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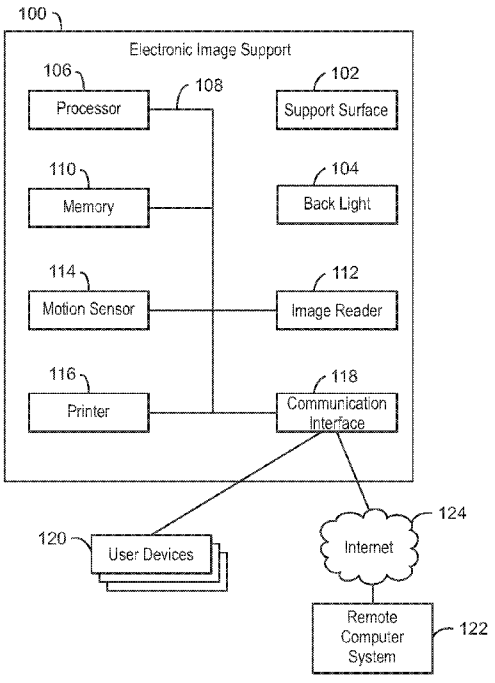

FIG. 1

(57) Abstract: Examples disclosed herein relate to an electronic image support. An example device includes a support surface for receiving and displaying printed images, an image reader to identify the printed images displayed on the support surface, and a processor to monitor a status of the electronic image support and save the status to a memory. The status includes an identification of each of the printed images currently being displayed on the support surface.

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IMAGE SUPPORTS

BACKGROUND

[0001] There are several mobile devices available today that provide the ability to take high quality photographs. For example, smart phones enable most people to have a high quality camera at their disposal at all times. Accordingly, the taking of photographs has become a regular activity in many people's lives. By contrast, the actual printing and displaying of photographs is less common. Many people find it more convenient to display photographs on their personal devices, rather than printing and displaying them.

DESCRIPTION OF THE DRAWINGS

[0002] Certain examples are described in the following detailed description and in reference to the drawings, in which:

[0003] Fig. 1 is a block diagram of an example electronic image support;

[0004] Fig. 2 is a perspective view of an example electronic image support;

[0005] Fig. 3 is a diagram of an example image support with a camera based image reader;

[0006] Fig. 4 is a diagram of an example image support with an RFID based image reader;

[0007] Fig. 5 is a process flow diagram summarizing a method of operating an electronic image support;

[0008] Fig. 6 is a block diagram of an example non-transitory, computer-readable medium including instructions to direct a processor to operate an electronic image support;

[0009] Fig. 7 is a block diagram of an example electronic image support.

DETAILED DESCRIPTION

[0010] This present disclosure relates to an electronic image support that provides the ability to display a plurality of printed images and track the status of the image support. The status of the image support includes such information as which images have been printed, which images are being displayed on the image support, the position and orientation of the images on the image support, etc. The status of

the image support can be tracked over time to provide additional analytics such as the time and date that an image is added to or removed from the image support, the amount of time that an image is displayed, and others. The printed images that are displayed in the image support may be identified by an image reader, which may be a camera array or an RFID reader, for example. The identification of the images enables the electronic image support to associate the printed image with its corresponding digital representation stored in memory.

[0011] In some embodiments, the image support may have a built-in printer or a docking station for coupling a handheld printer. Identification of the printed image may be facilitated by the printer, which provides an identifier that attaches to the printed image. For example, when printing an image, the printer may print an identifier to the front or back of the image that uniquely identifies the image. In another example, the paper on which the image is printed may have a pre-printed identifier, which the printer may read when printing the image. The pre-printed identifier may then be associated with the digital representation of the image in memory when the image is printed. In both cases, the printed image will have an identifier that can be read by the camera array when the printed image is added to the image support. In another example, the paper on which the image is printed may have an RFID tag that stores a unique identifier that uniquely identifies the RFID tag and the image. The RFID tag identifier may be programmed during printing or read during printing. When the printed image is then added to the image support, the RFID tag can be read by the RFID reader. The electronic image support described herein provides an aesthetically pleasing medium for displaying images and encourages users to print images more frequently.

[0012] Fig. 1 is a block diagram of an example electronic image support. The electronic image support 100 includes a support surface 102 that is able to receive a plurality of printed images for displaying. The printed images may be held on the support surface 102 using any suitable attachment technique. For example, the image support 100 may include clear plastic strips that cover the support surface 102 and may be lifted to allow insertion a printed image. The printed images may be any type of image, including photographs, text images such as task reminders or news articles, and others. Some images may be printed by the user or may be obtained from a publication such as newspaper or magazine, for example. Additional items

may also be added to the support surface that are not actually printed, such as handwritten notes for example.

[0013] In some examples, the support surface 102 may be lit from behind by a backlight 104. The backlight 104 may include Light Emitting Diode (LED) light sources, incandescent bulbs, and others. The backlight 104 causes the displayed images to be light from behind. In some examples, the backlight 104 may also aid in allowing the image support 100 to identify the printed images. The image support 100 may be wall mounted, or displayed on a table top, for example.

[0014] The image support includes at least one processor 106. The processor 106 can be a single core processor, a multicore processor, a processor cluster, and the like. The processor 106 can may include an application specific integrated circuit (ASIC), or a field programmable gate array (FPGA), or any combination thereof to implement the image identification and status tracking as described herein. The processor 106 can be coupled to other units through a bus 108. The bus 108 can include peripheral component interconnect (PCI) or peripheral component interconnect express (PCIe) interconnects, Peripheral Component Interconnect eXtended (PCIx), or any number of other suitable technologies for transmitting information.

