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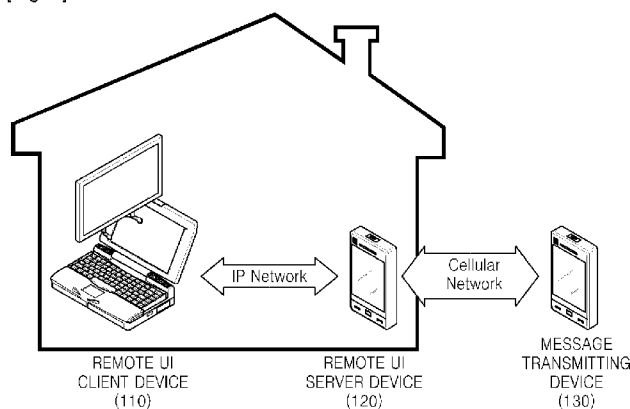
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(54) **Title:** METHOD AND APPARATUS FOR PROVIDING REMOTE USER INTERFACE SERVICES

[Fig. 1]



(57) **Abstract:** A method and an apparatus by which a remote user interface (UI) client device provides a remote UI service, the method comprising receiving an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of a message, from a remote UI server device; obtaining the first UI resource from the remote UI server device by using the URL; receiving external inputs of message control commands via the first UI resource; and transmitting the message control command to the remote UI server device.



Description

Title of Invention: METHOD AND APPARATUS FOR PROVIDING REMOTE USER INTERFACE SERVICES

Technical Field

- [1] Apparatuses and methods consistent with the exemplary embodiments relate to providing a remote user interface (UI) service, and more particularly, to a method and an apparatus for providing a remote UI service, such as Multimedia Messaging Service (MMS) and Simple Message Service (SMS), for controlling message-related functions of a remote UI server device, by using a remote UI client device.

Background Art

- [2] Mobile devices, such as cellular phones, perform communications services, such as telephone calls and message exchange, between other devices, by using communication technologies including global system for mobile communication (GSM) and code division multiple access (CDMA).
- [3] A mobile device performs various controls, such as connection or termination of telephone calls and confirming, forwarding, or replying to messages, via a user interface (UI) embodied in the mobile device.
- [4] Meanwhile, a mobile device may be remote-controlled by a control device within a home network by transmitting commands according to a predetermined protocol to the mobile device using home network technology. In this case, new functions according to the predetermined protocol should be embodied in the control device and the mobile device.

Disclosure of Invention

Solution to Problem

- [5] Exemplary embodiments address at least the above problems and/or disadvantages and other disadvantages not described above. Also, the exemplary embodiments are not required to overcome the disadvantages described above, and an exemplary embodiment may not overcome any of the problems described above.
- [6] The exemplary embodiments provide a method and an apparatus for providing a remote UI service, such as MMS and SMS, for controlling message-related functions of a remote UI server device, by using a remote UI client device.
- [7] The exemplary embodiments also provide a computer readable recording medium having recorded thereon a computer program for executing the method.

Advantageous Effects of Invention

- [8] According to the present exemplary embodiment, messaging services of the remote UI server device may be extended to other devices within a home network by enabling

the remote UI client device to use and control message-related functions including the MMS and the SMS.

- [9] Furthermore, the present exemplary embodiment provides a user convenience that a user may easily control message-related functions of the remote UI server device by using the remote UI client device.

Brief Description of Drawings

- [10] The above and other aspects of the exemplary embodiments will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:
- [11] FIG. 1 is a diagram showing a method of providing a remote user interface (UI) service according to an exemplary embodiment;
- [12] FIG. 2 is a diagram showing a UI resource providing a UI which notifies receipt of SMS messages, according to an exemplary embodiment;
- [13] FIG. 3 is a diagram showing a UI resource providing a UI which replies received SMS messages, according to an exemplary embodiment;
- [14] FIG. 4 is a diagram showing a UI resource providing a UI which forwards received SMS messages, according to an exemplary embodiment;
- [15] FIG. 5 is a diagram showing a UI resource providing a UI which notifies receipt of MMS messages, according to an exemplary embodiment;
- [16] FIG. 6 is a diagram showing a UI resource providing a UI which notifies receipt of MMS messages, according to another exemplary embodiment;
- [17] FIG. 7 is a block diagram showing the structure of a remote UI client device 700 according to an exemplary embodiment;
- [18] FIG. 8 is a block diagram showing the structure of the remote UI server device 800 according to an exemplary embodiment;
- [19] FIG. 9 is a flowchart of the process through which the remote UI client device 700 provides a remote UI service, according to an exemplary embodiment; and
- [20] FIG. 10 is a flowchart of the process through which a remote UI server device provides a remote UI service, according to an exemplary embodiment.

Best Mode for Carrying out the Invention

- [21] According to an aspect of the exemplary embodiments, there is provided a method by which a remote user interface (UI) client device provides a remote UI service, the method including the steps of receiving an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of a message, from a remote UI server device; obtaining the first UI resource from the remote UI server device by using the URL; receiving external inputs of message control commands via the first UI resource; and transmitting the message control command to the remote UI

server device.

- [22] The message may include multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.
- [23] The first UI resource may include a web page or bitmaps of an application and provides a UI which partially displays the content of the message and receives external inputs of message control commands for controlling the message.
- [24] The message control commands may include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto.
- [25] The method may further include obtaining a second UI resource providing a UI, which displays the complete content of the message, from the remote UI server device in the case where the control command is either a confirm or play back.
- [26] The method may further include obtaining a third UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, from the remote UI server device; receiving external inputs of texts and the control command for transmitting a message by using the third UI resource; and transmitting the texts and the control command for transmitting the message to the remote UI server device, in the case where the control command is a reply.
- [27] The method may further include the steps of obtaining a fourth UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, from the remote UI server device; receiving an external input of a command for selecting a commonly used phrase; and transmitting the command for selecting the commonly used phrase to the remote UI server device.
- [28] The method may further include obtaining a fifth UI resource providing a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting telephone numbers, from the remote UI server device; receiving external inputs of the control command for selecting telephone number; and transmitting the control commands for selecting telephone numbers to the remote UI server device, in case where the control command is a forward command.
- [29] The method may further include a step of displaying the first UI resource.
- [30] The step of displaying the first UI resource may include displaying a web page by using a web browser or bitmaps of a UI application by using a bitmap browser.
- [31] The event message may be composed according to universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, but is not limited thereto, and the event message may be received via a unicast transmission or a multicast transmission.
- [32] According to another aspect of the exemplary embodiments, there is provided a method by which a remote user interface (UI) server device provides a remote UI

service, the method including the steps of receiving a message from a message transmitting device; transmitting an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of the message, to a remote UI client device; transmitting the first UI resource to the remote UI client device by using the URL in response to a request from the remote UI client device; receiving a control command for controlling the message from the remote UI client device; and controlling the message by executing control functions related to the message.

