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(54) Title: METHOD AND SYSTEM FOR BIDIRECTIONAL VISUAL DATA EXCHANGE BETWEEN DEVICES

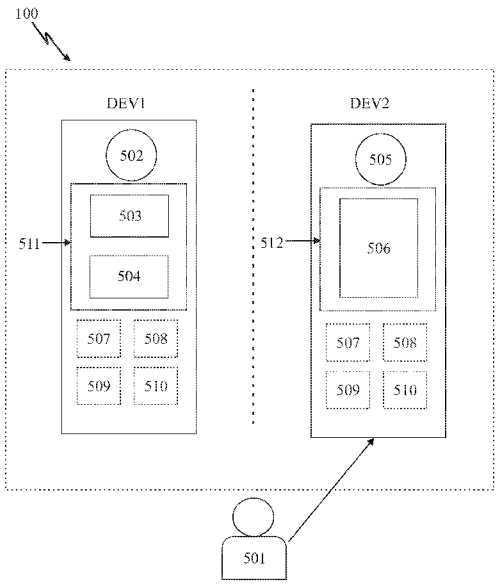


FIGURE 4

(57) Abstract: A method and system (100) for automatic bidirectional visual data exchange between devices (DEV1, DEV2) in response to minimal user intervention is disclosed. The system (100) configuration requires two devices (DEV1, DEV2) facing each other in a spaced apart manner with an image capturing means and a display provided on the frontal faces of the respective devices (DEV1, DEV2). One of the two devices further comprises discrete visual data (503) and visual feedback containers (504) and the other of the two devices further comprises a common visual data and feedback container (506). The method essentially comprises the steps of guiding and positioning of one device with respect to the other, detecting a change in state in either of the two devices (DEV1, DEV2) from capturing visual data to generating visual data and initiating a second directional visual data exchange between the two devices (DEV1, DEV2) after validation of the first directional visual data exchange.

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METHOD AND SYSTEM FOR BIDIRECTIONAL VISUAL DATA EXCHANGE BETWEEN DEVICES

FIELD OF THE DISCLOSURE

The present invention relates to the field of electronic devices having a display and image capturing means, particularly to a method and system for bidirectional visual data exchange between the devices with minimal user intervention.

BACKGROUND

Transferring or exchanging data between devices finds application in several commonly executed tasks. Authentication process in a client-server environment during purchase of a product having a two-dimensional barcode image, and performing a digital signature in a client-server environment are two very typical use cases that involve exchange of data between two devices. Wi-Fi and Bluetooth protocols are common protocols employed to transfer data between devices. In order to transfer and exchange visual data between devices, devices with image capturing capabilities and display screens are required.

Figure 1 is a schematic representation of a one directional data exchange as known in the art. A single device DEV with a rear camera 102 and a front display screen 103 is ready to capture visual data and further process the visual data with computational instructions and display information about the visual data as a readable data. A use case for a one directional data exchange is typically when a user 105 intends to purchase an object that has two-dimensional barcode image 101, which describes the object information. The user 105 with a device DEV and a reader of two-dimensional barcode software installed in the device DEV uses the rear camera 102 of the device DEV and sets the position of the device DEV guided by the front screen display 103 of the device DEV such that the two-dimensional barcode image 101 is within the targeted area of the display screen 103. It also serves as a preview screen of the image to assist in capturing the image of the two-dimensional barcode 101. The device DEV with the rear camera 102 captures the two-dimensional barcode 101, translates or decodes

the captured image into a readable data for the user 105. The transfer 104 of the two-dimensional barcode image, which is the visual data to the device DEV is considered as a single directional exchange of visual data.

Figure 2 is a schematic representation of two devices constituting a system provided for flow of bidirectional exchange of visual data. A two directional data exchanges between devices occurs when two devices where each has a display screen to display visual data and a camera to capture the visual data are set to exchange visual data between one another. Generally, the steps involved in bidirectional exchange of visual data include generating and displaying visual data by a first device, capturing the visual data of the first device by a second device having a camera and processing of the captured visual data. Typically, a user sets the second device in a position where the rear camera of the second device can capture the visual data generated by the first device. The display screen of the second device serves as a visual feedback for user to view and contain the visual data accurately. The true position of the second device is guided by the camera visual feedback at the front display screen of the second device. This completes the first transfer of visual data from the first device to the second device.

Upon successful validation of the captured and processed visual data generated by the first device, the second device generates a new visual data. In order for the first device to read the new visual data, manual or user intervention is required. User triggers an action to activate the camera and provides a camera visual feedback on the first device, which will stop display of the previous visual data display generated by the first device. User is required to turn over or flip back the second device, and show the new visual data to the camera of the first device. The first device then captures and processes the visual data. This completes the second transfer of visual data from the second device to the first device. For instance, 202 and 203 represent rear cameras associated with devices DEV1 and DEV2, respectively and 204 and 205 represent visual data shown on the front display screens of the devices respectively. The first transfer

is a visual data transfer where the visual data generated by device DEV1 is captured by the camera 203 of the device DEV2. The second transfer is a visual data transfer where the visual data generated by the device DEV2 is captured by the camera 202 of the device DEV1.

A use case for bidirectional data exchange is typically an authentication process that occurs in a client and server environment. For first directional data transfer, device DEV1 serving as a server generates data to prove server identity along with other authentication data, then translates or encodes the data to visual data, sends the data to device DEV2 serving as a client and asks for client identity. Device DEV2 receives the transferred data by capturing the visual data image generated by the server device DEV1, and processes and decodes the received data. If the received data is validated, only then the client device DEV2 generates data to prove client identity and other authentication data. For the second directional data transfer, the data generated by client is translated or encoded to visual data and made ready to be sent as visual data to the server device DEV1. The server device DEV1 will receive the visual data by capturing the visual data image generated by the client device DEV2 and process the data. If the received data is validated, the server device DEV1 authenticates the client device DEV2.

Another use case for two directional data exchange is the method of performing digital signature in a client and server environment. For first directional data transfer, device DEV1 serving as a server generates data to sign, translates data to sign to visual data and is ready to send the visual data to a client device DEV2 by displaying the visual data on the display screen of device DEV1. Device DEV2 serving as a client, receives the visual data from device DEV1 by capturing the visual data image, and processes the data by performing digital signature on the data. For the second directional data transfer, the client device DEV2 is ready to send the signature to the server device DEV1 for signature verification and translates or encodes the signature to visual data. The server device DEV1 receives the data by capturing the visual data image generated by the client

device DEV2 and processes the data by performing signature verification. If the signature is valid, only then the server device DEV1 authenticates the signature.

It is thus seen in the art that in order to read a two-dimensional barcode a user typically adopts the data transfer technique as illustrated in Figure 1. The technique uses a rear camera to capture the two dimensional barcode and a front display screen serves a preview to capture the two dimensional barcode and set the position of the device. This technique works well for one directional exchange.

