

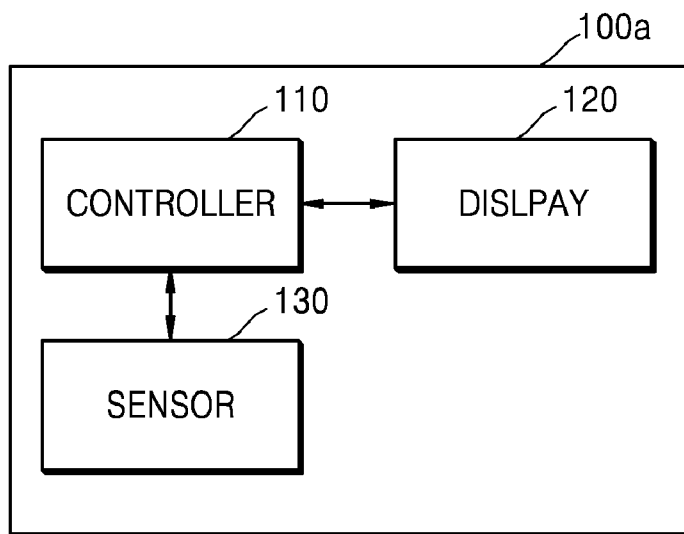


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- (71) **Applicant: SAMSUNG ELECTRONICS CO., LTD.**
[KR/KR]; 129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do 16677 (KR).
- (72) **Inventors: LEE, Jin-ha;** #102-301, 151, Hyeonchung-ro,
Dongjak-gu, Seoul 06904 (KR). **MOON, Jong-bo;** #812-
2003, 232, Yeongtong-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do 16698 (KR). **PARK, Jun-seong;** 65-1,
Dongsuwon-ro 551beon-gil, Yeongtong-gu, Suwon-si,
Gyeonggi-do 16503 (KR).
- (74) **Agent: Y.P.LEE, MOCK & PARTNERS;** 12F Daelim
Acrotel, 13 Eonju-ro 30-gil, Gangnam-gu, Seoul 06292
(KR).

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(54) **Title:** IMAGE DISPLAY APPARATUS AND METHOD



(57) **Abstract:** An image display apparatus and an image display method are provided. The image display apparatus includes a display configured to display an item list including items, and a sensor configured to sense a first input for zooming out on the item list, and sense a second input for zooming in on the item list. The image display apparatus further includes a controller configured to control the display to display the items with a decrease in size in response to the sensor sensing the first input, and display the items with an increase in size in response to the sensor sensing the second input.

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Description

Title of Invention: IMAGE DISPLAY APPARATUS AND METHOD

Technical Field

- [1] Apparatuses and methods consistent with exemplary embodiments relate to an image display apparatus and an image display method, and more particularly, to an image display apparatus and an image display method, in which an item list including a plurality of items may be zoomed in or out on.

Background Art

- [2] An image display apparatus is an apparatus having a function of displaying an image that may be viewed by a user. A user may view broadcasting through an image display apparatus. An image display apparatus displays, on a display, broadcasting selected by a user from broadcast signals transmitted by a broadcasting station. Globally, a current trend in broadcasting is a switch from analog broadcasting to digital broadcasting.
- [3] Digital broadcasting denotes broadcasting in which digital images and audio signals are transmitted. Digital broadcasting is more resistant to external noise than analog broadcasting, thereby having a low data loss, being used for error correction, and providing a clear screen having high resolution. In addition, digital broadcasting enables bidirectional services, unlike analog broadcasting.
- [4] Recently, smart televisions are being provided to provide a variety of content in addition to a digital broadcasting function. Instead of being manually operated according to selection by users, smart televisions are meant to analyze and provide what users desire without manipulation from the users.

Disclosure of Invention

Solution to Problem

- [5] Aspects of one or more exemplary embodiments provide an image display apparatus and an image display method in which an item list is zoomed in or out on, thus facilitating retrieval of an item from the item list or movement between a plurality of items in the item list.

Advantageous Effects of Invention

- [6] According to an exemplary embodiment, a user may easily and quickly retrieve an item from an item list, or move between a plurality of items in the item list by zooming in/out on the item list.
- [7] According to an exemplary embodiment, a user may easily and quickly search for content by setting a bookmark item.

