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(71) Applicant: 504057115
Logic, K.K.
3-17-7 Kahei, Adachi, Tokyo-to
(74) Agent: 100064908
Masatake SHIGA, patent attorney
(74) Agent: 100101465
Masakazu AOYAMA, patent attorney
(74) Agent: 100108453
Yasuhiko MURAYAMA, patent attorney
(72) Inventor: Takahashi SUSUMU
% Logic, K.K.
3-17-7 Kahei, Adachi, Tokyo-to
(72) Inventor: Toshikazu ITO
% Logic, K.K.
3-17-7 Kahei, Adachi, Tokyo-to

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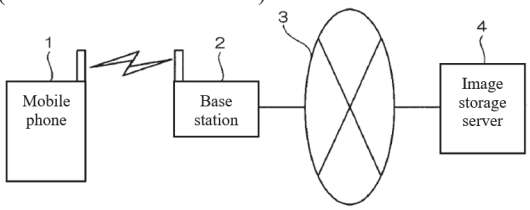
(54) (TITLE OF THE INVENTION) **IMAGE STORAGE SYSTEM, MOBILE TERMINAL, IMAGE STORAGE DEVICE, IMAGE STORAGE METHOD, IMAGE TRANSMISSION PROGRAM, AND IMAGE STORAGE PROGRAM**

(57) (ABSTRACT)
(PROBLEM) To facilitate an easy transmission of a captured image and transmission of high-quality images.
(MEANS FOR SOLVING) Immediately after capturing an image, a mobile telephone 1 divides the captured image data into predetermined size [data] and sequentially sends the data to an image storage server 4 as an HTTP request. The image storage server 4 sequentially saves the divided image data to store them as one image data. Furthermore, the image storage server 4 generates and stores images for thumbnails and images for photograph display. The image storage server 4 sends an email containing the URL of a web page that publishes an image data selected by the mobile telephone 1, among the stored image data, to the publishing destination. The terminal which received the e-mail downloads the published image data according to the URL attached to the e-mail.
(SELECTIVE DRAWING) FIG. 1



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(Scope of Patent Claims)
(Claim 1)
An image storage system, characterized in that the system comprising

a mobile terminal provided with a photographing means and a transmission means for transmitting the captured image data via a network by an HTTP request immediately after capturing the image by a photographing means, and

an image storage device provided with a receiving means for receiving the image data from the mobile terminal via a network, and a storage means for storing the received image data.

(Claim 2)
An image storage system, characterized in that the system comprising
a mobile terminal provided with a storage means for storing one or more image data, a selection means for selecting an image from the image data stored by the storage means, and a transmission means for transmitting the image data selected by the selection means via a network by an HTTP request, and

an image storage device provided with a receiving means for receiving the image data transmitted by an HTTP request via a network from the mobile terminal, and a storage means for storing the image data received by the receiving means.

(Claim 3)
A mobile terminal, characterized in that the terminal comprising
a photographing means, and

a transmission means for transmitting the captured image data to a server on a network by an HTTP request immediately after capturing the image by the photographing means.

(Claim 4)
A mobile terminal, characterized in that the terminal comprising

a storage means for storing one or more image data,

a selection means for selecting an image from the image data stored by the storage means, and

a transmission means for transmitting the image data selected by the selection means via a network by an HTTP request.

(Claim 5)
The mobile terminal as recited in Claim 3 or 4, characterized in that the terminal comprising a division means for dividing the image data captured by the photographing means into predetermined size [data],

wherein the transmission means sequentially transmits the image data divided by the division means to a server on a network by an HTTP request.

(Claim 6)
The mobile terminal as recited in Claim 5, characterized in that the terminal comprising a resizing instruction means for transmitting a resizing instruction to image data after all of the divided image data have been transmitted by the transmission means.

(Claim 7)
The mobile terminal as recited in Claim 3 through 6, characterized in that the terminal comprising
a login processing means for logging-in into the server,

a user ID acquiring means for acquiring a user ID specific to a user from the server after logging-in by the login processing means, and

a file name generation means for generating a file name containing at least the user ID acquired by the user ID acquiring means as a file name of the image data captured by the photographing means.

(Claim 8)
An image storage device, characterized in that the device comprising

a receiving means for receiving the image data transmitted by a HTTP request via a network, and

a storage means for storing the image data received by the receiving means.

(Claim 9)
The image storage device as recited in Claim 8, characterized in that the device comprising a storage control

means for storing the image data transmitted sequentially in the storage means as one image data until the receiving means receives a termination command.
(Claim 10)
The image storage device as recited in Claim 9, characterized in that the storage control means determines a storage location in the storage means of the received image data based on the user ID contained in the file name of the image data received by the receiving means.
(Claim 11)
The image storage device as recited in any one of Claims 8 to 10, characterized in that the device comprising a resizing means for resizing the image data received by the receiving means according to the purpose of publishing the image data.
(Claim 12)
The image storage device as recited in any one of Claims 8 to 11, characterized in that the device comprising a publishing control means for publishing the image data stored in the storage means to a user terminal accessed via a network.
(Claim 13)
The image storage device as recited in Claim 12, characterized in that the device comprising a publishing image selection means for selecting, from among the image data stored in the storage means, the image data allowed to be published according to an instruction from the transmission origin of the image data,

wherein the publishing control means publishes the image data selected by the publishing image selection means to a user terminal accessed via a network.
(Claim 14)
The image storage device as recited in Claim 12, characterized in that the device comprising a publishing destination determination means for determining a publishing destination to which the image data set as publishable is published according to an instruction from the transmission origin of the image data,

wherein the publishing control means publishes the image data set as publishable to a user terminal of publishing destination determined by the publishing destination determination means.
(Claim 15)
The image storage device as recited in Claim 14, characterized in that the device comprising

a publishing location information generation means for generating publishing location information that shows the publishing location of the image data set as publishable,

a mail creation means for creating a mail in which a publishing location information generated by the publishing location information generation means is described, and

a mail transmission means for transmitting the mail created by the mail creation means to the publishing destination determined by the publishing destination determination means.
(Claim 16)
The image storage device as recited in Claim 13, characterized in that the resizing means generates a plurality of low resolutions image data based on the stored image data, and

the publishing control means publishes to the terminal of the publishing destination the image data of the resolution according to the display ability of the terminal of the publishing destination.
(Claim 17)
An image transmission method, characterized in that, immediately after photographing, the captured image data is transmitted to a server on a network by an HTTP request.
(Claim 18)
An image transmission method, characterized in that an image is selected from one or more image data stored, and the selected image data is transmitted via a network by an HTTP request.
(Claim 19)
An image storage method, characterized in that the image data transmitted via a network by an HTTP request is received, and the received image data is stored.
(Claim 20)
An image transmission program, characterized in that the following steps are performed by a computer:

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a step of capturing an image, and

a step of transmitting the captured image data immediately after photographing to a server on a network by an HTTP request.

(Claim 21)

An image transmission program, characterized in that the following steps are performed by a computer:

a step of selecting an image from one or more image data stored, and

a step of transmitting the selected image data via a network by an HTTP request.