For bidirectional visual data exchange, if the same technique as illustrated in Figure 1 is adopted, the user is required to intervene and provide a response. Figure 3 is a schematic representation of steps (a) through (d) involved in bidirectional exchange of visual data as known in the art. The key components are generally referenced by reference numerals and indicated particularly only in one instance for clarity in the illustration. A user is first required to manually set devices DEV1 and DEV2 as indicated in step (a). Device DEV1 captures visual data 205 generated by device DEV2 using rear camera 202. The user is required to manually turn over or flip back device DEV1 to enable capture of the image displayed on device DEV2 and ensure that the visual data 205 on the device DEV2 faces the rear camera 202 of the device DEV1. Device DEV1 previews the visual data 205 to set the position of the device DEV2 guided by the front display screen and then the visual data 205 is captured by the device DEV1 as indicated in step (b). The device DEV1 then generates visual data 204 on its display screen to be captured by the rear camera 203 of device DEV2. User is again required to manually turn over or flip back both the devices as indicated in step (c) to enable visual data transfer. The device DEV2 previews the visual data 204 to set the position of the device DEV1 guided by the front display screen and then the visual data 204 is captured by the device DEV2 as indicated in step (d).

It is thus seen that to have a successful bidirectional visual data transfer between two devices user interventions like capturing visual data using a rear camera of a

device with the user having to manually turn over or flip back the device so that user can preview the screen in order to set the visual data to be accurately captured is necessary. Again, noticing changing state of a device from presenting a visual data to capturing a new visual data and a need for the user to manually trigger an action to invoke the next visual data transfer to another device are also necessary. Even when front camera of the two devices are adopted in place of the rear camera, the setup of the devices may not be accurate enough to ensure preview of the visual data within each device's capture area, due to hardware limitation.

There is thus a need to provide a system and method that facilitates automatic bidirectional exchange of visual data between devices with minimal user intervention.

DEFINITIONS

The terms used throughout this specification are defined as follows, unless otherwise limited in specific instances.

The expression 'visual data' used hereinafter in the specification refers to data including static or dynamic images, patterns, symbols, video, generated text, arrangements and conversions associated with barcode images, QR-code and the like.

The expression 'user' used hereinafter in the specification refers to person or a robot or any other machine or program or assistive technology products intending to initiate a two-way communication between two devices, defined herein above.

The expression 'machine readable media' used hereinafter in the specification refers to RAM, ROM, EPROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code in the form of machine-executable instructions or data structures and which can be accessed

by a general purpose or special purpose computer or other machine with a processor.

The expression 'computer program product' is defined as a manufactured product embodied in a machine readable medium as defined herein above.

The expression 'device' used hereinafter in the specification refers to a system or a device with (a) image capturing means, built-in or external, like a camera or any other optical device or instrument and (b) display. The device, as referred is typically, a mobile communication device, a mobile computer, a desktop computer, client or server machines and the like. The device may optionally be a computational device or system with a built-in processor or a device that co-operates with an external processing means. In the context of the present description, the expressions "system", "assembly", "device", as well as any other equivalent expressions or compound words thereof or both, may be used interchangeably. The same applies for any other mutually equivalent expressions mentioned herein, as apparent to a person skilled in the art.

These definitions are in addition to those expressed in the art.

SUMMARY

In accordance with an aspect of the present disclosure, there is provided a method for performing automatic bidirectional transfer of visual data between two devices, each of the devices having at least one image capturing means and a display provided on the frontal faces of the respective device, the devices facing each other in a spaced apart configuration. The method of the present disclosure is characterized by the steps of guiding and positioning of at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices; initiating a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices; detecting a change in state in either of the two devices from capturing visual data to generating visual data; and initiating a second directional

visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange.

In accordance with a second aspect of the present disclosure, there is provided a computer program product for performing automatic bidirectional transfer of visual data between two devices, characterized by instructions operable to cause one or more modules to perform steps as described herein above.

In accordance with a third aspect of the present disclosure, there is provided a system for performing automatic bidirectional transfer of visual data between two devices. The system comprises two devices facing each other in a spaced apart configuration. Each of the devices necessarily includes at least one image capturing means and a display, provided on the frontal faces of the respective devices. Each of the devices further include a guide adapted to guide and position at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices; a first data communicator adapted to initiate a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices; a data sensor adapted to detect a change in state in either of the two devices from capturing visual data to generating visual data; and a second data communicator adapted to initiate a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange. One of the two devices further comprises discrete visual data and visual feedback containers and the other of the two devices further comprises a common visual data and feedback container.

In accordance with a fourth aspect of the present disclosure, there is provided a computer program product for performing automatic bidirectional transfer of visual data between two devices, the computer program product being tangibly

implemented on a machine readable media and characterized in that it comprises a guide, a first data communicator, a data sensor and a second data communicator as described herein above.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

A method and system for bidirectional visual data exchange between devices, in accordance with the present disclosure will now be described with the help of the accompanying drawings, in which:

Figure 1 is a schematic representation of a one directional data exchange as known in the art;

Figure 2 is a schematic representation of two devices constituting a system provided for flow of bidirectional exchange of visual data;

Figure 3 is a schematic representation of steps (a) through (d) involved in bidirectional exchange of visual data as known in the art;

Figure 4 is a schematic representation of the system that performs automatic bidirectional transfer of visual data between two devices, in accordance with the present disclosure;

Figure 5 is a schematic representation of steps (a) through (d) involved in bidirectional exchange of visual data in accordance with the present disclosure;

Figure 6 is a flow diagram illustrating the key steps involved in the method for performing automatic bidirectional transfer of visual data between two devices in accordance with the present disclosure;

Figure 7 is a flow diagram illustrating the sub steps comprising the step of guiding the positioning of at least one device in accordance with the present disclosure;

Figure 8 is a flow diagram illustrating the sub steps comprising the step of initiating a first directional visual data exchange in accordance with the present disclosure;

Figure 9 is a flow diagram illustrating the sub steps comprising the step of detecting a change in state in either of the two devices in accordance with the present disclosure; and

Figure 10 is a flow diagram illustrating the sub steps comprising the step of initiating a second directional visual data exchange in accordance with the present disclosure.

DETAILED DESCRIPTION

The conventional visual data exchange techniques perform a one directional data exchange as seen in FIGURE 1 and a bidirectional exchange of visual data as seen in FIGURE 2 and FIGURE 3. It is seen that the conventional bidirectional visual data exchange as illustrated in Figure 3 is successful when both devices have capability to manually turn over or flip back and involves multiple user actions and responses. Accordingly, the devices must necessarily be able to manually turn over or flip back, requires user action and response to initiate the software to invoke the camera services to capture visual data and necessitates user action and response to manually arrange the next capture of visual data.

In order to overcome the aforementioned drawbacks, the present disclosure provides a method and system for bidirectional visual data exchange between devices in response to minimal user intervention or response which will now be described with reference to the embodiment shown in the accompanying drawings. The embodiment does not limit the scope and ambit of the disclosure. The description relates purely to the exemplary embodiment and its suggested applications.

The embodiment herein and the various features and advantageous details thereof are explained with reference to the non-limiting embodiment in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiment herein may be practiced and to further enable those of skill in the art to practice the embodiment herein. Accordingly, the description should not be construed as limiting the scope of the embodiment herein.