Brief Description of Drawings

- [8] The above and/or other aspects will be more apparent by describing exemplary embodiments with reference to the accompanying drawings, in which:
- [9] FIG. 1 is a diagram showing an image display apparatus and a control apparatus, according to an exemplary embodiment;
- [10] FIG. 2 is a block diagram showing a configuration of an image display apparatus, according to an exemplary embodiment;
- [11] FIG. 3 is a block diagram showing a configuration of an image display apparatus, according to another exemplary embodiment;
- [12] FIG. 4 is a diagram showing a software configuration stored in a storage of FIG. 3;
- [13] FIG. 5 is a block diagram showing a configuration of a control apparatus, according to an exemplary embodiment;
- [14] FIGS. 6A, 6B, 6C, and 6D are views illustrating an example in which an item list is zoomed out on, according to an exemplary embodiment;
- [15] FIGS. 7A, 7B, 7C, 7D, 7E, and 7F are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to an exemplary embodiment;
- [16] FIGS. 8A, 8B, 8C, and 8D are views illustrating an example in which an item list is zoomed in on, according to an exemplary embodiment;
- [17] FIGS. 9A and 9B are views illustrating an example in which an item list is zoomed in on, according to another exemplary embodiment;
- [18] FIGS. 10A, 10B, 10C, 10D, 10E, 10F, and 10G are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to another exemplary embodiment;
- [19] FIGS. 11A, 11B, 11C, 11D, 11E, 11F, and 11G are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to another exemplary embodiment; and
- [20] FIG. 12 is a flowchart showing an image display method, according to an exemplary embodiment.

Best Mode for Carrying out the Invention

- [21] Exemplary embodiments address at least the above problems and/or disadvantages and other disadvantages not described above. Also, one or more exemplary embodiments are not required to overcome the disadvantages described above, and an exemplary embodiment may not overcome any of the problems described above.
- [22] Aspects of one or more exemplary embodiments provide an image display apparatus and an image display method in which an item list is zoomed in or out on, thus facilitating retrieval of an item from the item list or movement between a plurality of items in the item list.

- [23] According to an aspect of an exemplary embodiment, an image display apparatus includes a display configured to display an item list including items, and a sensor configured to sense a first input for zooming out on the item list, and sense a second input for zooming in on the item list. The image display apparatus further includes a controller configured to control the display to display the items with a decrease in size in response to the sensor sensing the first input, and display the items with an increase in size in response to the sensor sensing the second input.
- [24] The first input may include at least one among an input of dragging in a first direction on a touch pad included in a control apparatus controlling the image display apparatus, an input of tilting the control apparatus in a second direction, and an input of pressing a first direction key among four direction keys included in the control apparatus.
- [25] The second input may include at least one among an input of dragging in a third direction opposite to the first direction on the touch pad, an input of tilting the control apparatus in a fourth direction opposite to the second direction, and an input of pressing a second direction key in a direction opposite to the first direction key among the four direction keys.
- [26] The controller may be further configured to control the display to display lower items included in at least one among the items in response to the sensor sensing the first input.
- [27] The controller may be further configured to control the display to display an upper item region including lines corresponding to the items, the lines being listed in succession, in response to the sensor sensing the first input.
- [28] The controller may be further configured to control the display to change the lines into the items, and display the items, in response to the sensor sensing the second input while the lines are displayed.
- [29] The controller may be further configured to set at least one among the items as a bookmark item, the sensor may be further configured to sense a user input of moving the bookmark item in a direction toward a point that is highlighted among the display, and the controller may be further configured to control the display to increase a moving speed of the bookmark item, and move the bookmark item to the highlighted point, in response to the sensor sensing the user input and a distance between the bookmark item and the highlighted point being equal to or less than a value.
- [30] The controller may be further configured to control the display to display detailed information of at least one among the items in response to the sensor sensing the second input.
- [31] The controller may be further configured to control the display to display an upper item including the items in response to the sensor sensing the second input.

- [32] The sensor may be further configured to sense the sensed first input be disengaged while the items are displayed with a decrease in size, and sense the sensed second input be disengaged while the items are displayed with an increase in size. The controller may be further configured to control the display to display the items with an increase in size and in original states thereof in response to the sensor sensing the sensed first input be disengaged while the items are displayed with a decrease in size, and control the display to display the items with a decrease in size and in original states thereof in response to the sensor sensing the sensed second input be disengaged while the items are displayed with an increase in size.
- [33] The sensor may be further configured to sense a flip input of a control apparatus controlling the image display apparatus, while the items are displayed with a decrease or increase in size, and the controller may be further configured to control the display to maintain display of the items with a decrease or increase in size in response to the sensor sensing the flip input.
- [34] The sensor may be further configured to sense a third input for moving the item list, and the controller may be further configured to control the display to move the item list to change an item that is highlighted among the items in response to the sensor sensing the third input.
- [35] The sensor may be further configured to sense a third input for moving a highlight of an item in the item list, and the controller may be further configured to control the display to move the highlight to change the highlighted item among the items in response to the sensor sensing the third input.
- [36] The display may be further configured to display a cursor indicating a position of a user input, and the controller may be further configured to control the display to move the cursor from a first point of the item list to a second point of the item list in response to the sensor sensing the first input or the second input.
- [37] The controller may be further configured to control the display to highlight an item on which the cursor is positioned among the items.
- [38] According to an aspect of another exemplary embodiment, there is provided an image display method of an image display apparatus, the image display method including displaying an item list including items, and sensing a first input for zooming out on the item list, or a second input for zooming in on the item list. The image display method further includes displaying the items with a decrease in size in response to the sensing the first input, and displaying the items with an increase in size in response to the sensing the second input.
- [39] The image display method may further include displaying lower items included in at least one among the items in response to the sensing the first input.
- [40] The image display method may further include displaying an upper item region

including lines corresponding to the items, the lines being listed in succession, in response to the sensing the first input.