(Claim 22)

An image storage program, characterized in that the following steps are performed by a computer:

a step of receiving the image data transmitted via a network by an HTTP request, and

a step of storing the received image data.

(Detailed Description of the Invention)

(Technical Field)

(0001)

The present invention relates to an image storage system, a mobile terminal, an image storage device, an image storage method, an image transmission program, and an image storage program.

(Background of the Invention)

(0002)

Conventionally, in mobile telephone terminals, when an image is captured with a camera provided to the main body [of the terminal], and the image is sent to others, the image is sent by attaching it to an e-mail. In addition, a system for storing an image captured with a digital camera in an image storage server on a network by using a communication function of a mobile phone has been proposed (for example, see Patent Literature 1). In the prior art, an image captured with a digital camera is saved in a removable recording medium, wherein the recording medium is installed in a mobile phone, and the image is transmitted to a predetermined image storage server via a base station and a network. The image transmitted from the mobile phone is received and stored in the image storage server.

(Patent Literature 1) Japanese Unexamined Patent Application Publication No. 2002-157574

(Description of the Invention)

(Problem to be Solved by the Invention)

(0003)

However, in the prior art in which an image is transmitted by attaching it to an e-mail, there is a problem of complicated operation from the time to attach an image to an e-mail after image photographing until the time to transmit it, or a troublesome operation when the email address of the transmission destination is long. Although photographing of a high-definition image has become feasible with a digital camera or a mobile phone in recent years, with the prior art (mail attachment, Patent Literature 1) described above, there is a problem that a high-definition image cannot be transmitted to a server from a mobile telephone terminal since the data more than a predetermined size (typically 10 KB) cannot be transmitted due to a restriction on the service provided by a communication provider.

(0004)

The present invention was made in consideration of such circumstances, with the objective of providing an image storage system, a mobile terminal, an image storage device, an image storage method, an image transmission program, and an image storage program, in which a captured image can be transmitted easily, and a high-definition image can be transmitted.

(Means for Solving the Problems)

(0005)

The present invention was made to solve the problems described above and is characterized by providing a mobile terminal provided with a photographing means and a transmission means for transmitting the captured image data immediately after capturing the image by a photographing means via a network by an HTTP request, and an

image storage device provided with a receiving means for receiving the image data from the mobile terminal via a network, and a storage means for storing the received image data.

(0006)

The present invention solved the problems described above and is characterized by providing a mobile terminal provided with a storage means for storing one or more image data, a selection means for selecting an image from the image data stored by the storage means, and a transmission means for transmitting the image data selected by the selection means via a network by an HTTP request; and an image storage device provided with a receiving means for receiving the image data transmitted by an HTTP request via a network from the mobile terminal, and a storage means for storing the image data received by the receiving means.

(0007)

The present invention solved the problems described above and is characterized by providing a photographing means and a transmission means for transmitting the captured image data to the server on a network by an HTTP request immediately after capturing the image by the photographing means.

(0008)

The present invention solved the problems described above and is characterized by providing a storage means for storing one or more image data, a selection means for selecting an image from the image data stored by the storage means, and a transmission means for transmitting the image data selected by the selection means via a network by an HTTP request.

Furthermore, the present invention is characterized in that the mobile terminal comprises a division means for dividing into a predetermined size the image data captured by the photographing means, wherein the transmission means sequentially transmits the image data divided by the division means to a server on a network by an HTTP request.

(0009)

The present invention is characterized by providing the mobile terminal with a resizing instruction means for transmitting a resizing instruction to the image data, after all the divided image data is transmitted by the transmission means.

(0010)

The present invention is characterized by providing the mobile terminal with a login processing means for logging-in to the server, a user ID acquiring means for acquiring a user ID specific to a user from the server after logging-in by the login processing means, and a file name generation means for generating a file name containing at least the user ID acquired by the user ID acquiring means as a file name of the image data captured by the photographing means.

(0011)

This invention was made to solve the problems described above and is characterized by providing a receiving means for receiving the image data transmitted by an HTTP request via a network, and a storage means for storing the image data received by the receiving means.

(0012)

The present invention is characterized by providing the image storage device with a storage control means for storing the image data transmitted sequentially in the storage means as one image data until a termination command is received by the receiving means.

(0013)

The present invention is characterized in that, in the image storage device, the storage control means determines the storage location in the storage means of the received image data based on the user ID included in the file name of the image data received by the receiving means.

(0014)

The present invention is characterized by providing the image storage device with a resizing means for resizing the image data received by the receiving means according to the object of publishing the image data.

(0015)

The present invention is characterized by providing the image storage device with a publishing control means for publishing the image data stored in the storage means to the user terminal accessed via a network.

(0016)

The present invention is characterized by providing the image storage device with a publishing image selection means for selecting the image data that is allowed to be published, among the image data stored in the storage means, according to the instruction from the transmission origin of the image data, wherein the publishing control means publishes the image data selected by the publishing image selection means to the user terminal accessed via a network.

(0017)

The present invention is characterized by providing the image storage device with a publishing destination determination means for determining the destination to publish the image data set as publishable according to the instruction from the transmission origin of the image data, wherein the publishing control means publishes the image data set as publishable to a user terminal designated as the publishing destination determined by the publishing destination determination means.

(0018)

The present invention is characterized by providing the image storage device with a publishing location information generation means for generating publishing location information that shows a publishing location of the image data set as publishable, a mail creation means for creating a mail in which a publishing location information generated by the publishing location information generation means is described, and a mail transmission means for transmitting the mail created by the mail creation means to a publishing destination determined by the publishing destination determination means.

(0019)

The present invention is characterized in that, in the image storage device, the resizing means generates a plurality of low resolution image data based on the image data stored, and the publishing control means publishes to the terminal of the publishing destination the image data having a resolution according to the display capability of the terminal of the publishing destination.

(0020)

This invention was made to solve the problems described above, characterized in that, immediately after photographing, the captured image data is transmitted to the server on a network by an HTTP request.

(0021)

This invention was made to solve the problems described above, characterized in that an image from one or more image data stored is selected, and the selected image data is transmitted via a network by an HTTP request.

(0022)

This invention was made to solve the problems described above, characterized in that the image data transmitted via a network by an HTTP request is received, and the received image data is stored.

(0023)

This invention was made to solve the problems described above, characterized in that the following steps are performed by a computer: a step of capturing an image, and a step of transmitting the captured image data immediately after photographing to a server on a network by an HTTP request.

(0024)

This invention was made to solve the problems described above, characterized in that the following steps are performed by a computer: a step of selecting an image from one or more image data stored, and a step of transmitting the selected image data via a network by an HTTP request.

(0025)

This invention was made to solve the problems described above, characterized in that the following steps are performed by a computer: a step of receiving the image data transmitted via a network by an HTTP request, and a step of storing the received image data.

(Effect of the Invention)
(0026)

As described above, according to the present invention, in a mobile terminal, immediately after photographing by a photographing means, the transmission means transmits the captured image data via a network by an HTTP request, and in an image storage device, the receiving means receives the image data from the mobile terminal via a network, and the received image data is stored in a storage means.