The description herein after, of the specific embodiment will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify or adapt or perform both for various applications such specific embodiment without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Figure 4 is a schematic representation of the system that performs automatic bidirectional transfer of visual data between two devices, in accordance with the present disclosure. The system uses front camera of the two devices to minimize user intervention. However, the setup may hinder preview of the visual data and may inaccurately setup the devices to not be within each device's capture area, due to hardware limitation. These limitations are overcome by the system 100 of the present disclosure as illustrated in Figure 4. 502 and 505 represent the front cameras of devices DEV1 and DEV2 respectively. User 501 holds device DEV2 to capture the visual data generated by the device DEV1. Device DEV1 is provided with two discrete containers viz., a visual data container 503 and a visual feedback container 504. The visual data container 503 holds the generated visual data and shows on the display 511 of the device DEV1. The

visual feedback container 504 holds the visual feedback, the output preview from frontal camera 502 of device DEV1. Device DEV2 is provided with a common visual data and feedback container 506 which serves dual functions viz., as a visual data container to display generated visual data and visual feedback container to display the output preview from frontal camera 505 of device DEV2 on the display 512. Furthermore each of the devices DEV1 and DEV2 are also provided with a guide 507 to guide and position at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices, a first data communicator 508 to initiate a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices, a data sensor 509 to detect a change in state in either of the two devices from capturing visual data to generating visual data and a second data communicator 510 to initiate a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange.

Network connectivity is an optional setup for this configuration and the system of the present disclosure works in either an offline or an online environment.

Although the exemplary embodiment of the system 100 has been explained with reference to front cameras 502 and 505, it may be understood that any image capturing means may be used in the context.

Figure 5 is a schematic representation of steps (a) through (d) involved in bidirectional exchange of visual data in accordance with the present disclosure by the system 100 as illustrated in Figure 4. The key components are generally referenced by reference numerals and indicated particularly only in one instance for clarity in the illustration. The devices DEV1 and DEV2 are set such that they face each other in a spaced apart configuration with image capturing means 502 and 505 respectively associated with devices DEV1 and DEV2. Device DEV1 is

provided with discrete visual data and visual feedback containers 503 and 504 respectively and device DEV2 is provided with a common visual data and feedback container 506 as explained herein above. Device DEV1 displays visual data generated on its display 511 in the visual data container 503. Device DEV2 captures the visual data generated by device DEV1 using the image capturing means 505 as indicated in step (a). Device DEV2 then generates visual feedback on its display 512 in the common visual data and feedback container 506. Device DEV1 shows visual feedback as received by the image capturing means 502 and holds it in the visual feedback container 504 as indicated in step (b). The captured visual data from device DEV1 is processed by device DEV2 for validation. Device DEV2 then generates a new visual data in the common visual data and feedback container 506 for capture by the image capturing means 502 of device DEV1 as indicated in step (c). Device DEV1 previews the visual data on display 512 and captures the new visual data for processing as indicated in step (d).

Figure 6 is a flow diagram illustrating the key steps involved in the method for performing automatic bidirectional transfer of visual data between two devices in accordance with the present disclosure. The method as disclosed includes the steps of guiding and positioning of at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices, initiating a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices, detecting a change in state in either of the two devices from capturing visual data to generating visual data and initiating a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange.

The minimalistic user intervention in the system and method of the present disclosure includes user action and response to activate a set of instructions or

software, such as entering a web address to access a service provider on a server or a click on a set of computer instructions or a combination thereof.

Figure 7 is a flow diagram illustrating the sub steps comprising the step of guiding the positioning of at least one device in accordance with the present disclosure. The sub steps include presenting an interface to a user for approval on using the image capturing means on a first device constituting the two devices, communicating with and activating the image capturing means in the first device, converting virtual data associated with the interface into an image to generate a visual data in a visual data container on the first device, presenting an interface to a user for approval on using the image capturing means on a second device constituting the two devices and providing a visual feedback in a visual feedback container on the first device serving as a guide to accurately position the second device constituting the two devices.

The guide may be implemented by a visual or voice signal or a combination thereof. The true position of the device DEV2 remains the same throughout the completion of bidirectional exchange of visual data between the devices. User action to turn over or flip back device as seen in the prior art is no longer a requisite. The visual feedback on device DEV1 acts as a mirror for the device DEV2 and serves as a visual guide for user to position the device DEV2, thus eliminating use or need for a rear camera. The position of the visual feedback depends on the location of the image capturing means. For a built-in camera inside a device, the recommended position is as illustrated in Figure 4. For external camera, automated instructions to set the visual feedback position with specific guides are presented to the user.

Figure 8 is a flow diagram illustrating the sub steps comprising the step of initiating a first directional visual data exchange in accordance with the present disclosure. The sub steps include detecting visual data in the visual data

container on a first device and capturing and receiving visual data presented by the first device using the image capturing means of a second device.

Figure 9 is a flow diagram illustrating the sub steps comprising the step of detecting a change in state in either of the two devices in accordance with the present disclosure. The sub steps include processing a captured visual data from a first device to validate the captured visual data, generating new visual data in a common visual data and feedback container in a second device, thereby replacing the visual data feedback in the common visual data and feedback container, if the captured visual data is validated and detecting a change in state of the second device from capturing visual data to generating visual data in the second device.

The synchronous detection of change in state and automated response to the detection further eliminates the need for user intervention.

Figure 10 is a flow diagram illustrating the sub steps comprising the step of initiating a second directional visual data exchange in accordance with the present disclosure. The sub steps include detecting visual data in a common visual data and feedback container in a second device, capturing visual data presented by the second device using the image capturing means of a first device, receiving the captured visual data in a visual feedback container on the first device and processing the captured visual data from the second device to validate the captured visual data with the visual data in a visual data container on the first device.

The technical or economical advancements offered by one or more aspects of the method and system for bidirectional visual data exchange between devices, of the present disclosure, include the realization of an automatic bidirectional visual data exchange between devices with minimal user intervention; and

removal of the limitation on the devices involved being light weight and capable of being flipped or turned over.

The terminology used herein is for the purpose of describing particular example embodiments only and is not intended to be limiting. As used herein, the singular forms "a", "an" and "the" may be intended to include the plural forms as well, unless the context clearly indicates otherwise.

The terms "comprises," "comprising," “including,” and “having,” are inclusive and therefore specify the presence of stated features, integers, steps, operations, elements, or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, or groups thereof. The method steps, processes, and operations described herein are not to be construed as necessarily requiring their performance in the particular order discussed or illustrated, unless specifically identified as an order of performance. It is also to be understood that additional or alternative steps may be employed.

The use of the expression “at least” or “at least one” suggests the use of one or more elements, as the use may be in one of the embodiments to achieve one or more of the desired objects or results.

The process steps, method steps, algorithms or the like may be described in a sequential order, such processes, methods and algorithms may be configured to work in alternate orders. In other words, any sequence or order of steps that may be described does not necessarily indicate a requirement that the steps be performed in that order. The steps of processes described herein may be performed in any order practical. Further, some steps may be performed simultaneously, in parallel, or concurrently.

CLAIMS

1. A system (100) for performing automatic bidirectional transfer of visual data between two devices (DEV1, DEV2), said system (100) comprises two devices (DEV1, DEV2) facing each other in a spaced apart configuration, characterized in that each of the devices (DEV1, DEV2) comprising:
   i. at least one image capturing means provided on a frontal face;
   ii. a display provided on the frontal face;
   iii. a guide (507) to position at least one of the two devices (DEV1, DEV2) with respect to the other device to ensure distinctive capture of visual data between the two devices;
   iv. a first data communicator (508) to initiate a first directional visual data exchange between the two devices (DEV1, DEV2) by capturing and receiving visual data presented by one of the two devices;
   v. a data sensor (509) for detecting a change in state in either of the two devices from capturing visual data to generating visual data; and
   vi. a second data communicator (510) to initiate a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange,

   wherein one of the two devices further comprises discrete visual data (503) and visual feedback containers (504) and the other of the two devices further comprises a common visual data and feedback container (506).