[0015] The processor 106 can be linked through the bus to a memory 110, which may include volatile memory, non-volatile memory, or some combination thereof. For example, the memory 110 may include Random Access Memory (RAM), persistent solid state memory such as flash memory, and others. The memory 110 may be used to store information about the status of the image support 100 and computer code for carrying out the various functions of the printer as described herein. The memory 110 may also be used to store user files, such as image files that may be stored and/or printed by the user.

[0016] The processor 106 may be coupled through the bus 108 to an image reader 112. The image reader 112 may be controlled by the processor 106 to determine which images are currently being displayed on the support surface 102. In some examples, the image reader 112 is also able to determine the location and orientation of the images. In some examples, the image reader 112 is an array of cameras configured to read an image identifier printed on a back of each of the printed images. The image reader 112 may also be an RFID reader configured to

read an RFID tag coupled with the printed image. Examples of an image identification system are described further in relation to Figs. 3 and 4.

[0017] The status of the image support 100 may be determined periodically according to a specified status update interval. In some examples, the image support 100 may include a motion sensor 114 for determining when an image may have been added to or removed from the support surface 102. The motion sensor 114 may be an accelerometer, for example. If the image support 100 includes a motion sensor 114, the detection of motion may be used to trigger a status update.

[0018] The image support 100 may also include a printer 116 communicatively coupled to the processor 106. The printer 116 may be a built-in component of the image support 100 or may be coupled to the image support 100 through a docking station included in the image support 100. In embodiments with a docking station for receiving a printer, the printer 116 may be a small portable hand held printer. Docking the printer 116 to the image support 100 enables the printer 116 to communicate with the image support 100 and receive power for charging a battery of the printer 116.

[0019] The image support 100 may also include a communication interface 118, which may be wired communication interface, wireless communication interface, or combination thereof. Suitable wireless communication interfaces include Bluetooth, WiFi, and others. Suitable wired communication interfaces include Ethernet and others. The communication interface 118 may enable user devices 120 to communicate with the image support 100. For example, the user devices 120 may include a laptop computer, smart phone, and others. Communication with the image support 100 may enable users to control the image support 100, send electronic images to the image support 100 for printing or storage, retrieve electronic images from the image support 100, retrieve status information from the image support 100, and the like. The communication interface may also enable the image support 100 to upload data to remote computing system 122 such as a cloud server through the internet 124.

[0020] The image support 100 enables image status tracking. The status information collected by the image support 100 may include an identification of the corresponding stored image file, a display time describing when each of the printed images were added to the support surface, a removal time describing when each of

the printed images were removed from the support surface 102, and a display duration describing an amount of time that each of the printed images were displayed on the support surface. The time that a printed image was added or removed may include the time of day as well as the day, month, and year. The status information may also include a position and orientation of each of the printed images displayed on the support surface. The status information may also include an identity of the user or device that created the image or initiated the printing of the image. In some examples, the status information may also include a description of the content of the image. For example, the digital version of the image may have associated metadata that describes the image. The image content description may be determined automatically or manually entered by the user. For example, the image content description may be determined by the image capture device or the user may be prompted to provide a description of the image during capture, storage, or printing of the image. The image content description may include any suitable type of information, including the identity of people in the photo, the location where the photo was taken, the time when the photo was taken, whether the image has a landscape or portrait orientation, and others.

[0021] The status of the image support 100, which is tracked over time, enables a variety of analytical features. For example, the analysis of the status information can allow a ranking of the images related to each image's relative level of interest or significance. Those images that have been displayed for a longer duration may be ranked as having a higher level of significance, whereas images that have been displayed for a shorter duration may be ranked as having a lower level of significance. The level of significance may also be correlated with a particular time of year. For example, images that are displayed during particular holidays may be characterized as having a higher level of significance during specific times of year.

[0022] The ranking and characterizations of the images may be used to implement a variety of features, such as autonomous printing of images, image printing suggestions, and others. For example, if a particular image is rated as having a high level of significance during a particular time of year, and if the current status of the image support indicates that the image is not currently displayed, the printer may autonomously print the image, or a suggestion may be sent to a user's mobile device suggesting that the image be printed. As used herein, autonomous

printing refers to the printing of an image which is not initiated by the user, but is rather initiated by the image support itself based on the analysis of the status information.

[0023] The status information may also be used to generate a virtual image support using the digital image files corresponding to the printed images, as well as the positions, sizes, and orientations of the printed images. As used herein, the term virtual image support refers to a digital image that represents the status of the actual image support 100. In the virtual image support, the digital images corresponding to the printed images may be arranged in a composite image with the same relative sizes, positions, and orientations as in the actual image support. The virtual image may be generated by the image support processor 106, one of the user devices 120, or the remote computing system 122. The virtual image support may be stored to memory or uploaded to the remote storage system for display on a Web page, for example.

[0024] In some examples, the image reader 112 is able to correlate the printed images with their corresponding digital representation. For example, the printer 116 may print an identifier on the front or back of the printed image during printing. Additionally, the paper on which the image is printed may have a preexisting identifier, which may be read by the printer 116 when the printing is initiated. The identifier identifies the image by associating the printed image with its stored digital representation. The image reader 112 may then read the identifier when the printed image is placed on the support surface 102 of the image support 100. Additional features of example image reading techniques are described in relation to Figs. 3 and 4.

[0025] Fig. 2 is a perspective view of an example electronic image support. As described above, the image support 100 includes a support surface 102 for receiving printed pictures 200 and other items. In the example shown in fig. 2, the pictures 200 are held in place by clear plastic strips 202 that may be lifted to allow insertion of a picture or other item. Any number of strips 202 may be used, including a single strip. Other attachment techniques may also be used, such as magnetic, and tension based coupling techniques.

