

IMAGE TAKING APPARATUS AND A METHOD FOR TAKING IMAGES

Background of the Invention

1. Field of the Invention

5 The present invention relates to an image taking apparatus and a method for taking images.

2. Description of the Related Art

A stand type image taking apparatus is known for taking an image of a document as a subject. The stand type
10 image taking apparatus includes: an image taking section for taking the still image of the document placed on a work table; and a stand section for fixing the image taking section at the height remote from the work table. Such an image taking apparatus is used in, for example, a
15 financial institution (for example, a bank) and placed on a counter of the financial institution. As the document, a ledger sheet is exemplified, which is possessed by a guest, and on which the guest name and the money associated with a deposit or payment are noted.

20 The guest brings the document (ledger sheet) and visits the counter, and an operator deals with the deposit or payment through the document (ledger sheet) for the guest. Simultaneously, the operator passes and receives the money associated with the deposit or payment, to and
25 from the guest, and puts a seal on the document (ledger sheet) in order to certify the pass and reception of the money. The operator places the document (ledger sheet)

on a work table, in order to record the guest name noted on the document (ledger sheet) and the amount of money associated with the deposit or payment, after the action of the guest. At this time, the image taking section takes
5 an image of the document (ledger sheet) placed on the work table and outputs a still image data to the information processing apparatus. When the operator places the document (ledger sheet) on the work table, the process for the document (ledger sheet) has been ended. In such an
10 image taking apparatus, even if the operator thinks that the process has been ended, there is a case that an error exists in the money of the reception and pass with respect to the amount of money noted on the document (ledger sheet), a case that the pass of the money is forgotten, and a case
15 that the operator does not check the reception of the money.

In conjunction with the above-mentioned apparatus for image taking will be described below.

Japanese Laid Open Patent Application JP H09-181951A discloses a picture input apparatus for automatically
20 switching between a dynamic image output and a high quality still image output. This picture input apparatus includes: an image input device for inputting an image; a detector for detecting the presence or absence of the change in the image inputted from the image input device;
25 and a high resolution still image generator for generating a high resolution still image from the image inputted from the image input device when the detector detects that the

image is not changed.

Japanese Laid Open Patent Application JP H09-200722A discloses an image-input apparatus that can take a still image of a high quality with a simple operation. In this
5 image input apparatus, the image input apparatus including a taking device and a processor for compressing a picture signal transmitted from the image-taking device is characterized in that the image-taking device has a
10 switcher for switching the image-taking from a dynamic image to the still image and a reporter for reporting the on/off state of the switcher to the processor and that the processor has a first compressor for carrying out the
compression suitable for the dynamic image, a second
15 compressor for carrying out the compression suitable for the still image, and a selector for selecting the first compressor or the second compressor in accordance with the reported on/off state.

Japanese Laid Open Patent Application JP 2002-199189A discloses an image taking apparatus that can reduce
20 a reading process time, in an image taking operation of a high definition. This image taking apparatus uses a CCD area sensor and reads the image of a ticket. This is characterized by including: an image taking section for
reading the image under a first definition obtained from
25 the number of the pixels possessed by the CCD area sensor and a second definition generated from the picture of a plurality of frames obtained by displacing the CCD area

sensor by the predetermined specifiable number of the pixels; an image memory for storing the image read by the photographer; and an image processor for processing the image read by the photographer and also characterized in
5 that the photographer switches the image definition from the first definition to the second definition and then reads the image, if the read image satisfies a predetermined judgment condition when the image is read under the first definition.

10 Japanese Laid Open Patent Application JP 2003-132306A discloses an IC tag reading apparatus which is designed so as to read an identification data of an IC tag in a short time, even in a case of using an IC chip that is much shorter than a wavelength of a usage microwave.
15 This IC tag reading apparatus is characterized by including: an IC tag composed of an input circuit and an IC chip, which is embedded in a chip embedding region of a reading target whose size is defined, for storing an identification code in advance; a target holder for holding
20 the reading target in a predetermined position; a coupling circuit of a question device, which is movably installed at a position opposite to the chip embedding region of the reading target, for coupling to an input circuit of the IC tag; the question device for reading the identification
25 code stored in the IC chip when the coupling circuit is coupled to the input circuit of the IC tag; a tag position detector for searching the chip embedding region of the

reading target set for the target holder and detecting the position of the IC tag embedded in the chip embedding region; and a position adjuster for adjusting the position so that the coupling circuit of the question device is
5 opposite to the IC tag in accordance with the position information detected by the tag position detector, and making it closer to the IC tag, and then coupling to the input circuit of the IC tag.

Japanese Laid Open Patent Application JP 2004-
10 127277A discloses a method of judging an electronic document information with regard to a file. This method is the method of storing the information with regard to the file, and this is characterized by including: a step of obtaining an electronic representation of a first file;
15 a step of judging a first feature describer in accordance with the electronic representation of the first file; a step of judging a feature describer matched with the first feature describer from a first database, in which the first database stores the information to identify a plurality
20 of feature describers and the electronic document information with regard to the respective feature describers in the plurality of feature describers, and the electronic document information with regard to the feature describer is constituted by the information to identify
25 an electronic document; a step of judging the electronic document information related to the matched feature describer from the first database; and a step of storing

the identification code related to the identification tag and the electronic document information related to the matched feature describer in a second database so that the electronic document information related to the matched
5 feature describer is related to the identification code.

Japanese Laid Open Patent Application JP H11-313193A discloses a stand type image scanner apparatus whose softness and usage efficiency are high. This image scanner apparatus includes: an image taking unit where an
10 image former for forming a predetermined image, an image reader for converting the image formed by the former into an electric signal and then detecting it, and an illuminator for illuminating the predetermined image are integrally configured; and a stand for movably holding the
15 image taking unit, and this is also characterized in that the image taking unit is held at a predetermined height opposite to the predetermined image at the time of the usage and that when it is not used, it is moved thereby enabling the enlargement of space.

20 Japanese Laid Open Patent Application JP 2003-162693A discloses a display input apparatus that enables the easy business about articles and enables the measurement and improvement of sales effectiveness. This display input apparatus is characterized by including: a
25 displaying device for displaying the information of a dynamic image and/or a still image on a displaying surface; and an input device, which has an antenna section placed

oppositely to the displaying surface so as to communicate with an external IC tag without any contact, and inputs a tag information stored by the IC tag, and this is characterized in that the displaying device displays the input position information indicating the position of the antenna section to communicate with the IC tag, and if the IC tag is made closer to the region where this input position information is displayed, the input device can input the tag information.

Summary of the Invention

Example embodiments of the present invention seek to provide an image taking apparatus and a method for taking images that can surely process a document.

Example embodiments of the present invention also seek to provide an image taking apparatus and a method for taking images that can read an image correspondingly to a document.

Example embodiments of the present invention further seek to provide an image taking apparatus and a method for taking images that can detect a forgery document.

This and other objects, features and advantages of the present invention will be readily ascertained by referring to the following description and drawings.

A first aspect of the present invention provides an image taking

apparatus including a table, an image taking section which takes images of subjects on and above the table, a detecting section which detects a document in a predetermined area on the table, an imaging switch section which outputs a first detection signal when the document is not in the predetermined area, and outputs a second detection signal when the document is in the predetermined area, based on a detection result of the detecting section, a dynamic

image output controller which controls the image taking section such that the image taking section takes a dynamic image of subjects on and above the table, and outputs a dynamic image data indicating the dynamic image to an information processor, in response to the first detection signal and a still image output controller which controls the image taking section such that the image taking section takes a still image of the document on the table, and outputs a still image data indicating the still image to the information processor, in response to the second detection signal.

In the image taking apparatus, the detecting section may include a sensor section which detects the document in the predetermined area, and outputs a document detection signal to the imaging switch section. The imaging switch section may output the first detection signal when not receiving the document detection signal from the sensor section, and outputs the second detection signal when receiving the document detection signal from the sensor

section.

In the image taking apparatus, an RF-ID tag may be affixed to the document. The detecting section may include an RF-ID reader which communicates with the RF-ID tag when the document is in the predetermined area. The RF-ID reader may output a document detection signal to the imaging switch section when communicating with the RF-ID tag. The imaging switch section may output the first detection signal when not receiving the document detection signal from the RF-ID reader, and output the second detection signal when receiving the document detection signal from the RF-ID reader.