2. A method for performing automatic bidirectional transfer of visual data between two devices (DEV1, DEV2), each of the devices having at least one image capturing means and a display provided on frontal faces of the respective device, the devices (DEV1, DEV2) facing each other in a spaced apart configuration, characterized in the following steps:

i. positioning of at least one of the two devices (DEV1, DEV2) with respect to the other device to ensure distinctive capture of visual data between the two devices (DEV1, DEV2);

ii. initiating a first directional visual data exchange between the two devices (DEV1, DEV2) by capturing and receiving visual data presented by one of the two devices;

iii. detecting a change in state in either of the two devices (DEV1, DEV2) from capturing visual data to generating visual data; and

iv. initiating a second directional visual data exchange between the two devices (DEV1, DEV2) by capturing and receiving visual data presented by the other of the two devices (DEV1, DEV2) after validation of the first directional visual data exchange.

3. A method according to claim 2, wherein the step of positioning of at least one device comprises the following steps:

i. presenting an interface to a user for approval on using the image capturing means (502) on a first device (DEV1) constituting the two devices (DEV1, DEV2);

ii. communicating with and activating the image capturing means (502) in the first device (DEV1);

iii. converting virtual data associated with the interface into an image to generate a visual data in a visual data container (503) on the first device (DEV1);

iv. presenting an interface to a user for approval on using the image capturing means (505) on a second device (DEV2) constituting the two devices(DEV1, DEV2); and

v. providing a visual feedback in a visual feedback container (504) on the first device (DEV1) serving as a guide to accurately position the second device (DEV2) constituting the two devices (DEV1, DEV2).

4. A method according to claim 2, wherein the step of initiating a first directional visual data exchange comprises the following steps:
   i. detecting visual data in the visual data container (503) on a first device (DEV1); and
   ii. capturing and receiving visual data presented by the first device (DEV1) using the image capturing means (505) of a second device (DEV2).

5. A method according to claim 2, wherein the step of detecting a change in state further comprises the following steps:
   i. processing a captured visual data from a first device (DEV1) to validate the captured visual data;
   ii. generating new visual data in a common visual data and feedback container (506) in a second device (DEV2), thereby replacing the visual data feedback in the common visual data and feedback container (506), if the captured visual data is validated; and
   iii. detecting a change in state of the second device (DEV2) from capturing visual data to generating visual data in the second device (DEV2).

6. A method according to claim 2, wherein the step of initiating a second directional visual data exchange further comprises the following steps:
   i. detecting visual data in a common visual data and feedback container (506) in a second device (DEV2);
   ii. capturing visual data presented by the second device (DEV2) using the image capturing means (502) of a first device (DEV1);
   iii. receiving the captured visual data in a visual feedback container (504) on the first device (DEV1); and
   iv. processing the captured visual data from the second device (DEV2) to validate the captured visual data with the visual data in a visual data container (503) on the first device (DEV1).

7. A computer program product for performing automatic bidirectional transfer of visual data between two devices (DEV1, DEV2) facing each other in a spaced apart configuration, each of the devices having at least one image capturing means and a display provided on frontal faces of the respective device, said computer program product having instructions operable to cause one or more modules to,

   i. position at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices;

   ii. initiate a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices;

   iii. detect a change in state in either of the two devices from capturing visual data to generating visual data; and

   iv. initiate a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange.

wherein one of the two devices further comprises discrete visual data (503) and visual feedback containers (504) and the other of the two devices further comprises a common visual data and feedback container (506).

8. A computer program product for performing automatic bidirectional transfer of visual data between two devices (DEV1, DEV2) facing each other in a spaced apart configuration, each of the devices having at least one image capturing means and a display provided on the frontal faces of the respective device, said computer program product being tangibly implemented on a machine readable media and characterized in that it comprises:

i. a guide (507) to position at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices;

ii. a first data communicator (508) to initiate a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices;

iii. a data sensor (509) to detecting a change in state in either of the two devices from capturing visual data to generating visual data; and

iv. a second data communicator (510) adapted to initiate a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange,

wherein one of the two devices further comprises discrete visual data (503) and visual feedback containers (504) and the other of the two devices further comprises a common visual data and feedback container (506).

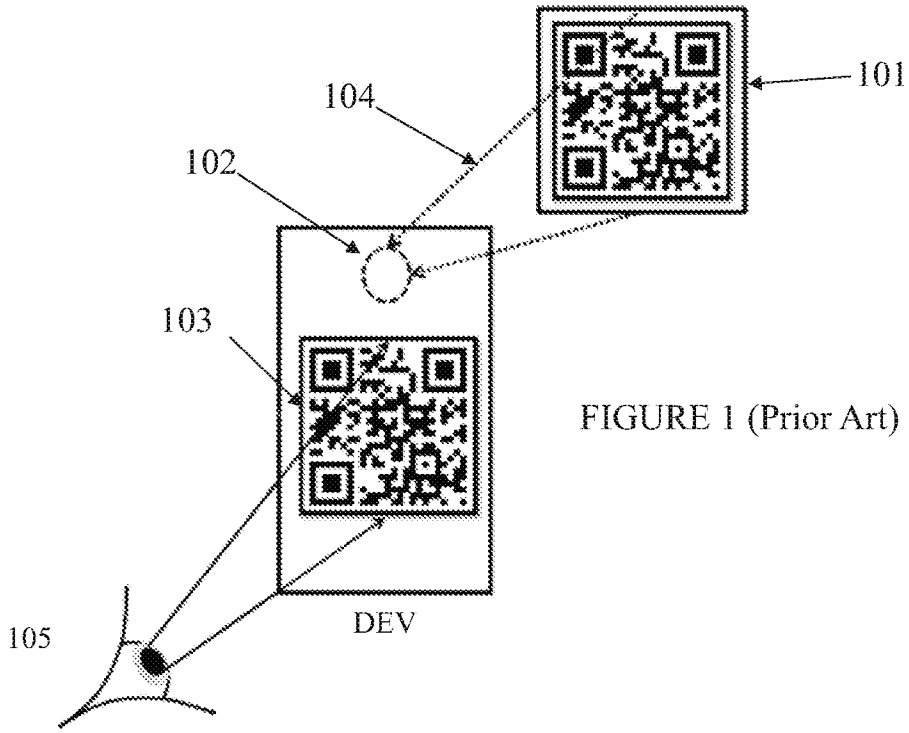


FIGURE 1 (Prior Art)