- [33] The message includes multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.
- [34] The first UI resource includes a web page or bitmaps of an application and provides a UI which partially displays the content of the message and receives external inputs of message control commands for controlling the message.
- [35] The message control commands include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto.
- [36] The method may further include a step of transmitting a second UI resource providing a UI, which displays the complete content of the message, to the remote UI client device, in the case where the control command is either a confirm command or a play back command.
- [37] The method may further include transmitting a third UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, to the remote UI client device, in the case where the control command is a reply command.
- [38] The method may further include transmitting a fourth UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, to the remote UI client device.
- [39] The method may further include transmitting a fifth UI resource providing a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting telephone numbers, to the remote UI client device, in the case where the control command is a forward command.
- [40] The event message may be composed according to universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, but is not limited thereto, and the event message may be transmitted via a unicast transmission or a multicast transmission.
- [41] According to another aspect of the exemplary embodiments, there is provided a computer readable recording medium having recorded thereon a computer program for executing the method.

[42] According to another aspect of the exemplary embodiments, there is provided a remote user interface (UI) client device including an event handler unit receiving an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of a message, from a remote UI server device; a UI resource obtaining unit obtaining the first UI resource from the remote UI server device by using the URL; a control command inputting unit receiving external inputs of message control commands via the first UI resource; and a control command transmitting unit transmitting the message control command to the remote UI server device.

[43] According to another aspect of the exemplary embodiments, there is provided a remote user interface (UI) server device including a message receiving unit receiving a message from a message transmitting device; an event handler unit transmitting an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of the message, to a remote UI client device; a UI resource transmitting unit transmitting the first UI resource to the remote UI client device by using the URL in response to a request from the remote UI client device; and a control command receiving unit receiving a control command for controlling the message from the remote UI client device; and a control unit controlling the message.

Mode for the Invention

[44] The exemplary embodiments will now be described more fully with reference to the accompanying drawings, in which exemplary embodiments are shown. In the drawings, the thicknesses of layers and regions are exaggerated for clarity. Like reference numerals in the drawings denote like elements, and thus their description will be omitted.

[45] FIG. 1 is a diagram showing a method of providing a remote user interface (UI) service according to an exemplary embodiment.

[46] A remote UI server device 120 remotely provides a UI resource via a network. The UI resource provides a UI for notifying receipt of messages and for receiving external inputs of message control commands, and includes a web page or bitmaps of an application. A remote UI client device 110 receives notifications of messages and receives external inputs of message control commands via the UI resource provided by the remote UI server device 120. The remote UI client device 110 transmits input commands to the remote UI server device 120. Message control commands include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto. The remote UI server device 120 controls corresponding messages by using transmitted commands.

[47] The remote UI server device 120 may be a device for receiving messages from a

message transmitting device via a network including a cellular network and a data network. Examples of the remote UI server device 120 include a handheld phone and an IP phone, but is not limited thereto. Examples of messages received by the remote UI server device 120 include multimedia messaging service (MMS) messages and simple messaging service (SMS) messages, but is not limited thereto.

[48] The remote UI client device 110 is a device including a display unit for displaying messages, and is a network-based device to which a user may easily input message control commands and texts. Examples of the remote UI devices 110 include a DTV and a PC, but is not limited thereto.

[49] According to the present exemplary embodiment, messaging services of the remote UI server device 120 may be extended to other devices within a home network by enabling the remote UI client device 110 to use and control message-related functions including the MMS and the SMS.

[50] Furthermore, the present exemplary embodiment provides a user convenience that a user may easily control message-related functions of the remote UI server device 120 by using the remote UI client device 110.

[51] FIG. 2 is a diagram showing a UI resource providing a UI which notifies receipt of SMS messages, according to an exemplary embodiment.

[52] The remote UI server device 120, which received a SMS message, transmits an event message, which includes a uniform resource locator (URL) for accessing a UI resource providing a UI notifying the receipt of the message, to the remote UI client device 110.

[53] The remote UI client device 110 obtains the UI resource from the remote UI server device 120 by using the URL. In the example shown in FIG. 2, the remote UI client device 110 obtains a UI resource providing a UI, which partially displays the content of the SMS message and receives external inputs of message control command for controlling the SMS message, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 210 in FIG. 2.

[54] In the case where the remote UI client device 110 receives an external input of a message control command to confirm the message, the remote UI client device 110 transmits the message control command to confirm the message to the remote UI server device 120. Then, then remote UI client device 110 obtains a UI resource providing a UI, which displays the complete content of the SMS message, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 220 in FIG. 2.

[55] Furthermore, although a UI for receiving SMS message control commands, such as reply, forward, delete, and save, may either be provided via the UI resource partially displaying the content of a SMS message or the UI resource displaying the complete content of the SMS message, it would have been obvious to one of ordinary skill in the

art that the UI for receiving SMS message control commands, such as reply, forward, delete, and save, may be embodied otherwise.

[56] FIG. 3 is a diagram showing a UI resource providing a UI which replies to received SMS messages, according to an exemplary embodiment.

[57] In the case where the remote UI client device 110 receives an external input of a message control command to reply the message, the remote UI client device 110 transmits the message control command to reply the message to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 310 in FIG. 3.

[58] In the case where the remote UI client device 110 receives an external input of a command for selecting a commonly used phrase, the remote UI client device 110 transmits the command for selecting a commonly used phrase to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource providing a UI, which displays selected commonly used phrases, from the remote UI server device 120, and displays the corresponding UI resource indicated by the reference numeral 320 in FIG. 3.

[59] FIG. 4 is a diagram showing a UI resource providing a UI which forwards received SMS messages, according to an exemplary embodiment.

[60] In the case where the remote UI client device 110 receives an external input of a message control command to forward the message, the remote UI client device 110 transmits the message control command to forward the message to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource providing a UI, which displays a list of telephone numbers and users associated with each telephone number, and receives inputs of commands for selecting telephone numbers, from the remote UI server device 120, and displays the corresponding UI resource indicated by the reference numeral 410 in FIG. 4.

[61] In the case where the remote UI client device 110 receives an external input of a command for selecting a telephone number, the remote UI client device 110 transmits the command for selecting a telephone number to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource providing a UI, which displays selected telephone numbers, from the remote UI server device 120, and displays the corresponding UI resource indicated by the reference numeral 420 in FIG. 3.