Therefore, the complicated operation for transmitting the captured image by an e-mail can be omitted, and the image can be easily transmitted. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0027)

Furthermore, according to the present invention, in a mobile terminal, a selection means selects an image from one or more image data stored in the storage means, and a transmission means transmits the selected image data via a network by an HTTP request; while in an image storage device, a receiving means receives the image data from the mobile terminal transmitted according to the HTTP request via a network, and the image data received by the receiving means is stored in a storage means.

Therefore, the complicated operation for transmitting the captured image by an e-mail can be omitted, and the captured image can be easily transmitted. An image storage device on a network can be used as an image save destination and backup destination for the image data, even when image data is stored in the mobile terminal to the full storage capacity. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0028)

As described above, according to the present invention, immediately after photographing by a photographing means, a transmission means transmits the captured image data to a server on a network by an HTTP request.

Therefore, the complicated operation for transmitting the captured image by an e-mail can be omitted, and the captured image can be easily transmitted. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0029)

According to the present invention, the selection means selects an image from one or more image data stored in the storage means, and the transmission means transmits the image data selected by the selection means via a network by an HTTP request.

Therefore, the complicated operation for transmitting the captured image by an e-mail can be omitted, and the captured image can be easily transmitted. An image storage device on a network can also be used as an image save destination and backup destination for the image data, even when image data is stored in the mobile terminal to the full storage capacity. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0030)

According to the present invention, the image data captured by the photographing means is divided into predetermined size [data] by the division means, and the image data divided by the division means is sequentially transmitted by the transmission means to the server on a network by an HTTP request.

Therefore, a high-definition image can be transmitted even if there is a limit to the size of data that can be transmitted once.

(0031)

According to the present invention, after all the divided image data are transmitted by the transmission means, a resizing instruction to the image data is transmitted by a resizing instruction means.

Therefore, the captured image can be transmitted easily, and attaching a division number to the divided image data becomes unnecessary.

(0032)

Furthermore, according to the present invention, a user ID specific to a user is acquired from the server by the user ID acquiring means after logging-in to the server by a login processing means, and a file name containing at least the acquired user ID is generated by the file name generation means as the file name of the image data captured.

Therefore, the captured image can be transmitted easily, and on the server side, a user can be identified by the file name of the image data, without having to authenticate the user with a password, or the like.

(0033)

According to the present invention, the image data transmitted by the HTTP request via a network is received by a receiving means, and the received image data is stored in a storage means.

Therefore, prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability to process [the data] as an HTTP request.

(0034)

According to the present invention, a storage control means stores the sequentially transmitted image data in the storage means as one image data until a termination command is received by the receiving means.

Therefore, a high-definition image can be transmitted even if there is a limit to the size of data that can be transmitted once.

(0035)

According to the present invention, the storage control means determines the storage location in the storage means for the received image data based on the user ID included in the file name of the image data received by the receiving means.

Therefore, a user can be identified by the file name of the image data, without having to authenticate the user with a password, or the like, and the image data can be stored for each user.

(0036)

According to the present invention, the image data received by the receiving means is resized by a resizing means according to the publishing objective of the image data.

Therefore, when the stored image data is published, the image data of a size according to the display ability of the terminal of the publishing destination can be provided.

(0037)

According to the present invention, a publishing control means publishes the image data stored in the storage means to the user terminal accessed via a network.

Therefore, the image data can be shared by publishing the stored image data.

(0038)

According to the present invention, a publishing image selection means selects the publishable image data that is allowed to be published, among the image data stored in the storage means, according to the instruction from the transmission origin of the image data, and the publishing control means publishes the selected image data to the user terminal accessed via a network.

Therefore, only specific image data can be published, preventing data other than that from becoming published.

(0039)

According to the present invention, the publishing destination determination means determines and registers the publishing destination, to which the image data set as publishable is to be published, according to the instruction of transmission origin of the image data, and the publishing control means publishes the image data set as publishable to the user terminal of the publishing destination that has been registered.

Therefore, the stored image data can be published only to a specific destination. The publishing destination can be determined by selecting from the publishing destination registered in advance by a user in the image storage device, or by registering a publishing destination by a user each time.

(0040)

According to the present invention, the publishing location information generation means generates the publishing location information showing the publishing location of the image data set as publishable, and the mail creation means creates a mail in which the publishing location information is described, and the mail transmission means transmits the created mail to the publishing destination.

Therefore, only the image data may be transmitted from the image transmission origin to the image storage device, and it is not necessary to send any e-mail to the publishing destination; therefore, it is possible to omit a complicated operation for performing an email transmission to the image transmission origin.

(0041)

According to the present invention, the resizing means generates the image data of a plurality of low resolutions based on the stored image data and publishes to the terminal of the publishing destination the image data having a resolution according to the display ability of the terminal of the publication destination.

Therefore, the image data according to the display capability of the terminal of the publishing destination can be provided. The display ability of the terminal of the publishing destination may be acquired at the time of access from the publishing destination, or it may be acquired using the information registered in advance, including an email address.

(0042)

According to the present invention, immediately after photographing, the image data captured is transmitted to the server on a network by an HTTP request.

Therefore, the complicated operation of transmission by e-mail can be omitted, and the captured image can be transmitted easily. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0043)

According to the present invention, an image is selected from one or more image data stored, and the selected image data is transmitted via a network by an HTTP request.

Therefore, the complicated operation for the transmission by e-mail can be excluded, and the captured image can be transmitted easily. Even when image data is stored to a full storage capacity in a mobile terminal, the image storage device on a network can be used as the saving destination of an image and the backup destination of the image data. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0044)

According to the present invention, the image data transmitted by the HTTP request via a network is received, and the received image data is stored.

Therefore, prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0045)

According to the present invention, a computer is configured to perform a step of capturing an image and a step of transmitting the image data captured immediately after photographing to the server on a network by an HTTP request.

Therefore, the complicated operation for the transmission by e-mail can be excluded, and the captured image can be transmitted easily. Furthermore, prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0046)

According to the present invention, a computer is configured to perform a step of selecting an image from one or more image data stored and a step of transmitting the selected image data via a network by an HTTP request.

Therefore, the complicated operation for the transmission by e-mail can be excluded, and the captured image can be transmitted easily. An image storage device on a network can be used as an image save destination and backup destination for the image data, even when image data is stored in the mobile terminal to the full storage capacity. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(0047)

According to the present invention, a computer is configured to perform a step of receiving the image data transmitted by the HTTP request via a network, and a step of storing the image data received.

Therefore, the complicated operation for the transmission by e-mail can be excluded, and the captured image can be transmitted easily. Prompt processing of the image data can be achieved without having to check the mail server if there is any email, owing to the ability of the image storage device to process [the data] as an HTTP request.

(Best Mode of Carrying Out the Invention)

(0048)

The best mode for carrying out the present invention will be described below.