[0026] The image support 100 also includes the printer 116. In this example, the printer 116 is shown as a small hand-held printer, which is inserted into a docking

station 204. Docking the printer 116 may establish communication with other components of the image support 100 such as the processor 106. Printed images 200 may be held by the printer 116 until removed by the user.

[0027] The status of the image support 100 may be determined periodically or in response to detecting that a printed image 200 or other item has been added to the image support 100. The status of the image support 100 may be determined, in part, by an image reader 112 (Fig. 1). The height, h, of the image support 100 may be specified to provide enough room for proper operation of the image reader 112 (Fig. 1). For example, in the case of a camera based image reader, the height of the image support 100 may be specified to ensure that the camera or cameras have a field of view suitable for viewing the entire support surface 102.

[0028] Fig. 3 is a diagram of an example image support with a camera based image reader. In this examples, the image reader 112 (Fig. 1) includes an array of cameras 300 aimed at the support surface 102. In some examples, the cameras 300 have wide angle lenses, sometimes referred to as fish eye lenses, to increase the field of view of the cameras 300. The number of cameras 300 may vary depending on factors such as the area of the support surface 102, the distance of the cameras 300 from the support surface, the field of view of the cameras 300, and others. In some examples, a single camera may be sufficient to capture an image of the entire support surface 102.

[0029] Together, the array of cameras 300 are able to capture an image of the entire support surface 102. During this process, the backlighting of the support surface 102 may help to illuminate the items. The images captured by the array of cameras 300 may be combined into a composite image, which is analyzed to characterize items that have been added to the support surface 102. For example, the composite image may be analyzed to identify the outline of printed images on the support surface. From that, the number, size, position and orientation of the items can be determined.

[0030] Some or all of the items coupled to the support surface 102 may be printed images and may have an associated identifier 302 that uniquely identifies each of the printed images 200. The identifier 302 may be a set of alphanumeric characters, a bar code, a Quick Response (QR) code, or others. The identifier 302 may be located on the back side of the printed image 200 or the front side of the printed

image 200. The backlighting provided by the image support 100 may enable the cameras 300 to capture a suitable image of the identifier even if the identifier is on the front surface of the printed image 200.

[0031] The identifier 302 may be printed on the print medium contemporaneously with the printing of the specified image. Upon the initiation of a print job, the identifier 302 may be assigned to the printed image and associated with the digital representation of the image stored in memory 110 (Fig. 1). In some examples, the identifier 302 may already be on the print medium prior to printing. For example, the identifier 302 may be added to the print medium during fabrication of the print medium. Upon the initiation of a print job, the identifier 302 may be read by the printer 116 (Fig. 1) and associated with the digital representation of the image stored in memory 110 (Fig. 1).

[0032] In some cases, not all of the items coupled to the support surface 102 will be printed images and may not have an identifier that is recognizable by the image reader. For example, the user may place a hand written note or newspaper clipping on the support surface 102. In such cases, the item may be recognized by the image reader as being present on the support surface 102, and some status information may be collected and stored for the item, such as the position, orientation, size, and time of placement or removal. Additionally, the user may associate the item with an image by scanning the image and uploading the scanned image to the memory 110. In some examples, a user may be able to print a blank printout from the printer 116, such that the printout will have an identifier, but the identifier will not be associated with any digital image stored in memory. The user may then draw on the blank print medium and attach the item to the support surface. In such cases, the user may scan the image drawn on the blank print medium, upload the scanned image to the memory 110, and manually associate the scanned image with the identifier on the print medium. This may be done prior to attaching the item to the support surface or at some later date.

[0033] Fig. 4 is a diagram of an example image support with an RFID based image reader. In this examples, the image reader 112 (Fig. 1) includes a RFID reader 400 disposed within the image support 100 behind the support surface 102. As described above, some or all of the items attached to the support surface 102 may be printed images and may have an associated identifier 302 that uniquely

identifies each of the printed images 200. In the example shown in Fig. 4, the identifier 302 is an RFID tag, which may be a passive RFID tag that is powered by the signal generated by the RFID reader 400.

[0034] The RFID tag may be attached to the print medium prior to printing. For example, the RFID tag may be attached to the print medium during fabrication of the print medium by adhering the RFID tag to the surface of the print medium or embedding the RFID tag within the print medium. Each RFID tag may have stored therein an identifier that uniquely identifies each RFID tag and by extension each print medium. Upon the initiation of a print job, the identifier stored to the RFID tag may read by the printer 116 (Fig. 1) and associated with the digital representation of the image stored in memory 110 (Fig. 1).

[0035] During a status update of the image support 100, the RFID reader 400 may broadcast a signal to interrogate the RFID tags. The RFID tags respond to the interrogation signal by broadcasting their own unique identifier back the RFID reader. This enables the RFID reader to determine the printed images that have been attached to the support surface. However, the RFID reader may not be able to determine the positions, sizes, or orientations of the printed pictures. In some examples, the image reader 112 includes both the RFID reader of Fig. 4 and the camera array of Fig. 3 to provide a more complete set of status information.

[0036] Fig. 5 is a process flow diagram summarizing a method of operating an electronic image support. The method may be performed by the processor 106 show in Fig. 1 and may begin at block 502.

[0037] At block 502, an instruction to print a specified image stored in memory is received. The instruction may be received from a user through one of the user devices 120, from the remote computing system 122, or may be generated by the processor itself based on analysis of the status information generated by the image support.

[0038] At block 504, the specified image may be printed, and an image identifier disposed on the printed image is associated with the specified image stored in memory. The image identifier may be added to the printed image during printing or read by the printer during printing if the identifier is preexisting on the print medium.

