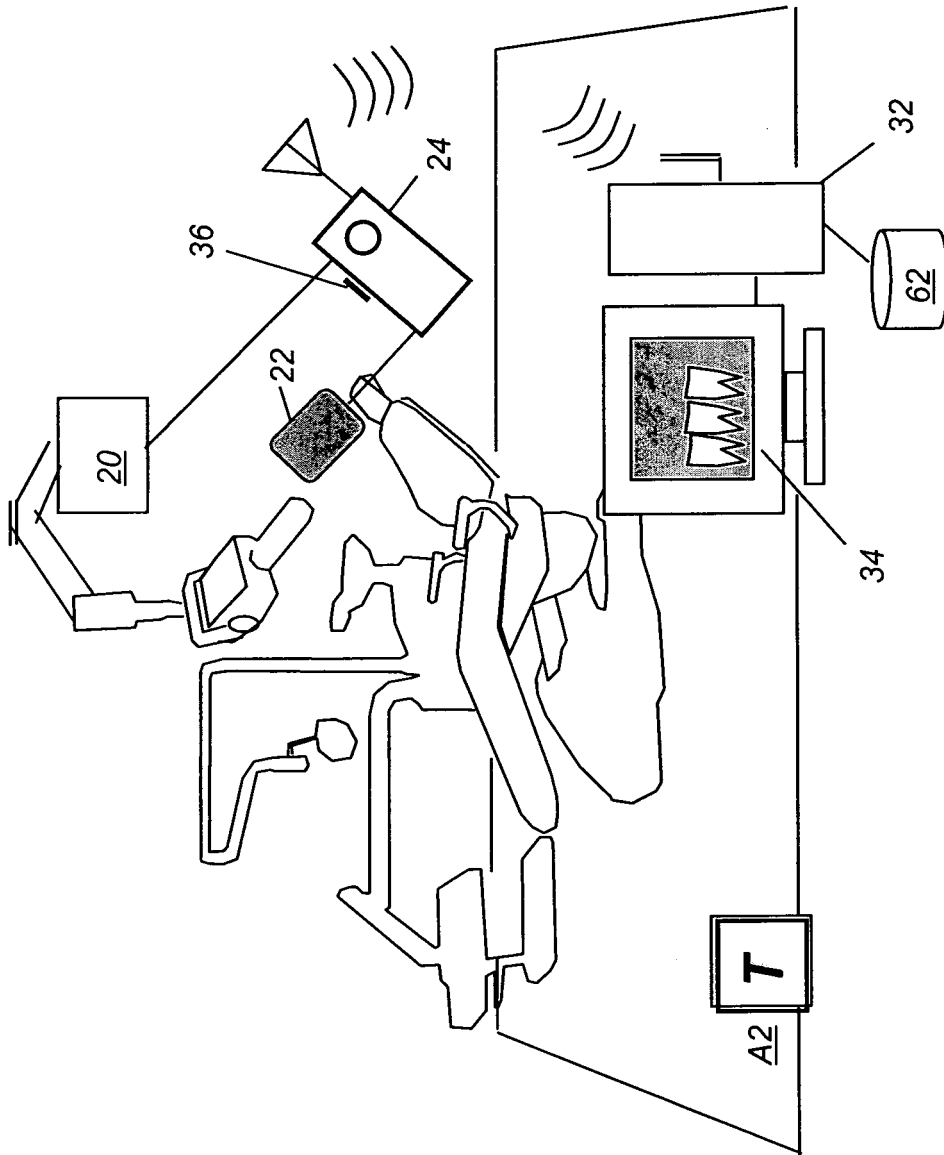


FIG. 7

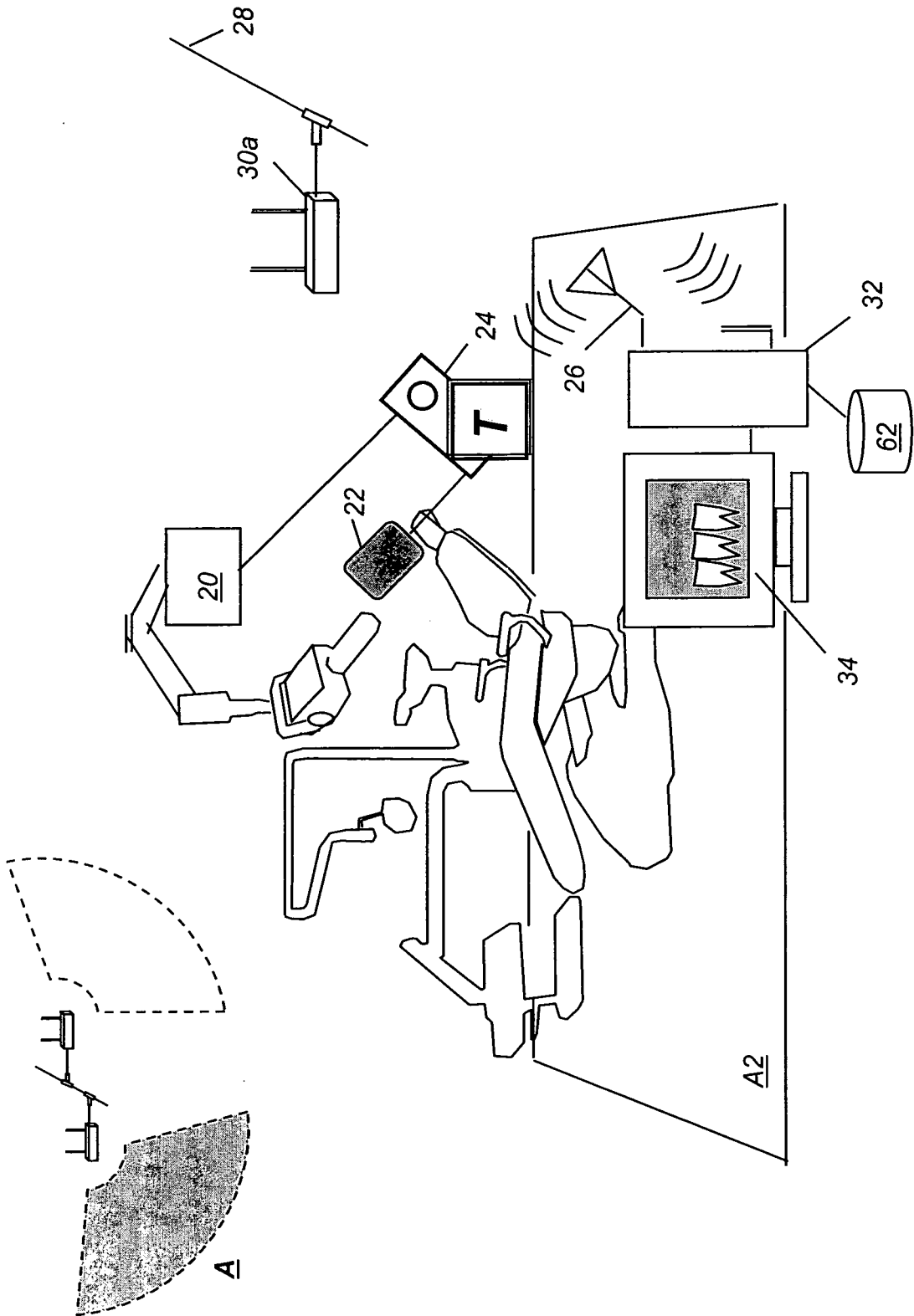


FIG. 8

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20100104065 A1 [0006]
- US 20090022276 A1 [0006]

专利名称(译)	无线探测器与成像设备的关联		
公开(公告)号	EP2624741B1	公开(公告)日	2017-09-20
申请号	EP2010793038	申请日	2010-10-07
[标]申请(专利权)人(译)	特罗菲公司		
申请(专利权)人(译)	杯		
当前申请(专利权)人(译)	杯		
[标]发明人	LEMAIRE ALAIN BOTHOREL SYLVIE JEANNEAU CAROLINE		
发明人	LEMAIRE, ALAIN BOTHOREL, SYLVIE JEANNEAU, CAROLINE		