The image taking apparatus may further include an image taking parameter controller. An image taking data including parameters predetermined for taking an image of the document may be stored in the RF-ID tag. The RF-ID reader may obtain the image taking data when communicating with the RF-ID tag, output the image taking data to the image taking parameter controller, and output the document detection signal to the imaging switch section. The image taking parameter controller may control the image taking section such that the image taking section takes the image of the document in the predetermined area based on the parameters obtained from the RF-ID tag. The image taking section may take the image of the document in the predetermined area based on controls by the image taking parameter controller and the still image output

controller.

The image taking apparatus may further include a truth/false judging section which receives the still image data from the still image output controller. A first document identifier identifying the document may be described on the document. A second document identifier identifying the document may be stored in the RF-ID tag. The RF-ID reader may obtain the second document identifier when communicating the RF-ID tag, output the second document identifier to truth/false judging section, and output the document detection signal to the imaging switch section. The truth/false judging section may output a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor.

The image taking apparatus may further include an image taking parameter controller, and a truth/false judging section which receives the still image data from the still image output controller. A first document identifier identifying the document may be described on the document. A second document identifier identifying the document and an image taking data including parameters predetermined for taking an image of the document may be stored in the RF-ID tag. The RF-ID reader may obtain the image taking data and the second document identifier when communicating with the RF-ID tag, output the image taking data to the image taking parameter controller, output the

second document identifier to truth/false judging section, and output the document detection signal to the imaging switch section. The image taking parameter controller may control the image taking section such that the image taking section takes the image of the document in the predetermined area based on the parameters obtained from the RF-ID tag. The image taking section may take the image of the document in the predetermined area based on controls by the image taking parameter controller and the still image output controller. The truth/false judging section may output a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor. The image taking apparatus may further include a stand section which supports the image taking section at a position remote from the table. The image taking apparatus may further include the detecting section is provided in the table.

Another aspect of the present invention provides a method for taking images including: (a) detecting a document in a predetermined area on a table; (b) taking a dynamic image of subjects on and above the table, and outputs a dynamic image data indicating the dynamic image to an information processor when the document is not in the predetermined area; and (c) taking a still image of the document on the table, and outputs a still image data indicating the still image to the information processor when the document is

in the predetermined area.

In the method for taking images, an RF-ID tag may be affixed to the document. An image taking data including parameters predetermined for taking an image of the document may be stored in the RF-ID tag. The step (a) may include (a1) obtaining the image taking data. The step (c) may include (c1) taking the still image of the document in the predetermined area based on the parameters obtained from the RF-ID tag.

10 In the method for taking images, a first document identifier identifying the document may be described on the document. An RF-ID tag may be affixed to the document. A second document identifier identifying the document may be stored in the RF-ID tag. The step (a) may be include 15 (a2) obtaining the second document identifier. The step (c) may be include (c2) outputting a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor.

20 In the method for taking images, a first document identifier identifying the document may be described on the document. An RF-ID tag may be affixed to the document. A second document identifier identifying the document and an image taking data including parameters predetermined 25 for taking an image of the document may be stored in the RF-ID tag. The step (a) may include (a3) obtaining the image taking data and the second document identifier. The

step (c) may include (c3) taking the image of the document in the predetermined area based on the parameters obtained from the RF-ID tag, and (c4) outputting a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor.

Another aspect of the present invention provides a computer-readable medium applied to an image taking apparatus, wherein the image taking apparatus includes: a table, an image taking section which takes images of subjects on and above the table, a detecting section which detects a document in a predetermined area on the table, and a computer which is connected to the image taking section and the detecting section, the computer-readable medium comprising code that, when executed, causes the computer to perform the following: (a) outputting a first detection signal when the document is not in the predetermined area, and outputting a second detection signal when the document is in the predetermined area, based on a detection result of the detecting section, (b) controlling the image taking section such that the image taking section takes a dynamic image of subjects on and above the table, and outputting a dynamic image data indicating the dynamic image to an information processor, in response to the first detection signal; and (c) controlling the image taking section such that the image

taking section takes a still image of the document on the table, and outputting a still image data indicating the still image to the information processor, in response to the second detection signal.

5 In the computer-readable medium, the detecting section may include a sensor section which detects the document in the predetermined area, and outputs a document detection signal to the computer. Sthe step (a) may include: (a1) outputting the first detection signal when
10 not receiving the document detection signal from the sensor section, and (a2) outputting the second detection signal when receiving the document detection signal from the sensor section.

 In the computer-readable medium, an RF-ID tag may be
15 affixed to the document. The detecting section may include an RF-ID reader which communicates with the RF-ID tag when the document is in the predetermined area. The RF-ID reader may output a document detection signal to the computer when communicating with the RF-ID tag. The step
20 (a) may include: (a3) outputting the first detection signal when not receiving the document detection signal from the RF-ID reader, and (a4) outputting the second detection signal when receiving the document detection signal from the RF-ID reader.

25 In the computer-readable medium, an image taking data including parameters predetermined for taking an image of the document may be stored in the RF-ID tag. The RF-ID

reader may obtain the image taking data when communicating with the RF-ID tag, output the image taking data to the image taking parameter controller, and output the document detection signal to the imaging switch section. The step 5 (c) may include: (c1) controlling the image taking section such that the image taking section takes the image of the document in the predetermined area based on the parameters obtained from the RF-ID tag.

In the computer-readable medium, a first document 10 identifier identifying the document may be described on the document. A second document identifier identifying the document may be stored in the RF-ID tag. The RF-ID reader may obtain the second document identifier when communicating the RF-ID tag, output the second document 15 identifier and the document detection signal to the computer. The step (c) may include: (c2) outputting a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor.

20 In the computer-readable medium, a first document identifier identifying the document may be described on the document. A second document identifier identifying the document and an image taking data including parameters predetermined for taking an image of the document may be 25 stored in the RF-ID tag. The RF-ID reader may obtain the image taking data and the second document identifier when communicating with the RF-ID tag, output the image taking

data, the second document identifier, and the document detection signal to the computer. The step (c) may include: (c3) controlling the image taking section such that the image taking section takes the image of the document in the predetermined area based on the parameters obtained from the RF-ID tag, and (c4) outputting a comparison result between the first identifier in the still image data and the second identifier from the RF-ID tag to the information processor.

The image taking apparatus according to embodiments of the present invention can surely process the document. The image taking apparatus according to embodiments of the present invention can read the image correspondingly to the document. The image taking apparatus can detect the forged document.

Brief Description of the Drawings

Fig. 1 is a perspective view showing the stand type image taking apparatus (hereafter, referred to as the image taking apparatus) according to the first embodiment of the present invention;

Fig. 2 is a exploded perspective view showing the image taking section 11 of the image taking apparatus according to the first embodiment of the present invention;

Fig. 3 is a block diagram showing the configuration of the image taking apparatus according to the first embodiment of the present invention;

Fig. 4 is a flowchart showing an operation of a method

for taking images according to the first embodiment of the present invention;

Fig. 5 is a perspective view showing a stand type image taking apparatus according to the second embodiment of the present invention;

Fig. 6 is a block diagram showing the configuration of the image taking apparatus according to the second embodiment of the present invention;

Fig. 7 is a flowchart showing an operation of a method for taking images according to the second embodiment of the present invention;

Fig. 8 is a perspective view showing a stand type image taking apparatus (hereafter, referred to as an image taking apparatus) according to the third embodiment of the present invention;

Fig. 9 is a block diagram showing the configuration of the image taking apparatus according to the third embodiment of the present invention;

Fig. 10 is a flowchart showing an operation of a method for taking images according to the third embodiment of the present invention;

Fig. 11 is a perspective view showing a stand type image taking apparatus (hereafter, referred to as an image taking apparatus) according to the fourth embodiment of the present invention;

Fig. 12 is a block diagram showing the configuration of the image taking apparatus according to the fourth

embodiment of the present invention; and

Fig. 13 is a flowchart showing an operation of a method for taking images according to the fourth embodiment of the present invention.

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Description of the Preferred Embodiments

Embodiments of an image taking apparatus and a method for taking images according to the present invention will be described below with reference to the attached drawings.