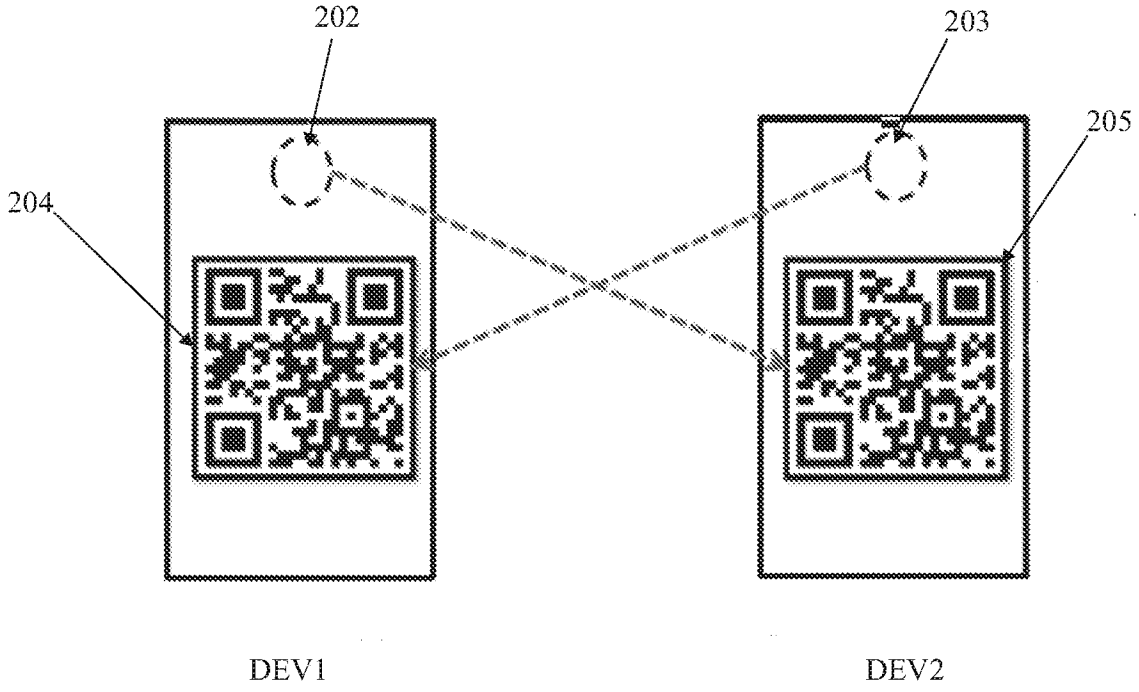


FIGURE 2

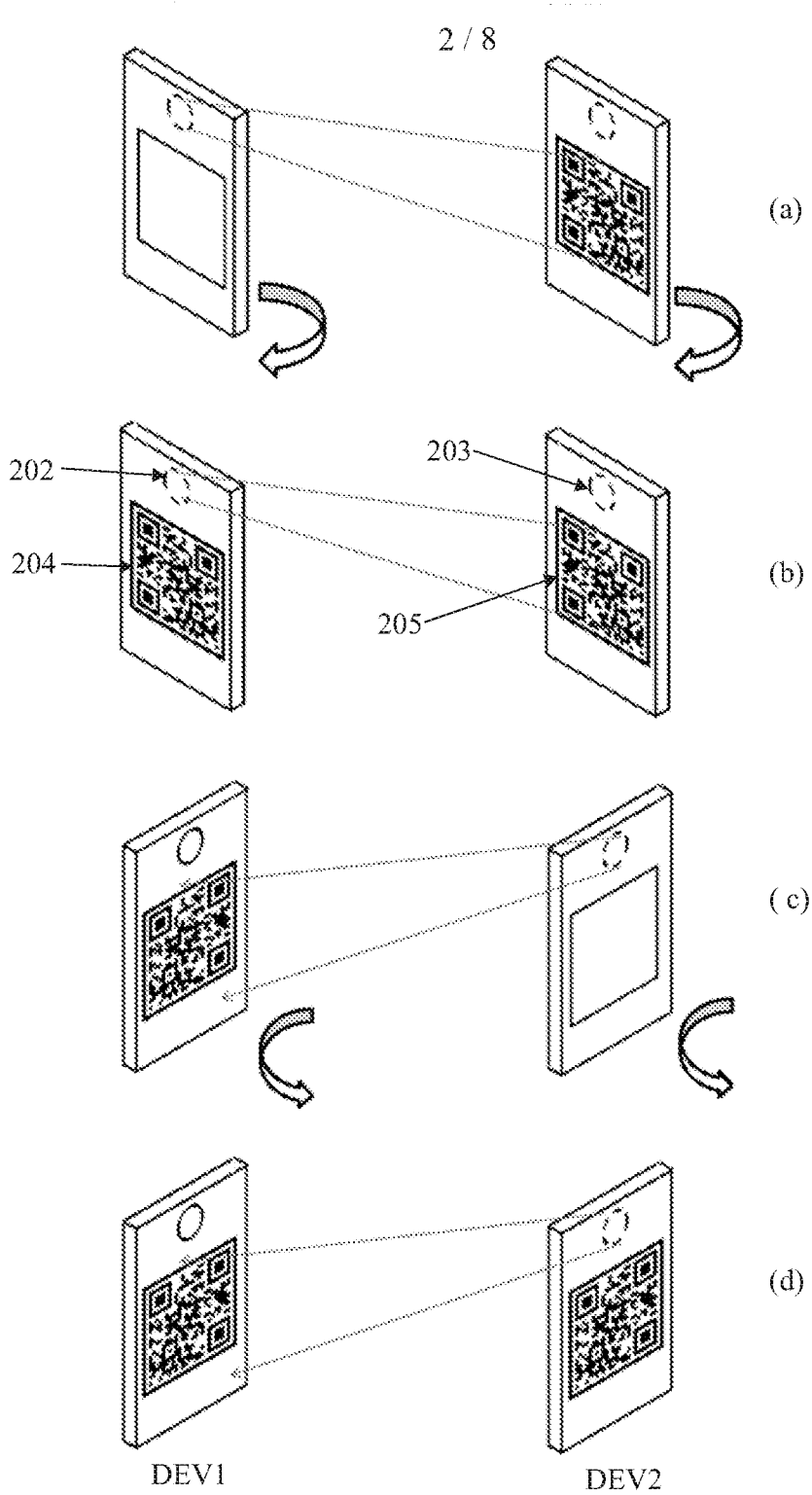


FIGURE 3 (Prior Art)