IPC分类号	A61B6/00 A61B6/14 H04W4/00 H04W4/04 H04W84/12 A61B5/00		
CPC分类号	A61B6/14 A61B5/0013 A61B6/4494 A61B6/545 A61B6/548 A61B6/563 A61B6/586 H04W4/80 H04W84/12		
代理机构(译)	Santarelli的		
其他公开文献	EP2624741A1		
外部链接	Espacenet		

摘要(译)

一种用于将图像数据导向牙科治疗部位的方法。传感器控制器位于牙科治疗部位处的编程射频识别装置附近。根据从射频识别设备获得的信息，命令条目配置传感器控制器编码和发送图像数据内容以便传送到接收地址。与传感器控制器相关联的数字传感器定位在对象附近。从数字传感器获取图像数据，并从传感器控制器发送到无线接入点，并从无线接入点发送到接收地址的主计算机。获取的发送图像数据存储在计算机可访问的电子存储器中。

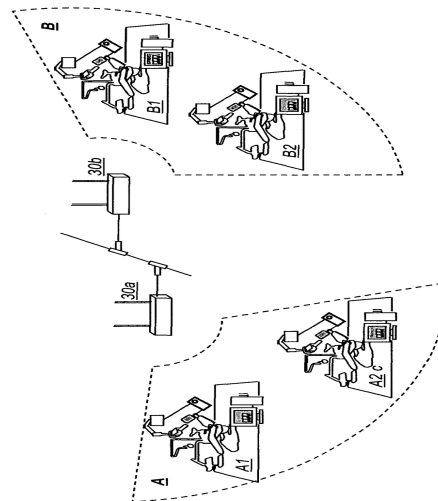


FIG. 1