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(71) Applicant(s):  
**Canon Europa NV**  
**(Incorporated in the Netherlands)**  
**Bovenkerkerweg 59-61, 1185 XB Amstelveen,**  
**Netherlands**  
 (72) Inventor(s):  
**Benjamin John Parks**  
**Pierre-Jean Champault**  
**Ricardo Jose Teixeira Dos Santos**  
 (74) Agent and/or Address for Service:  
**Canon Europe Ltd**  
**European Patent Department, 3 The Square,**  
**Stockley Park, UXBRIDGE, Middlesex, UB11 1ET,**  
**United Kingdom**

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**US 20110085196 A1** **US 20090021776 A1**  
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(54) Title of the Invention: **Image-processing system and image processing method**  
 Abstract Title: **Image-processing system and method using mobile device**

(57) An image-processing system and method comprises a peripheral device 10 (such as a printer, scanner or multi-functional peripheral), a mobile device 11 (such as a mobile phone, PDA or laptop) and a server 13. The peripheral device registers communication parameters with the server using identification information; the mobile device sends a request to the server with this identification information; wherein the server allows a connection between the mobile device and peripheral device. The identification information may be a random number generated by the peripheral device. The identification information may be a code that is input manually into the mobile device, or machine-readable code (such as a barcode) that is read by a camera of the mobile device. An alternative embodiment is where the identification information is the location of the peripheral device; the mobile device sends a request to the server with the mobile devices location (determined by GPS, for example); wherein the server allows a connection between the mobile device and a nearby peripheral device.