10 (First Embodiment)

Fig. 1 is a perspective view showing the stand type image taking apparatus (hereafter, referred to as the image taking apparatus) according to the first embodiment of the present invention. The image taking apparatus includes
15 an image taking apparatus body 1, an image taking controller 20 and an information processor 30. The image taking controller 20 is connected to the image taking apparatus body 1 and the information processor 30.

The image taking apparatus body 1 includes a leg
20 section 2, a stand section 3 and a head section 4. The head section 4 includes an image taking section 11 for imaging a subject. The leg section 2 is bonded to one end of the stand section 3 as the same unit, and the other end of the stand section 3 is bonded to the head section 4 as
25 the same unit. That is, the leg section 2, when placed on working surface exemplified on a table, supports the stand section 3 so that the stand section 3 stands

independently. The stand section 3 supports the head section 4 at the position remote from the working surface and holds the image taking section 11 at a constant height above a document base 6.

5 The leg section 2 includes a vertical leg section 5-1 and a horizontal leg section 5-2. The vertical leg section 5-1 and the horizontal leg section 5-2 are bar-shaped, respectively. One end of the vertical leg section 5-1 is bonded to one end of the horizontal leg section 5-2, and
10 the direction of the extension of the vertical leg section 5-1 is orthogonal to the direction of the extension of the horizontal leg section 5-2. That is, the vertical leg section 5-1 and the horizontal leg section 5-2 generate the L-shaped sections.

15 The image taking apparatus body 1 further includes the document base 6.

 The document base 6 is bonded to the leg section 2 as the same unit, and constitutes the region where a document 7 is placed. The vertical leg section 5-1 and
20 the horizontal leg section 5-2 are further designed so as to properly take a still image of the document 7 when the document 7 is placed on a predetermined position 9 of the document base 6. When the document 7 is put on the predetermined position 9, a side 8-1 that is one side of
25 the document 7 is placed so as to be in contact with the vertical leg section 5-1, a side 8-2 that is another side of the document 7 is placed so as to be in contact with

the horizontal leg section 5-2. In this case, a surface of the document 7 is oriented towards the image taking section 11.

The image taking apparatus body 1 further includes
5 an optical sensor 10.

The optical sensor 10 is installed at the predetermined position 9 of the document base 6, for example, so that it is placed at the center of the document 7, when the side 8-1 of the document 7 is in contact with
10 the vertical leg section 5-1 and the side 8-2 of the document 7 is in contact with the horizontal leg section 5-2.

Fig. 2 is a exploded perspective view showing the image taking section 11 of the image taking apparatus
15 according to the first embodiment of the present invention. The image taking section 11 includes lensed 12 and an area image sensor 13. The lenses 12 use the light emitted from the document 7 and forms the image of the document 7 on the surface of the area image sensor 13. The area image
20 sensor 13 generates an electric signal showing the image from the formed image.

Fig. 3 is a block diagram showing the configuration of the image taking apparatus according to the first embodiment of the present invention.

25 The optical sensor 10 detects whether or not the document 7 is placed on the predetermined position 9 of the document base 6, by detecting the emitted light. If

the document 7 is not placed on the predetermined position 9, the light is emitted to the optical sensor 10. At this time, the optical sensor 10 detects that the document 7 is not placed on the predetermined position 9. If the document 7 is placed on the predetermined position 9, the light is not emitted to the optical sensor 10. At this time, the optical sensor 10 detects that the document 7 is placed on the predetermined position 9 and outputs a document detection signal 110 as an electric signal to the image taking controller 20.

The image taking controller 20 includes a dynamic image output controller 21, a still image output controller 22 and an imaging switch section 23.

When the imaging switch section 23 does not receive the document detection signal 110 from the optical sensor 10, the imaging switch section 23 outputs a first detection signal 101 to the dynamic image output controller 21. When receiving the document detection signal 110 from the optical sensor 10, the imaging switch section 23 outputs a second detection signal 102 to the still image output controller 22.

In response to the first detection signal 101, the dynamic image output controller 21 outputs a dynamic image control signal 103 to control the image taking section 11 such that the image taking section 11 takes a dynamic image of the document 7 placed on the document base 6. Then, the dynamic image output controller 21 outputs a dynamic

image data 105, which is received from the image taking section 11, through the imaging switch section 23 to the information processor 30. At this time, the dynamic image output controller 21 outputs the dynamic image control signal 103 to the image taking section 11 X times per second (X is a positive integer). The dynamic image data 105 is taken by the image taking section 11. The dynamic image data 105 represents the document 7 placed on the document base 6.

10 In response to the second detection signal 102, the still image output controller 22 outputs a still image control signal 104 to control the image taking section 11 such that the image taking section 11 takes a still image of the document 7 placed on the predetermined position 9 of the document base 6. Then, the still image output controller 22 outputs a still image data 106, which is received from the image taking section 11, through the imaging switch section 23 to the information processor 30. The still image data 106 is taken by the image taking section 11. The still image data 106 represents the document 7 placed on the predetermined position 9.

The information processor 30 includes a computer 31 and a display 33. The computer 31 is connected to the display 33 and includes a controller 32 that is a computer program. The controller 32 displays the image data (the dynamic image data 105 and the still image data 106) outputted from the image taking controller 20 on the

display 33. The computer 31 further has a memory 34. The controller 32 records the image data (the dynamic image data 105 and the still image data 106) in time sequence, in the memory 34.

5 For example, the image taking apparatus according to the first embodiment of the present invention is used in a financial institution (for example, a bank), and the image taking apparatus body 1 is installed on the counter of the financial institution. In such a way that an
10 operator of the financial institution can use the information processor 30 in a counter task and even in the time band of tasks other than the counter task, a power source is always supplied to the information processor 30. In order that the operator uses the image taking apparatus
15 body 1 in the time band of the counter task, the power source is supplied to the image taking apparatus body 1 and the image taking controller 20 in the time band of the counter task. Also, In the case of a ledger sheet as the document
7, a document identifier, the name of a guest and the amount
20 of the money associated with a deposit or payment are noted on the document 7. As the document identifier, a particular number, a particular character, and a shape of its number and character are exemplified.

Fig. 4 is a flowchart showing an operation of a method
25 for taking images according to the first embodiment of the present invention. When the operator carries out the counter task, the power source is supplied to the optical

sensor 10 of the image taking apparatus body 1 (Step S11). The optical sensor 10 detects the emitted light and consequently detects whether or not the document 7 is placed on the predetermined position 9 of the document base 6 (Step S12: a placement detecting process). Also, the power source is supplied to the image taking controller 20 (Step S15). The imaging switch section 23 of the image taking controller 20 monitors a signal outputted from the optical sensor 10 (Step S16; a first imaging switch process).

The guest brings the document 7 and visits the counter, and the operator deals with the deposit or payment through the document 7 for the guest. Simultaneously, the operator passes and receives the money associated with the deposit or payment, to and from the guest on the document base 6, and puts a seal on the document 7 on the document base 6, in order to certify the pass and reception of the money. At this time, at the placement detecting process (Step S12), when the light is emitted to the optical sensor 10, the optical sensor 10 detects that the document 7 is not placed on the predetermined position 9 (Step S12: NO). Also, at the first imaging switch process (Step S16), when the imaging switch section 23 does not receive the signal (document detection signal 110) from the optical sensor 10, the imaging switch section 23 outputs the first detection signal 101 to the dynamic image output controller 21 (Step S16: NO). At this time, the dynamic image output

controller 21 carries out the first dynamic image output control process (Step S17).

At the first dynamic image output control process (Step S17), the dynamic image output controller 21 outputs
5 the dynamic image control signal 103 to the image taking section 11 X times per second, in response to the first detection signal 101. In response to the dynamic image control signal 103, the image taking section 11 takes the images of actions between the operator and the guest (the
10 pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the subject, as the document 7 placed on the document base 6, and outputs the dynamic image data 105 to the dynamic image output controller 21 (Step S20; an image taking process). The
15 dynamic image output controller 21 outputs the dynamic image data 105 through the imaging switch section 23 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the dynamic image data 105 outputted from the image taking
20 controller 20 on the display 33 and records the dynamic image data 105 on the memory 34 in the time sequence. The image taking controller 20 carries out the first imaging switch process (Step S16), if the power source is supplied (Step S19 : YES) even after the execution of the first
25 dynamic image output control process (Step S17).