[62] FIG. 5 is a diagram showing a UI resource providing a UI which notifies receipt of MMS messages, according to an exemplary embodiment.

- [63] The remote UI server device 120, which received a MMS message, transmits an event message, which includes a URL for accessing a UI resource providing a UI, which notifying the receipt of the message, to the remote UI client device 110.
- [64] The remote UI client device 110 obtains the UI resource from the remote UI server device 120 by using the URL. In the example shown in FIG. 5, the remote UI client device 110 obtains a UI resource providing a UI, which displays information regarding the sender of the MMS message and receives external inputs of message control command for controlling the MMS message, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 510 in FIG. 5.
- [65] In case where the remote UI client device 110 receives an external input of a message control command to confirm the message, the remote UI client device 110 transmits the message control command to confirm the message to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource providing a UI, which displays the complete content of the MMS message, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 520 in FIG. 5.
- [66] Furthermore, although a UI for receiving MMS message control commands, such as reply, forward, delete, and save, may be either provided via the UI resource displaying information regarding the sender of the MMS message or the UI resource displaying the complete content of the MMS message, it would have been obvious to one of ordinary skill in the art that the UI for receiving MMS message control commands, such as reply, forward, delete, and save, may be embodied otherwise.
- [67] FIG. 6 is a diagram showing a UI resource providing a UI which notifies receipt of MMS messages, according to another exemplary embodiment.
- [68] The remote UI server device 120, which received a MMS message, transmits an event message, which includes a URL for accessing a UI resource providing a UI, which notifies the receipt of the message, to the remote UI client device 110.
- [69] The remote UI client device 110 obtains the UI resource from the remote UI server device 120 by using the URL. In the example shown in FIG. 6, the remote UI client device 110 obtains a UI resource providing a UI, which partially displays the content of the MMS message and receives external inputs of message control command for controlling the MMS message, from the remote UI server device 120 and displays the corresponding UI resource indicated by the reference numeral 610 in FIG. 6.
- [70] In the case where the remote UI client device 110 receives an external input of a message control command to confirm the message, the remote UI client device 110 transmits the message control command to confirm the message to the remote UI server device 120. Then, the remote UI client device 110 obtains a UI resource

providing a UI, which displays the complete content of the MMS message, from the remote UI server device 120 and displays the corresponding UI resource (not shown).

[71] Furthermore, although a UI for receiving MMS message control commands, such as reply, forward, delete, and save, may be either provided via the UI resource partially displaying the content of the MMS message or the UI resource displaying the complete content of the MMS message, it would have been obvious to one of ordinary skill in the art that the UI for receiving MMS message control commands, such as reply, forward, delete, and save, may be embodied otherwise.

[72] FIG. 7 is a block diagram showing the structure of a remote UI client device 700 according to an exemplary embodiment.

[73] The remote UI client device 700 includes an event handler unit 710, a UI resource obtaining unit 720, a display unit 730, a control command inputting unit 740, and a control command transmitting unit 750.

[74] In the case where the remote UI server device 800 receives a message, the event handler unit 710 receives an event message, which includes a URL for accessing a UI resource providing a UI notifying the receipt of the message, from a remote UI server device 800. Examples of the messages received by the remote UI server device 700 include MMS messages and SMS messages, but is not limited thereto.

[75] The UI resource partially displays the content of the message, provides a UI for receiving external inputs of message control commands, and includes a web page or bitmaps of an application.

[76] An event message may be composed according to any of various home network standards, including universal plug and play (UPnP) RemoteUI and consumer electronics association (CEA) 2014 standards, and is received via a unicast transmission or a multicast transmission.

[77] The UI resource obtaining unit 720 obtains a UI resource from the remote UI server device 800 by using a URL. Protocols via which the UI resource obtaining unit 720 obtains a UI resource include extended remoting technology (XRT), remote desktop protocol (RDP), and hypertext transfer protocol (HTTP). However, it will be obvious to one of ordinary skill in the art that other protocols may also be used.

[78] A capability matching unit (not shown) obtains capability information with respect to a UI resource from the remote UI server device 800. Capability information includes resolution information and codec information with respect to a UI resource. The UI resource obtaining unit 720 may obtain a UI resource that can be processed by the remote UI client device 700 with reference to capability information obtained by the capability matching unit.

[79] Meanwhile, if a device (e.g., a UPnP control point device) acting as a negotiator between the remote UI server device 800 and the remote UI client device 700 exists,

the capability matching unit transmits capability information with respect to a UI resource that can be processed by the remote UI client device 700 to the negotiating device. In this case, the capability matching unit obtains capability information negotiated between the remote UI server device 800 and the remote UI client device 700 from the negotiating device. The UI resource obtaining unit 720 may obtain a UI resource that can be processed by the remote UI client device 700 with reference to the negotiated capability information obtained by the capability matching unit.

- [80] The display unit 730 displays a UI resource. The display unit 730 displays either a web page by using a web browser or bitmaps of a UI application by using a bitmap browser.
- [81] The control command inputting unit 740 receives external inputs of message control commands via a UI resource. Message control commands includes confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto. The control command inputting unit 740 receives the external inputs of message control commands via a web page or an application with a message control command inputting interface.
- [82] The control command transmitting unit 750 transmits an externally input control command to the remote UI server device 800 by using a UI resource. The control command transmitting unit 750 may use either the same session as a session for obtaining a UI resource, or an asynchronous session independent from the session for obtaining the UI resource. An asynchronous session may be embodied by using asynchronous JavaScript and XML (AJAX). However, it will be obvious to one of ordinary skill in the art that an asynchronous session may be embodied by using any of various other methods. AJAX refers to a web developing technique for authoring a communicative web application and is capable of exchanging and manipulating data asynchronously with a web server. Detailed descriptions of AJAX are omitted here.
- [83] In the case where a control command transmitted by the control command transmitting unit 750 is either a control command to confirm a message or a control message to play back a message, the UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays the complete content of the message, from the remote UI server device 800.
- [84] In the case where a control command transmitted by the control command transmitting unit 750 is a control command to reply to the message, the UI resource obtaining unit 720 obtains a UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, from the remote UI server device 800. The control command inputting unit 740 receives external inputs of texts and a control command for transmitting a message. The control command transmitting

unit 740 transmits the texts and the control command for transmitting the message to the remote UI server device 800.