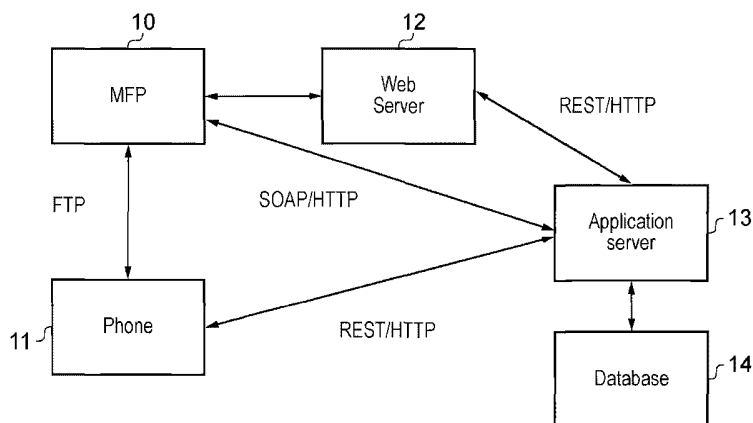


FIG. 1

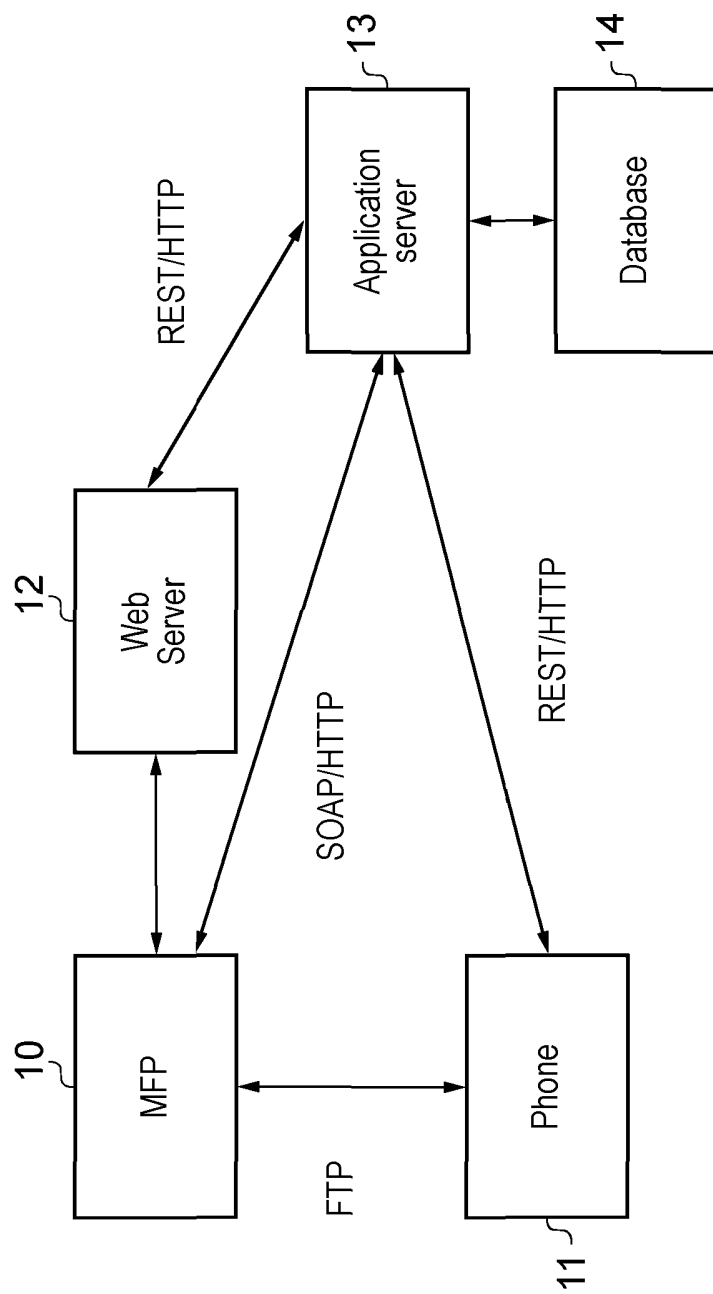


FIG. 1

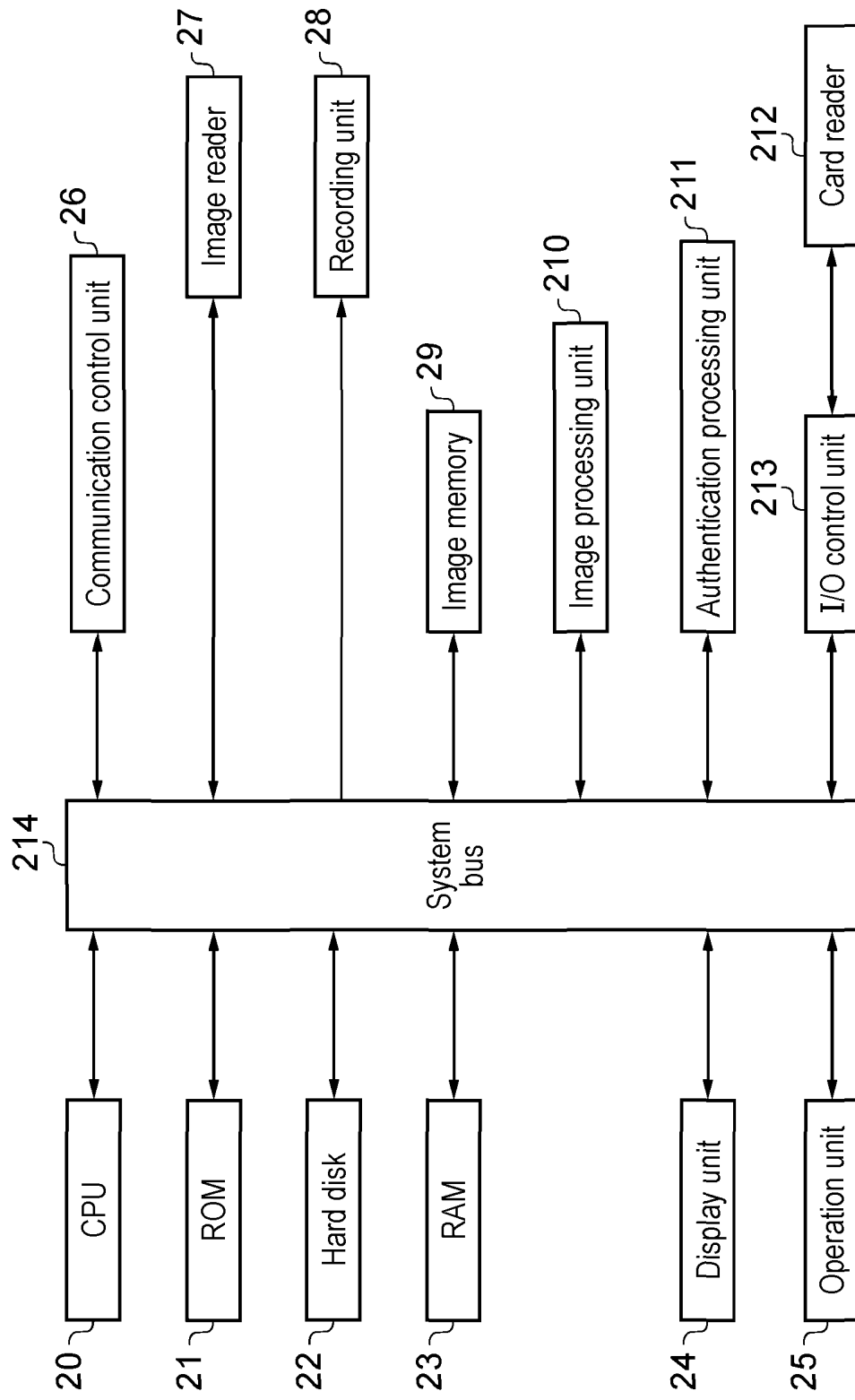


FIG. 2

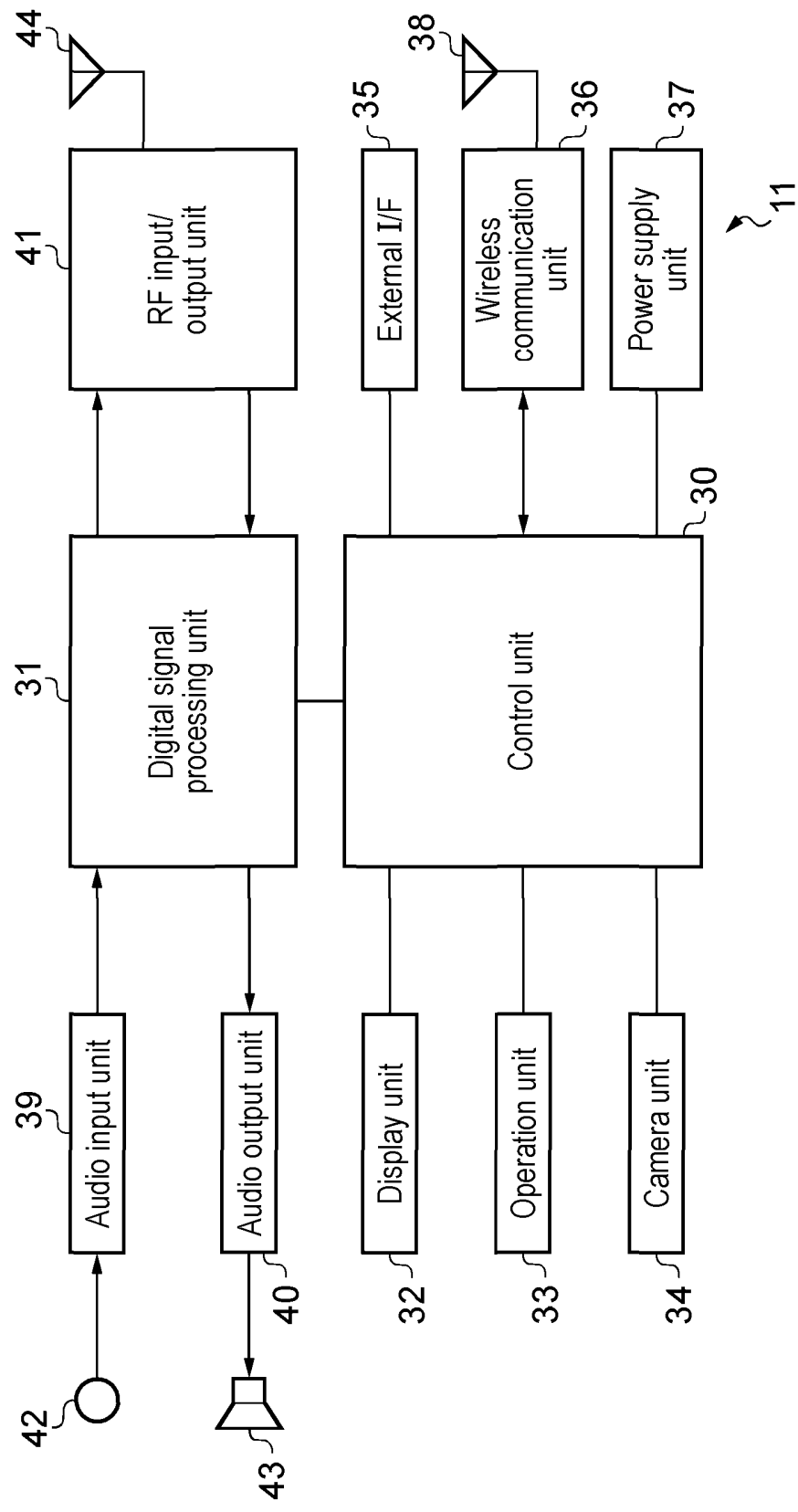


FIG. 3

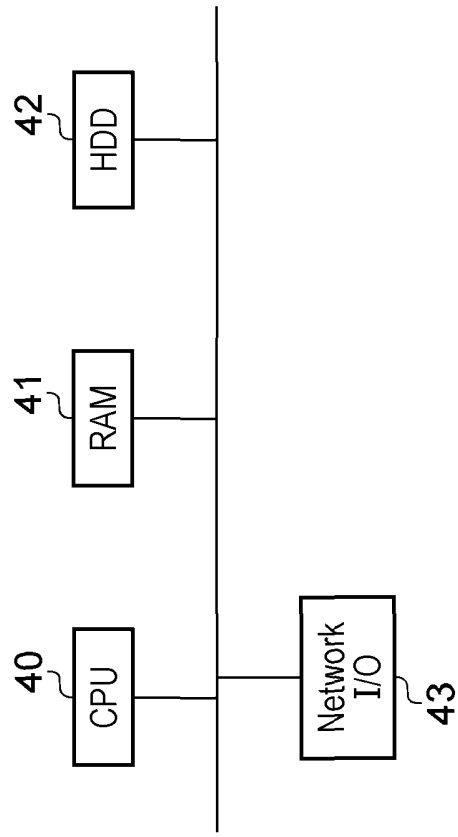


FIG. 4

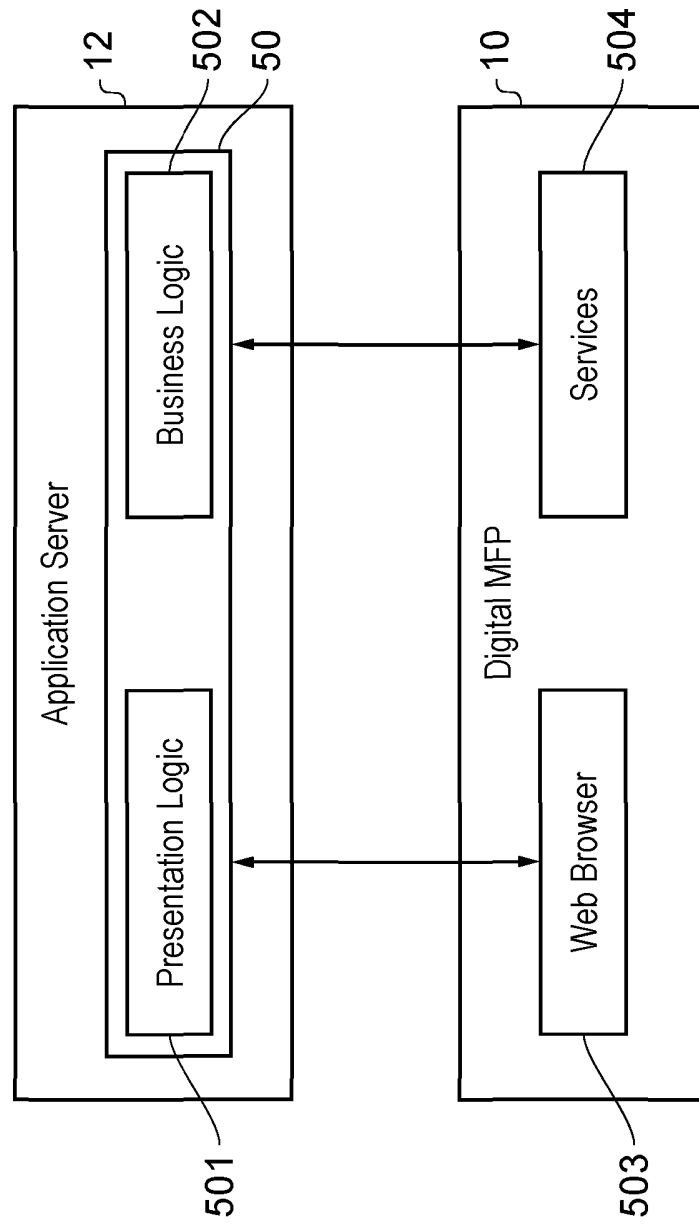