[0039] At block 506, the presence of the printed picture on a support surface of the electronic image support is detected and the image identifier is read. The

presence may be determined using motion detection, RFID interrogation, capturing an image of the printed picture, and others.

[0040] At block 508, a status of the electronic image support is stored to memory. The status can include the image identifier, as well as a variety of additional information such as the position and orientation or the printed image, a display time describing when the printed picture was added to the support surface, a removal time describing when the printed picture was removed from the support surface, and a display duration describing an amount of time that the printed picture was displayed on the support surface, among others.

[0041] It is to be understood that the block diagram of Fig. 5 is not intended to indicate that the method 500 is to include all of the actions shown in Fig. 5. Rather, the method 500 can include fewer or additional components not illustrated in Fig. 5.

[0042] Fig. 6 is a block diagram of an example non-transitory, computer-readable medium including instructions to direct a processor to operate an electronic image support. The computer readable medium 600 may be the memory 110 of Fig. 1. The computer readable medium 600 may be coupled to a processor 602 to execute instructions stored in the computer-readable medium 600. The instructions direct the operations of the electronic image support 100, such as the image identification and status tracking techniques described herein.

[0043] The computer-readable medium 600 includes an image identifier 604 and an status tracker 606. The image identifier 604 identifies the images attached to the support surface of a image support according to the techniques described herein. For example, the image identifier 604 may direct the operations of a printer to dispose an identifier on printed images or read identifiers from the print medium of printed pictures as described herein. The image identifier 604 also associates the image identifier disposed on the printed picture with the digital version of the image stored to memory. The image identifier 604 can also direct the operations of an image reader to read the picture identifier in response to detection of the printed picture on a support surface of an electronic image support. The status tracker 606 records a status of the electronic image support to memory and tracks the status of the image support over time.

[0044] It is to be understood that the block diagram of Fig. 6 is not intended to indicate that the computer-readable medium 600 is to include all of the components

shown in Fig. 6. Rather, the computer-readable medium 600 can include fewer or additional components not illustrated in Fig. 6.

[0045] Fig. 7 is a block diagram of an example electronic image support. The electronic image support 100 is a simplified version of the electronic image support 100 shown in Fig. 1. The electronic image support 100 of Fig. 7 includes the support surface 102, the processor 106, the memory 110, and the image reader 112. The support surface 102 is configured to receive and display images, including printed images. The image reader 112 is configured to identify the images displayed on the support surface 102. The processor 106 is configured to monitor the status of the electronic image support 100 and save the status to the memory 110. The status includes an identification of each of the images currently being displayed on the support surface 102 and, optionally, additional information in accordance with the techniques described herein.

[0046] While the present techniques may be susceptible to various modifications and alternative forms, the techniques discussed above have been shown by way of example. It is to be understood that the technique is not intended to be limited to the particular examples disclosed herein. Indeed, the present techniques include all alternatives, modifications, and equivalents falling within the scope of the following claims.

CLAIMS

What is claimed is:

1. An electronic image support, comprising:

a support surface for receiving and displaying printed images;

an image reader to identify the printed images displayed on the support surface;

a processor to monitor a status of the electronic image support and save the status to a memory, wherein the status comprises an identification of each of the printed images currently being displayed on the support surface.

2. The electronic image support of claim 1, wherein the status comprises a position and orientation of each of the printed images displayed on the support surface.

3. The electronic image support of claim 1, wherein the status is tracked over time to generate image support analytics comprising at least one of:

a display time describing when each of the printed images were added to the support surface;

a removal time describing when each of the printed images were removed from the support surface; and

a display duration describing an amount of time that each of the printed images were displayed on the support surface.

4. The electronic image support of claim 1, wherein the image reader is an array of cameras configured to read an image identifier printed on a back of each of the printed images.

5. The electronic image support of claim 1, wherein the image reader is an RFID reader configured to read an RFID tag coupled with the printed image, wherein the printer is to associate a unique identifier stored to the RFID tag with an image identifier that uniquely identifies a digital representation of the printed image.

6. A method of operating an electronic image support, comprising:

printing a specified image to generate a printed image and associating an image identifier disposed on the printed image with the specified image stored in memory;

detecting the presence of the printed image on a support surface of the electronic image support and reading the image identifier; and

recording a status of the electronic image support to memory, wherein the status comprises the image identifier.

7. The method of claim 6, comprising detecting a position and orientation of the printed image on the support surface, wherein the status comprises the position and orientation.

8. The method of claim 6, comprising tracking the status over time to generate image support analytics comprising at least one of:

a display time describing when the printed image was added to the support surface;

a removal time describing when the printed image was removed from the support surface; and

a display duration describing an amount of time that the printed image was displayed on the support surface.

9. The method of claim 6, comprising printing the image identifier on the printed image contemporaneous with the printing of the specified image.

10. The method of claim 6, wherein the image identifier is stored to an RFID tag coupled with the printed image, wherein reading the image identifier comprises reading the RFID tag via an RFID reader.

11. A non-transitory machine-readable storage medium encoded with instructions executable by a processor, the machine-readable storage medium comprising instructions to direct the processor to:

print a specified image to generate a printed image;

associate an image identifier disposed on the printed image with the specified image;

read the image identifier in response to detection of the printed image on a support surface of an electronic image support; and

record a status of the electronic image support to memory, wherein the status comprises the image identifier.

12. The non-transitory machine-readable storage medium of claim 11, comprising instructions to direct the processor to detect a position and orientation of the printed image on the support surface, wherein the status comprises the position and orientation.