The operator places the document 7 on the predetermined position 9 of the document base 6, in order

to record the document identifier, the name of the guest, and the amount of money associated with the deposit or payment, which are noted on the document 7, after the action between the operator and the guest. At this time, at the
5 placement detecting process (Step S12), the light is not emitted to the optical sensor 10. Thus, the optical sensor 10 detects that the document 7 is placed on the predetermined position 9 (Step S12: YES). The optical sensor 10 outputs the document detection signal 110 to the
10 image taking controller 20 (step S13). Also, at the first imaging switch process (Step S16), the imaging switch section 23 receives the signal (document detection signal 110) from the optical sensor 10 and outputs the second detection signal 102 to the still image output controller
15 22 (Step S16: YES). At this time, the still image output controller 22 carries out the first still image output control process (Step S18).

At the first still image output control process (Step S18), the still image output controller 22 outputs the
20 still image control signal 104 to the image taking section 11 in response to the second detection signal 102. In response to the still image control signal 104, the image taking section 11 takes an image of the document content indicating the content (the document identifier, the name
25 of the guest, the amount of money, and the putting of the seal) noted on the document 7 placed on the predetermined position 9 of the document base 6. Then, the image taking

section 11 outputs the still image data 106 to the still image output controller 22 (Step S20; the image taking process). The still image output controller 22 outputs the still image data 106 through the imaging switch section 23 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the still image data 106 outputted from the image taking controller 20 on the display 33, and records the still image data 106 in the memory 34 in the time sequence. The image taking controller 20 carries out the first imaging switch process (Step S16), if the power source is supplied (Step S19 : YES), even after the execution of the first still image output control process (Step S18).

From the above explanation, according to the image taking apparatus of the first embodiment of the present invention, until the document 7 is placed on the predetermined position 9 of the document base 6, the dynamic image output controller 21 outputs the actions between the operator and the guest (ex. the pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the dynamic image data 105 to the information processor 30. When the document 7 is placed on the predetermined position 9, the still image output controller 22 outputs the document content (the document identifier, the name of the guest, the money, and the putting of the seal) as the still image data 106 to the information processor 30. If the image

data (the dynamic image data 105 and the still image data 106) are displayed on the display 33 of the information processor 30, a manager who manages the operator can check whether or not an error exists in the money of the reception
5 and pass with regard to the amount of money noted on the document 7, whether or not the operator forgets the document 7 and the pass and reception of the money, and whether or not the operator checks the reception of the money, based on the dynamic image data 105 and the still
10 image data 106. Even if the image data (the dynamic image data 105 and the still image data 106) are recorded in the memory 34 of the information processor 30, the manager can check whether or not the error exists in the document 7 and the money caused by the operator, whether or not the
15 operator forgets the document 7 and the pass of the money, and whether or not the operator checks the reception of the money, based on the dynamic image data 105 and the still image data 106, at a later date. Consequently, according to the image taking apparatus based on the first embodiment
20 of the present invention, the operator can surely process the document 7.

In the image taking apparatus based on the first embodiment of the present invention, the image taking controller 20 is the computer, and the hardware
25 configuration (circuit configuration) of the image taking controller 20 can be attained by using the computer program. In this case, the image taking controller 20 includes a

CPU (Central Processing Unit) (not shown) and a memory (not shown). Its memory stores the dynamic image output controller 21, the still image output controller 22 and the imaging switch section 23, which are the computer
5 programs (the image taking program) that can be read by the CPU.

(Second Embodiment)

The first embodiment uses the optical sensor 10 as the detector for detecting whether or not the document 7
10 is placed on the predetermined position 9 of the document base 6. However, the second embodiment attains the effect similar to that of the first embodiment, even in a case of using an RF-ID (Radio Frequency - Identification) reader for communicating with an RF-ID tag at a predetermined
15 distance, as the foregoing detector. In the second embodiment, the explanations of the same configurations as the first embodiment are omitted.

Fig. 5 is a perspective view showing a stand type image taking apparatus (hereafter, referred to as the image
20 taking apparatus) according to the second embodiment of the present invention. The image taking apparatus according to the second embodiment includes the information processor 30, an image taking apparatus body 41 and an image taking controller 50. The image taking
25 controller 50 is connected to the image taking apparatus body 41 and the information processor 30.

The image taking apparatus body 41 includes the leg

section 2, the stand section 3, the head section 4, the image taking section 11, the document base 6 and an RF-ID reader 42. The RF-ID reader 42 is installed on the predetermined position 9 of the document base 6, for example, such that it is placed at the center of the document 7, when the side 8-1 of the document 7 is in contact with the vertical leg section 5-1 and when the side 8-2 of the document 7 is in contact with the horizontal leg section 5-2.

10 Fig. 6 is a block diagram showing the configuration of the image taking apparatus according to the second embodiment of the present invention.

 The RF-ID reader 42 can communicate with an RF-ID tag 43 in a predetermined distance. That is, the RF-ID reader 42 transmits a read signal to the RF-ID tag 43 through an electric wave. If the RF-ID tag 43 exists in the predetermined distance in which the read signal can be received, the RF-ID tag 43 transmits a reply signal (tag identifier) through the electric wave, in response to the read signal (electric wave). This RF-ID tag 43 is affixed on the document 7. Concretely, so as to enable the communication between the RF-ID reader 42 and the RF-ID tag 43, the RF-ID tag 43 is affixed on a center on a surface different from a surface towards the image taking section 11, of the document 7.

 The RF-ID reader 42 communicates with the RF-ID tag 43 and consequently detects whether or not the document

7 is placed on the predetermined position 9 of the document base 6. If the document 7 is not placed on the predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is longer than the predetermined distance. At this time, the RF-ID reader 42 cannot detect the RF-ID tag 43 and consequently detects that the document 7 is not placed on the predetermined position 9. If the document 7 is placed on the predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. At this time, the RF-ID reader 42 can detect the RF-ID tag 43 and consequently detects that the document 7 is placed on the predetermined position 9 and then outputs a document detection signal 120 as an electric signal to the image taking controller 50.

The image taking controller 50 includes the dynamic image output controller 21, the still image output controller 22 and an imaging switch section 53.

When the imaging switch section 53 does not receive the document detection signal 120 from the RF-ID reader 42, it outputs the first detection signal 101 to the dynamic image output controller 21. The imaging switch section 53, when receiving the document detection signal 120 from the RF-ID reader 42, outputs the second detection signal 102 to the still image output controller 22.

For example, the image taking apparatus according to the second embodiment of the present invention is used in

the financial institution (for example, the bank), and the image taking apparatus body 41 is installed in the counter of the financial institution. In such the way that the operator of the financial institution can use the information processor 30 in the counter task and even in the time band of the tasks other than the counter task, the power source is always supplied to the information processor 30. In order that the operator uses the image taking apparatus body 41 in the time band of the counter task, the power source is supplied to the image taking apparatus body 41 and the image taking controller 50 in the time band of the counter task. Also, in the case of a ledger sheet as the document 7, the document identifier (the particular number, the particular character, and the shape of its number and character), the name of the guest and the amount of money associated with the deposit or payment are noted on the document 7.

Fig. 7 is a flowchart showing an operation of a method for taking images according to the second embodiment of the present invention. When the operator carries out the counter task, the power source is supplied to the RF-ID reader 42 of the image taking apparatus body 41 (Step S21). The RF-ID reader 42 communicates with the RF-ID tag 43 and consequently detects whether or not the document 7 is placed on the predetermined position 9 of the document base 6 (Step S22: the placement detecting process). Also, the power source is supplied to the image taking controller

50 (Step S25). The imaging switch section 53 of the image taking controller 50 monitors a signal outputted from the RF-ID reader 42 (Step S26; a second imaging switch process).

5 The guest brings the document 7 and visits the counter, and the operator deals with the deposit or payment through the document 7 for the guest. Simultaneously, the operator passes and receives the money associated with the deposit or payment, to and from the guest on the document
10 base 6, and puts the seal on the document 7 on the document base 6 in order to certify the pass and reception of the money. At this time, at the placement detecting process (Step S22), since the document 7 is not placed on the predetermined position 9, a distance between the RF-ID
15 reader 42 and the RF-ID tag 43 is longer than a predetermined distance, and the RF-ID reader 42 cannot communicate with the RF-ID tag 43 (Step S22: NO). Also, at the second imaging switch process (Step S26), the imaging switch section 53 does not receive the signal
20 (document detection signal 120) from the RF-ID reader 42. Thus, the imaging switch section 53 outputs the first detection signal 101 to the dynamic image output controller 21 (Step S26: NO). At this time, the dynamic image output controller 21 carries out the second dynamic image output
25 control process (Step S27).