- [41] The image display method may further include changing the lines into the items, and displaying the items, in response to the sensing the second input while the lines are displayed.
- [42] The image display method may further include setting at least one among the items as a bookmark item, sensing a user input of moving the bookmark item in a direction toward a point that is highlighted among a display, and increasing a moving speed of the bookmark item, and moving the bookmark item to the highlighted point, in response to the sensing the user input and a distance between the bookmark item and the highlighted point being equal to or less than a value.
- [43] The image display method may further include displaying detailed information of at least one among the items in response to the sensing the second input.
- [44] The image display method may further include displaying an upper item including the items in response to the sensing the second input.
- [45] The image display method may further include sensing the sensed first input be disengaged while the items are displayed with a decrease in size, sensing the sensed second input be disengaged while the items are displayed with an increase in size, displaying the items with an increase in size and in original states thereof in response to the sensing the sensed first input be disengaged while the items are displayed with a decrease in size, and displaying the items with a decrease in size and in original states thereof in response to the sensing the sensed second input be disengaged while the items are displayed with an increase in size.
- [46] The image display method may further include sensing a flip input of a control apparatus controlling the image display apparatus, while the items are displayed with a decrease or increase in size, and maintaining display of the items with a decrease or increase in size in response to the sensing the flip input.
- [47] The image display method may further include sensing a third input for moving the item list, and moving the item list to change an item that is highlighted among the items in response to the sensing the third input.
- [48] The image display method may further include sensing a third input for moving a highlight of an item in the item list, and moving the highlight to change the highlighted item among the items in response to the sensing the third input.
- [49] The image display method may further include displaying a cursor indicating a position of a user input, and moving the cursor from a first point of the item list to a second point of the item list in response to the sensing the first input or the second input.
- [50] The image display method may further include highlighting an item on which the

cursor is positioned among the items.

- [51] According to an aspect of another exemplary embodiment, there is provided an image display apparatus including a display configured to display categories including a category that is highlighted, a sensor configured to sense a first input for zooming out, from a remote control apparatus, and a controller configured to control the display to display items included in the highlighted category in response to the sensor sensing the first input while the highlighted category is displayed, and display the items with a decrease in size in response to the sensor sensing the first input while the items are displayed.
- [52] The controller may be further configured to control the display to display lines corresponding to the items in response to the sensor sensing the first input while the decreased items are displayed.
- [53] The sensor may be further configured to sense a second input for zooming in, from the remote control apparatus, and the controller may be further configured to control the display to display the decreased items in response to the sensor sensing the second input while the lines are displayed, and display the items in response to the sensor sensing the second input while the decreased items are displayed.
- [54] The controller may be further configured to control the display to display detailed information of an item that is highlighted among the items in response to the sensor sensing the second input while the items are displayed.
- [55] The controller may be further configured to control the display to display the highlighted category in response to the sensor sensing the second input while the items are displayed.

Mode for the Invention

- [56] Exemplary embodiments are described in greater detail with reference to the accompanying drawings.
- [57] Exemplary embodiments of the present disclosure may be diversely modified. Accordingly, exemplary embodiments are illustrated in the drawings and are described in detail in the detailed description. However, it is to be understood that the present disclosure is not limited to an exemplary embodiment, but includes all modifications, equivalents, and substitutions without departing from the scope and spirit of the present disclosure. Also, well-known functions or constructions may not be described in detail because they would obscure the disclosure with unnecessary detail.
- [58] In the following description, the same drawing reference numerals are used for the same elements even in different drawings. The matters defined in the description, such as detailed construction and elements, are provided to assist in a comprehensive understanding of the exemplary embodiments. Thus, it is apparent that the exemplary em-

bodiments can be carried out without those specifically defined matters. Hereinafter, it is understood that 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.