(0049)

A. First embodiment

A-1. Configuration of the first embodiment

FIG. 1 is a block diagram showing an approximate configuration of the image storage system of the first embodiment. In the drawing, a mobile phone 1 comprises a camera having a photographing function; once an image is captured by a camera, the image data captured is immediately sent to an image storage server 4 via a base station 2 and a communication line network 3 by a wireless communication. At this time, immediately after photographing, the mobile phone 1 transmits the captured image to a preset transmission destination (image storage server mentioned below) as a HTTP (Hyper Text Transfer Protocol) request. If the size of the image data is larger than a predetermined size, the mobile phone 1 automatically divides the captured image data into predetermined size [data] and sequentially transmits the divided image data to a preset transmission destination (image storage server mentioned below) as an HTTP request. Therefore, on the mobile phone 1 side, a user does not need to attach an image and send it through e-mail. Although in this embodiment, the mobile phone 1 is made into and described as an example of a mobile terminal, it is not limited thereto; any mobile devices provided with a communication function and a photographing function such as PDA may also be used.

(0050)

The base station 2 mediates the communication between the mobile phone 1 and the communication line network 3 existed within the circle of the service area of a local station. The communication line network 3 includes a network such as a telephone line, the Internet, or the like, provided by a communication provider.

(0051)

Once the HTTP request is received from the mobile phone 1, the image storage server 4 connects the image data, if divided, and registers it as one image data on the web page dedicated for the user only. In this case, the image data

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is not necessarily transmitted or received by an e-mail, but the image data is received through HTTP in the image storage server 4, so CGI (Common Gateway Interface) on the server side can perform the above mentioned processing (registration to a web page) immediately after receiving an HTTP request. Since the image data is transmitted after being divided, high definition images can be transmitted and received without being influenced by any restriction (10 KB or less) in terms of the service provided by a communication provider.

(0052)

The image storage server 4 performs a resize process of an image in order to publish the image on a web page. Specifically, the image storage server 4 generates two image data: the image data used as thumbnails (70 pixels (width) × 70 pixels (length), and JPG compression ratio: 40%) used for viewing screen (viewing an album) and the image data used as a photograph display (200 pixels (width) × 200 pixels (length), and JPG compression ratio: 80%) used for viewing screen (viewing an album). Therefore, three image data of the original image data, the image data for thumbnails, and the image data for a photograph display are stored in the image storage server 4.

(0053)

Next, FIG. 2 is a conceptual diagram illustrating the software configuration of the mobile phone 1 and the image storage server 4 described above. The mobile phone 1 has a JAVA (registered trademark) execution environment (JavaVM: Java Virtual Machine) 1-2 installed in a hardware 1-1, wherein the JAVA (registered trademark) execution environment 1-2 is installed with an application for mobile [devices] 1-3 for performing the transmission control of the image data.

(0054)

The image storage server 4 has an OS (Operating System) 4-2 installed in a hardware 4-1 and further has an ASP (Active Server Pages) 4-3, a WEB (World Wide Web) server 4-4, a DB (Database) server 4-5, and a CGI 4-6 installed. And installed on top thereon is an application for server 2-7 for performing reception of image data, connection of the divided image data, registration to a web page, resizing of an image, and other tasks.

(0055)

Next, FIG. 3 is a block diagram showing the functional configuration of the application for mobile. In the drawing, the application for mobile 1-3 includes a login process unit 10, a user ID storage unit 11, and a photograph transmission processing unit 12. The login process unit 10 stores in the user ID storage unit 11 the user ID acquired from an access to the image storage server 4 in launching the application for mobile 1-3. The user ID storage unit 11 temporarily stores the user ID acquired in login process.

(0056)

The photograph transmission processing unit 12 includes a photographed picture acquisition instruction unit 14 and an HTTP transmission instruction unit 15. The photographed picture acquisition instruction unit 14 instructs an image capture to the hardware 1-1 via the JAVA (registered trademark) execution environment 1-2 and comprises a file name-generating processing unit 16 for generating a predetermined file name to the captured image data. The rule for creating a file name is as follows: the system date .jpg in the format of user ID + YYYYMMDDHHMISS (year, month, day, hour, minute, and second).

(0057)

The HTTP transmission instruction unit 15 instructs the hardware 1-1 via the JAVA (registered trademark) execution environment 1-2 to transmit the captured image data to the image storage server 4, wherein the unit comprises an image dividing unit 17 for dividing the image data into multiple [data] for every predetermined size when the image data is equal to or larger than a predetermined size (for example, 10 KB), and a resizing instruction unit 18 for giving a resizing instruction to the image storage server 4 for allowing easy viewing on a web page.

(0058)

When carrying out division and transmission of the image file from the mobile phone 1, the information showing the order of the file such as division number (Ex. 5/10, or the like) is not included in the HPPT transmission

data. This is because the mobile phone 1 adopts a sequential transmission rule for transmitting a divided file one at a time and transmitting the next divided file after waiting for the response of the reception completion on the image storage server 4 side. On the image storage server 4 side, the next processing is carried out by determining a resizing instruction as a termination of the sequential transmission. By adopting this rule, demodulation to the original image file is possible on the image storage server 4 side by adding the file content in the order in which the divided file is transmitted, without basing on the division number. However, it is not limited thereto; a division number may also be attached and sent, if needed.

(0059)

Next, FIG. 4 is a block diagram showing the functional configuration of the application for server 4-7 and the functional configuration of a DB server. In the drawing, the application for server 4-7 includes an application-for-mobile download processing unit 20, a login process unit 21, an image storage processing unit 22, and an image publishing processing unit 23.

(0060)

The application-for-mobile download processing unit 20 provides the application for mobile 1-3 of the mobile phone 1 according to the download request from the mobile phone 1. The login process unit 21 performs authentication concerning login into the web page published. In particular, in this embodiment, pre-registered users are permitted to access the image storage server 4 for storing image data.

(0061)

Next, the image storage processing unit 22 processes the stored image data, wherein this unit comprises a combined image processing unit 24 for combining the divided image data, if the image data has been divided, to be one image data, and a resize processing unit 25 for generating the image data to be published to a web page.

(0062)

The image publishing processing unit 23 performs processing in publishing the image data from the mobile phone 1 to a web page, wherein the unit comprises an image selection screen generating unit 26, a publishing destination selection screen generating unit 27, a URL and mail notification unit 28, and a display image screen generating unit 29.

(0063)

The image selection screen generating unit 26 generates an image selection screen for allowing the user of the mobile phone 1 to select the publishable image data from among the stored image data. The publishing destination selection screen generating unit 27 generates a screen for selecting the destination to which the image of a web page can be published. The URL and mail notification unit 28 notifies the URL of the web page by an e-mail to the destination, if the image has been registered in the web page. In publishing the stored image data, the display image screen generating unit 29 generates a display image screen for displaying an arrangement of thumbnails of the image data set as publishable and a display image screen for displaying one image selected from the thumbnails in the size according to the display screen capability of the destination's terminal (image for a photograph display).