- [85] Meanwhile, the texts may include commonly used phrases. Thus, the UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, from the remote UI server device 800. The control command inputting unit 740 receives an external input of a command for selecting a commonly used phrase. The control command transmitting unit 750 transmits the command for selecting a commonly used phrase to the remote UI server device 800. The UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays reply texts including selected commonly used phrases, from the remote UI server device 800.
- [86] In the case where a control command transmitted by the control command transmitting unit 750 is a control command to forward the message, the UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays a list of telephone numbers and associated users, and receives external inputs of commands for selecting telephone numbers, from the remote UI server device 800. The control command inputting unit 740 receives external inputs of the control command for selecting telephone numbers. The control command transmitting unit 740 transmits the control commands for selecting telephone numbers to the remote UI server device 800. The UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays selected telephone numbers and reply texts, from the remote UI server device 800.
- [87] FIG. 8 is a block diagram showing the structure of the remote UI server device 800 according to an exemplary embodiment.
- [88] The remote UI server device 800 includes a message receiving unit 810, an event handler unit 820, a UI resource transmitting unit 830, a control command receiving unit 840, and a control unit 860.
- [89] The message receiving unit 810 receives messages from a message transmitting device via a cellular network, including a global system for mobile communication (GSM) network and a code division multiple access (CDMA) network. Examples of the messages received by the message receiving unit 810 include MMS messages and SMS messages, but are not limited thereto.
- [90] The event handler unit 820 transmits an event message, which includes a URL for accessing a UI resource providing a UI notifying the receipt of a message, to a remote UI client device 700.
- [91] The UI resource transmitting unit 830 transmits a UI resource to the remote UI client device 700 in response to a request from the remote UI client device 700. Protocols via which the UI resource transmitting unit 830 transmits a UI resource include XRT,

RDP, and HTTP. However, it will be obvious to one of ordinary skill in the art that other protocols may also be used.

- [92] A capability matching unit (not shown) transmits capability information with respect to a UI resource to the remote UI client device 700. Capability information includes resolution information and codec information with respect to a UI resource. The remote UI client device 700 may obtain a UI resource that can be processed by the remote UI client device 700 with reference to capability information obtained by the capability matching unit.
- [93] Meanwhile, if a device (e.g., a UPnP control point device) acting as a negotiator between the remote UI server device 800 and the remote UI client device 700 exists, the capability matching unit transmits capability information with respect to a UI resource to the negotiating device. In this case, the capability matching unit obtains capability information negotiated between the remote UI server device 800 and the remote UI client device 700 from the negotiating device. The UI resource transmitting unit 830 may transmit a UI resource that can be processed by the remote UI client device 700 with reference to the negotiated capability information obtained by the capability matching unit.
- [94] Meanwhile, an event message may be composed according to any of various home network standards, including universal plug and play (UPnP) RemoteUI and consumer electronics association (CEA) 2014 standards, and is received via a unicast transmission or a multicast transmission.
- [95] The control command receiving unit 840 receives external inputs of control commands from the remote UI client device 700. The control command receiving unit 840 may use either the same session as a session for transmitting a UI resource or an asynchronous session independent from the session for transmitting the UI resource. An asynchronous session may be embodied by using AJAX. However, it will be obvious to one of ordinary skill in the art that an asynchronous session may be embodied by using any of various other methods. The control commands include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto. The control command inputting unit 740 receives the external inputs of message control commands via a web page or an application with a message control command inputting interface.
- [96] A control unit 850 executes control functions related to corresponding messages.
- [97] In the case where a control command received by the control command receiving unit 840 is either a control command to confirm a message or a control message to play back a message, the UI resource transmitting unit 830 transmits a UI resource providing a UI, which displays the complete content of the message, to the remote UI

client device 700.

- [98] In the case where a control command received by the control command receiving unit 840 is a control command to reply to the message, the UI resource transmitting unit 830 transmits a UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, to the remote UI client device 700.
- [99] Meanwhile, the texts may include commonly used phrases. Thus, the UI resource transmitting unit 830 transmits a UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, to the remote UI client device 700.
- [100] In the case where a control command received by the control command receiving unit 840 is a control command to forward the message, the UI resource transmitting unit 830 transmits a UI resource providing a UI, which displays a list of telephone numbers and associated users of the telephone numbers, and receives external inputs of commands for selecting telephone numbers, to the remote UI client device 700.
- [101] FIG. 9 is a flowchart of the process through which the remote UI client device 700 provides a remote UI service, according to an exemplary embodiment.
- [102] In operation 910, in the case where the remote UI server device 800 receives a message, the remote UI client device 700 receives an event message, which includes a URL for accessing a UI resource providing a UI notifying the receipt of the message, from a remote UI server device 800.
- [103] In operation 920, the remote UI client device 700 obtains a UI resource from the remote UI server device 800 by using a URL.
- [104] In operation 930, the remote UI client device 700 receives external inputs of message control commands via a UI resource. Message control commands include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto. The remote UI client device 700 receives the external inputs of message control commands via a web page or an application with a message control command inputting interface.
- [105] In operation 940, the remote UI client device 700 transmits an externally input control command to the remote UI server device 800 by using a UI resource.
- [106] In the operation 940, in the case where a control command transmitted by the remote UI client device 700 is either a control command to confirm a message or a control message to play back a message, the remote UI client device 700 obtains a UI resource providing a UI, which displays the complete content of the message, from the remote UI server device 800 (not shown in FIG. 9).
- [107] In the operation 940, in the case where a control command transmitted by the remote UI client device 700 is a control command to reply to the message, the remote UI client device 700 obtains a UI resource providing a UI, which receives external inputs

of texts and a control command for transmitting a message, from the remote UI server device 800 (not shown in FIG. 9). The remote UI client device 700 receives external inputs of texts and a control command for transmitting a message by using the UI resource. The remote UI client device 700 transmits the texts and the control command for transmitting the message to the remote UI server device 800 (not shown in FIG. 9).

[108] Meanwhile, the texts may include commonly used phrases. Thus, the remote UI client device 700 obtains a UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, from the remote UI server device 800 (not shown in FIG. 9). The remote UI client device 700 receives an external input of a command for selecting a commonly used phrase (not shown in FIG. 9). The remote UI client device 700 transmits the command for selecting a commonly used phrase to the remote UI server device 800 (not shown in FIG. 9). The UI resource obtaining unit 720 obtains a UI resource providing a UI, which displays reply texts including selected commonly used phrases, from the remote UI server device 800 (not shown in FIG. 9).

[109] In the operation 940, in the case where a control command transmitted by the remote UI client device 700 is a control command to forward the message, the remote UI client device 700 obtains a UI resource providing a UI, which displays a list of telephone numbers, and associated users of the telephone numbers, and receives external inputs of commands for selecting telephone numbers, from the remote UI server device 800 (not shown in FIG. 9). The remote UI client device 700 receives external inputs of the control command for selecting telephone number (not shown in FIG. 9). The remote UI client device 700 transmits the control commands for selecting telephone numbers to the remote UI server device 800 (not shown in FIG. 9). The remote UI client device 700 obtains a UI resource providing a UI, which displays selected telephone numbers and reply texts, from the remote UI server device 800 (not shown in FIG. 9).