- [59] In this disclosure below, when it is described that one comprises (or includes or has) some elements, it may be understood that it may comprise (or include or have) only those elements, or it may comprise (or include or have) other elements as well as those elements if there is no specific limitation. Moreover, each of terms such as “unit” and “module” described in the specification denotes an element for performing at least one function or operation, and may be implemented in hardware, software or the combination of hardware and software.
- [60] FIG. 1 is a diagram showing an image display apparatus 100 and a control apparatus 200, according to an exemplary embodiment.
- [61] As shown in FIG. 1, the image display apparatus 100 may be a TV, which is an example, and may be implemented as an electronic device including a display 120 of FIG. 2. For example, the image display apparatus 100 may be implemented as one of various electronic devices such as a smart phone, a tablet PC, a digital camera, a camcorder, a laptop computer, a desk top, an e-book terminal, a digital broadcasting terminal, a personal digital assistant (PDA), a portable multimedia player (PMP), a navigation device, an MP3 player, a wearable device, etc. Exemplary embodiments may be implemented in a display device having a large display 120 such as a TV, but is not limited thereto. In addition, the image display apparatus 100 may be stationary or mobile and may be a digital broadcasting receiver capable of receiving digital broadcasting.
- [62] The image display apparatus 100 may be implemented as a curved display apparatus, which is a screen with a curvature, or a flexible display apparatus having an adjustable curvature in addition to a flat display apparatus. An output resolution of the image display apparatus 100 may include, for example, high definition (HD), full HD, ultra HD, or a higher resolution.
- [63] The control apparatus 200 may be implemented as various types of apparatuses for controlling the image display apparatus 100 such as a remote control or cell phone.
- [64] In addition, the control apparatus 200 may control the image display apparatus 100 through short-range communication such as infrared (IR) or Bluetooth. The control apparatus 200 may control a function of the image display apparatus 100 using at least one of a key (including a button), a touchpad, a microphone capable of receiving a user’s voice, and a sensor capable of recognizing a motion of the control apparatus 200.
- [65] The control apparatus 200 includes a power on/off button for powering the image

display apparatus 100 on or off. The control apparatus 200 may also change a channel on, adjust the volume of, select a terrestrial broadcast/cable broadcast/satellite broadcast on, or set a configuration of the image display apparatus 100 according to a user input.

[66] In addition, the control apparatus 200 may be a pointing device. For example, the control apparatus 200 may operate as a pointing device when a predetermined key input is received.

[67] The image display apparatus 100 may be controlled by a user input of moving the control apparatus 200 up, down, left, or right or tilting the control apparatus 200 in any direction. Information regarding movement of the control apparatus 200 that is sensed through a sensor of the control apparatus 200 may be transmitted to the image display apparatus 100. The image display apparatus 100 may calculate coordinates of the cursor on the display from the information regarding the movement of the control apparatus 200 and move the cursor in accordance with the calculated coordinates. Thus, a cursor on the display of the image display apparatus 100 may move or various displayed menus may be activated.

[68] Alternatively, on a condition that the control apparatus 200 includes a touch pad, a cursor on the display of the image display apparatus 100 may be moved, or various displayed menus may be selectively activated according to a displacement of an object such as a user's finger that moves on the touch pad.

[69] The term "user" used herein denotes a person who uses the control apparatus 200 to control a function or operation of the image display apparatus 100, and may include a viewer, a manager, or an installation engineer.

[70] The image display apparatus 100 according to an exemplary embodiment displays an item list including a plurality of items on the display.

[71] In addition, the image display apparatus 100 according to an exemplary embodiment may display the plurality of items included in the item list with an increase or decrease in size in response to an input for zooming out on the item list or an input for zooming in on the item list.

[72] FIG. 2 is a block diagram showing a configuration of an image display apparatus 100a, according to an exemplary embodiment. The image display apparatus 100a of FIG. 2 may be an example of the image display apparatus 100 of FIG. 1.

[73] Referring to FIG. 2, the image display apparatus 100a according to an exemplary embodiment includes a controller 110, a display 120, and a sensor 130.

[74] The display 120 converts an image signal, a data signal, an on-screen display (OSD) signal, a control signal or the like, which is processed by the controller 110, into a driving signal. The display 120 may be implemented as a plasma display panel (PDP), a liquid crystal display (LCD), an organic light emitting diode (OLED), or a flexible

display and may also be implemented as a three-dimensional (3D) display. In addition, the display 120 may be configured as a touch screen and thus used as an input device as well as an output device.

[75] The display 120 according to an exemplary embodiment may display an item list including a plurality of items. In addition, the display 120 may display a cursor indicating a position of a user input on the display 120.

[76] The sensor 130 according to an exemplary embodiment may sense the user input and deliver the sensed signal to the controller 110. In addition, the sensor 130 may sense a user input, such as a power on/off, a channel selection, a channel up/down, or a screen setting, from the control apparatus 200. The sensor 130 according to an exemplary embodiment may sense a user input for moving the cursor displayed on the display 120. In addition, the sensor 130 according to an exemplary embodiment may sense an input for entering a pointing mode. For example, the sensor 130 may sense an input of touching a touch region of the control apparatus 200 or an input of pressing a predetermined button of the user input unit of the control apparatus 200.