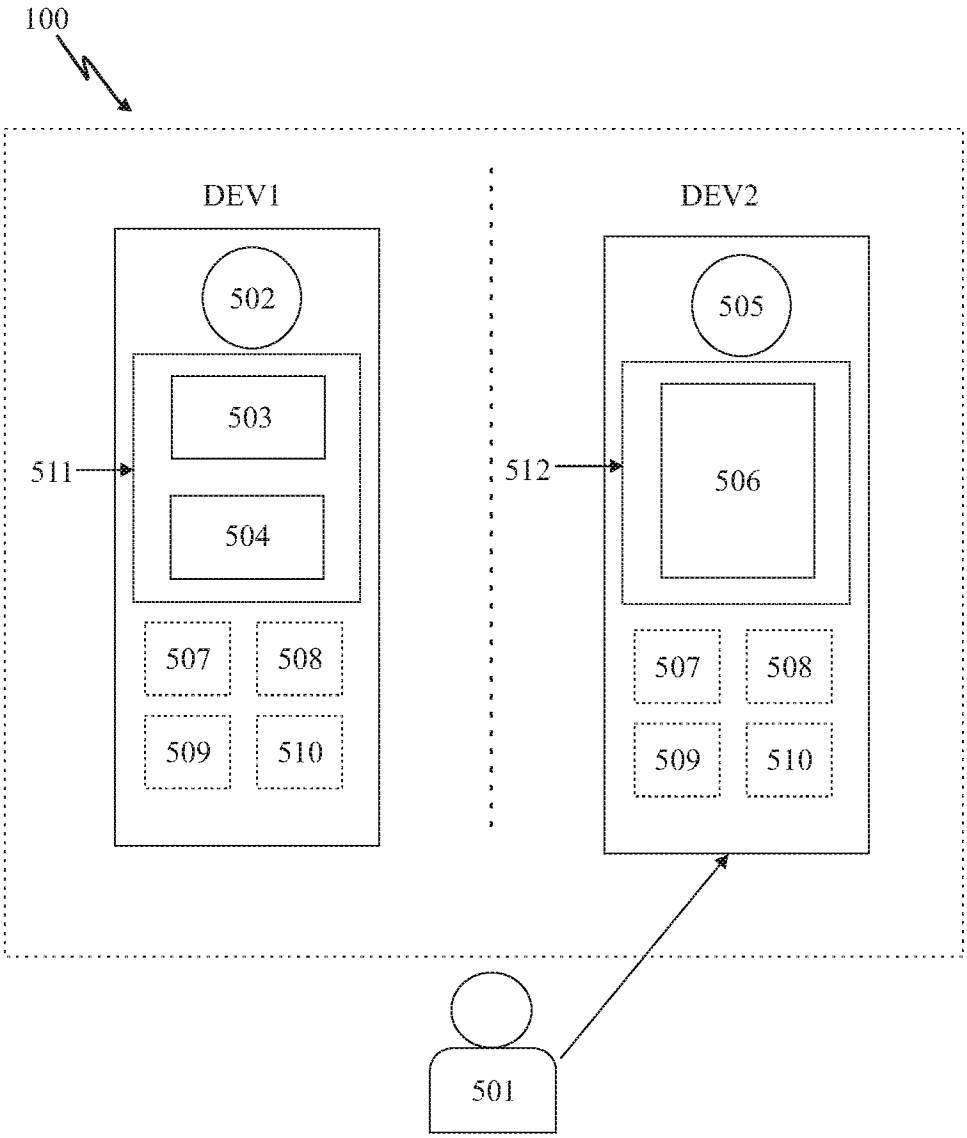

100
DEV1
DEV2
502
505
503
506
511
512
504
507
508
509
510
507
508
509
510
501

FIGURE 4

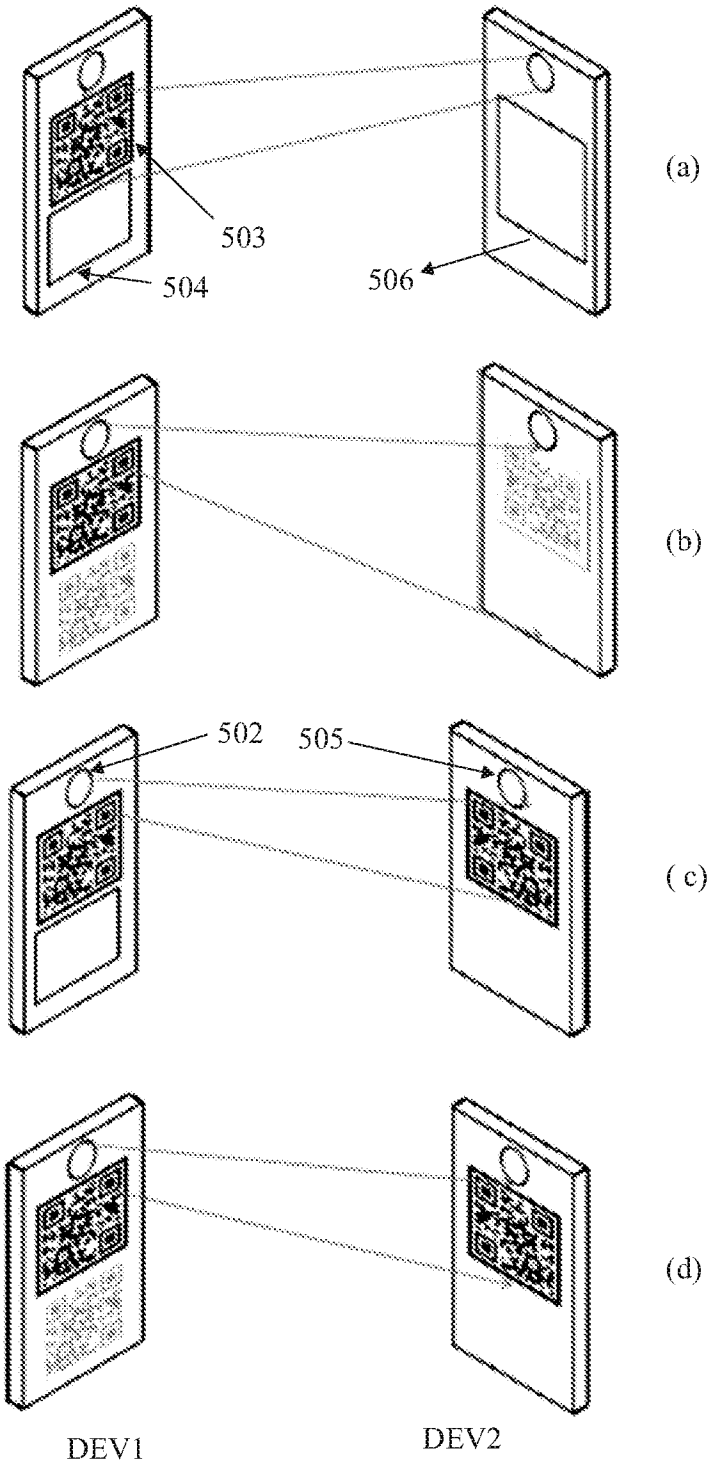


FIGURE 5

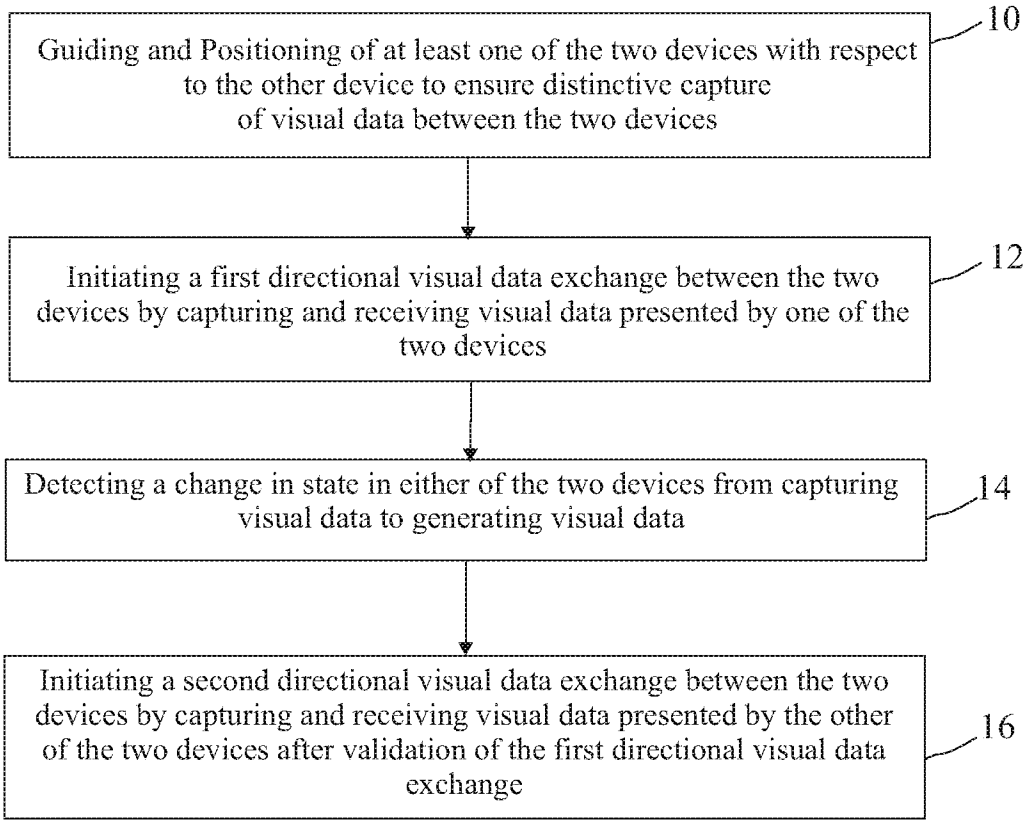

Guiding and Positioning of at least one of the two devices with respect to the other device to ensure distinctive capture of visual data between the two devices
10
Initiating a first directional visual data exchange between the two devices by capturing and receiving visual data presented by one of the two devices
12
Detecting a change in state in either of the two devices from capturing visual data to generating visual data
14
Initiating a second directional visual data exchange between the two devices by capturing and receiving visual data presented by the other of the two devices after validation of the first directional visual data exchange