(0064)

DB server 4-5 comprises a user ID area 30 for storing a user ID for identifying from which user the image has been received, a user registration image area 31 for storing the received image data in association with the user ID of the transmission origin, and a user registration publishing destination list area 32 for storing the name, the email address, and other information on the publishing destination. The user ID 30 is stored in association with a device number specific to the mobile phone 1.

(0065)

A-2. Operation of the first embodiment

The operation of the first embodiment described above will be described next.

(0066)

(1) Login process

First, the login process in registering to the image storage server 4 will be described. Here, FIG. 5 is a flow chart for describing the operation of login process. In the mobile phone 1, once the application for mobile

1-3 is launched (Sa1), a device number and a login request specific to the mobile phone 1 are transmitted to the image storage server 4 via the base station 2 and the communication line network 3 (Sa2). With reference to the user ID area 30 of DB server 2-5, the image storage server 4 searches a user ID based on the device number (Sa3). And the user ID is transmitted to the mobile phone 1 (Sa4). In the mobile phone 1, the user ID transmitted from the image storage server 4 is received and stored in the user ID area 11 (Sa5). In the mobile phone 1, when an image data is transmitted to the image storage server 4, the user on the image storage server 4 side is specified by including the user ID in the file name of image data.

(0067)

(2) Photographed picture transmission process

Next, the operation with the mobile phone 1 in transmitting a captured image will be described. Here, FIG. 6 is a sequence diagram for describing the operation in transmitting the image captured with the mobile phone 1. In the mobile phone 1, the process is started by making a choice, such as "Taking a photograph," in a menu screen, or the like. Once a choice has been made, the application for mobile 1-3 sends out a photographed picture acquisition instruction to the hardware 1-1 via JAVA (registered trademark) 1-2 (SA1). In the hardware 1-1, once the photographed picture acquisition instruction is received, photographed picture acquisition is performed (namely, taking a photograph) (SA2), and the executed result (captured image data) is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SA3).

(0068)

Next, in the application for mobile 1-3, the HTTP transmission instruction of the captured image data is sent out to the hardware 1-1 via JAVA (registered trademark) 1-2 (SA4). In the hardware 1-1, once the HTTP transmission instruction is received, the HTTP transmission to the image storage server 4 of the captured image data is performed (SA5), and the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SA6). When image data is divided into several data at this time, step SA5 is repeated, and once the transmission of all the divided image data is completed, the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2.

(0069)

Next, in the application for mobile 1-3, the resizing instruction to the transmitted image data is sent out to the hardware 1-1 via JAVA (registered trademark) 1-2 (SA7). In the hardware 1-1, once the resizing instruction is received, the resizing instruction is transmitted to the image storage server 4 (SA8), and the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SA9). In the application for mobile 1-3, once the executed result is received, this process ends (SS10).

(0070)

(3) Photographed picture acquisition instruction (on the mobile phone side)

Next, the photographed picture acquisition instruction described above will be described. Here, FIG. 7 is a flow chart for describing the operation of the photographed picture acquisition instruction unit 14. First, the camera of the mobile phone 1 is activated (Sb1), and a shutter is pressed to take a photograph or cancel the task. And once [the task] with the camera has been completed (Sb2), the camera determines whether a photograph has been taken (Sb3). This process ends if no photograph has been taken. The captured photograph is acquired if a photograph has been taken (Sb4). At this time, a file name is generated using the user ID stored at the time of login, and the time and date that can be acquired using an internal clock.

(0071)

(4) HTTP transmission instruction (on the mobile phone side)

Next, the HTTP transmission instruction unit 15 described above will be described. FIG. 8 is a flow chart for describing the operation of HTTP transmission instruction. First, a HTTP connection is initiated (Sc1), and 9-kb of photograph taken is read by the image dividing unit 17 (Sc2). Next, once the read image data (9 kb) is transmitted to the image storage server 4 through HTTP (Sc3), and the transmission is completed, the HTTP connection is ended (Sc4). In transmitting the divided image using HTTP, the generated file name is also transmitted

together. Next, a determination is made as to whether the communication has been completed normally (Sc5); if the communication is not completed normally, this process ends.

(0072)

If the communication has been completed normally, a determination is made as to whether all the data of the photographed picture have been transmitted (Sc6); if all the data are not transmitted, the process returns to step Sc1, the processing described above is repeated, and the image data is transmitted 9 kb at a time to the image storage server 4 through HTTP. If all the data is able to be transmitted, a resizing instruction is transmitted to the image storage server 4 by the resizing instruction unit 18 (Sc7).

(0073)

(5) Reception process (on the image storage server side)

Next, the reception process on the image storage server side will be described. FIG. 9 is a flow chart for describing the operation of the reception process on the image storage server side. First, the image storage processing unit 22 (divided image processing unit 24) in the image storage server 4 receives a divided file (9 kb of image data) from the mobile phone 1 (Sd1) and determines whether a file with the same name has already been received (Sd2). And when the divided file (image data) with the same file name has already been received, the divided file received is written as an addition (combination) to the existing file (Sd3). When no divided file with the same file name has been received, the divided file received is written as a new file (Sd4). Since a user ID is included in the file name, the writing of the divided file is associated with the user ID, and [the file] is recorded in the user registration image area 31 of DB server 2-5. And in any case, this process ends. This process is performed each time a divided image is received through HTTP transmission from the mobile phone 1.

(0074)

(6) Image resize process (on the image storage server side)

Next, the image resize process on the image storage server side will be described. FIG. 10 is a flow chart for describing the operation of the image resize process on the image storage server side. Once a resizing instruction is received from the mobile phone 1 (Se1), the resize processing unit 25 in the image storage server 4 first performs a termination process of the divided file received until now (Se2). Next, the image for thumbnails (70 pixels (width) × 70 pixels (length), and JPG compression ratio: 40%) is generated and stored (Se3), and the image for a photograph display (200 pixels (width) × 200 pixels (length), and JPG compression ratio: 80%) is generated and stored (Se4). These generated image for thumbnails and image for a photograph display are stored in association with the user ID and the received image.

(0075)

(7) Publishing process of an image

Next, the publishing process for publishing the image data stored in the image storage server 4 by the processing described above on a web page will be described. Here, FIG. 11 is a flow chart for describing the operation of the publishing process of the image data. First, in a mobile phone, once “View an album” displayed on a screen is selected, a user ID and an image share command are transmitted to the image storage server 4 (Sf1). The image selection screen generating unit 26 in the image storage server 4 generates an image for image display using the image for thumbnails associated with the user ID, and the thumbnail screen data having thumbnails arranged on one screen is transmitted to the mobile phone 1 (Sf2).

(0076)

Next, in the mobile phone 1, once the thumbnail image data is received, a thumbnail screen is displayed (Sf3). And once a user selects an image to be published and clicks “Publish,” the selected image information and the publishing command are transmitted to the image storage server 4 (Sf4). The publishing destination selection screen generating unit 27 in the image storage server 4 generates a screen for presenting to a mobile phone a list of publishing destination for showing the list of publishing destinations registered in advance by this user, and the list screen data is transmitted to a mobile phone (Sf5).