[110] FIG. 10 is a flowchart of the process through which the remote UI server device 800 provides a remote UI service, according to an exemplary embodiment.

[111] In an operation 1010, the remote UI server device 800 receives messages from a message transmitting device via a cellular network, including a GSM network and a CDMA network. Examples of the messages received by the remote UI server device 800 include MMS messages and SMS messages, but are not limited thereto.

[112] In an operation 1020, the remote UI server device 800 transmits an event message, which includes a URL for accessing a UI resource providing a UI notifying the receipt of a message, to a remote UI client device 700.

[113] In an operation 1030, the remote UI server device 800 transmits a UI resource to the remote UI client device 700 in response to a request from the remote UI client device

700.

- [114] In an operation 1040, the remote UI server device 800 receives external inputs of control commands from the remote UI client device 700. The control commands include confirm commands, playback commands, stop commands, reply commands, forward commands, delete commands, save commands, and move commands, but are not limited thereto.
- [115] In an operation 1050, the remote UI server device 800 executes control functions related to corresponding messages.
- [116] In the operation 1040, in the case where a control command received by the remote UI server device 800 is either a control command to confirm a message or a control message to play back a message, the remote UI server device 800 transmits a UI resource providing a UI, which displays the complete content of the message, to the remote UI client device 700 (not shown in FIG. 10).
- [117] In the operation 1040, in the case where a control command received by the remote UI server device 800 is a control command to reply to the message, the remote UI server device 800 transmits a UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, to the remote UI client device 700 (not shown in FIG. 10).
- [118] Meanwhile, the texts may include commonly used phrases. Thus, the remote UI server device 800 transmits a UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting commonly used phrases, to the remote UI client device 700.
- [119] In the operation 1040, in case where a control command received by the remote UI server device 800 is a control command to forward the message, the remote UI server device 800 transmits a UI resource providing a UI, which displays a list of telephone numbers, and associated users of the telephone numbers, and receives external inputs of commands for selecting telephone numbers, to the remote UI client device 700.
- [120] While the exemplary embodiments have been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the exemplary embodiments as defined by the following claims.
- [121] For example, each of the remote UI client device 700 and the remote UI server device 800 according to exemplary embodiments may include a bus coupled with each of components, at least one processor coupled with the bus, and a memory, which is coupled to the bus to store commands, received messages, or generated messages and is coupled with the at least one processor to perform the commands described above.
- [122] The exemplary embodiments may be written as computer programs and can be im-

plemented in general-use digital computers that execute the programs using a computer readable recording medium. Examples of the computer readable recording medium include magnetic storage media (e.g., ROM, floppy disks, hard disks, etc.), and optical recording media (e.g., CD-ROMs, or DVDs).

[123] The invention may also be embodied in other exemplary embodiments as computer readable codes on a computer readable transmission medium which may include carrier waves (such as data transmission through the Internet).

[124] Further, expressions such as at least one of, when preceding a list of elements, modify the entire list of elements and do not modify the individual elements of the list.

Claims

- [Claim 1] A method by which a remote user interface (UI) client device provides a remote UI service, the method comprising:
receiving an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of a message, from a remote UI server device;
obtaining the first UI resource from the remote UI server device by using the URL;
receiving external inputs of at least one message control command via the first UI resource; and
transmitting the message control command to the remote UI server device.
- [Claim 2] The method of claim 1, wherein the message comprises multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.
- [Claim 3] The method of claim 1, wherein the first UI resource comprises a web page or bitmaps of an application and provides a UI which partially displays the content of the message and receives external inputs of message control commands for controlling the message.
- [Claim 4] The method of claim 1, wherein the message control commands comprise at least one of a confirm command, a playback command, a stop command, a reply command, a forward command, a delete command, a save command, and a move command.
- [Claim 5] The method of claim 4, wherein when the message control command is at least one of a confirm command or playback command, a second UI resource providing a UI, which displays the complete content of the message, is obtained from the remote UI server device.
- [Claim 6] The method of claim 5, wherein when the control command is a reply command, further comprising:
obtaining a third UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, from the remote UI server device;
receiving external inputs of texts and the control command for transmitting a message by using the third UI resource; and
transmitting the texts and the control command for transmitting the message to the remote UI server device.
- [Claim 7] The method of claim 6, further comprising:

obtaining a fourth UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting at least one of the commonly used phrases, from the remote UI server device;

receiving an external input of a command for selecting a commonly used phrase; and

transmitting the command for selecting the commonly used phrase to the remote UI server device.

[Claim 8] The method of claim 7, wherein when the control command is a forward command, further comprising:

obtaining a fifth UI resource providing a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting at least one telephone number, from the remote UI server device;

receiving external inputs of the control command for selecting the at least one telephone number; and

transmitting the control commands for selecting the at least one telephone number to the remote UI server device.

[Claim 9] The method of claim 3, further comprising displaying the first UI resource.

[Claim 10] The method of claim 9, wherein the displaying the first UI resource comprises displaying a web page by using a web browser or bitmaps of a UI application by using a bitmap browser.

[Claim 11] The method of claim 1, wherein the event message is composed according to universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, and the event message is received via a unicast transmission or a multicast transmission.

[Claim 12] A method of providing a remote user interface (UI) service by a remote UI server device, the method comprising:

receiving a message from a message transmitting device;

transmitting an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of the message, to a remote UI client device;

requesting, by the UI client device, the first resource using the URL;

transmitting the first UI resource to the remote UI client device in response to the request from the remote UI client device;

receiving a control command for controlling the message from the

- remote UI client device; and
executing control functions related to the message.
- [Claim 13] The method of claim 12, wherein the message comprises multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.
- [Claim 14] The method of claim 12, wherein the first UI resource comprises a web page or bitmaps of an application and provides a UI which partially displays content of the message and receives external inputs of a message control command for executing the control functions related to the message.
- [Claim 15] The method of claim 14, wherein the message control command comprises at least one of a confirm command, a playback command, a stop command, a reply command, a forward command, a delete command, a save command, and a move command.
- [Claim 16] The method of claim 15, wherein when the message control command is at least one of a confirm command or a playback command, transmitting a second UI resource providing a UI, which displays complete content of the message, to the remote UI client device.
- [Claim 17] The method of claim 16, wherein when the control command is a reply command, transmitting a third UI resource providing a UI, which receives external inputs of texts and a control command for transmitting a message, to the remote UI client device.
- [Claim 18] The method of claim 17, further comprising transmitting a fourth UI resource providing a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting at least one commonly used phrase, to the remote UI client device.
- [Claim 19] The method of claim 15, wherein when the control command is a forward command, further comprising transmitting a fifth UI resource providing a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting at least one telephone number, to the remote UI client device.
- [Claim 20] The method of claim 12, wherein the event message is composed according to at least one of a universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, and the event message is transmitted via a unicast transmission or a multicast transmission.
- [Claim 21] A remote user interface (UI) client device comprising:
an event handler unit which receives an event message, which includes

a URL for accessing a first UI resource which provides a UI which notifies the receipt of a message, from a remote UI server device;
a UI resource obtaining unit which obtains the first UI resource from the remote UI server device by using the URL;
a control command inputting unit which receives external inputs of message control commands via the first UI resource; and
a control command transmitting unit which transmits the message control command to the remote UI server device.