FIG. 5

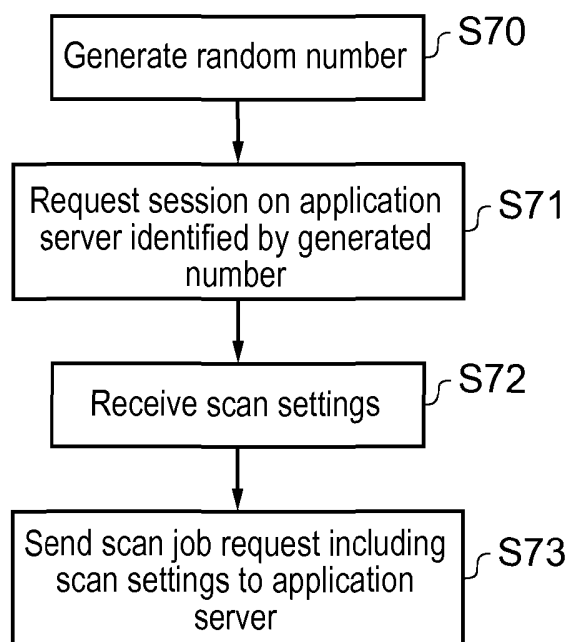


FIG. 6

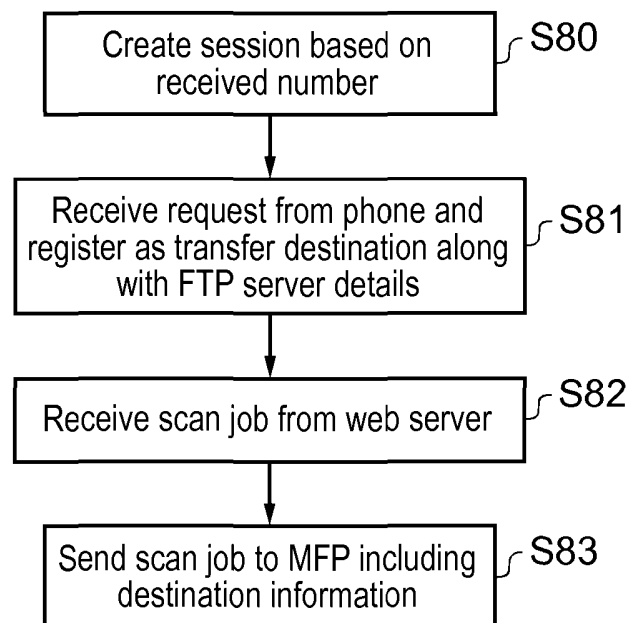


FIG. 7



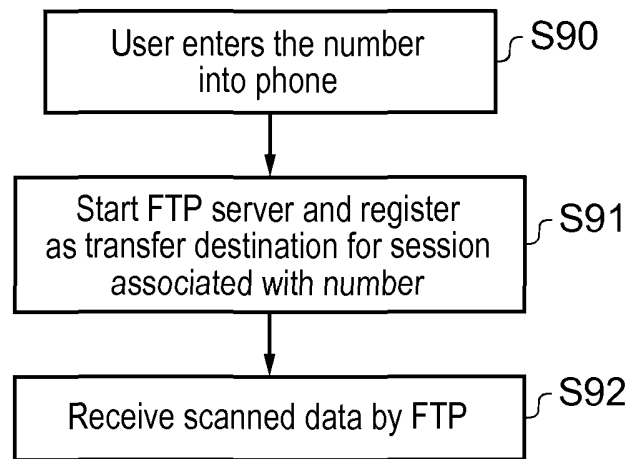


FIG. 8

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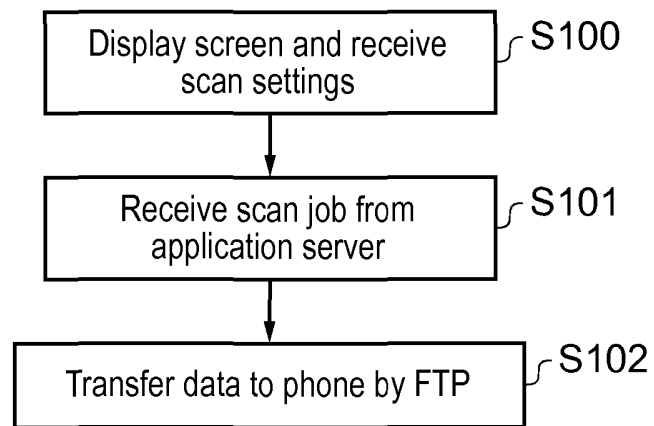