(0077)

In the mobile phone 1, the list of publishing destinations is displayed according to the list image data (Sf6). And once a user selects the publishing destination and clicks "Confirm," the selected information on the publishing destination and the determination command are transmitted to the image storage server 4 (Sf7). The URL and mail notification unit 28 in the image storage server 4 generates the URL of the web page on which the image selected on the mobile phone side is published (Sf8), and the e-mail containing the generated URL is transmitted to the selected destination according to the information on the publishing destination (Sf9). And this process ends.

(0078)

In the destination terminal that receives the e-mail described above, the URL described in the e-mail is clicked directly. Clicking the URL opens a browser to display the web page (download page) indicated by the URL. The user then clicks the download link of the web page to start the download of image data.

(0079)

When there is a terminal information on the publishing destination (a PC terminal, a mobile phone, or the like), the display image screen generating unit 29 may be configured so as to describe in an e-mail the URL of the image data of either original image data or the image data for a photograph display according to the type of the terminal acquired from terminal information. For example, when a terminal of the publishing destination is a PC terminal, it may be referred to as a URL of the original image data, and when it is a mobile phone, it may be referred to as the URL of the image data for a photograph display (200 pixels (width) × 200 pixels (length), and JPG compression ratio: 80%).

(0080)

According to the first embodiment described above, immediately after pressing a shutter to capture an image, the captured image data is divided into predetermined size (for example, 9 kb) [data] and sequentially transmitted as an HTTP request to the image storage server 4 set up in advance; therefore, on the mobile phone 1 side, a user does not need to prepare any e-mail. On the image storage server 4 side, CGI on the server side can perform the processing described above immediately after receiving an HTTP request. Large-capacity image data with high image quality can be transmitted without being influenced by a service limitation posed by a communication provider.

(0081)

In the processing described above, when one wants to check a thumbnail image (to view a larger image) in a mobile phone 1, one may simply selects a thumbnail image and clicks "Confirm." In this case, the image storage server 4 may generate a screen that displays the image for a photograph display corresponding to the selected thumbnail and transmit it to the mobile phone 1. Multiple publishing images and publishing destinations may also be selected, respectively.

(0082)

B. A second embodiment

Next, a second embodiment of the present invention will be described. The second embodiment is characterized by a user selecting one or more image data from a plurality of image data stored in the mobile phone 1 and transmitting and storing the image data to the image storage server 4. Therefore, the system configuration, the mobile phone 1, and the configuration of the image storage server 4 are the same as those of the first embodiment described above, so the description thereof is omitted.

(0083)

B-1. Operation of the second embodiment

Next, the operation of the second embodiment will be described.

(1) User-selected photograph transmission process

First, the operation of transmitting to the image storage server 4 the image data selected by the user from a plurality of image data stored in the mobile phone 1 will be described. Here, FIG. 12 is a sequence diagram for describing the operation of transmitting to the image storage server 4 the image data selected from a plurality of image data stored in the mobile phone 1 in the second embodiment.

(0084)

In the mobile phone 1, once a user selects one or more image data from a plurality of image data stored, a selected photograph acquisition instruction is sent to the hardware 1-1 via JAVA (registered trademark) 1-2 (SB1).

In the hardware 1-1, once the selected photograph acquisition instruction is received, the selected photograph is acquired (SB2), and the executed result (acquired image data) is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SB3). At this point, if the file name of the selected image data is not the file name containing a user ID, the naming convention shall be the system date.jpg in the format of the user ID + YYYYMMDDHHMISS (year, month, day, hour, minute, and second).

(0085)

Next, in the application for mobile 1-3, the HTTP transmission instruction of the selected image data is sent out to the hardware 1-1 via JAVA (registered trademark) 1-2 (SB4). In the hardware 1-1, once the HTTP transmission instruction is received, the HTTP transmission of the selected image data to the image storage server 4 is performed (SB5), and the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SB6). When the image data is divided into a plurality of data at this time, the step SS5 is repeated, and once the transmission of all the divided image data is completed, the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2.

(0086)

Next, in the application for mobile 1-3, the resizing instruction to the transmitted image data is sent out to the hardware 1-1 via JAVA (registered trademark) 1-2 (SB7). In the hardware 1-1, once the resizing instruction is received, the resizing instruction is transmitted to the image storage server 4 (SB8), and the executed result is returned to the application for mobile 1-3 via JAVA (registered trademark) 1-2 (SB9). When a plurality of image data is chosen, Steps SS14-SS19 described above are repeated. In the application for mobile 1-3, once the executed result is received, this process ends (SB10).

(0087)

(2) Selected photograph acquisition instruction (on the mobile phone side)

Next, the selected photograph acquisition instructions (SB1–SB3) described above will be described in details. Here, FIG. 13 is a flow chart for describing the operation of the selected photograph acquisition instruction. First, a photograph selection screen on which a photograph to be transmitted to the image storage server 4 is selected from a plurality of photographs (image data) stored in the mobile phone 1 is launched (Sg1), and a desired photograph is chosen or canceled. And once [the task performed on] the photograph selection screen is completed (Sg2), a determination is made as to whether a photograph has been chosen or not (Sg3). And this process ends if no photograph has been chosen. If a photograph has been chosen, the selected photograph is acquired (Sg4). At this time, a file name is generated using the user ID and the date and time.

(0088)

Hereinafter, since the process after HTTP transmission instruction is the same as that in the embodiment described above, the description thereof is omitted.

(0089)

As described above, according to the second embodiment, one or more image data can be selected from the image data already stored in the mobile phone 1, the selected image data can be transmitted to the image storage server 4 and published to the publishing destination that has been registered in advance. Thereby, when the mobile phone 1 is full of the stored image data, the image storage server 4 can be used as the place to save the image data and the backup destination.

(0090)

In the embodiment described above, a series of processes executed by the application for mobile 1-3 is stored in the recording medium capable to be read by a computer in the form of a program, where this program is read and executed by the computer to execute those processes. That is, the application for mobile 1-3 is realized by the central processing unit, such as a CPU, reading the program in the main memory device, such as ROM and RAM, and performing the processing of information and arithmetic processing.

(0091)

The recording medium readable by a computer here refers to a magnetic disk, magneto-optical disc, CD-ROM, DVD-ROM, semiconductor memory, or the like. This computer program is distributed to a computer by a communication line, and the computer that received this distribution may be configured to run the program. Especially, in the embodiment described above, the program may be configured to be downloaded from the image storage server 4.

(Brief Description of the Drawings)

(0092)

(FIG. 1) is a block diagram showing the approximate configuration of the image storage system of the first embodiment.

(FIG. 2) is a conceptual diagram illustrating the software configuration of the mobile phone 1 and the image storage server 4.

(FIG. 3) is a block diagram showing the functional configuration of the application for mobile 1-3.

(FIG. 4) is a block diagram showing the functional configuration of the application for server 2-7 and the functional configuration of a DB server.

(FIG. 5) is a flow chart for describing the operation of a login process.

(FIG. 6) is a sequence diagram for describing the operation in transmitting the image captured with the mobile phone 1.

(FIG. 7) is a flow chart for describing the operation of a photographed picture acquisition instruction.