[Claim 22]

The remote UI client device of claim 21, wherein the message comprises at least one of multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.

[Claim 23]

The remote UI client device of claim 21, wherein the first UI resource comprises a web page or bitmaps of an application and provides a UI which partially displays the content of the message and receives external inputs of message control commands for controlling the message.

[Claim 24]

The remote UI client device of claim 21, wherein the message control commands comprise at least one of a confirm command, a playback command, a stop command, a reply command, a forward command, a delete command, a save command, and a move command.

[Claim 25]

The remote UI client device of claim 24, wherein, when the control command is at least one of a confirm command and a playback command, the UI resource obtaining unit obtains a second UI resource providing a UI, which displays the complete content of the message, from the remote UI server device.

[Claim 26]

The remote UI client device of claim 25, wherein, when the control command is a reply command, the UI resource obtaining unit obtains a third UI resource which provides a UI, which receives external inputs of texts and a control command for transmitting the message, from the remote UI server device,
the control command inputting unit receives external inputs of texts and a control command for transmitting a message by using the third UI resource, and
the control command transmitting unit transmits the texts and the control command for transmitting the message to the remote UI server device.

[Claim 27]

The remote UI client device of claim 26, wherein the UI resource obtaining unit obtains a fourth UI resource providing a UI, which

displays a list of commonly used phrases and receives inputs of commands for selecting at least one commonly used phrase, from the remote UI server device,
the control command inputting unit receives an external input of a command for selecting the at least one commonly used phrase, and
the control command transmitting unit transmits the command for selecting the at least one commonly used phrase to the remote UI server device.

[Claim 28] The remote UI client device of claim 27, wherein, when the control command is a forward command, the UI resource obtaining unit obtains a fifth UI resource providing a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting at least one telephone number, from the remote UI server device,
the control command inputting unit receives external inputs of the control command for selecting the at least one telephone number; and
the control command transmitting unit transmits the control commands for selecting the at least one telephone number to the remote UI server device.

[Claim 29] The remote UI client device of claim 23, further comprising a display unit which displays the first UI resource.

[Claim 30] The remote UI client device of claim 29, wherein displaying the first UI resource comprises displaying a web page by using a web browser or displays bitmaps of a UI application by using a bitmap browser.

[Claim 31] The remote UI client device of claim 21, wherein the event message is composed according to universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, and
the event message is received via a unicast transmission or a multicast transmission.

[Claim 32] A remote user interface (UI) server device comprising:
a message receiving unit which receives a message from a message transmitting device;
an event handler unit which transmits an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of the message, to a remote UI client device;
a control command transmitting unit which transmits a request for the first UI resource using the URL;
a UI resource transmitting unit which transmits the first UI resource to the remote UI client device in response to the request for the first UI

- resource; and
a control command receiving unit which receives a control command for controlling the message from the remote UI client device; and
a control unit which executes control functions related to the message.
- [Claim 33] The remote UI server device of claim 32, wherein the message comprises at least one of multimedia messaging service (MMS) messages and simple messaging service (SMS) messages.
- [Claim 34] The remote UI server device of claim 32, wherein the first UI resource comprises a web page or bitmaps of an application and provides a UI which partially displays content of the message and receives external inputs of message control commands for controlling the message.
- [Claim 35] The remote UI server device of claim 34, wherein the message control commands comprises at least one of a confirm command, a playback command, a stop command, a reply command, a forward command, a delete command, a save command, and a move command.
- [Claim 36] The remote UI server device of claim 35, wherein, when the control command is at least one of a confirm command or a playback command, the UI resource transmitting unit transmits a second UI resource providing a UI, which displays the complete content of the message, to the remote UI client device.
- [Claim 37] The remote UI server device of claim 36, wherein, when the control command is a reply command, the UI resource transmitting unit transmits a third UI resource which provides a UI, which receives external inputs of texts and a control command which transmits a message, to the remote UI client device.
- [Claim 38] The remote UI server device of claim 37, wherein the UI resource transmitting unit transmits a fourth UI resource which provides a UI, which displays a list of commonly used phrases and receives inputs of commands for selecting at least one commonly used phrase, to the remote UI client device.
- [Claim 39] The remote UI server device of claim 38, wherein, when the control command is a forward command, the UI resource transmitting unit transmits a fifth UI resource which provides a UI, which displays a list of telephone numbers and receives external inputs of commands for selecting at least one telephone number, to the remote UI client device.
- [Claim 40] The remote UI server device of claim 32, wherein the event message is composed according to universal plug and play (UPnP) RemoteUI or consumer electronics association (CEA) 2014 standards, and

the event message is transmitted via a unicast transmission or a multicast transmission.

[Claim 41]

A computer readable recording medium having embodied thereon a computer program for executing a method by which a remote user interface (UI) client device provides a remote UI service, the method comprising:

receiving an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of a message, from a remote UI server device;

obtaining the first UI resource from the remote UI server device by using the URL;

receiving external inputs of at least one message control command via the first UI resource; and

transmitting the message control command to the remote UI server device.