At the second dynamic image output control process (Step S27), the dynamic image output controller 21 outputs

the dynamic image control signal 103 to the image taking section 11 X times per second, in response to the first detection signal 101. In response to the dynamic image control signal 103, the image taking section 11 takes the
5 images of the actions between the operator and the guest (the pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the subject, as the document 7 placed on the document base 6, and outputs the dynamic image data 105 to the dynamic image
10 output controller 21 (Step S30; the image taking process). The dynamic image output controller 21 outputs the dynamic image data 105 through the imaging switch section 53 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the
15 dynamic image data 105 outputted from the image taking controller 50 on the display 33 and records the dynamic image data 105 on the memory 34 in the time sequence. The image taking controller 50 carries out the second imaging switch process (Step S26), if the power source is supplied
20 (Step S29: YES) even after the execution of the second dynamic image output control process (Step S27).

The operator places the document 7 on the predetermined position 9 of the document base 6, in order to record the document identifier, the name of the guest,
25 and the amount of money associated with the deposit or payment, which are noted on the document 7, after the action between the operator and the guest. At this time, at the

placement detecting process (Step S22), the document 7 is placed on the predetermined position 9. Thus, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. The RF-ID reader 42 communicates with the RF-ID tag 43 and outputs the document detection signal 120 to the image taking controller 50 (Step S22: YES). Also, at the second imaging switch process (Step S26), the imaging switch section 53 receives the signal (document detection signal 120) from the RF-ID reader 42 and outputs the second detection signal 102 to the still image output controller 22 (Step S26: YES). At this time, the still image output controller 22 carries out the second still image output control process (Step S28).

At the second still image output control process (Step S28), the still image output controller 22 outputs the still image control signal 104 to the image taking section 11 in response to the second detection signal 102. In response to the still image control signal 104, the image taking section 11 takes an image of the document content indicating the content (the document identifier, the name of the guest, the money, and the putting of the seal) noted on the document 7 placed on the predetermined position 9 of the document base 6. Then, the image taking section 11 outputs the still image data 106 to the still image output controller 22 (Step S30; the image taking process). The still image output controller 22 outputs the still

image data 106 through the imaging switch section 53 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the still image data 106 outputted from the image taking
5 controller 50 on the display 33, and records the still image data 106 in the memory 34 in the time sequence. The image taking controller 50 carries out the second imaging switch process (Step S26), if the power source is supplied (Step S29: YES), even after the execution of the second still
10 image output control process (Step S28).

From the above explanation, according to the image taking apparatus of the second embodiment of the present invention, until the document 7 is placed on the predetermined position 9 of the document base 6, the
15 dynamic image output controller 21 outputs the actions between the operator and the guest (ex. the pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the dynamic image data 105 to the information processor 30. When the
20 document 7 is placed on the predetermined position 9, the still image output controller 22 outputs the document content (ex. the document identifier, the name of the guest, the money, and the putting of the seal) as the still image data 106 to the information processor 30. If the image
25 data (the dynamic image data 105 and the still image data 106) are displayed on the display 33 of the information processor 30, the manager who manages the operator can

check whether or not an error exists in the money of the reception and pass with regard to the amount of money noted on the document 7, whether or not the operator forgets the document 7 and the pass and reception of the money, and
5 whether or not the operator checks the reception of the money, based on the dynamic image data 105 and the still image data 106. Even if the image data (the dynamic image data 105 and the still image data 106) are recorded in the memory 34 of the information processor 30, the manager can
10 check whether or not the error exists in the document 7 and the money caused by the operator, whether or not the operator forgets the document 7 and the pass of the money, and whether or not the operator checks the reception of the money, based on the dynamic image data 105 and the still
15 image data 106, at a later data. Consequently, according to the image taking apparatus based on the second embodiment of the present invention, the operator can surely process the document 7.

In the image taking apparatus based on the second
20 embodiment of the present invention, the image taking controller 50 is the computer, and the hardware configuration (circuit configuration) of the image taking controller 50 can be attained by using the computer program. In this case, the image taking controller 50 includes a
25 CPU (Central Processing Unit) (not shown) and a memory (not shown). Its memory stores the dynamic image output controller 21, the still image output controller 22 and

the imaging switch section 23, which are the computer programs (the image taking program) that can be read by the CPU.

(Third Embodiment)

5 In the third embodiment, a parameter, which is specified in advance in order to take an image of the document 7, is recorded on the RF-ID tag 43. Thus, in addition to the effect of that of the second embodiment, it is possible to take the image corresponding to the
10 document 7. In the third embodiment, the same explanations as the second embodiment are omitted.

Fig. 8 is a perspective view showing a stand type image taking apparatus (hereafter, referred to as an image taking apparatus) according to the third embodiment of the
15 present invention. The image taking apparatus according to the third embodiment includes the information processor 30, the image taking apparatus body 41 and an image taking controller 60. The image taking controller 60 is connected to the image taking apparatus body 41 and the
20 information processor 30.

Fig. 9 is a block diagram showing the configuration of the image taking apparatus according to the third embodiment of the present invention.

An image taking data 131 is recorded on the RF-ID tag
25 43 affixed on the document 7. The image taking data 131 has the parameters with regard to a resolution, a color/monochrome, a document size, a position of imaging

region on the document 7. For example, as the specified parameters, when the parameter of the resolution is "200dpi", the parameter of the color/monochrome is "Color", the parameter of the document size is "A4", and the
5 parameter of the position of imaging region is "Upper Half", the image taking section 11 can take an image of the upper half of the document 7 of the A4 size at the color and 200dpi, based on the image taking data 131. This image taking data 131 is read by the RF-ID reader 42. That is, the RF-ID
10 reader 42 transmits the read signal to the RF-ID tag 43 through the electric wave. If the document 7 is placed on the predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. In this case, the RF-ID tag 43 transmits
15 the reply signal (ex. the tag identifier and the image taking data 131) through the electric signal in response to the read signal (electric wave). At this time, the RF-ID reader 42 outputs the document detection signal 120 and image taking data 131 as the electric signals to the
20 image taking controller 60.

The image taking controller 60 includes the dynamic image output controller 21, the still image output controller 22, an imaging switch section 63 and an image taking parameter controller 64.

25 When the imaging switch section 63 does not receive the document detection signal 120 from the RF-ID reader 42, it outputs the first detection signal 101 to the dynamic

image output controller 21. The imaging switch section 63, when receiving the document detection signal 120 from the RF-ID reader 42, outputs the second detection signal 102 to the still image output controller 22.

5 In response to the image taking data 131 from the RF-ID reader 42, the image taking parameter controller 64 outputs an image taking control signal 132 to control the image taking section 11 such that the image taking section 11 takes the image of the document 7 placed on the
10 predetermined position 9 of the document base 6 based on the parameters (the resolution, the color/monochrome, the read size and the read region position).

For example, the image taking apparatus according to the third embodiment of the present invention is used in
15 the financial institution (for example, the bank), and the image taking apparatus body 41 is installed on the counter of the financial institution. In such a way that the operator of the financial institution can use the information processor 30 in the counter task and even in
20 the time band of the tasks other than the counter task, the power source is always supplied to the information processor 30. In order that the operator uses the image taking apparatus body 41 in the time band of the counter task, the power source is supplied to the image taking
25 apparatus body 41 and the image taking controller 60 in the time band of the counter task. Also, in the case of ledger sheet as the document 7, the document identifier

(ex. the particular number, the particular character, and the shape of its number and character), the name of the guest and the money associated with the deposit or payment are noted on the document 7.

5 Fig. 10 is a flowchart showing an operation of a method for taking images according to the third embodiment of the present invention. When the operator carries out the counter task, the power source is supplied to the RF-ID reader 42 of the image taking apparatus body 41 (Step S31).
10 The RF-ID reader 42 communicates with the RF-ID tag 43 and consequently detects whether or not the document 7 is placed on the predetermined position 9 of the document base 6 (Step S32: the placement detecting process). Also, the power source is supplied to the image taking controller
15 60 (Step S35). The imaging switch section 63 of the image taking controller 60 monitors the signal outputted from the RF-ID reader 42 (Step S36; a third imaging switch process).