[77] In addition, the sensor 130 may sense a first input for zooming out on an item list or a second input for zooming in on the item list.

[78] For example, the sensor 130 may sense, as the first input, at least one of an input of dragging in a first direction on a touch pad on a condition that the touch pad is included in the control apparatus 200 for controlling the image display apparatus 100a, an input of tilting a pointing device in a second direction on a condition that the control apparatus 200 is the pointing device, and an input of pressing of a direction key on a condition that the control apparatus 200 includes four direction keys. Alternatively, the sensor 130 may sense, as a second input, at least one of an input of dragging in a third direction opposite to the first direction on the touch pad, an input of tilting the pointing device in a fourth direction opposite to the second direction, and an input of pressing an opposite direction key of the direction key among the four direction keys.

[79] In addition, the sensor 130 may sense an input for moving an item list, an input for moving a highlight in the item list, and an input for moving a cursor.

[80] The controller 110 according to an exemplary embodiment may process an image signal and input the processed image signal to the display 120. Thus, an image corresponding to the image signal may be displayed on the display 120. In addition, the controller 110 may control the image display apparatus 100a by a user command sensed through the sensor 130 or an internal program.

[81] For example, according to an exemplary embodiment, the controller 110 may display the plurality of items included in the item list with a decrease in size in response to the sensed first input (a user input for zooming out on the item list). In addition, the controller 110 may display the plurality of items included in the item list with an

increase in size in response to the sensed second input (a user input for zooming in on the item list).

[82] The controller 110 may display lower items included in at least one of the plurality of items in response to the first input.

[83] The controller 110 may display an upper item region including the plurality of items and display lines corresponding to the plurality of items in the upper item region such that the lines are listed in succession, in response to the first input.

[84] The controller 110 may change the lines to the plurality of items corresponding to the lines and display the changed items, in response to the second input.

[85] When a user input of moving a bookmark item among the plurality of items in a direction toward a highlighted point is sensed, and a distance between the bookmark item and the highlighted point is equal to or less than a predetermined distance, the controller 110 may increase a moving speed of the bookmark item and move the bookmark item to the highlighted point.

[86] The controller 110 may display detailed information about at least one of the plurality of items in response to the second input.

[87] The controller 110 may display an upper item including the plurality of items in response to the second input.

[88] When the sensed input is disengaged while the plurality of items are displayed with a decrease or increase in size, the controller 110 may spring the plurality of items back to their original states.

[89] When a flip input is sensed while the plurality of items are displayed with a decrease or increase in size, the controller 110 may maintain a state in which the plurality of items are displayed with a decrease or increase in size although the sensed input is disengaged.

[90] The controller 110 may move the item list to change a highlighted item among the plurality of items in response to a user input for moving the item list.

[91] The controller 110 may move the highlight to change the highlighted item among the plurality of items in response to a user input for moving the highlight in the item list.

[92] The controller 110 may move a cursor from a first point in the item list to a second point in the item list in accordance with the first input or second input. The controller 110 may highlight an item on which the cursor is positioned.

[93] FIG. 3 is a block diagram showing a configuration of an image display apparatus 100b, according to another exemplary embodiment. The image display apparatus 100b of FIG. 3 may be an example of the image display apparatus 100 of FIG. 1.

[94] Referring to FIG. 3, the image display apparatus 100b according to an exemplary embodiment further includes a video processor 180, an audio processor 115, an audio output interface 125, a power supply 160, a tuner 140, a communication interface 150,

an input/output interface 170, and a storage 190 in addition to the controller 110, the display 120, and the sensor 130.

[95] In the description of FIG. 3, repetitive description on the controller 110, the display 120, and the sensor 130 described in FIG. 2 will be omitted.

[96] The video processor 180 processes video data received by the image display apparatus 100b. The video processor 180 may perform various image processing operations, such as decoding, scaling, noise filtering, frame rate conversion, and resolution conversion, on the video data.

[97] The display 120 displays a video included in a broadcast signal received through the tuner 140 by control of the controller 110. In addition, the display 120 may display content (e.g., a video) that is input through the communication interface 150 or the input/output interface 170. The display 120 may output an image stored in the storage 190 by control of the controller 110. In addition, the display 120 may display a voice user interface (UI) (e.g., including a voice command guide) for performing a voice recognition task corresponding to voice recognition, or a motion UI (e.g., including a user motion guide for motion recognition) for performing a motion recognition task corresponding to motion recognition.

[98] The audio processor 115 processes audio data. The audio processor 115 may perform various processing operations, such as decoding, amplification, and noise filtering, on the audio data. The audio processor 115 may include a plurality of audio processors to process audios corresponding to a plurality of pieces of content.