FIG. 9

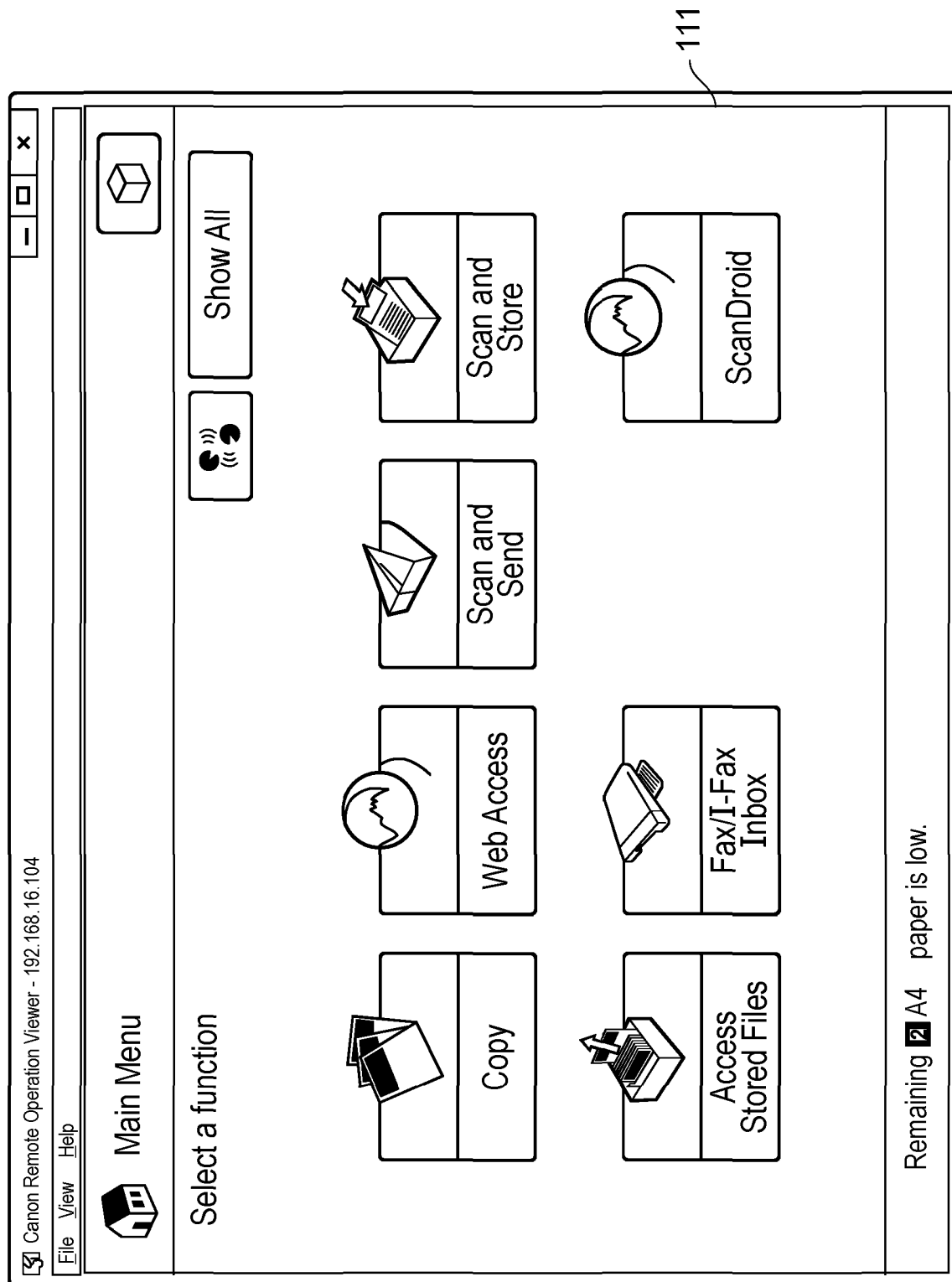


FIG. 10



11/14

FIG. 11

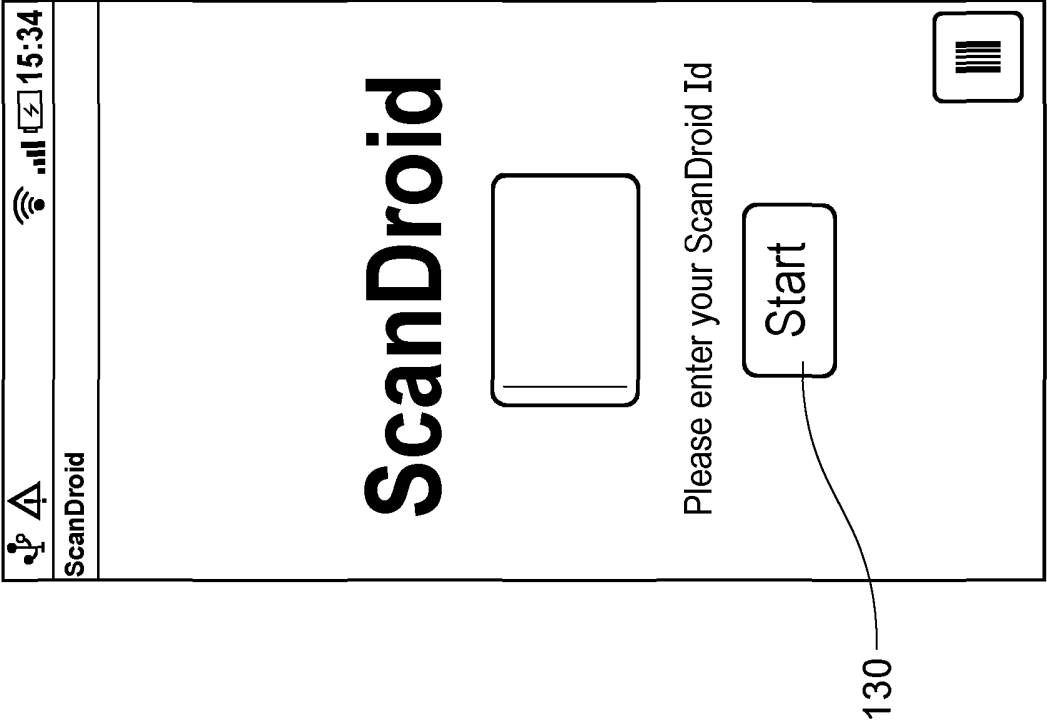


FIG. 12

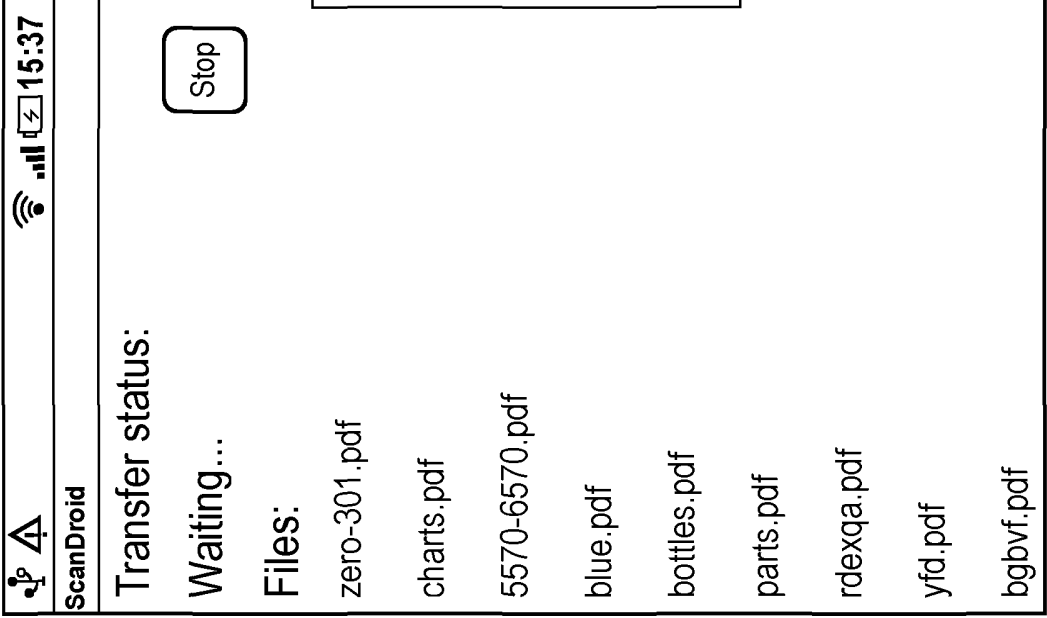


FIG. 13

Canon Remote Operation Viewer - 192.168.16.104

FileViewHelp

ScanDroid

File name:ipad

File format:PDF

Two sided:One Sided

Resolution:300x300

Colour:Auto colour grey

Preview:☒No☐Yes

BackStart Scan

Remote Operation is being used...

150

FIG. 14

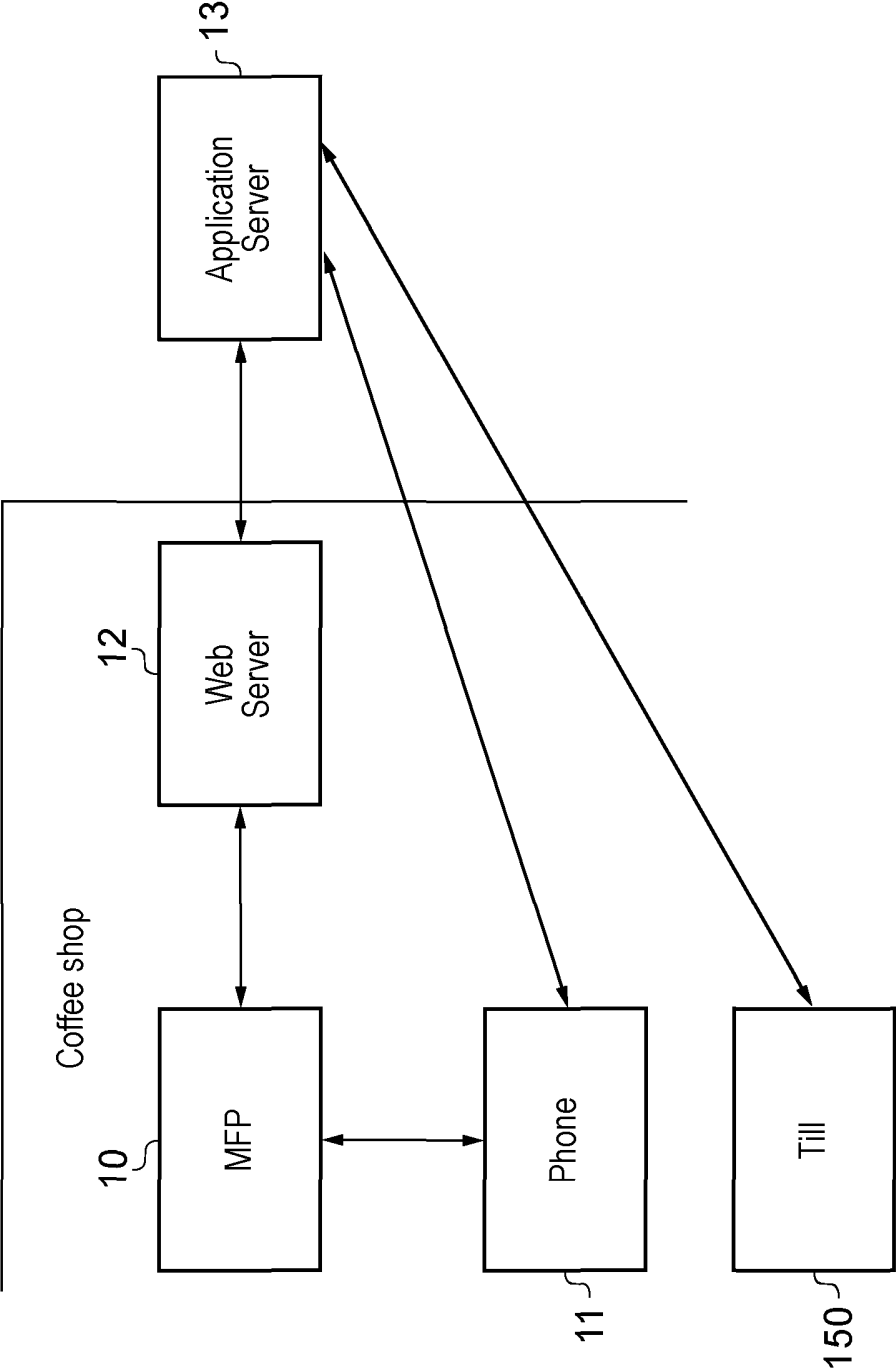


FIG. 15

## IMAGE-PROCESSING SYSTEM AND IMAGE-PROCESSING METHOD

### BACKGROUND OF THE INVENTION

#### Field of the Invention

5   **[0001]**     The present invention relates to an image-processing system and an image-processing method. In particular, the present invention relates to communication between peripheral devices, such as printers, scanners, fax machines, etc., and mobile  
10 devices, such as mobile telephones, PDAs, etc.

#### Description of the Related Art

**[0002]**     Mobile devices, such as mobile telephones and PDAs, are widely used in modern society. Similarly,  
15 large MFP (Multi-function Peripheral) devices are also widely used in office environments, print rooms, universities, etc. However, a practical method for printing from mobile phones to MFPs or for scanning



documents to mobile phones has been lacking.

**[0003]** WO 2007/026938 describes a mechanism for scanning to and printing from mobile phones. The mobile phone communicates with an MFP using an RFID card, 5 which allows exchange of wireless network configuration parameters. Based on the wireless configuration parameters communication between the mobile phone and the MFP is configured to allow jobs to be printed from the mobile phone or documents to be scanned to the 10 mobile phone.

**[0004]** Whilst the teaching of WO 2007/026938 goes some way towards allowing mobile printing, it is inconvenient because it requires a non-contact IC card unit (contactless smart card) to be built into the 15 mobile phone. Mobile phones and other devices with such built-in contactless smart cards are not yet in wide-spread use.

**[0005]** Modern mobile phones (so called smart phones)

now include operating systems and the ability to  
download and install software applications.

#### SUMMARY OF THE INVENTION

- 5   **[0006]**     It is an object of the present invention to  
provide an image-processing system and an image-  
processing method that allows communication between  
mobile devices and peripheral devices without the need  
for dedicated hardware in the mobile device.
- 10   **[0007]**     According to a first aspect of the present  
invention there is provided an image-processing system  
comprising: a peripheral apparatus including a  
peripheral device, the peripheral apparatus being  
configured to send a registration request to register  
15   communication parameters of the peripheral device in  
association with a piece of identification information;  
a server configured to receive the registration  
request and to register the communication parameters of

the peripheral device in association with the piece of  
identification information; and a mobile device  
configured to determine the piece of identification  
information and to send a request to the server with  
5 the determined piece of identification information,  
wherein the server is configured to associate the  
registered details of the peripheral device with the  
request from the mobile device thereby allowing a  
connection to be configured between the mobile device  
10 and the peripheral device.

**[0008]** Preferably the connection between the mobile  
device and the peripheral device is configured by at  
least one of the mobile device and the peripheral  
apparatus retrieving communication parameters stored on  
15 the server.

**[0009]** In some embodiments, the connection between  
the mobile device and the peripheral device is a direct  
connection such that the mobile device and the

peripheral device can communicate directly with each other. In other embodiments, the connection between the mobile device and the peripheral device is an indirect connection. The indirect connection may be a connection  
5 involving one or more servers.

**[0010]** In some embodiments, the piece of identification information is a code, the peripheral device is configured to provide the code to a user, and the mobile device is configured to determine the  
10 identification information by entry of the code into the mobile device by a user. Preferably the code is displayed on a display of the peripheral device. In some embodiments the code is a number.

**[0011]** In other embodiments, the peripheral device  
15 is configured to provide a barcode or other machine-readable code encoding the piece of identification information; and the mobile device is configured to determine the piece of identification information by

reading and decoding the barcode or other machine-readable code provided by the peripheral device.

**[0012]** In other embodiments the piece of identification information is derivable from a position  
5 of the peripheral device; and the mobile device is configured to determine the piece of identification information by detecting a position of the peripheral device. Preferably, the position of the peripheral device is determined using a position detection means  
10 in the mobile device. In some embodiments the position detection means is a global positioning sensor. Preferably the piece of identification information is a predetermined number of digits of location coordinates of the peripheral device.

15 **[0013]** In some embodiments, the mobile device is further configured to determine parameters to allow communication with the server. Preferably, the mobile device is configured to determine the parameters to

allow communication with the server by reading a machine-readable code encoding an address of the server.