16

FIGURE 6

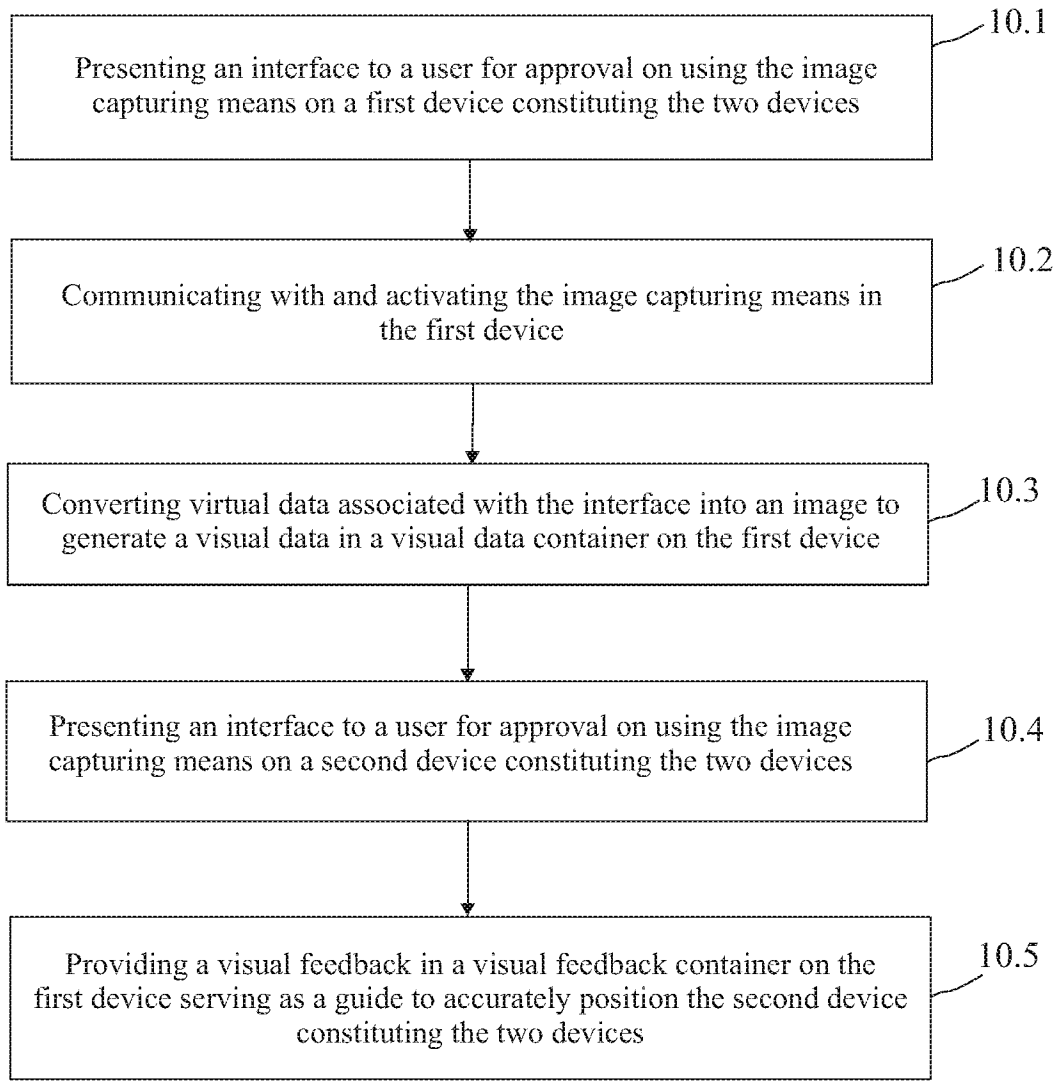

Presenting an interface to a user for approval on using the image capturing means on a first device constituting the two devices
10.1
Communicating with and activating the image capturing means in the first device
10.2
Converting virtual data associated with the interface into an image to generate a visual data in a visual data container on the first device
10.3
Presenting an interface to a user for approval on using the image capturing means on a second device constituting the two devices
10.4
Providing a visual feedback in a visual feedback container on the first device serving as a guide to accurately position the second device constituting the two devices
10.5