 The guest brings the document 7 and visits the counter,
20 and the operator deals with the deposit or payment through the document 7, for the guest. Simultaneously, the operator passes and receives the money associated with the deposit or payment, to and from the guest on the document base 6, and puts the seal on the document 7 on the document
25 base 6 in order to certify the pass and reception of the money. At this time, at the placement detecting process (Step S32), since the document 7 is not placed on the

predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is longer than the predetermined distance, and the RF-ID reader 42 cannot communicate with the RF-ID tag 43 (Step S32 : NO). Also,
5 at the third imaging switch process (Step S36), the imaging switch section 63 does not receive the signal (document detection signal 120) from the RF-ID reader 42. Thus, the imaging switch section 63 outputs the first detection signal 101 to the dynamic image output controller 21 (Step
10 S36: NO). At this time, the dynamic image output controller 21 carries out the third dynamic image output control process (Step S37).

At the third dynamic image output control process (Step S37), the dynamic image output controller 21 outputs
15 the dynamic image control signal 103 to the image taking section 11 X times per second, in response to the first detection signal 101. In response to the dynamic image control signal 103, the image taking section 11 takes the images of the actions between the operator and the guest
20 (the pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the subject, as the document 7 placed on the document base 6, and outputs the dynamic image data 105 to the dynamic image output controller 21 (Step S40; the image taking process).
25 The dynamic image output controller 21 outputs the dynamic image data 105 through the imaging switch section 63 to the information processor 30. At this time, the

controller 32 of the information processor 30 displays the dynamic image data 105 outputted from the image taking controller 60 on the display 33 and records the dynamic image data 105 on the memory 34 in the time sequence. The
5 image taking controller 60 carries out the third imaging switch process (Step S36), if the power source is supplied (Step S39 - YES) even after the execution of the third dynamic image output control process (Step S37).

The operator places the document 7 on the
10 predetermined position 9 of the document base 6, in order to record the document identifier, the name of the guest, and the amount of money associated with the deposit or payment, which are noted on the document 7, after the action between the operator and the guest. At this time, at the
15 placement detecting process (Step S32), the document 7 is placed on the predetermined position 9. Thus, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. The RF-ID reader 42 communicates with the RF-ID tag 43 and outputs the
20 document detection signal 120 and the image taking data 131 to the image taking controller 60 (Step S32: YES). Also, at the third imaging switch process (Step S36), the imaging switch section 63 receives the signal (document detection signal 120) from the RF-ID reader 42 and outputs
25 the second detection signal 102 to the still image output controller 22 (Step S36: YES). At this time, the still image output controller 22 carries out the third still

image output control process (Step S38).

At the third still image output control process (Step S38), the still image output controller 22 outputs the still image control signal 104 to the image taking section 11 in response to the second detection signal 102. In response to the image taking data 131 from the RF-ID reader 42, the image taking parameter controller 64 outputs the image taking control signal 132 including the parameters (the resolution, the color/monochrome, the read size and the read region position) to the image taking section 11. The image taking section 11 takes an image of the document content indicating the content (the document identifier, the name of the guest, the money, and the putting of the seal) noted on the document 7 placed on the predetermined position 9 of the document base 6, in response to the still image control signal 104 and the image taking control signal 132. Then, the image taking section 11 outputs the still image data 106 to the still image output controller 22 (Step S40; the image taking process). The still image output controller 22 outputs the still image data 106 through the imaging switch section 63 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the still image data 106 outputted from the image taking controller 60 on the display 33, and records the still image data 106 in the memory 34 in the time sequence. The image taking controller 60 carries out the third imaging switch process

(Step S36), if the power source is supplied (Step S39: YES), even after the execution of the third still image output control process (Step S38).

From the above explanation, according to the image
5 taking apparatus of the third embodiment of the present invention, the parameters which are pre-specified in order to take the image of the document 7 are recorded on the RF-ID tag 43. Thus, in addition to the effect of the second embodiment, it is possible to read the image corresponding
10 to the document 7.

In the image taking apparatus based on the third embodiment of the present invention, the image taking controller 60 is the computer, and the hardware configuration (circuit configuration) of the image taking
15 controller 60 can be attained by using the computer program. In this case, the image taking controller 60 includes a CPU (Central Processing Unit) (not shown) and a memory (not shown). Its memory stores the dynamic image output controller 21, the still image output controller 22 and
20 the imaging switch section 23, which are the computer programs (the image taking program) that can be read by the CPU.

(Fourth Embodiment)

In the fourth embodiment, the document identifier
25 (for example, the particular number, the particular character, and the shape of its number and character) noted on the document 7 is recorded on the RF-ID tag 43. Thus,

in addition to the effect of the third embodiment, it is possible to detect the forged draft. In the fourth embodiment, the same explanations as the third embodiment are omitted.

5 Fig. 11 is a perspective view showing a stand type image taking apparatus (hereafter, referred to as an image taking apparatus) according to the fourth embodiment of the present invention. The image taking apparatus according to the fourth embodiment includes the
10 information processor 30, the image taking apparatus body 41 and an image taking controller 70. The image taking controller 70 is connected to the image taking apparatus body 41 and the information processor 30.

Fig. 12 is a block diagram showing the configuration
15 of the image taking apparatus according to the fourth embodiment of the present invention.

The image taking data 131 and a document identifier 141 are recorded on the RF-ID tag 43 stuck on the document 7. The document identifier 141 is equal to the document
20 identifier (ex. the particular number, the particular character, and the shape of its number and character) noted on the document 7. If the document identifier noted on the document 7 differs from the document identifier 141 recorded on the RF-ID tag 43, the document 7 is forged.
25 The image taking data 131 and the document identifier 141 are read by the RF-ID reader 42. That is, the RF-ID reader 42 transmits the read signal to the RF-ID tag 43 through

the electric wave. If the document 7 is placed on the predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. In this case, the RF-ID tag 43 transmits
5 the reply signal (ex. the tag identifier, the image taking data 131 and the document identifier 141) through the electric signal, on the basis of the read signal (electric wave). At this time, the RF-ID reader 42 outputs the document detection signal 120, the image taking data 131
10 and the document identifier 141 as the electric signal to the image taking controller 70.

The image taking controller 70 includes the dynamic image output controller 21, the still image output controller 22, the image taking parameter controller 64,
15 an imaging switch section 73 and a truth/false judging section 74.

When the imaging switch section 73 does not receive the document detection signal 120 from the RF-ID reader 42, the imaging switch section 73 outputs the first
20 detection signal 101 to the dynamic image output controller 21. The imaging switch section 73, when receiving the document detection signal 120 from the RF-ID reader 42, outputs the second detection signal 102 to the still image output controller 22. Also, when the imaging switch
25 section 73 outputs the second detection signal 102 to the still image output controller 22, the imaging switch section 73 is connected to the truth/false judging section

74. Then, the imaging switch section 73 outputs the still image data 106 outputted from the still image output controller 22 to the truth/false judging section 74.

The truth/false judging section 74 outputs: a
5 comparison result (judging result) 142 between the document identifier in the still image data 106 from the imaging switch section 73 and the document identifier 141 from the RF-ID reader 42, to the information processor 30. The controller 32 of the information processor 30 displays
10 the dynamic image data 105 outputted from the image taking controller 70 on the display 33. Also, the controller 32 outputs the still image data 106 and truth/false judging section 74, which are outputted from the image taking controller 70, on the display 33. Also, the controller
15 32 records the dynamic image data 105 outputted from the image taking controller 70 in the memory 34 in the time sequence. Also, the controller 32 records the still image data 106 and truth/false judging section 74, which are outputted from the image taking controller 70, in the
20 memory 34 in the time sequence.

For example, the image taking apparatus according to the fourth embodiment of the present invention is used in the financial institution (for example, the bank), and the image taking apparatus body 41 is installed in the counter
25 of the financial institution. In such a way that the operator of the financial institution can use the information processor 30 in the counter task and even in

the time band of the tasks other than the counter task, the power source is always supplied to the information processor 30. In order that the operator uses the image taking apparatus body 41 in the time band of the counter task, the power source is supplied to the image taking apparatus body 41 and the image taking controller 70 in the time band of the counter task. Also, in the case of a ledger sheet of as the document 7, the foregoing document identifier, the name of the guest and the money associated with the deposit or payment are noted on the document 7.