In some embodiments the machine-readable code is a barcode.

5   **[0014]**     In some embodiments the mobile device is a mobile phone, a PDA, a digital camera, a laptop computer, or other mobile device. In some embodiments the peripheral device is an MFP, a printer, a scanner or a fax machine.

10   **[0015]**     In a further aspect of the present invention there is provided an image-processing method for an image-processing apparatus comprising a peripheral apparatus, a server and a mobile device, the peripheral apparatus comprising a peripheral device, the method  
15   comprising: the peripheral apparatus sending a registration request to register communication parameters of the peripheral device in association with a piece of identification information at the server;

the server receiving the registration request and  
registering the communication parameters of the  
peripheral device in association with the piece of  
identification information; the mobile device  
5 determining the piece of identification information and  
sending a request to the server with the determined  
piece of identification information; and the server  
associating the registered details of the peripheral  
device with the request from the mobile device thereby  
10 allowing a connection to be configured between the  
mobile device and the peripheral device.

**[0016]** According to a further aspect of the present  
invention there is provided a mobile device comprising  
a printing/scanning function for sending a file for  
15 printing and/or for receiving a scanned file, the  
printing/scanning function including: means for reading  
and decoding a machine readable code in order to  
determine a piece of identification information; and

means for sending a request to a server including the determined piece of identification information.

**[0017]** According to yet a further aspect of the present invention there is provided a method for

5 printing from a mobile device comprising: reading and decoding a machine readable code in order to determine a piece of identification information; and sending a request to a server including the determined piece of identification information.

10 **[0018]** According to a yet further aspect of the present invention there is provided a peripheral apparatus comprising: means configured to provide a user with a piece of identification information in the form of a machine-readable code.

15 **[0019]** According to a yet further aspect of the present invention there is provided a method for a peripheral apparatus comprising: providing a user with a piece of identification information in the form of a



machine readable code.

**[0020]** According to a yet further aspect of the present invention there is provided a server comprising: means for receiving a registration request  
5 from a peripheral apparatus including communication parameters for the peripheral apparatus; means for registering the peripheral apparatus in accordance with a received request in association with a piece of identification information; means for receiving a  
10 request from a mobile device including the piece of identification information; and means for associating the registered peripheral apparatus with the request from the mobile device using the piece of identification information.

15 **[0021]** According to a yet further aspect of the present invention there is provided a method for a server comprising: receiving a registration request from a peripheral apparatus including communication

parameters for the peripheral apparatus; registering  
the peripheral apparatus in association with a piece of  
identification information in accordance with a  
received request; receiving a request from a mobile  
5 device including the piece of identification  
information; and associating the registered peripheral  
apparatus with the request from the mobile device using  
the piece of identification information.

**[0022]** According to a yet further aspect of the  
10 present invention there is provided an image-processing  
system comprising: a peripheral apparatus including a  
peripheral device, the peripheral apparatus being  
configured to send a registration request to register  
communication parameters of the peripheral device in  
15 association with a piece of location information; a  
server configured to receive the registration request  
and to register the communication parameters of the  
peripheral device in association with the piece of

location information; and a mobile device configured to determine its location and to send a request to the server with the determined mobile device location information, wherein the server is configured to  
5 identify the registered details of the peripheral device based on the mobile device location information in the request from the mobile device thereby allowing a connection to be configured between the mobile device and the peripheral device.

10 **[0023]** Preferably the server is configured to identify the peripheral device by determining that its registered location is within a predetermined distance of the mobile device location included in the request from the mobile device.

15 **[0024]** In some embodiments the server is configured so that, in a case that the server determines that a plurality of peripheral devices are within the predetermined distance of the mobile device location

included in the request from the mobile device, the server causes a message to be displayed on the mobile device to cause a user to select one of the plurality of peripheral devices for connection.

- 5   **[0025]**     According to a further aspect of the present invention there is provided an image-processing method for an image-processing system comprising a peripheral apparatus, a server and a mobile device, the peripheral apparatus including a peripheral device, the method
- 10 comprising: the peripheral apparatus sending a registration request to the server to register communication parameters of the peripheral device in association with a piece of location information; the server receiving the registration request and
- 15 registering the communication parameters of the peripheral device in association with the piece of location information; the mobile device determining its location and sending a request to the server with the

determined mobile device location information; and the  
server identifying the registered details of the  
peripheral device based on the mobile device location  
information in the request from the mobile device  
5 thereby allowing a connection to be configured between  
the mobile device and the peripheral device.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0026]** Embodiments of the present invention will now  
10 be described, by way of example only, with reference to  
the accompanying figures in which:

**[0027]** Figure 1 shows architecture of the first  
embodiment;

**[0028]** figure 2 shows hardware of an MFP;

15 **[0029]** figure 3 shows hardware of a mobile phone;

**[0030]** figure 4 shows server hardware;

**[0031]** figure 5 shows communications between a web  
server and the MFP;

**[0032]** figure 6 shows steps performed at the web  
server;

**[0033]** figure 7 shows steps performed at an  
application server;

5 **[0034]** figure 8 shows steps performed at the mobile  
phone;

**[0035]** figure 9 shows steps performed at the MFP;

**[0036]** figure 10 shows a display of the MFP;

**[0037]** figure 11 shows another display of the MFP;

10 **[0038]** figure 12 shows a display of the mobile  
phone;

**[0039]** figure 13 shows another display of the mobile  
phone;

**[0040]** figure 14 shows another display of the MFP;

15 and

**[0041]** figure 15 shows a configuration of the fifth  
embodiment.

**[0042]**

## DESCRIPTION OF THE EMBODIMENTS

### First Embodiment

**[0043]** Figure 1 shows architecture of an image-  
5 processing system of the first embodiment. The image-  
processing system comprises an MFP (multi-function  
peripheral) 10 and a mobile phone 11. The MFP 10 has an  
associated web server 12, as will be explained in more  
detail below. The image-processing system further  
10 comprises an application server 13 and a database 14.  
The application server 13 and database 14 are shown  
separately in Figure 1, but in other embodiments the  
database 14 may be stored on the application server 13.

**[0044]** Figure 2 shows the hardware configuration of  
15 the MFP 10. The MFP comprises a CPU 20, a ROM 21, a  
hard disk drive 22, and a RAM 23. These components are  
standard hardware components for computers and other  
devices and perform their usual functions. The MFP 10

further comprises a display unit 24, an operation unit 25, a communication control unit 26, an image reader 27, a recording unit 28, an image memory 29, an image processing unit 210, an authentication unit 211, a card reader 212, and an I/O control unit 213. The display unit 24 is a touch-screen LCD display provided on the MFP 10 to allow a user to make selections and view information on the MFP 10. The operation unit 25 is a keypad and other buttons to allow a user to enter settings and other information to the MFP 10. The communication control unit 26 is provided to allow the MFP 10 to communicate over a LAN with the web server 12. The image reader 27 is a scanner that allows scanning of documents. The recording unit 28, shown in Figure 2, represents parts of the MFP 10 dedicated to printing. The recording unit 28 functions to print image data onto a recording medium and output the recording medium for collection by a user. The image memory 29 is a



memory provided for storage of image data during scanning by the image reader 27 or printing by the recording unit 28. The image-processing unit 210 represents various application specific integrated  
5 circuits (ASIC) provided in the MFP 10 in order to increase the speed of certain image processing operations, such as conversion of scanned R,G,B data into C,M,Y,K data during a copying operation. The authentication processing unit 211 is provided in order  
10 to authenticate user details received from the card reader 212. Data from the card reader 212 is received at the authentication unit 211 via an I/O control unit 213. The authentication unit may be implemented by software run using the CPU 20 and RAM 23 rather than as  
15 a separate hardware component. The components described above are interconnected via a system bus 214.

**[0045]** The MFP 10 runs an operating system. In this particular embodiment the operating systems is the MEAP

operating system provided on MFP devices sold by Canon (RTM). The operating system allows the running of JAVA applications and also includes a web interface as will be explained later.

5   **[0046]**     Figure 3 shows the hardware configuration of the mobile phone 11. The mobile phone 11 comprises a control unit 30 connected to a digital signal processing unit 31. The control unit 30 controls operation of a display unit 32, an operation unit 33, a  
10 camera unit 34, an external I/F 35, a wireless communication unit 36, and a power supply unit 37. The display unit comprises an LCD display for displaying information to a user of the phone 11. The operation unit 33 comprises a keypad and other operation buttons  
15 to allow a user to make inputs into the mobile phone 11. The camera unit 34 is a camera that is integrated into the phone 11 to allow a user to take pictures and to collect visual information. The external I/F is a port

provided in the mobile phone 11 to allow the mobile  
phone 11 to communicate with other devices. In  
particular the external I/F allows the mobile phone 11  
to be connected to a computer for the purposes of  
5 synchronizing data (contact details, calendar entries  
etc.) stored on the mobile phone 11 with data stored on  
the computer. The wireless communication unit 36  
provides support for various wireless services. In  
particular the wireless communication unit 36 provides  
10 support for Wi-Fi communication. The wireless  
communication unit 36 is connected to an antenna 38.  
The power supply unit 37 includes a battery and a  
mechanism for charging the battery from an external  
power supply.

15 **[0047]** The digital signal processing unit 31 is  
connected to an audio input unit 39, an audio output  
unit 40, and an RF input/output unit 41. The audio  
input unit 39 is an analogue to digital processor for

receiving and converting audio signals from a  
microphone 42. The audio output unit 40 is a digital to  
analogue processor for receiving and converting digital  
signals into an analogue output to be output by a  
5 speaker 43. The RF input/output unit 41 is connected to  
an antenna 44 and is used to allow the mobile phone 11  
to communicate with a local mobile phone station. The  
audio input unit 39, audio output unit 40, digital  
signal processing unit 31 and RF input/output unit 41  
10 allow the mobile phone 11 to operate as a portable  
telephone.