FIGURE 7

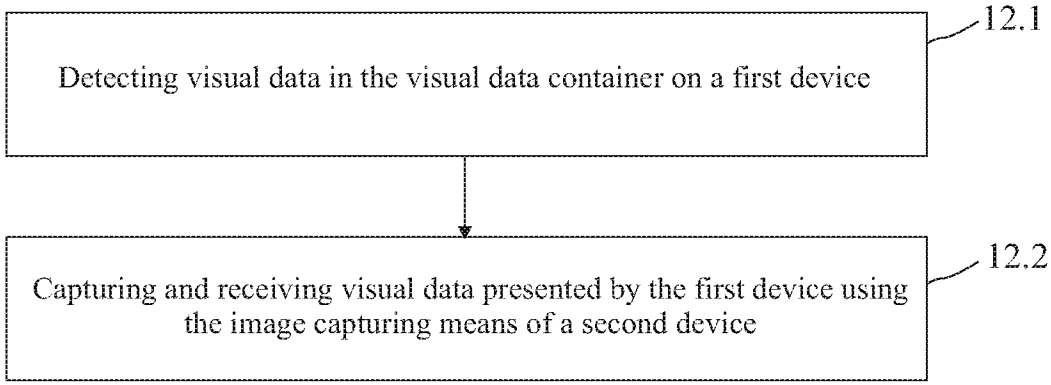


FIGURE 8

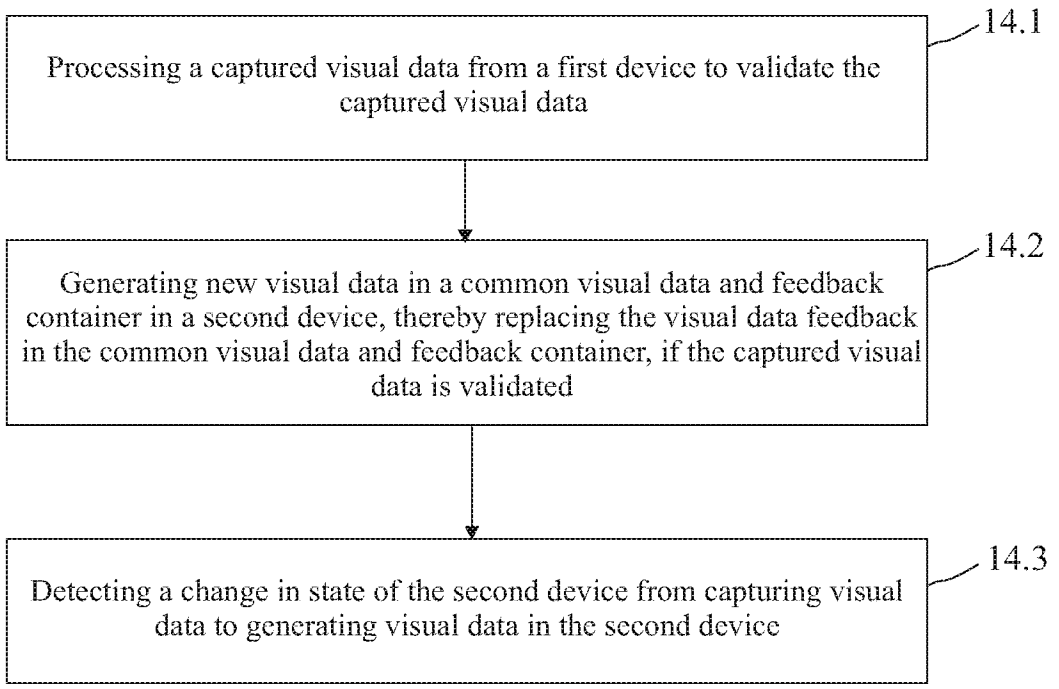


FIGURE 9

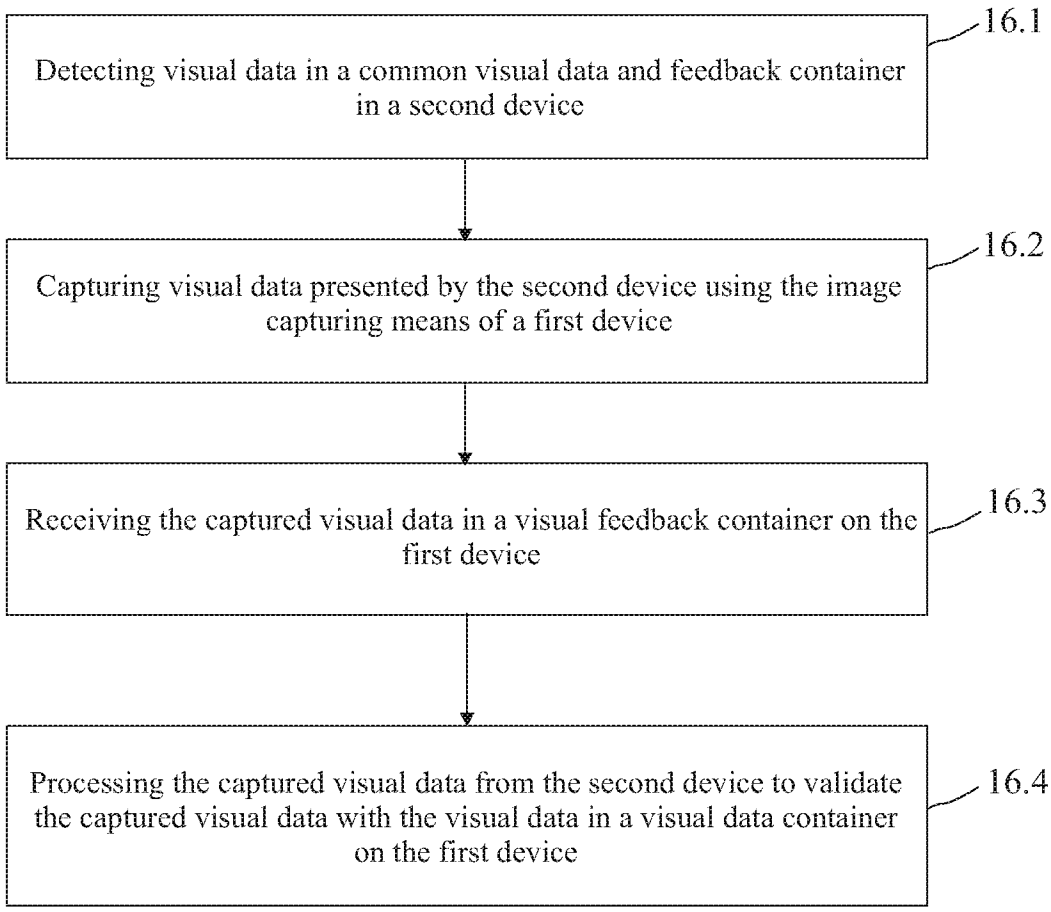

Detecting visual data in a common visual data and feedback container in a second device
16.1
Capturing visual data presented by the second device using the image capturing means of a first device
16.2
Receiving the captured visual data in a visual feedback container on the first device
16.3
Processing the captured visual data from the second device to validate the captured visual data with the visual data in a visual data container on the first device
16.4

FIGURE 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/MY2015/050101

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06K17/00 G06K7/10 G06K19/06
ADD.

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)
G06K

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8 256 673 B1 (KIM MOON J [US]) 4 September 2012 (2012-09-04) abstract column 4, line 61 - column 5, line 41; claim 1; figures 4,6	1,2,4-8
X	US 2013/237155 A1 (KIM MOON J [US]) 12 September 2013 (2013-09-12) paragraphs [0047], [0048]; claims 1-3; figure 2	1,2,4-8
X	US 2014/084067 A1 (VANDERHULST GEERT [BE]) 27 March 2014 (2014-03-27) paragraphs [0043], [0044]; figures 4,5	1,2,4-8
X	US 2011/231270 A1 (DYKES ROBERT [US] ET AL) 22 September 2011 (2011-09-22) paragraph [0095]; figure 2A paragraphs [0123] - [0128]; figure 6	1,2,4-8

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

☒ See patent family annex.

* Special categories of cited documents :

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"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
8 February 2016	16/02/2016

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/MY2015/050101

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		JP 2015534181 A	26-11-2015
		KR 20150046210 A	29-04-2015
		US 2014084067 A1	27-03-2014
		WO 2014045105 A1	27-03-2014
US 2011231270 A1	22-09-2011	US 2011231270 A1	22-09-2011
		WO 2012096954 A1	19-07-2012