Fig. 13 is a flowchart showing an operation of a method for taking images according to the fourth embodiment of the present invention. When the operator carries out the counter task, the power source is supplied to the RF-ID reader 42 of the image taking apparatus body 41 (Step S41). The RF-ID reader 42 communicates with the RF-ID tag 43 and consequently detects whether or not the document 7 is placed on the predetermined position 9 of the document base 6 (Step S42: the placement detecting process). Also, the power source is supplied to the image taking controller 70 (Step S45). The imaging switch section 73 of the image taking controller 70 monitors the signal outputted from the RF-ID reader 42 (Step S46; a fourth imaging switch process).

The guest brings the document 7 and visits the counter, and the operator deals with the deposit or payment through the document 7 for the guest. Simultaneously, the

operator passes and receives the money associated with the deposit or payment, to and from the guest on the document base 6, and puts the seal on the document 7 on the document base 6 in order to certify the pass and reception of the money. At this time, at the placement detecting process (Step S42), since the document 7 is not placed on the predetermined position 9, the distance between the RF-ID reader 42 and the RF-ID tag 43 is longer than the predetermined distance, and the RF-ID reader 42 cannot communicate with the RF-ID tag 43 (Step S42: NO). Also, at the fourth imaging switch process (Step S46), the imaging switch section 73 does not receive the signal (document detection signal 120) from the RF-ID reader 42. Thus, the imaging switch section 73 outputs the first detection signal 101 to the dynamic image output controller 21 (Step S46: NO). At this time, the dynamic image output controller 21 carries out the fourth dynamic image output control process (Step S47).

At the fourth dynamic image output control process (Step S47), the dynamic image output controller 21 outputs the dynamic image control signal 103 to the image taking section 11 X times per second, in response to the first detection signal 101. In response to the dynamic image control signal 103, the image taking section 11 takes the images of the actions between the operator and the guest (the pass and reception of the money associated with the deposit or payment, and the putting of the seal) as the

subject, as the document 7 placed on the document base 6, and outputs the dynamic image data 105 to the dynamic image output controller 21 (Step S50; the image taking process). The dynamic image output controller 21 outputs
5 the dynamic image data 105 through the imaging switch section 73 to the information processor 30. At this time, the controller 32 of the information processor 30 displays the dynamic image data 105 outputted from the image taking controller 70 on the display 33 and records the dynamic
10 image data 105 on the memory 34 in the time sequence. The image taking controller 70 carries out the fourth imaging switch process (Step S46), if the power source is supplied (Step S49: YES) even after the execution of the fourth dynamic image output control process (Step S47).

15 The operator places the document 7 on the predetermined position 9 of the document base 6, in order to record the document identifier, the name of the guest, and the amount of money associated with the deposit or payment, which are noted on the document 7, after the action
20 between the operator and the guest. At this time, at the placement detecting process (Step S42), the document 7 is placed on the predetermined position 9. Thus, the distance between the RF-ID reader 42 and the RF-ID tag 43 is the predetermined distance or less. The RF-ID reader
25 42 communicates with the RF-ID tag 43 and outputs the document detection signal 120, the image taking data 131 and the document identifier 141 to the image taking

controller 70 (Step S42: YES). Also, at the fourth imaging switch process (Step S46), the imaging switch section 73 receives the signal (document detection signal 120) from the RF-ID reader 42 and outputs the second detection signal 102 to the still image output controller 22 (Step S46: YES). At this time, the still image output controller 22 carries out the fourth still image output control process (Step S48).

At the fourth still image output control process (Step S48), the still image output controller 22 outputs the still image control signal 104 to the image taking section 11 in response to the second detection signal 102. The image taking parameter controller 64 outputs the image taking control signal 132 including the parameters (the resolution, the color/monochrome, the document size and the position of the imaging region) to the image taking section 11 in response to the image taking data 131 from the RF-ID reader 42. In response to the still image control signal 104 and the image taking control signal 132, the image taking section 11 takes the image of the document content indicating the content (the document identifier, the name of the guest, the money, and the putting of the seal) noted on the document 7 placed on the predetermined position 9 of the document base 6. Then, the image taking section 11 outputs the still image data 106 to the still image output controller 22 (Step S50; the image taking process). The still image output controller 22 outputs

the still image data 106 through the imaging switch section 73 to the information processor 30. The imaging switch section 73 outputs the still image data 106 outputted from the still image output controller 22 to the truth/false
5 judging section 74. The truth/false judging section 74 outputs the comparison result 142 between the document identifier reflected in the still image data 106 from the imaging switch section 73 and the document identifier 141 from the RF-ID reader 42, to the information processor 30.

10 At this time, the controller 32 of the information processor 30 displays the comparison result 142 and the still image data 106 outputted from the image taking controller 70 on the display 33, and records the still image data 106 and the comparison result 142 in the memory 34
15 in the time sequence. The image taking controller 70 carries out the fourth imaging switch process (Step S46), if the power source is supplied (Step S49: YES), even after the execution of the fourth still image output control process (Step S48).

20 From the above explanation, according to the image taking apparatus based on the fourth embodiment of the present invention, the still image data 106 and the comparison result 142 are displayed on the display 33 of the information processor 30. At this time, if the
25 comparison result 142 indicates the coincidence between the document identifier noted on the document 7 and the document identifier 141 recorded on the RF-ID tag 43, the

document 7 is not forged. If the comparison result 142 does not indicate the coincidence between the document identifier noted on the document 7 and the document identifier 141 recorded on the RF-ID tag 43, the document 7 is forged. If the document 7 is forged, the manager managing the operator can stop the action between the operator and the guest, prior to the generation of the severe disaster. Also, even if the still image data 106 and the comparison result 142 are recorded in the memory 34 of the information processor 30, it is possible to certify that the document 7 is forged. In this way, according to the image taking apparatus of the fourth embodiment of the present invention, since the document identifier noted on the document 7 is recorded as the document identifier 141 on the RF-ID tag 43, it is possible to detect the forged document, in addition to the effect of the third embodiment.

In the image taking apparatus of the fourth embodiment of the present invention, the image taking controller 70 is the computer, and the hardware configuration (circuit configuration) of the image taking controller 70 can be attained by using the computer program. In this case, the image taking controller 70 includes a CPU (Central Processing Unit) (not shown) and a memory (not shown). Its memory stores the dynamic image output controller 21, the still image output controller 22, the image taking parameter controller 64, the imaging switch

section 73 and the truth/false judging section 74, which are the computer programs (the image taking program) that can be read by the CPU.

It is apparent that the present invention is not
5 limited to the above embodiment, that may be modified and changed without departing from the scope and spirit of the invention.

CLAIMS:

1. An image taking apparatus comprising:

a table;

An image taking section which takes images of
5 subjects on and above said table;

a detecting section which detects a document in
a predetermined area on said table;

an imaging switch section which outputs a first
detection signal when said document is not in said
10 predetermined area, and outputs a second detection
signal when said document is in said predetermined
area, based on a detection result of said detecting
section;

a dynamic image output controller which controls
15 said image taking section such that said image taking
section takes a dynamic image of subjects on and above
said table, and outputs a dynamic image data
indicating said dynamic image to an information
processor, in response to said first detection
20 signal; and

a still image output controller which controls
said image taking section such that said image taking
section takes a still image of said document on said
table, and outputs a still image data indicating said
25 still image to said information processor, in
response to said second detection signal.

2. The image taking apparatus according to claim 1,
wherein said detecting section includes a sensor
section which detects said document in said
predetermined area, and outputs a document detection
5 signal to said imaging switch section, and

said imaging switch section outputs said first
detection signal when not receiving said document
detection signal from said sensor section, and
outputs said second detection signal when receiving
10 said document detection signal from said sensor
section.

3. The image taking apparatus according to claims 1 or 2,
wherein an RF-ID tag is affixed to said document,
15 said detecting section includes an RF-ID reader
which communicates with said RF-ID tag when said
document is in said predetermined area,

said RF-ID reader outputs a document detection
signal to said imaging switch section when
20 communicating with said RF-ID tag, and

said imaging switch section outputs said first
detection signal when not receiving said document
detection signal from said RF-ID reader, and outputs
said second detection signal when receiving said
25 document detection signal from said RF-ID reader.