**[0048]** The mobile phone 11 is a so called 'smart  
phone' and runs Google (RTM) Android (RTM) operating  
system. In other embodiments other types of phone can  
15 be used, including those running different mobile phone  
operating systems.

**[0049]** The web server 12 and application server 13  
comprise typical server hardware exemplified by Figure

4. The server hardware includes a CPU 40, RAM 41, a hard disk drive 42 and a network I/O 43. The network I/O 43 allows the web server 12 and application server 13 to communicate over a LAN.

5   **[0050]**     Additional details of the image processing system will be described below. The configuration of the first embodiment is suitable for use for the purposes of demonstration of printing from and scanning to mobile phones in an exhibition or show room environment. A commercial implementation of the present invention will be described in the fourth embodiment.

10   **[0051]**     Referring again to Figure 1, the MFP 10, web server 12, application server 13, and mobile phone 11 are able to communicate with each other over a single  
15   Wi-Fi network.

16   **[0052]**     As mentioned above, the MFP 10 and the web server 12 are associated with each other. In particular, a web application 50 is run on the web server 12 in

order to control operations on the MFP 10. Figure 5 shows the web application 50, which includes presentation logic 501 and business logic 502.

Installed on the MFP 10 is a web browser 503 which  
5 receives HTML web pages to be displayed to a user from the presentation logic 501. Also installed on the MFP 10 is a service interface 504 to allow the business logic 502 of the web application 50 to access various services of the MFP 10. For example, the business logic  
10 502 may send commands to the service interface 504 (SOAP interface) to cause the scanner to perform a scanning operation.

**[0053]** A RESTful (Representational State Transfer) interface is provided between the web server 12,  
15 application server 13 and mobile phone 11. It is recalled that all three devices (web server 13, application server 14, and mobile phone 11) can communicate with each other via Wi-Fi over a single

network. The REST interface is defined as follows. In the following description the resource is given, then a description of the resource, followed by the HTTP request method and a description of the request method:

5

/sessionusers/{identification information}/session

A session object for given identification information.

From the session a list of transfers can be obtained.

10 GET: gets the session

/session/{sessionid}

A session object containing a collection of transfers registered for a given session.

15 GET: gets the session

PUT: updates the session

/transfers/

A collection of all transfers

POST: Registers a new transfer

/transfers/{transferid}

5 A transfer contains a device and destination object.

GET: gets the transfer

PUT: updates the transfer

/destinations/

10 A collection of FTP destinations

POST: registers a new destination

/destinations/{destinationid}

A destination with the specified ID. The destination

15 contains information about the FTP to which the scanned  
document will be sent.

GET: gets a destination

PUT: updates a destination



/devices/{deviceid}

A device. The device contains information about a SOAP service endpoint which is used for scanning a document.

5 It also includes the address for printing.

GET: gets the device.

**[0054]** Payloads of transactions conducted via the REST interface are formatted in XML or JSON.

10 **[0055]** The application server can also communicate with the MFP 10 via a SOAP/HTTP interface (services 504), allowing the application server to access services, such as printing, faxing, or scanning, on the MFP 10.

15 **[0056]** Operation of the image-processing system will now be described with reference to Figures 6 to 9.

Figure 6 is a flowchart showing steps performed by the web server 12, Figure 7 is a flowchart showing steps

performed by application server 13, Figure 8 is a flowchart showing steps performed by the mobile phone 11, and Figure 9 is a flowchart showing steps performed by the MFP 10. In each case, the steps are performed by an appropriately configured program or software running on the respective device on the hardware described earlier.

**[0057]** For purposes of illustration imagine a scenario in which a user holding the mobile phone 11 walks up to the MFP 10 and wishes to either scan to the mobile phone 11 or print from the mobile phone 11. When the user looks at the display unit 24 of the MFP 10, he or she sees a display corresponding to figure 10. The user uses the touch screen of the display unit 24 in order to select the 'scandroid' icon. Touching the icon on the touch screen launches the web browser 503 on the MFP 10. The web browser 503 requests a first page of the scandroid application from the web server 12

causing the scandroid application to be launched on the web server 12. The first page of the scandroid application is a web page shown in figure 11. Whilst generating the web page shown in figure 11, the web application 50 on the web server 12 generates a random number, s70. The generated number 110 is embedded in the web page by the presentation logic 501 and is displayed to the user in the web browser 503. At this time the application 50 also sends, S71, a message to the application server in order to generate a session. Upon receipt of this request, the application server 14 generates, S80, a session in the database 14. The generated session is identified by a sessionid, which is native to the database, and stores the random number as identification information in the session. The application server 13 also registers the MFP 10 as the source for transfers associated with the sessionid.

**[0058]** The user holding the mobile phone 11 next

launches a scandroid application on the mobile phone 11  
and is presented with the screen display shown in  
Figure 12 on the display unit 32 of the mobile phone 11.  
At this time the scandroid application on the mobile  
5 phone 11 starts an FTP server on the mobile phone 11.  
The user uses the operation unit 33 of the mobile phone  
11 to enter, S90, the generated identification number  
displayed on the display unit 24 of the MFP 10 into the  
mobile phone 11. The user then selects the start button  
10 130 shown in Figure 12.

**[0059]** The scandroid application on the mobile phone  
11 is pre-configured with an IP address of the  
application server 13 allowing the mobile phone to  
communicate with the application server 14. After the  
15 user has selected the start button 130, the scandroid  
application on the mobile phone 11 causes the mobile  
phone 11 to send a request to register, S91, the mobile  
phone 11 as the destination for the session with an

identification number corresponding to the entered  
number. This request includes details of the address of  
the FTP server running on the mobile phone 11. Upon  
receipt of this request, the application server  
5 registers, S81, the mobile phone 11 as the destination  
in connection with the session along with the FTP  
server details. In this way, the session including the  
generated identification number on the application  
server 13 includes information relating to both the MFP  
10 10 as source device and the mobile phone 11 as  
destination device.

**[0060]** Next the mobile phone displays on display  
unit 32 a list of files stored on the mobile phone.  
This display is shown in Figure 13.

15 **[0061]** Once the user has entered the identification  
number into the mobile phone 11, the user selects  
'next' on the display of the MFP 10 shown in Figure 12.  
The MFP 10 then displays a screen shown in Figure 14 to

allow the user to enter scan setting for use in the scanning operation, S100. The user may enter settings to specify color or mono scanning, a scanning resolution, a file format for the scanned document and  
5 a scanned document file name. The user then selects the start scan button 150.

**[0062]** In response to selection of the start scan button 150, the MFP notifies the web server 12 that the scan button 150 has been selected. The web server 12  
10 receives the scan settings in step S72. The web server 12 sends a request for a scan job including the scan settings to the application server 13 in step S73. In response to receipt of the request for a scan job, S82, the application server adds the FTP server details of  
15 the mobile phone 11 stored in the session to the scan settings and sends a scan job to the SOAP interface 504 of the MFP 10, S83. Upon receipt of the scan job, S101, including scan settings and destination details, the

MFP 10 performs the requested scan and sends, S102, the scanned document data to the FTP server on the mobile phone 11 over the Wi-Fi network.

**[0063]** The mobile phone 11 receives the scanned file, S92, and stores it in a memory on the mobile phone 11, thus completing the scanning operation.

**[0064]** If the user wishes to print from the mobile phone 11 to the printer 10, the user uses the scandroid application on the mobile phone 11 to select a file from a list of files stored on the mobile phone 11 and then selects a print command. The mobile phone 11 requests source device information from the application server 13, and then sends the selected file to LPR port 9100 of the MFP 10. The document to be printed must be stored or converted in the mobile phone 11 to a format that can be natively interpreted by the MFP 10, in this embodiment the file is sent in pdf format. In response to receiving the document, the MFP 10 prints the file.

## Second embodiment

**[0065]** In the first embodiment an association is set  
5 up between the MFP 10 and the mobile phone 11 based on  
the identification information, which is a random  
number generated by the web server 13. The web server  
13 generates a web page in which the generated number  
is embedded so that the user can read the number when  
10 the web page is displayed in the web browser 503 of the  
MFP 10 In the second embodiment, step S90 is performed  
using barcodes. The web server generates a web page  
(see Figure 11) in which a barcode 121 is embedded, the  
barcode 121 encoding the generated number.

15 **[0066]** In the second embodiment, when the user  
launches the scandroid application on the mobile phone  
11, the camera unit 34 is activated and the images  
collected by the camera unit 34 are displayed in a



window on the display unit 32. The user directs the camera unit 34 towards the display unit 24 of the MFP 10, which is displaying the web page with the embedded barcode 121. When the barcode 121 is in view of the camera, the mobile phone 11 automatically performs barcode recognition in order to extract the number from the barcode 121 displayed on the display unit 24 of the MFP 13.

**[0067]** The number extracted from the barcode is used by the mobile phone as the identification information in the same manner as described in the first embodiment. Accordingly, the description of the other operations of the image-processing system of the first embodiment will not be repeated.

**[0068]** The second embodiment is advantageous in the identification information can be obtained by 'scanning' the display unit 34 of the MFP 10 with the mobile phone 11. In embodiments where the generated

number itself is not displayed, it is more difficult,  
in a case that there is a queue of users waiting to use  
the MFP 10, for another user to make use of the  
identification information if they are not directly in  
5 front of the MFP 10. The second embodiment also has the  
advantage that it requires fewer button presses for a  
user and in that it speeds up the overall scanning  
method.