(FIG. 8) is a flow chart for describing the operation of HTTP transmission instruction.

(FIG. 9) is a flow chart for describing the operation of the reception on the image storage server side.

(FIG. 10) is a flow chart for describing the operation of the image resize processing on the image storage server side.

(FIG. 11) is a flow chart for describing the operation of the publishing process of the image data.

(FIG. 12) is a sequence diagram in the second embodiment for describing the operation for transmitting to the image storage server 4 the image data selected from a plurality of image data stored in the mobile phone 1.

(FIG. 13) is a flow chart for describing the operation of the selected photograph acquisition instruction.

(Explanations of References)

(0093)

1 … Mobile phone (mobile terminal)
2 … Base station
3 … Communication line network
4 … Image storage server (image storage device)
4-5 … DB server (storage means)
10 … Login process unit (login processing means, user ID acquiring means)
11 … User ID (user ID acquiring means)
12 … Photograph transmission processing unit (transmission means)
13 … Image sharing processing unit
14 … Photographed picture processing unit
15 … HTTP transmission instruction unit
16 … File name-generating processing unit (file name generation means)
17 … Image dividing unit (division means)
18 … Resizing instruction unit (resizing instruction means)
20 … Application-for-mobile download processing unit
21 … Login processing unit
22 … Image storage processing unit (receiving means)
23 … Image publishing processing unit (publishing control means)
24 … Divided image processing unit (storage control means)
25 … Resize processing unit (resizing means)
26 … Image selection screen generating unit (publishing image selection means)
27 … Publishing destination selection screen generating unit (publishing destination registration means)
28 … URL and mail notification unit (publishing location information generation means, mail preparation means, and mail transmission means)

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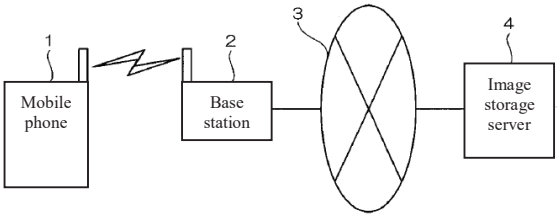
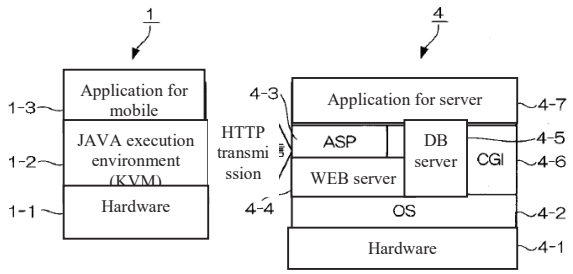
29 … Display image screen generating unit (display ability acquisition means)
30 … User ID area
31 … User registration image area
32 … User registration publishing destination list

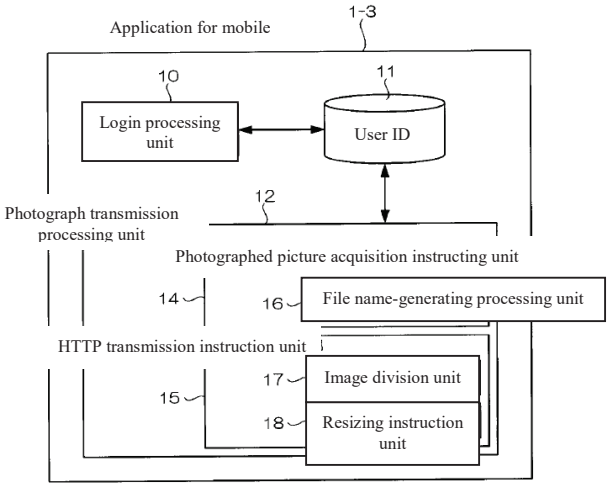
(FIG. 1)



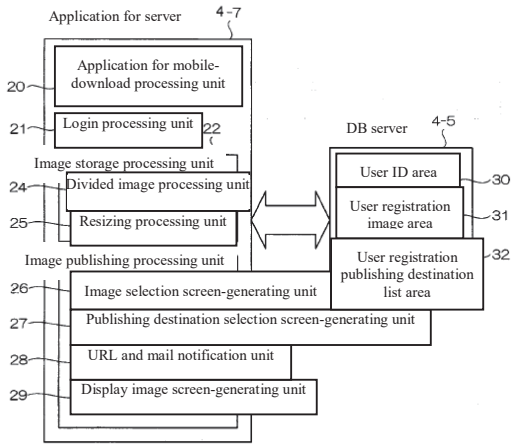
(FIG. 2)



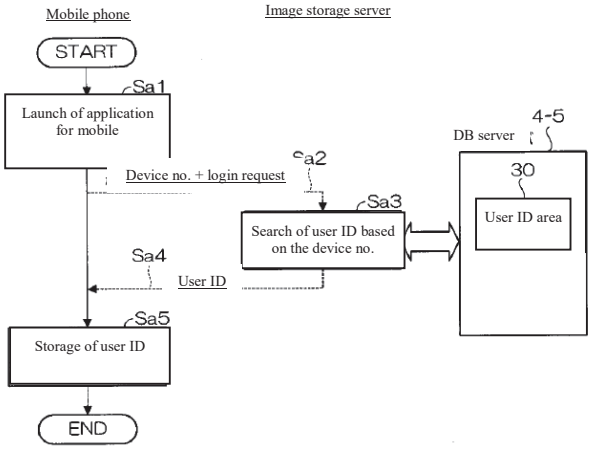
(FIG. 3)



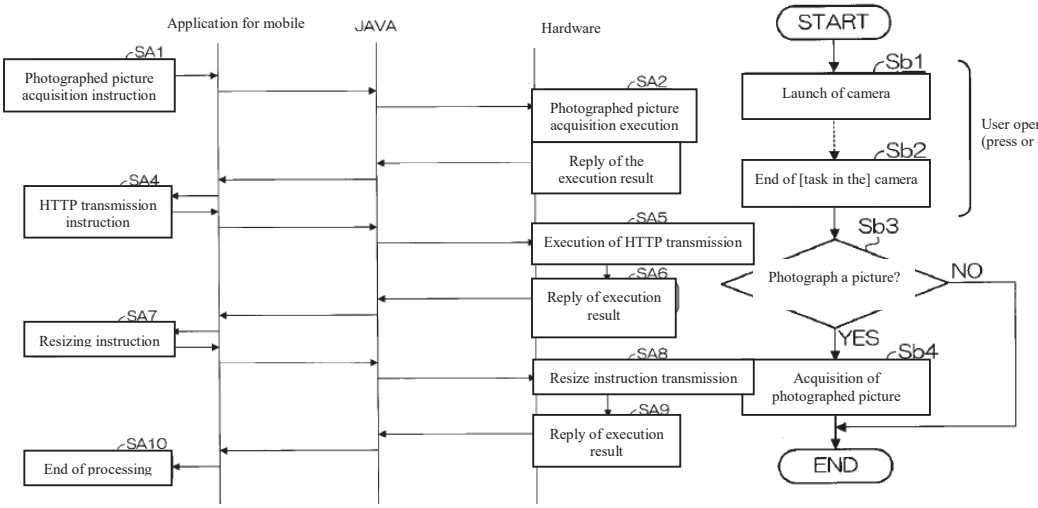
(FIG. 4)