[99] The audio output interface 125 outputs an audio included in a broadcast signal received through the tuner 140 by control of the controller 110. The audio output interface 125 may output an audio (e.g., a voice or sound) that is input through the communication interface 150 or the input/output interface 170. In addition, the audio output interface 125 may output an audio stored in the storage 190 by control of the controller 110. The audio output interface 125 may include at least one of a speaker 126, a headphone output terminal 127, and a Sony/Philips digital interface (S/PDIF) output terminal 128. The audio output interface 125 may include a combination of the speaker 126, the headphone output terminal 127, and the S/PDIF output terminal 128.

[100] The power supply 160 supplies power that is input from an external power source to elements inside the image display apparatus 100b by control of the controller 110. In addition, the power supply 160 may supply the internal elements with power that is output from one or more batteries positioned inside the image display apparatus 100b by control of the controller 110.

[101] The tuner 140 may conduct amplification, mixing, or resonance on a broadcast signal received by cable or wirelessly to tune and select only a frequency of a channel to be received by the display apparatus 100b among many radio wave components. The

broadcast signal includes an audio, a video, and additional information (e.g., an electronic program guide (EPG)).

- [102] [0100] The tuner 140 may receive a broadcast signal in a frequency band corresponding to a channel number (e.g., cable broadcasting No. 506) in response to a user input (e.g., a control signal including a channel number input, a channel up/down input, and a channel input on an EPG screen, which is received from the control apparatus 200).
- [103] The tuner 140 may receive a broadcast signal from various sources, such as terrestrial broadcasting, cable broadcasting, satellite broadcasting, and Internet broadcasting. The tuner 140 may also receive a broadcast signal from a source such as analog broadcasting or digital broadcasting. The broadcast signal received through the tuner 140 may be decoded (e.g., audio-decoded, video-decoded, or additional-information-decoded) into an audio, a video, and/or additional information. The decoded audio, video, and/or additional information may be stored in the storage 190 by control of the controller 110.
- [104] The tuner 140 of the image display apparatus 100b may be provided in a plurality. The tuner 140 may be implemented in one body with the image display apparatus 100b or may be implemented as a separate device (e.g., a set-top box, a tuner connected to the input/output interface 170, etc.) having a tuner, which is electrically connected with the image display apparatus 100b.
- [105] The communication interface 150 may connect the image display apparatus 100b with an external device (e.g., an audio device) by control of the controller 110. The controller 110 may transmit/receive content to/from the external device connected through the communication interface 150, download an application from the external device, or perform web browsing. The communication interface 150 may include one of a wireless LAN (WLAN) 151, Bluetooth 152, and wired Ethernet 153 in accordance with the performance and structure of the display apparatus 100b. In addition, the communication interface 150 may include a combination of the WLAN 151, Bluetooth 152, and wired Ethernet 153. The communication interface 150 may receive a control signal of the control apparatus 200 by control of the controller 110. The control signal may be implemented as a Bluetooth type signal, RF type signal, or WiFi type signal.
- [106] For example, the communication interface 150 may receive a signal corresponding to a Bluetooth type user input (e.g., a touch, press, touch gesture, voice, or motion) from the control apparatus 200 through communication using the Bluetooth 152. The communication interface 150 may further include short-range communication (e.g., near field communication (NFC) and Bluetooth low energy (BLE)) other than the Bluetooth.
- [107] The sensor 130 senses a user's voice, image, or interaction.

- [108] A microphone 131 receives a voice uttered by a user. The microphone 131 may convert the received voice into an electrical signal and output the electrical signal to the controller 110. The user's voice may include, for example, a voice corresponding to a menu or function of the image display apparatus 100b. A recognition range of the microphone 131 may be recommended as a distance of 4 meters or less from the microphone 131 to the user's position and may vary depending on a level of the user's voice and surrounding environments (e.g., a speaker sound or ambient noise).
- [109] According to an exemplary embodiment, the microphone 131 may receive the voice uttered by the user and output the received voice data to the controller 110 such that the controller 110 may use the voice data to identify an identity of the user who views the image display apparatus 100b.
- [110] The microphone 131 may be implemented in one body with or separately from the image display apparatus 100b. The separate microphone 131 may be electrically connected with the image display apparatus 100b through the communication interface 150 or input/output interface 170.
- [111] It will be readily understood by those skilled in the art that the microphone 131 may be excluded according to the performance and structure of the image display apparatus 100b.
- [112] A camera 132 receives an image (e.g., consecutive frames) corresponding to the user's motion including a gesture in a camera recognition range. For example, the recognition range of the camera 132 may be within a distance of about 0.1 meters to about 5 meters from the camera to the user. For example, the user's motion may include a body part of a user, such as the face, hand, fist, or finger of the user, or a motion of the body part of the user. The camera 132 may convert the received image into an electrical signal and output the electrical signal to the controller 110 by control of the controller 110.
- [113] According to an exemplary embodiment, the camera 132 may capture the face of the user and output the captured face image to the controller 110 such that the controller 110 may use the face image to identify an identity of the user who views the image display apparatus 100b.
- [114] The controller 110 may use the received motion recognition result to select a menu displayed on the image display apparatus 100b or perform control corresponding to the motion recognition result. For example, the control may include channel adjustment, volume adjustment, indicator movement, and cursor movement.
- [115] The camera 132 may include a lens and an image sensor. The camera 132 may use a plurality of lenses and image processing to support optical zoom or digital zoom. The recognition range of the camera 132 may be set variously depending on a camera angle and an ambient environment condition. When the camera 132 includes a plurality of