10 Third embodiment

**[0069]** In a third embodiment of the invention, the  
identification information is generated based on GPS  
co-ordinates of the MFP 10. The MFP 10 generates a  
session at the application server 13 and stores in the  
15 session a first predetermined number of the GPS co-  
ordinates identifying the location of the MFP 10.

**[0070]** In a case that a user wishes to scan from the  
MFP 10, the user places the mobile phone 11 on the MFP

10 and opens the scandroid application on the mobile  
phone. The scandroid application accesses a GPS unit on  
the mobile phone 11 and identifies GPS coordinates  
identifying the mobile phone's position. The scandroid  
5 application on the mobile phone 11 selects the first  
predetermined number of GPS coordinates and uses these  
coordinates as identification information to identify  
the session for registering as the destination device.  
As the mobile phone 11 and the MFP 10 are in the same  
10 location (the mobile phone 11 is resting on the MFP 10)  
the identification information registered for the MFP  
10 matches the identification information generated by  
the mobile phone 11 allowing the mobile phone 11 and  
MFP 10 to use the same session.

15 **[0071]** The identification information can be  
selected to be the first predetermined number of digits  
of the GPS position in any coordinate format. The  
predetermined number of coordinates should preferably

be selected so that the location of the MFP 10 is identified to within a reasonable degree of accuracy.

If too many coordinates are selected and the degree of accuracy is too high, the mobile phone 11 and MFP may  
5 not agree on their locations and they will not generate the same identification information. This will cause the image-processing system to fail. On the other hand, if too few digits of the GPS location are used, there may be a problem that two or more MFPs try to use the  
10 same identification information. This problem can be overcome by displaying a list of MFPs 10 registered in the session on the display unit 32 of the mobile phone 11 and allowing the user to select the appropriate MFP 10. In many cases, the predetermined number of  
15 coordinates should specify accuracy to within a few meters.

Fourth embodiment

**[0072]** In order to overcome the problems identified

above in the third embodiment, the fourth embodiment makes use of proximity in order to allow the mobile phone 11 to access the same session as the MFP 10.

**[0073]** In the fourth embodiment, the web server 12  
5 sends a request to generate a session at the  
application server 13 and registers the MFP 10 as a  
source device in the generated session. The request  
from the web server 12 includes coordinates identifying  
the location of the MFP 10, which are stored in the  
10 generated session by the application server 13.

**[0074]** When he or she wants to scan, the user brings  
the mobile phone 11 close to the MFP 10 and starts the  
scandroid application on the mobile phone 11. The  
scandroid application on the mobile phone 11 sends a  
15 request to register the mobile phone 11 as the  
destination device to the application server 13,  
including coordinates of its location identified from  
the built in GPS unit.

**[0075]** When the application server 13 receives the registration request from the mobile phone 11, it searches the sessions in the database in order to identify sessions with registered source devices that  
5 are located within a predetermined range of the mobile phone. The predetermined range may be, say, 5 meters.

**[0076]** If the application server finds no sessions with source devices within the predetermined range of the mobile phone 11, the application sends the mobile  
10 phone 11 an error message and the connection process fails.

**[0077]** If the application server 13 finds a single session with a source device within the predetermined range of the mobile phone 11, the application server 13  
15 identifies the session in which the source device is registered as the appropriate session and registers the mobile phone 11 as the destination device for that session.

**[0078]** If the application server 13 finds more than one session including a source device located within the predetermined range of the mobile phone 11, the application server 13 returns information indicating the identity of the sessions and corresponding source devices within range of the mobile phone 11. Upon receipt of this information the mobile phone 11 displays a list of the sessions and corresponding source devices on the mobile phone 11 in order to allow a user to select the appropriate source device from which he or she wishes to use to scan. Once the user has selected the appropriate session and source device, the selection is sent from the mobile phone 11 to the application server 13 and the application server registers the mobile phone 11 as the destination device in the appropriate session.

**[0079]** After the mobile phone 11 is registered as destination device in the appropriate session, the

method proceeds as previously described in connection  
with the first embodiment. The image-processing  
apparatus of the fourth embodiment allows easier  
operation in a case where there are multiple MFPs in a  
5 small area and allows the user to select the  
appropriate MFP 10 to scan from.

#### Fifth embodiment

**[0080]** Figure 14 shows a more commercial embodiment  
10 of the invention. The MFP 10 and web server 13 are set  
up in a coffee shop. A user carrying the mobile phone  
enters the coffee shop and wishes to print to the MFP  
10. The application server 13 is located outside of the  
coffee shop premises and may be a shared resource with  
15 other coffee shops (for example if the coffee shop is  
part of a chain).

**[0081]** Similar to the first and second embodiments,  
the web server 12 sends a request to register the MFP



10 at the application server 13 using a generated  
random number. The application server 13 receives this  
request and generates a session with identification  
information corresponding to the generated number. This  
5 process is automatically performed on a daily basis,  
with a new session with different identification  
information being generated overnight when the coffee  
shop is closed. As with the second embodiment, the  
identification information is encoded in a barcode.  
10 However, in the fourth embodiment, the barcode is  
generated at the application server 13 and is sent to a  
till 150 in the coffee shop.

**[0082]** In a case that a user wishes to print to  
and/or scan from the MFP 10, the user needs to make a  
15 purchase at the till 150. The ability to use the coffee  
shop's MFP 10 may be subject a separate charge or  
provided as a complimentary service to the coffee  
shop's customers. When the user has made an appropriate

purchase, the user is given a receipt with the barcode printed on it.

**[0083]** At this stage, as the user has walked in from the street, the mobile phone does not know the address of the application server that it should contact with a request. The address information may be configured on the user's phone in one of several different ways. Firstly, the application-server address information may be displayed in the coffee shop and the user may enter this information into a scandroid application on the mobile phone manually. Alternatively, different versions of the scandroid application may be available for download to the user's mobile phone with the application server details already pre-configured within it. For example, the user may download a scandroid application that allows printing and/or scanning within a particular chain of coffee shops, the downloaded scandroid application having the details of

the application server 13 for that serves the MFPs 10  
of that chain of coffee shops pre-configured. A third  
way of configuring the address of the application  
server 13 is to provide the address of the application  
5 server 13 in a barcode on the till receipt. In such  
embodiments, the till receipt includes two barcodes, a  
first barcode that encodes information about the  
address of the application server and a second barcode  
that encodes identification information of the session  
10 for accessing MFP 10.

**[0084]** In order to print or scan, the user opens the  
appropriate scandroid application on the mobile phone  
11 and scans the barcode on the till receipt in the  
manner described in connection with the second  
15 embodiment. If the address of the server is to be  
obtained by scanning a separate barcode on the till  
receipt, the scanning process involves two scanning  
steps, a first in which the barcode encoding the

address of the application server 13 is read and decoded by the mobile phone 11 and a second in which the barcode encoding the identification information is read and decoded by the mobile phone 11.

5   **[0085]**     The embodiment then proceeds as described previously to allow the user to print to and/or scan from the MFP 10. As noted above, the identification information is automatically changed on a daily basis, so that a user may use the barcode on his or her  
10   receipt to print and/or scan on the day of purchase, but will not be able to print or scan on another day because the identification information encoded in the barcode will have changed and the mobile phone 11 will fail to find the session of the MFP 10 on the  
15   application server 13.

**[0086]**     In contrast to the first embodiment, the fourth embodiment involves communication across multiple networks. The MFP 10 and web server 12

communicate with each other via a LAN internal to the coffee shop. The application server 13 is connected to the internet and is accessible by the web server 13 and the mobile phone 11 via a web interface.

5

Other embodiments

**[0087]** Embodiments of the present invention have been described above in which data is transferred between the MFP 10 and the mobile phone 11 over a Wi-Fi network. However, this is not necessarily the case and many other types of connection could be used. In some other embodiments the data is uploaded and/or downloaded between the mobile phone 11 and the MFP 10 via the web server 12. The mobile phone sends and receives data from the web server 12 using FTP over a 3G connection on the mobile phone 11. In such embodiments the data is transferred to or from the MFP 10 by the web server 13 via a LAN using FTP or HTTP.

10

15

**[0088]** The embodiments above have described scanning documents placed on the image reader 27 of the MFP 10 and sending the scanned document to the mobile phone 11. However, in another embodiment the user may scatter a collection of business cards on the image reader 27 of the MFP 10. In this embodiment, as before, the MFP 10 performs a scanning operation in response to a user's command entered on the MFP's user interface and invoked via the MFP's SOAP/HTTP interface. However, instead of immediately sending the scanned image data to the mobile phone 11 via FTP, the scanned data is first sent to the web server 13. The web server receives the scanned data and makes use of OCR and form recognition software installed on the web server 13. The form recognition software recognizes that the received scanned image corresponds to a collection of business cards and the OCR software identifies details on the business cards such as name, telephone number, address,

etc. The web server 13 then converts the extracted data into a business card format, such as vcard. The extracted vcard details are then embedded in a web page and the sent to the MFP 10 for display. The user then  
5 looks at the displayed web page on the display unit 24 to confirm the accuracy of the extracted vcard details before selecting a send option in the displayed web page. Selection of the send option by the user causes FTP transfer of the business cards in the vcard format  
10 to the mobile phone 11 using the FTP transfer method previously described in connection with the transfer of scanned image data. An advantage of this embodiment is that the vcard details (in XML format) are more useful and significantly smaller in size than the original  
15 document scanned by the MFP 10.

**[0089]** The first to fourth embodiments of the present invention include a separate MFP, web server, application server, and database. However, in other

embodiments of the invention the function of the web server may be included in the MFP.

**[0090]** In yet further embodiments the function of the application server may be included in the MFP. In  
5 such embodiments, the image processing system may include a plurality of MFPs and one of the MFPs may be configured to act as the application server, performing the function of the application server described above in the embodiments. Such a 'lead' MFP manages requests  
10 from the other MFPs and the mobile phone.