13. The non-transitory machine-readable storage medium of claim 11, comprising instructions to direct the processor to tracking the status over time to generate image support analytics comprising at least one of:

a display time describing when the printed image was added to the support surface;

a removal time describing when the printed image was removed from the support surface; and

a display duration describing an amount of time that the printed image was displayed on the support surface.

14. The non-transitory machine-readable storage medium of claim 11, comprising instructions to direct the processor to print the image identifier on a back of the printed image contemporaneous with the printing of the specified image.

15. The non-transitory machine-readable storage medium of claim 11, comprising instructions to direct the processor to transmit the status of the electronic image support to a remote computing system.

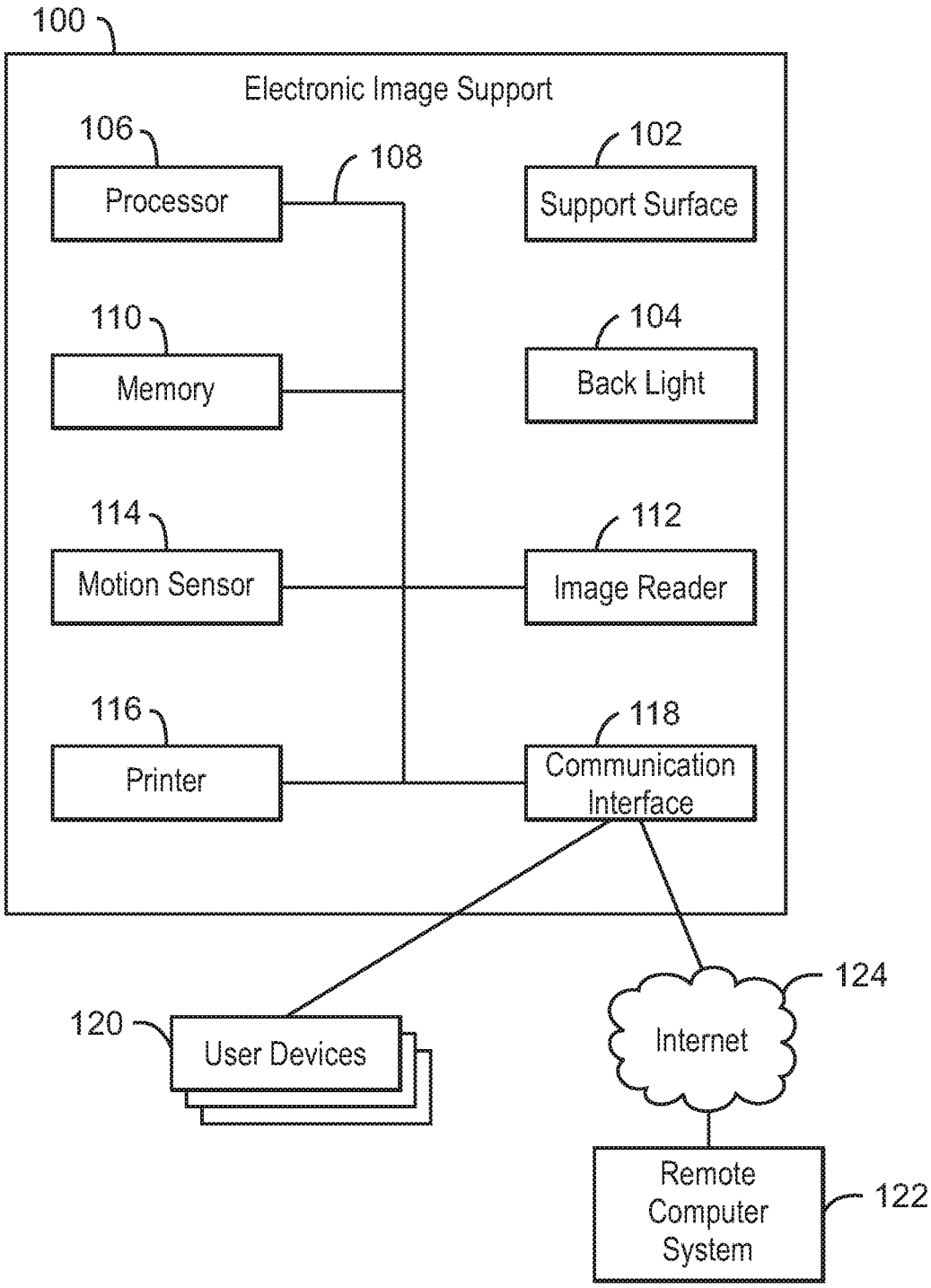

100
Electronic Image Support
106
Processor
108
102
Support Surface
110
Memory
104
Back Light
114
Motion Sensor
112
Image Reader
116
Printer
118
Communication Interface
120
User Devices
124
Internet
Remote Computer System
122