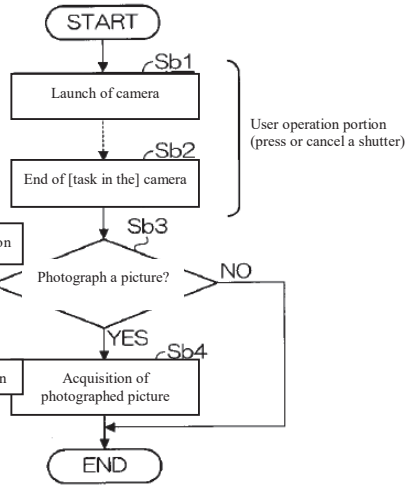
(FIG. 5)



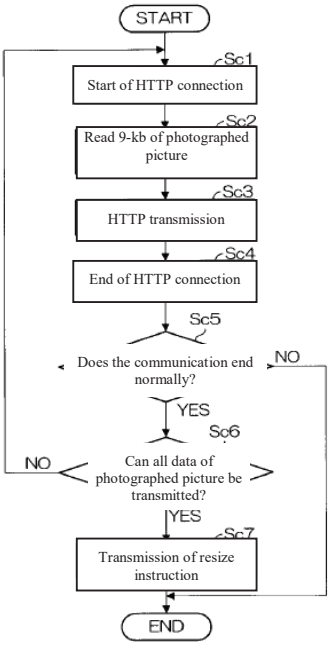
(FIG. 6)



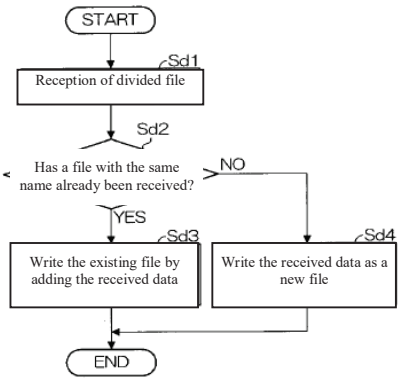
(FIG. 7)



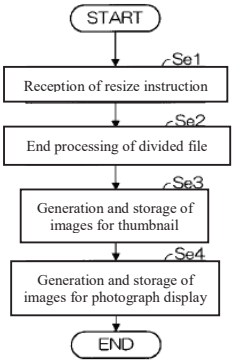
(FIG. 8)



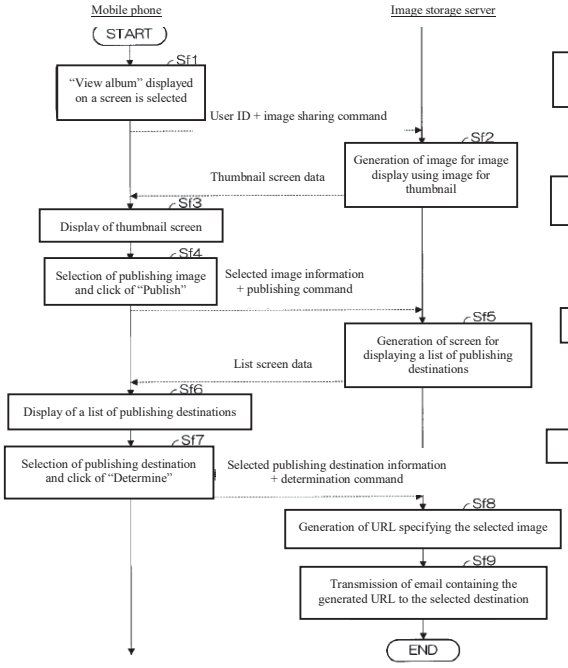
(FIG. 9)



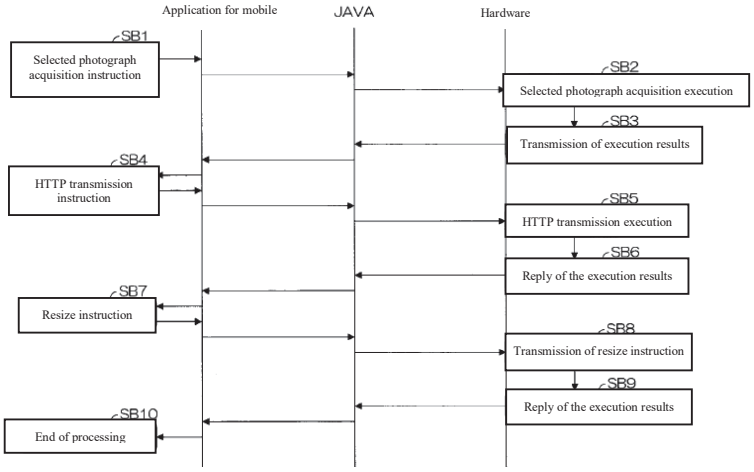
(FIG. 10)



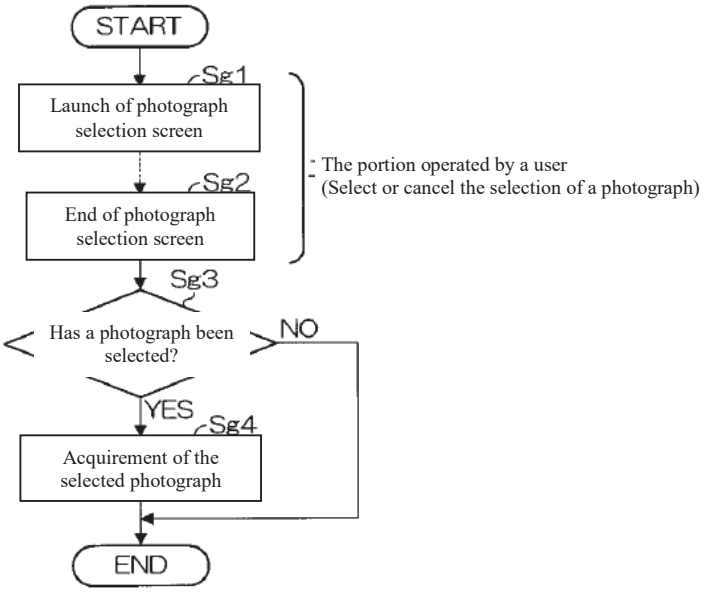
(FIG. 11)



(FIG. 12)



(FIG. 13)


START
Sg1
Launch of photograph selection screen
Sg2
End of photograph selection screen
The portion operated by a user
(Select or cancel the selection of a photograph)
Sg3
Has a photograph been selected?
NO
YES
Sg4
Acquirement of the selected photograph
END

Continued from the front page

(72) Inventor Taisuke TOMINAGA
% Logic, K.K. 3-17-7 Kahei, Adachi, Tokyo

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5C073 AB11 BB04 CD04

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