[Claim 42]

A computer readable recording medium having embodied thereon a computer program for executing a method of providing a remote user interface (UI) service by a remote UI server device, the method comprising:

receiving a message from a message transmitting device;

transmitting an event message, which includes a URL for accessing a first UI resource providing a UI notifying the receipt of the message, to a remote UI client device;

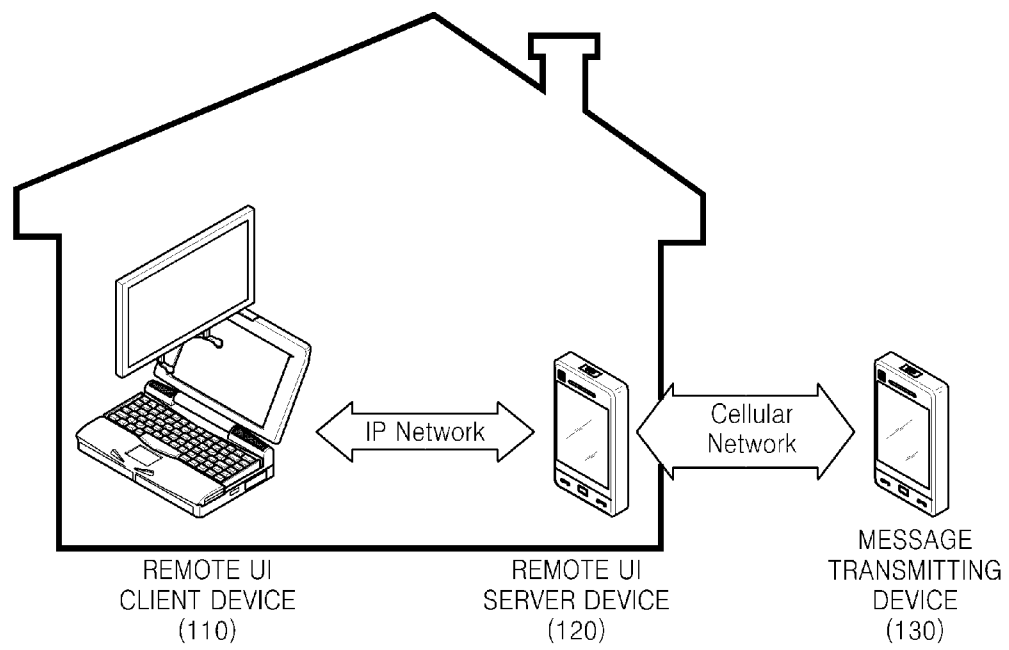
requesting, by the UI client device, the first resource using the URL;

transmitting the first UI resource to the remote UI client device in response to the request from the remote UI client device; and

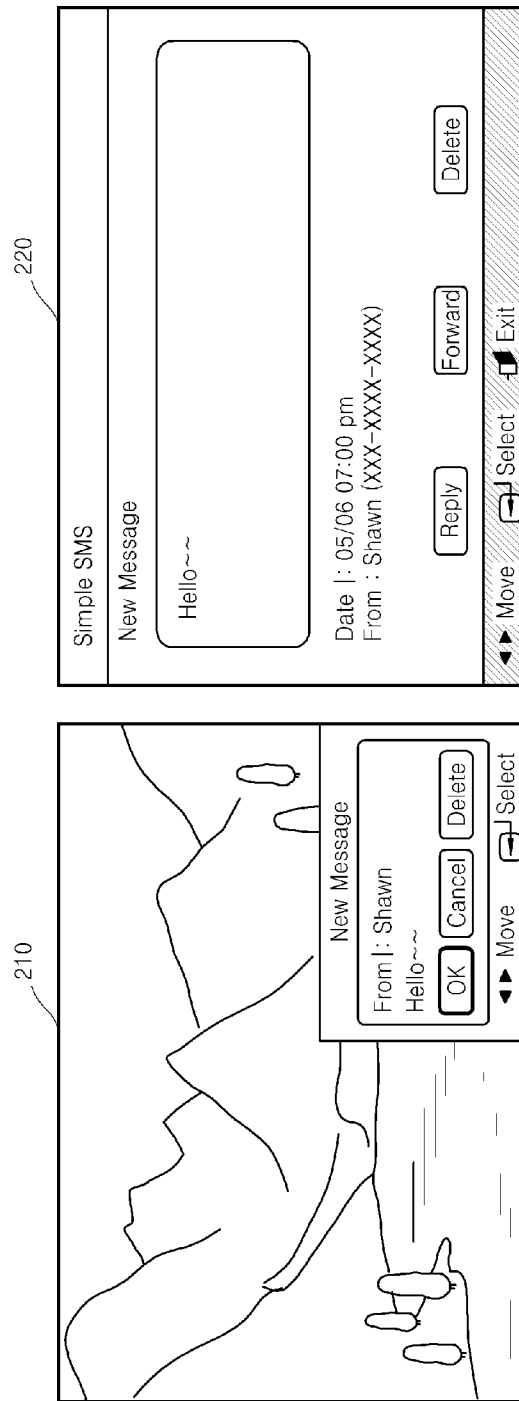
receiving a control command for controlling the message from the remote UI client device; and

executing control functions related to the message.

[Fig. 1]



[Fig. 2]



[Fig. 3]

Simple SMS	
Text Message	
OK. Call me again.	
From : XXX-XXXX-XXXX Receiver : Shawn (XXX-XXXX-XXXX)	
Send	
⏮ Select ⏭ Return 📄 Exit	

Simple SMS	
Text Message	
Select numbers on remote controller. ① OK ④ Call me again. ② I got it. ⑤ I'll visit you. ③ I'll call you later. ⑥ I'm good.	
OK	
⏮ Move ⏭ OK ⏭ Return 📄 Exit	

[Fig. 4]

410

Simple SMS

Receive NO.

Select numbers on remote controller.

① Shawn (XXX-XXX-XXXX)

② Susan (XXX-XXX-XXXX)

③ Elli (XXX-XXX-XXXX)

④ XXX(XXX-XXX-XXXX)

1/30

OK

Return

Exit

420

Simple SMS

Text Message

Hello~~

Sender : XXX-XXXX-XXXX

Receiver : Susan (XXX-XXXX-XXXX), Elli(XXX-XXXX-XXXX)