4. The image taking apparatus according to claim 3,

further comprising:

an image taking parameter controller,

wherein an image taking data including parameters predetermined for taking an image of said document is stored in said RF-ID tag,

said RF-ID reader obtains said image taking data when communicating with said RF-ID tag, outputs said image taking data to said image taking parameter controller, and outputs said document detection signal to said imaging switch section,

said image taking parameter controller controls said image taking section such that said image taking section takes said image of said document in said predetermined area based on said parameters obtained from said RF-ID tag, and

said image taking section takes said image of said document in said predetermined area based on controls by said image taking parameter controller and said still image output controller.

20

5. The image taking apparatus according to claim 3, further comprising:

a truth/false judging section which receives said still image data from said still image output controller,

wherein a first document identifier identifying said document is described on said document,

a second document identifier identifying said document is stored in said RF-ID tag,

said RF-ID reader obtains said second document identifier when communicating said RF-ID tag, outputs
5 said second document identifier to truth/false judging section, and outputs said document detection signal to said imaging switch section,

said truth/false judging section outputs a comparison result between said first identifier in
10 said still image data and said second identifier from said RF-ID tag to said information processor.

6. The image taking apparatus according to claim 3, further comprising:

15 an image taking parameter controller, and
a truth/false judging section which receives said still image data from said still image output controller,

wherein a first document identifier identifying
20 said document is described on said document,

a second document identifier identifying said document and an image taking data including parameters predetermined for taking an image of said document are stored in said RF-ID tag,

25 said RF-ID reader obtains said image taking data and said second document identifier when communicating with said RF-ID tag, outputs said image

taking data to said image taking parameter controller,
outputs said second document identifier to
truth/false judging section, and outputs said
document detection signal to said imaging switch
5 section,

said image taking parameter controller controls
said image taking section such that said image taking
section takes said image of said document in said
predetermined area based on said parameters obtained
10 from said RF-ID tag,

said image taking section takes said image of
said document in said predetermined area based on
controls by said image taking parameter controller
and said still image output controller, and

15 said truth/false judging section outputs a
comparison result between said first identifier in
said still image data and said second identifier from
said RF-ID tag to said information processor.

20 7. The image taking apparatus according to any one of
claims 1 to 6, further comprising:

a stand section which supports said image taking
section at a position remote from said table.

25 8. The image taking apparatus according to claim 1,
further comprising:

said detecting section is provided in said

table.

9. A method for taking images comprising:

(a) detecting a document in a predetermined area
5 on a table;

(b) taking a dynamic image of subjects on and
above said table, and outputs a dynamic image data
indicating said dynamic image to an information
processor when said document is not in said
10 predetermined area; and

(c) taking a still image of said document on said
table, and outputs a still image data indicating said
still image to said information processor when said
document is in said predetermined area.

15

10. The method for taking images according to claim
9, wherein an RF-ID tag is affixed to said document,
an image taking data including parameters
predetermined for taking an image of said document
20 is stored in said RF-ID tag,

said step (a) includes:

(a1) obtaining said image taking data,

said step (c) includes:

(c1) taking said still image of said document in
25 said predetermined area based on said parameters
obtained from said RF-ID tag.

11. The method for taking images according to claims 9 or 10, wherein a first document identifier identifying said document is described on said document,

an RF-ID tag is affixed to said document,

5 a second document identifier identifying said document is stored in said RF-ID tag,

said step (a) includes:

(a2) obtaining said second document identifier,

said step (c) includes:

10 (c2) outputting a comparison result between said first identifier in said still image data and said second identifier from said RF-ID tag to said information processor.

15 12. The method for taking images according to any one of claims 9 to 11, wherein a first document identifier identifying said document is described on said document,

an RF-ID tag is affixed to said document,

20 a second document identifier identifying said document and an image taking data including parameters predetermined for taking an image of said document are stored in said RF-ID tag,

said step (a) includes:

25 (a3) obtaining said image taking data and said second document identifier,

said step (c) includes:

(c3) taking said image of said document in said

predetermined area based on said parameters obtained from said RF-ID tag, and

(c4) outputting a comparison result between said first identifier in said still image data and said
5 second identifier from said RF-ID tag to said information processor.

13. A computer-readable medium applied to an image taking apparatus, wherein said image taking apparatus
10 includes:

a table,

an image taking section which takes images of subjects on and above said table,

a detecting section which detects a document in
15 a predetermined area on said table, and

a computer which is connected to said image taking section and said detecting section,

said computer-readable medium comprising code that, when executed, causes said computer to perform
20 the following:

(a) outputting a first detection signal when said document is not in said predetermined area, and outputting a second detection signal when said document is in said predetermined area, based on a
25 detection result of said detecting section;

(b) controlling said image taking section such that said image taking section takes a dynamic image

of subjects on and above said table, and outputting a dynamic image data indicating said dynamic image to an information processor, in response to said first detection signal; and

5 (c) controlling said image taking section such that said image taking section takes a still image of said document on said table, and outputting a still image data indicating said still image to said information processor, in response to said second
10 detection signal.

14. The computer-readable medium according to claim 13, wherein said detecting section includes a sensor section which detects said document in said
15 predetermined area, and outputs a document detection signal to said computer,

said step (a) includes:

(a1) outputting said first detection signal when not receiving said document detection signal from
20 said sensor section, and

(a2) outputting said second detection signal when receiving said document detection signal from said sensor section.

25 15. The computer-readable medium according to claims 13 or 14, wherein an RF-ID tag is affixed to said document,

said detecting section includes an RF-ID reader

which communicates with said RF-ID tag when said document is in said predetermined area,

said RF-ID reader outputs a document detection signal to said computer when communicating with said
5 RF-ID tag, and

said step (a) includes:

(a3) outputting said first detection signal when not receiving said document detection signal from said RF-ID reader, and

10 (a4) outputting said second detection signal when receiving said document detection signal from said RF-ID reader.

16. The computer-readable medium according to claim
15 15, wherein an image taking data including parameters predetermined for taking an image of said document is stored in said RF-ID tag,

said RF-ID reader obtains said image taking data when communicating with said RF-ID tag, outputs said
20 image taking data to said image taking parameter controller, and outputs said document detection signal to said imaging switch section, and

said step (c) includes:

(c1) controlling said image taking section such
25 that said image taking section takes said image of said document in said predetermined area based on said parameters obtained from said RF-ID tag.

17. The computer-readable medium according to claim 15, wherein a first document identifier identifying said document is described on said document,

5 a second document identifier identifying said document is stored in said RF-ID tag,

said RF-ID reader obtains said second document identifier when communicating said RF-ID tag, outputs said second document identifier and said document
10 detection signal to said computer,

said step (c) includes:

(c2) outputting a comparison result between said first identifier in said still image data and said second identifier from said RF-ID tag to said
15 information processor.

18. The computer-readable medium according to claim 15, wherein a first document identifier identifying said document is described on said document,

20 a second document identifier identifying said document and an image taking data including parameters predetermined for taking an image of said document are stored in said RF-ID tag,

said RF-ID reader obtains said image taking data
25 and said second document identifier when communicating with said RF-ID tag, outputs said image taking data, said second document identifier, and

said document detection signal to said computer,

said step (c) includes:

(c3) controlling said image taking section such
that said image taking section takes said image of
5 said document in said predetermined area based on said
parameters obtained from said RF-ID tag, and

(c4) outputting a comparison result between said
first identifier in said still image data and said
second identifier from said RF-ID tag to said
10 information processor.

IMAGE TAKING APPARATUS AND A METHOD FOR TAKING IMAGES

Abstract

An image taking apparatus includes a table, an image taking section, a detecting section, an imaging switch section, a dynamic image output controller and a still image output controller. The image taking section takes images of subjects on and above the table. The detecting section detects a document in a predetermined area on the table. The imaging switch section outputs a first detection signal when the document is not in the predetermined area, and outputs a second detection signal when the document is in the predetermined area, based on a detection result of the detecting section. The dynamic image output controller controls the image taking section such that the image taking section takes a dynamic image of subjects on and above the table, and outputs a dynamic image data indicating the dynamic image to an information processor, in response to the first detection signal. The still image output controller controls the image taking section such that the image taking section takes a still image of the document on the table, and outputs a still image data indicating the still image to the information processor, in response to the second detection signal.

FIG. 1