cameras, the camera 132 uses the plurality of cameras to receive a three-dimensional (3D) still image or 3D moving image.

[116] The camera 132 may be implemented in one body with or separately from the image display apparatus 100b. A separate device including the separate camera 132 may be electrically connected with the image display apparatus 100b through the communication interface 150 or input/output interface 170.

[117] It will be readily understood by those skilled in the art that the camera 132 may be excluded according to the performance and structure of the image display apparatus 100b.

[118] A light receiver 133 receives an optical signal (including a control signal) received from the external control apparatus 200 through an optical window of a bezel of the display 120. The light receiver 133 may receive an optical signal corresponding to a user input (e.g., a touch, press, touch gesture, voice, or motion) from the control apparatus 200. The control signal may be extracted from the received optical signal by control of the controller 110.

[119] The input/output interface 170 receives a video (e.g., a moving picture), an audio (e.g., a voice or music), and additional information (e.g., EPG) from the outside of the image display apparatus 100b by control of the controller 110. The input/output interface 170 may include one of a high-definition multimedia interface (HDMI) port 171, a component jack 172, a PC port 173, and a USB port 174. The input/output interface 170 may include a combination of the HDMI port 171, the component jack 172, the PC port 173, and the USB port 174.

[120] It will be readily understood by those skilled in the art that the configuration and operation of the input/output interface 170 may be implemented in various ways according to an exemplary embodiment.

[121] The controller 110 functions to control an overall operation of the image display apparatus 100b and a signal flow between the internal elements of the image display apparatus 100b and to process data. When there is a user's input, or a predetermined and stored condition is satisfied, the controller 110 may execute an operating system (OS) and various applications that are stored in the storage 190.

[122] The controller 110 includes a random access memory (RAM) 181 that stores a signal or data received from the outside of the image display apparatus 100b or is used as storage regions corresponding to various tasks performed by the image display apparatus 100b, a read only memory (ROM) 182 that stores a control program for controlling the image display apparatus 100b, and a processor 183.

[123] The processor 183 or the controller 110 may include a graphic processor (GPU) for performing graphical processing corresponding to a video. The processor 183 may be implemented as a system-on-chip (SoC) including a core and the GPU. The processor

- 183 may include a single core, a dual core, a triple core, a quad core, and a core which is a multiple thereof.
- [124] In addition, the processor 183 may include a plurality of processors. For example, the processor 183 may be implemented as a main processor and a sub processor that operates in a sleep mode.
- [125] A graphic processor 184 uses a calculator and a renderer to generate a screen including various objects such as an icon, image, text, or the like. The calculator uses the user input sensed through the sensor 130 to calculate attribute values, such as coordinates, forms, sizes, and colors in which the objects are to be displayed according to the layout of the screen. The renderer generates a screen having various layouts including the objects on the basis of the attribute values calculated by the calculator. The screen generated by the renderer is displayed within a display region of the display 120.
- [126] First to nth interfaces 185-1 to 185-n are connected with the above-described various types of elements. One of the interfaces may be a network interface connected with an external device through a network.
- [127] The RAM 181, the ROM 182, the processor 183, the graphic processor 184, and the first to nth interfaces 185-1 to 185-n are interconnected through an internal bus 186.
- [128] The term "controller of image display apparatus" used herein includes the processor 183, the ROM 182, and the RAM 181.
- [129] The storage 190 may store various types of data, programs, or applications for driving and controlling the image display apparatus 100b by control of the controller 110. The storage 190 may store input/output signals or data corresponding to the driving of the video processor 180, the display 120, the audio processor 115, the audio output interface 125, the power supply 160, the tuner 140, the communication interface 150, the sensor 130, and the input/output interface 170. The storage 190 may store control programs for controlling the image display apparatus 100b and the controller 110, an application initially provided by a manufacturer or downloaded from the outside, a graphical user interface (GUI) associated with the application, an object (e.g., an image text, icon, or button) for providing the GUI, user information, documents, databases, or relevant data.
- [130] In an exemplary embodiment, the term "storage" includes the storage 190, the ROM 182 or RAM 181 of the controller 110, or a memory card (e.g., a micro SD card or USB memory) mounted in the image display apparatus 100b. In addition, the storage 190 may include a nonvolatile memory, a volatile memory, a hard disk drive (HDD), and a solid state drive (SSD).
- [131] The storage 190 may include a broadcast receiving module, a channel control module, a volume control module, a communication control module, a voice