FIG. 1

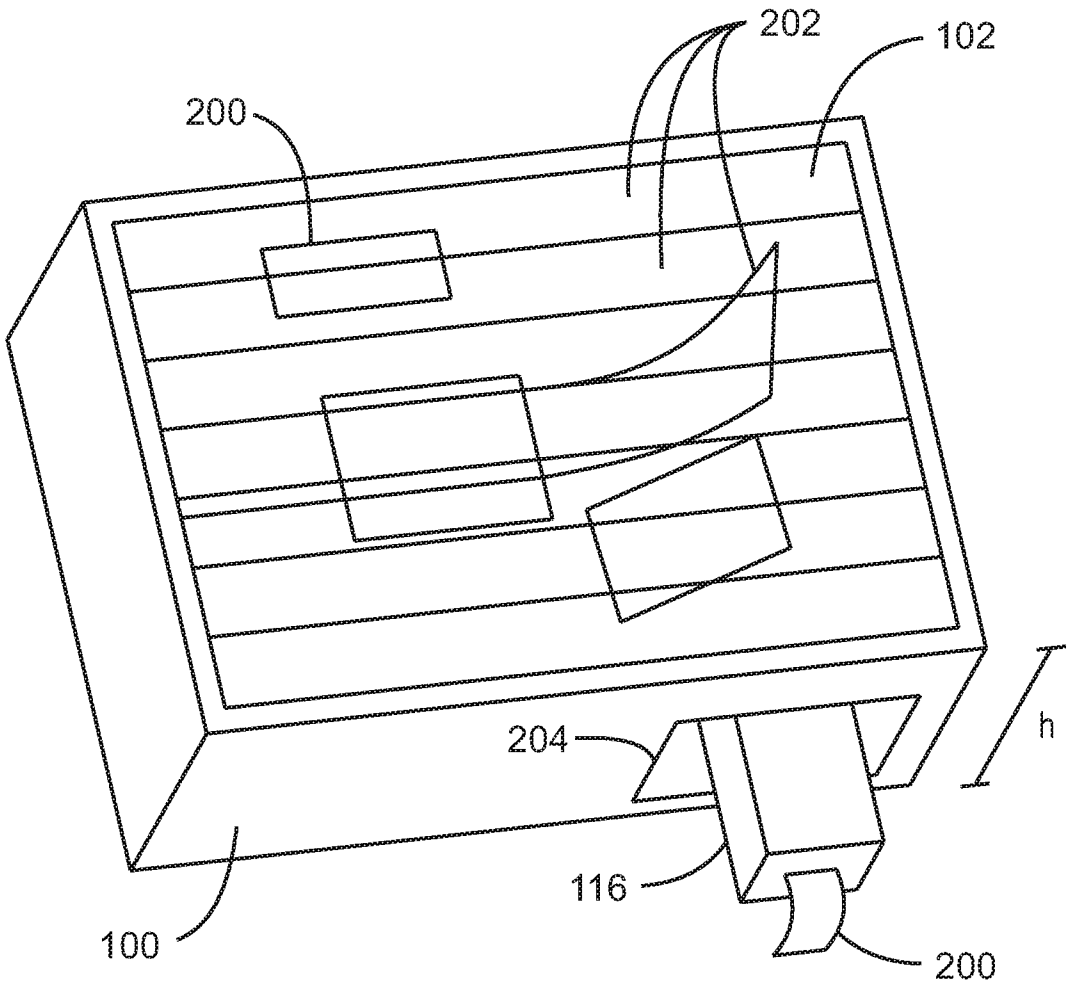


FIG. 2

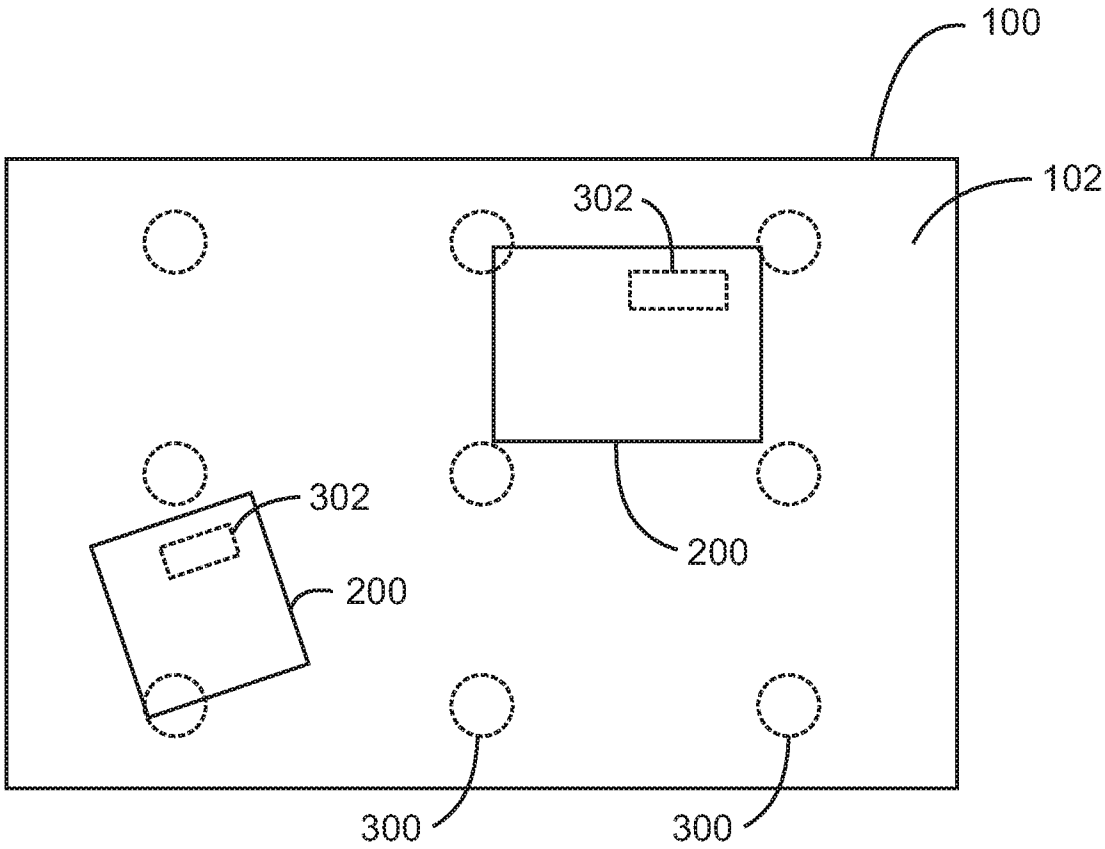