**[0091]** The functions of the web server and/or application server, when they are included in the MFP, may be provided by software and/or hardware in the MFP housing or be provided by connection of appropriate  
15 additional devices to the MFP.

**[0092]** Embodiments of the present invention have been described above. Further embodiments of the present invention can also be realized by systems that



read out and execute programs recorded on a memory  
device to perform the functions of the above-described  
embodiment(s), and by a method, the steps of which are  
performed by, for example, reading out and executing a  
5 program recorded on a memory device to perform the  
functions of the above-described embodiment(s). For  
this purpose, the program may be provided to the image-  
processing system, for example via a network or from a  
recording medium of various types serving as the memory  
10 device (e.g., computer-readable medium).

## CLAIMS

1. An image-processing system comprising:

a peripheral apparatus including a peripheral  
5 device, the peripheral apparatus being configured to  
send a registration request to register communication  
parameters of the peripheral device in association with  
a piece of identification information;

a server configured to receive the  
10 registration request and to register the communication  
parameters of the peripheral device in association with  
the piece of identification information; and

a mobile device configured to determine the  
piece of identification information and to send a  
15 request to the server with the determined piece of  
identification information,

wherein the server is configured to associate  
the registered details of the peripheral device with

the request from the mobile device thereby allowing a connection to be configured between the mobile device and the peripheral device.

5    2.    An image-processing system according to claim 1,  
wherein:

the piece of identification information is a code,  
the peripheral device is configured to provide the  
code to a user, and

10        the mobile device is configured to determine the  
identification information by entry of the code into  
the mobile device by the user.

3.    An image-processing system according to claim 1,  
15    wherein:

the peripheral device is configured to provide a  
machine-readable code encoding the piece of  
identification information; and

the mobile device is configured to determine the piece of identification information by reading and decoding the machine-readable code provided by the peripheral device.

5

4. An image-processing system according to any of claims 1 to 3, wherein the identification information is a random number.

10 5. An image-processing system according to any preceding claim, wherein the peripheral apparatus is configured to generate the identification information.

6. An image-processing system according to claim 1,  
15 wherein:

the piece of identification information is derivable from a position of the peripheral device; and the mobile device is configured to determine the

piece of identification information by detecting a position of the peripheral device.

7. An image-processing system according to any  
5 preceding claim, wherein the request sent by the mobile device to the server includes communication parameters of the mobile device.

8. An image-processing system according to any  
10 preceding claim, wherein the connection between the mobile device and the peripheral is configured by at least one of the mobile device and the peripheral device retrieving the other device's stored parameters from the server.

15

9. An image-processing system according to any preceding claim, wherein the mobile device is further configured to determine the parameters to allow

communication with the server.

10. An image-processing system according to claim 9,  
wherein the mobile device is configured to determine  
5 the parameters to allow communication with the server  
by reading and decoding a machine readable code.

11. An image-processing system according to claim 9,  
wherein:

10 the peripheral device is configured to provide a  
machine-readable code encoding the communication  
parameters of the server; and

the mobile device is configured to determine the  
communication parameters of the server by reading and  
15 decoding the machine-readable code provided by the  
peripheral device.

12. An image-processing system according to any

preceding claim, wherein the peripheral apparatus consists of the peripheral device or the peripheral apparatus consists of the peripheral apparatus connected to an associated server.

5

13. An image-processing system according to any preceding claim, wherein the server is included in a peripheral apparatus.

10 14. An image-processing apparatus according to any preceding claim, wherein the peripheral apparatus functions as at least one of a printer, a fax machine, or a scanner.

15 15. An image-processing apparatus according to any of claims 3, 10, or 11, wherein the machine-readable code is a bar code or a QR code.

16. An image-processing method for an image-processing apparatus comprising a peripheral apparatus, a server and a mobile device, the peripheral apparatus comprising a peripheral device, the method comprising:

5       the peripheral apparatus sending a registration request to register communication parameters of the peripheral device in association with a piece of identification information at the server;

          the server receiving the registration request and  
10       registering the communication parameters of the peripheral device in association with the piece of identification information;

          the mobile device determining the piece of identification information and sending a request to the  
15       server with the determined piece of identification information; and

          the server associating the registered details of the peripheral device with the request from the mobile



device thereby allowing a connection to be configured between the mobile device and the peripheral device.

17. A suite of programs that, when executed on an  
5 image-processing system, causes the image-processing system to perform the method of claim 16.

18. One or more storage media storing the suite of programs according to claim 17.

10

19. A mobile device comprising a printing/scanning function for sending a file for printing and/or receiving a scanned file, the printing/scanning function including:

15 means for reading and decoding a machine readable code in order to determine a piece of identification information; and

means for sending a request to a server including

the determined piece of identification information.

20. A mobile device according to claim 19, wherein the  
determined piece of identification information is  
5 identification information that identifies a peripheral  
apparatus.

21. A method for printing from a mobile device  
comprising:

10 reading and decoding a machine readable code in  
order to determine a piece of identification  
information; and

sending a request to a server including the  
determined piece of identification information.

15

22. A program that, when executed by a mobile device,  
causes the mobile device to perform a method according  
to claim 21.

23. A peripheral apparatus comprising:

means configured to provide a user with a piece of  
identification information in the form of a machine-  
5 readable code.

24. A peripheral apparatus according to claim 23,  
wherein the means configured to provide the piece of  
identification information is configured to provide the  
10 identification information to a user by at least one  
of: displaying the identification information on a  
display of the peripheral apparatus, and printing the  
identification information.

15 25. A peripheral apparatus according to claim 23 or  
claim 24, wherein the identification information is a  
random number.

26. A peripheral apparatus according to any of claims  
23 to 25 comprising means for generating the  
identification information.

5 27. A peripheral apparatus according to claim 26,  
wherein the peripheral apparatus is configured to  
provide the identification information in the form of a  
barcode or a QR code.

10 28. A method for a peripheral apparatus comprising:  
providing a user with a piece of identification  
information in the form of a machine readable code.

29. A server comprising:  
15 means for receiving a registration request from a  
peripheral apparatus including communication parameters  
for the peripheral apparatus;  
means for registering the peripheral apparatus in

accordance with a received request in association with  
a piece of identification information;

means for receiving a request from a mobile device  
including the piece of identification information; and

5 means for associating the registered peripheral  
apparatus with the request from the mobile device using  
the piece of identification information.

30. A method for a server comprising:

10 receiving a registration request from a peripheral  
apparatus including communication parameters for the  
peripheral apparatus;

registering the peripheral apparatus in  
association with a piece of identification information  
15 in accordance with a received request;

receiving a request from a mobile device including  
the piece of identification information; and

associating the registered peripheral apparatus

with the request from the mobile device using the piece of identification information.

31. An image-processing system comprising:

5       a peripheral apparatus including a peripheral device, the peripheral apparatus being configured to send a registration request to register communication parameters of the peripheral device in association with a piece of location information;

10       a server configured to receive the registration request and to register the communication parameters of the peripheral device in association with the piece of location information; and

      a mobile device configured to determine its  
15 location and to send a request to the server with the determined mobile device location information,

      wherein the server is configured to identify the registered details of the peripheral device based on

the mobile device location information in the request from the mobile device thereby allowing a connection to be configured between the mobile device and the peripheral device.

5

32. An image-processing system according to claim 31, wherein the server is configured to identify the peripheral device by determining that its registered location is within a predetermined distance of the  
10 mobile device location included in the request from the mobile device.

33. An image-processing system according to claim 32, wherein the server is configured so that, in a case  
15 that the server determines that a plurality of peripheral devices are within the predetermined distance of the mobile device location included in the request from the mobile device, the server causes a

message to be displayed on the mobile device to cause a user to select one of the plurality of peripheral devices for connection.

5 34. An image-processing method for an image-processing system comprising a peripheral apparatus, a server and a mobile device, the peripheral apparatus including a peripheral device, the method comprising:

the peripheral apparatus sending a registration  
10 request to the server to register communication parameters of the peripheral device in association with a piece of location information;

the server receiving the registration request and registering the communication parameters of the  
15 peripheral device in association with the piece of location information;

the mobile device determining its location and sending a request to the server with the determined



mobile device location information; and

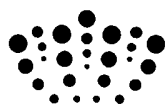
the server identifying the registered details of  
the peripheral device based on the mobile device  
location information in the request from the mobile  
5 device thereby allowing a connection to be configured  
between the mobile device and the peripheral device.

35. A suite of programs that, when executed by an  
image-processing apparatus causes the image-processing  
10 apparatus to perform a method according to claim 34.

36. One or more storage media storing a suite of  
programs according to claim 35.

15 37. An image processing system substantially as  
hereinbefore described and shown in Figures 1 to 14, or  
Figure 15.

38. A method of an image processing system comprising steps substantially as hereinbefore described and shown in Figures 1 to 14, or 15.



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**Claims searched:** 1-18, 29, 30

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## Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3, 5, 7-9, 12-14, 16-18, 29, 30	US 2009/0021776 A1 (DOLAN et al.) See figs. 2, 3; paras. 22-60
X	1, 5, 8, 9, 12-14, 16-18, 29, 30	US 2008/0184162 A1 (LINDSEY et al.) See abstract; fig. 2, paras. 21, 24, 35
A,P	-	US 2011/0085196 A1 (XU et al.) See abstract; fig. 1; para. 33

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

Worldwide search of patent documents classified in the following areas of the IPC

G06F; H04N

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

### International Classification:

Subclass	Subgroup	Valid From
G06F	0003/12	01/01/2006
H04N	0001/00	01/01/2006