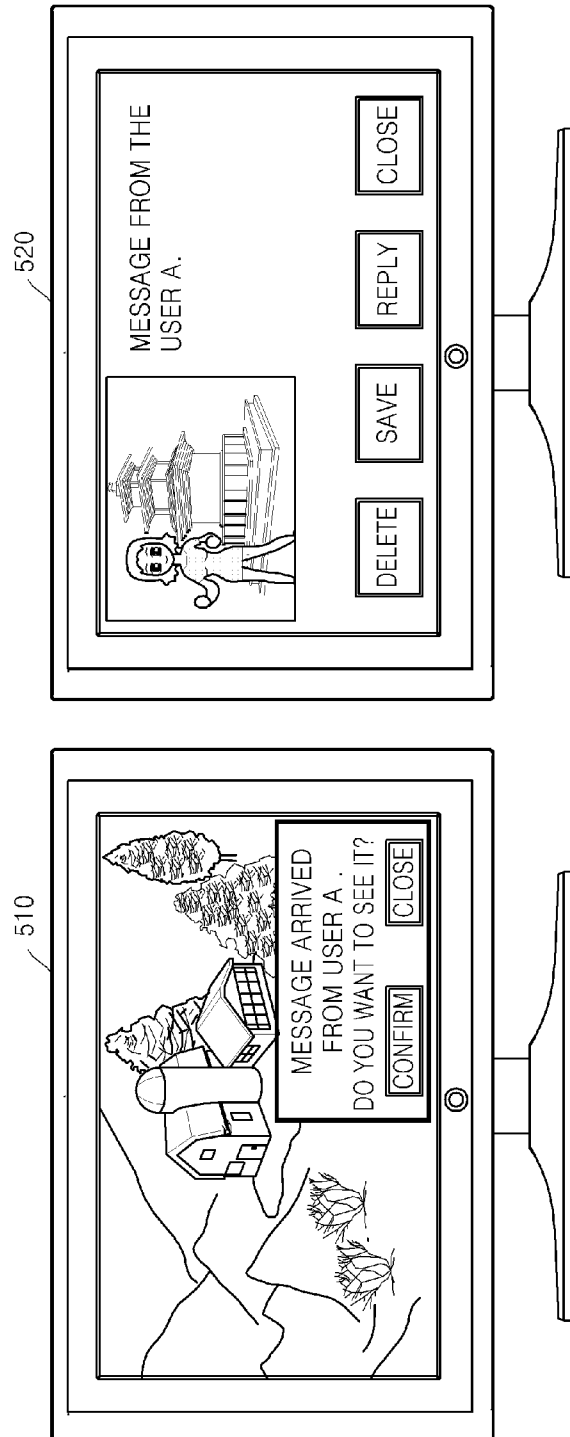
Send

Move

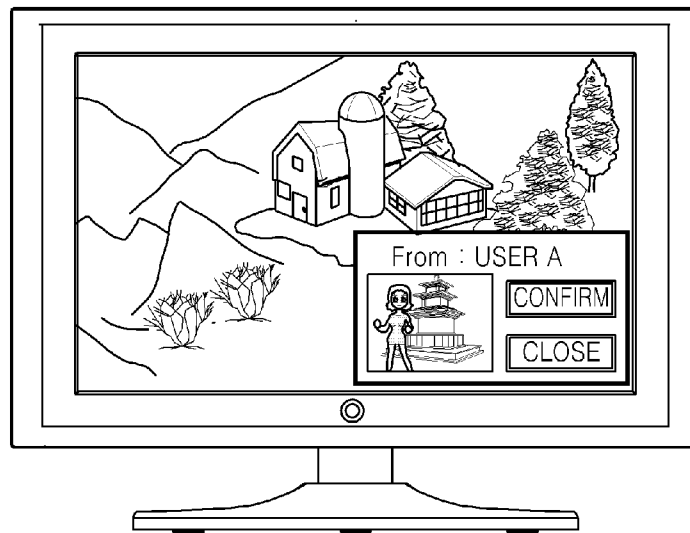
Select

Exit

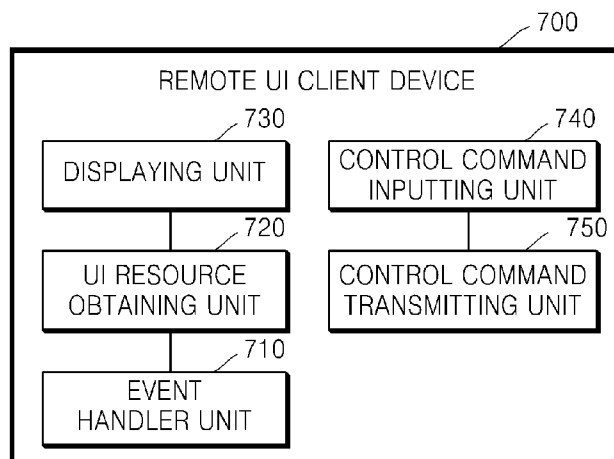
[Fig. 5]



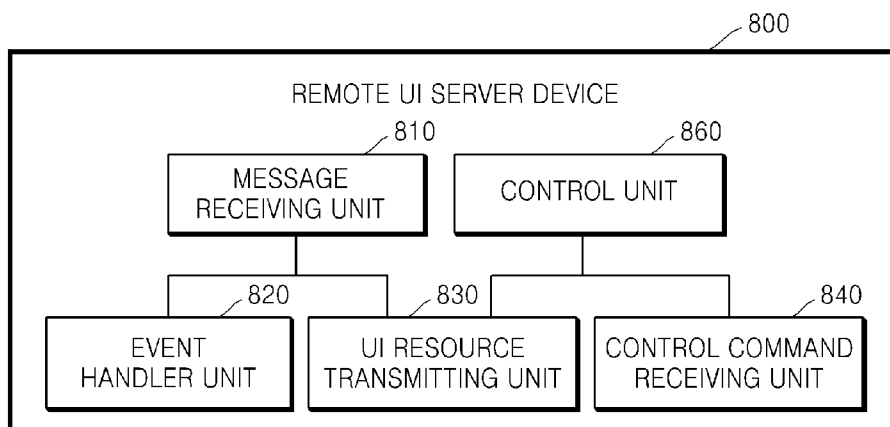
[Fig. 6]



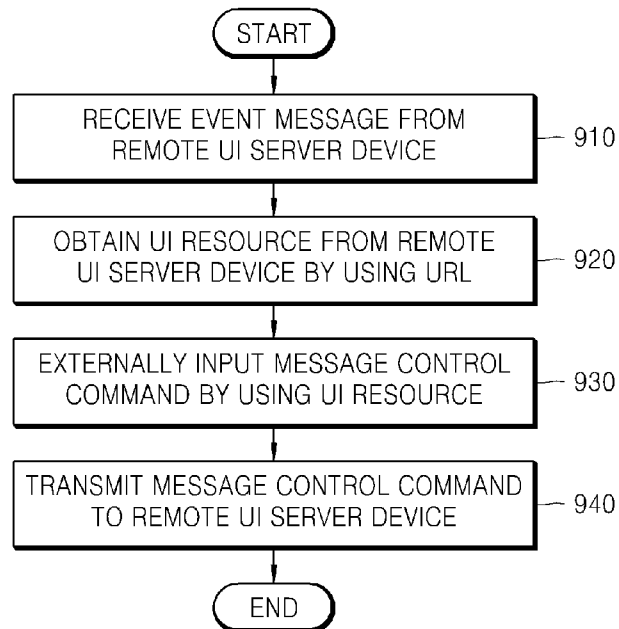
[Fig. 7]



[Fig. 8]



[Fig. 9]



[Fig. 10]