FIG. 3

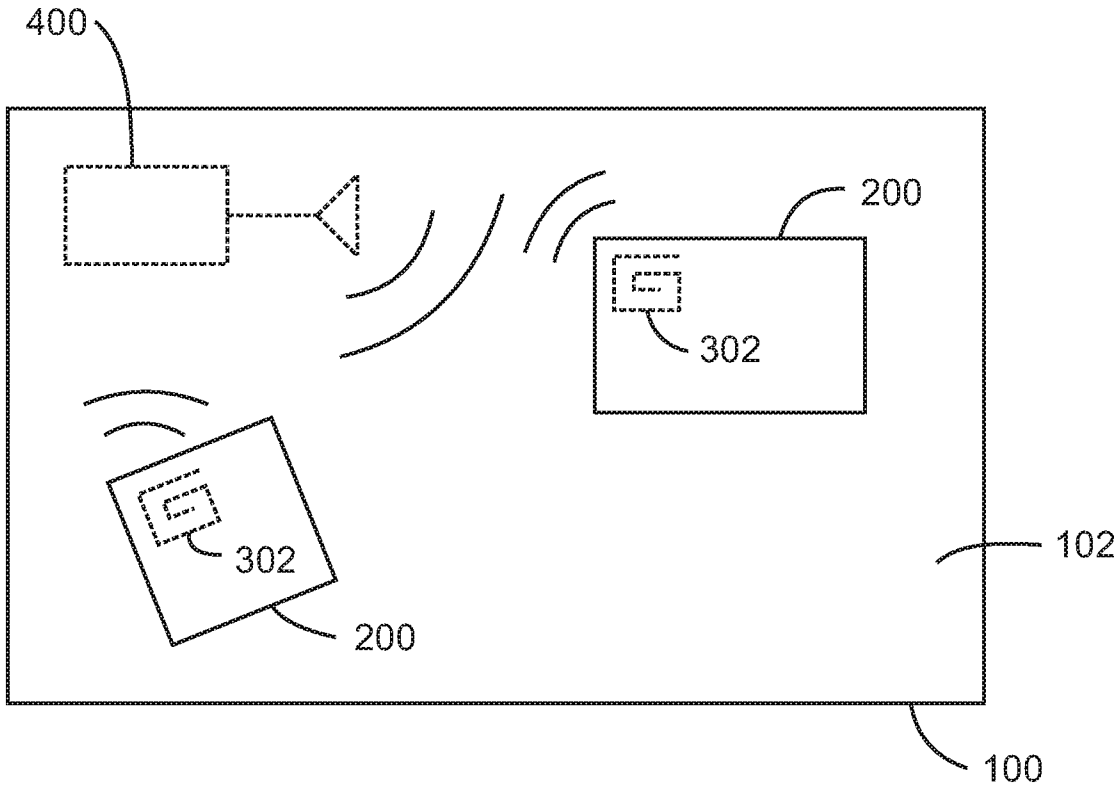
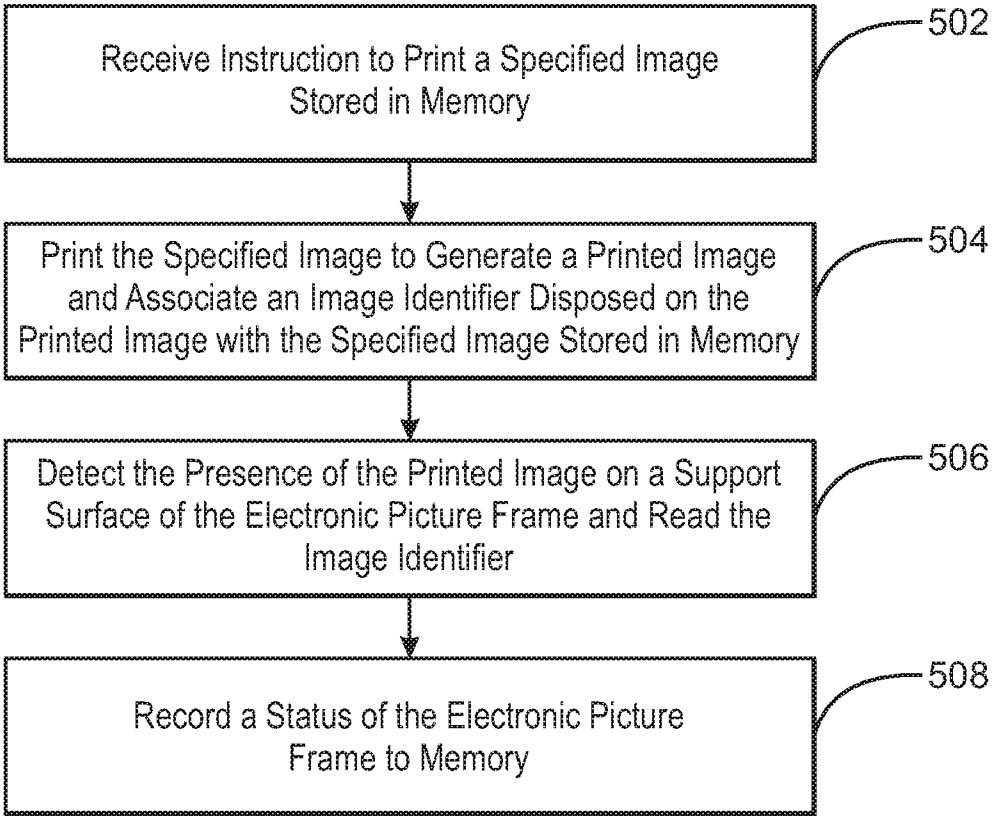


FIG. 4


Receive Instruction to Print a Specified Image Stored in Memory
502
Print the Specified Image to Generate a Printed Image and Associate an Image Identifier Disposed on the Printed Image with the Specified Image Stored in Memory
504
Detect the Presence of the Printed Image on a Support Surface of the Electronic Picture Frame and Read the Image Identifier
506
Record a Status of the Electronic Picture Frame to Memory
508

500

FIG. 5

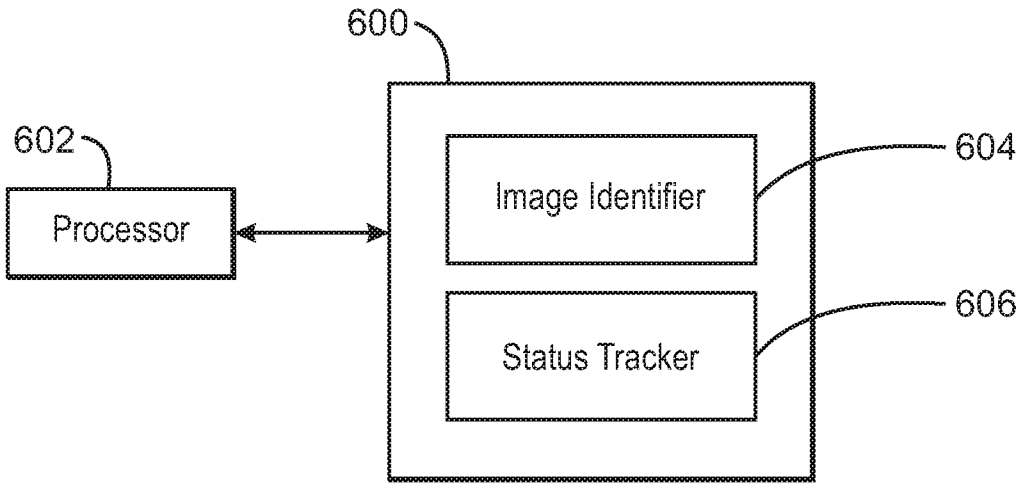


FIG. 6

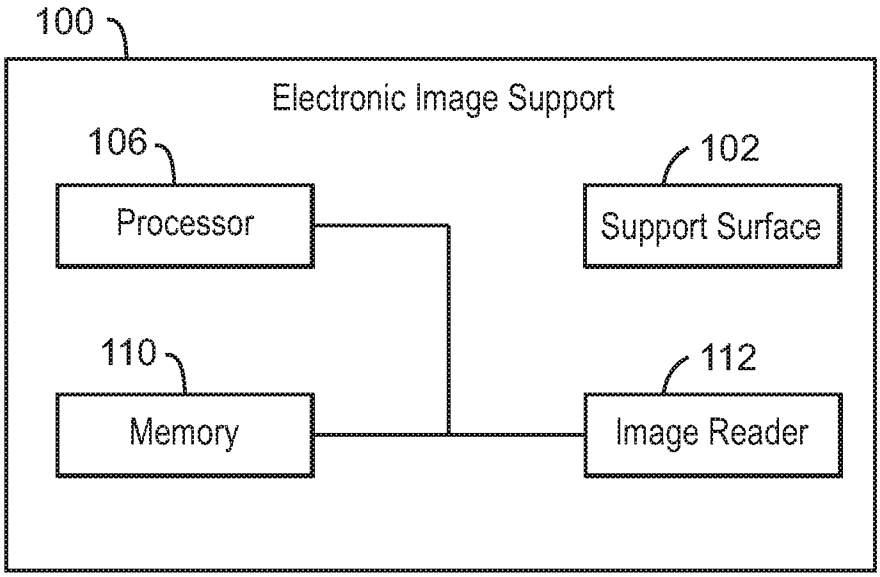

100
Electronic Image Support
106
Processor
102
Support Surface
110
Memory
112
Image Reader

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2018/056548

A. CLASSIFICATION OF SUBJECT MATTER

H04N 1/00 *(2006.01)*
G06F 3/00 *(2006.01)*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N 1/00-1/64, G06F 3/00-3/18, 15/00, 15/08-15/12, G03B 21/00, G06K 15/00-15/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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

PatSearch, Espacenet, USPTO, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0184476 A1 (SILVERBROOK RESEARCH PTY LTD) 22.07.2010, abstract, paragraphs [0011]-[0015], [0017]-[0018], [0024], [0031], [0075], [0079]-[0083], [0089]-[0094], [0098]-[0099], [0101], [0103], [0104], [0107]-[0111], [0114], [0116]-[0117], [0121], [0123], [0126], [0133]-[0135], [0156], claim 7, fig. 11	1-2, 4, 6-7, 9, 11-12, 14
Y		3, 5, 8, 10, 13, 15
Y	US 2010/0026470 A1 (MICROSOFT CORPORATION) 04.02.2010, paragraphs [0023], [0026], [0036], [0046], [0049], [0070], claims 2, 7-9	3, 5, 8, 10, 13, 15
A	US 7664294 B2 (KOENIG & BAUER AKTIENGESELLSCHAFT) 16.02.2010	1-15

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03 June 2019 (03.06.2019)	20 June 2019 (20.06.2019)

Name and mailing address of the ISA/RU:	Authorized officer
Federal Institute of Industrial Property, Berezhkovskaya nab., 30-1, Moscow, G-59, GSP-3, Russia, 125993 Facsimile No: (8-495) 531-63-18, (8-499) 243-33-37	I. Meshkova Telephone No. 8 (495)-531-64-81