recognition module, a motion recognition module, a light receiving module, a display control module, an audio control module, an external input control module, a power control module, a power control module of an external device that is wirelessly connected (e.g., via Bluetooth), a voice database (DB), or a motion DB. The modules and DBs of the storage 190 may be implemented in the form of software for the image display apparatus 100b to perform a broadcast reception control function, a channel control function, a volume control function, a communication control function, a voice recognition function, a motion recognition function, a light reception control function, a display control function, an audio control function, an external input control function, a power control function, or a power control function of an external device wirelessly connected (e.g., via Bluetooth). The controller 110 may perform each function using the software stored in the storage 190.

[132] In addition, the image display apparatus 100b having the display 120 may be electrically connected with a separate external device (e.g., a set-top box) having a tuner. For example, it will be readily understood by those skilled in the art that the image display apparatus 100b may be implemented as an analog TV, a digital TV, a 3D TV, a smart TV, an LED TV, an OLED TV, a plasma TV, or a monitor, but is not limited thereto.

[133] The image display apparatus 100b may include a sensor (e.g., an illumination sensor, a temperature sensor, etc.) that detects an internal or external state of the image display apparatus 100b.

[134] The block diagram of the image display apparatus 100a or 100b shown in FIG. 2 or 3 is a block diagram for an exemplary embodiment. Elements of the block diagram may be integrated, added, or omitted according to a specification of the image display apparatus 100a or 100b that is actually implemented. That is, two or more elements may be combined into one element, or one element may be divided into two or more elements. In addition, a function performed in each block is intended to describe exemplary embodiments, and its detailed operations or devices do not limit the exemplary embodiments.

[135] FIG. 4 is a diagram for describing a software configuration stored in the storage 190 of FIG. 3.

[136] Referring to FIG. 4, software including a base module 191, a sensing module 192, a communication module 193, a presentation module 194, a web browser module 195, and a service module 196 is stored in the storage 190.

[137] The base module 191 denotes a basic module that processes a signal delivered from hardware included in the image display apparatus 100b, and delivers the delivered signal to an upper layer module. The base module 191 includes a storage module 191-1, a security module 191-2, and a network module 191-3. The storage module

191-1 is a program module that manages databases (DBs) or registries. The processor 183 may use the storage module 191-1 to access a database in the storage 190 and read various types of data. The security module 191-2 is a program module that supports certification, request permission, and secure storage of hardware. The network module 191-3 includes a DNET module, an UPnP module, etc. as a module for supporting network connection.

- [138] The sensing module 192 is a module that collects information from various types of sensors and analyzes and manages the collected information. The sensing module 192 may also include a head direction recognition module, a face recognition module, a voice recognition module, a motion recognition module, an NFC recognition module, a rotation recognition module, a touch recognition module, a gesture recognition module, etc.
- [139] The communication module 193 is a module for performing communication with the outside. The communication module 193 includes a messaging module 193-1 such as a messenger program, a short message service (SMS) & multimedia message service (MMS) program, or an email program and a telephony module 193-2 including a call information aggregator program module, a voice over Internet protocol (VoIP) module, and so on.
- [140] The presentation module 194 is a module for configuring a display screen. The presentation module 194 includes a multimedia module 194-1 for replaying and outputting multimedia content and a UI and graphics rendering module 194-2 for performing user interfacing and graphic processing. The multimedia module 194-1 may include a player module, a camcorder module, a sound processing module, etc. Thus, the multimedia module 194-1 performs an operation of replaying various types of multimedia content to generate and replay a screen and a sound. The UI rendering module 194-2 may include an image compositor that combines images, a coordinate combination module that combines and generates coordinates of images to be displayed on the screen, an X11 module that receives various types of event from hardware, and a 2D/3D UI toolkit that provides a tool for configuring a 2D or 3D type UI.
- [141] The web browser module 195 denotes a module that performs web browsing to access a web server. The web browser module 195 may include various modules such as a web view module that configures a web page, a download agent module that performs downloading, a bookmark module, and a webkit module.
- [142] The service module 196 is a module including various types of applications for providing various services. In detail, the service module 196 may include various program modules such as an SNS program, a content replay program, a game program, an e-book program, a calendar program, a morning call management program, and

other widgets.

[143] In FIG. 4, various program modules are shown. However, it will be appreciated that the various program modules may be partially omitted, modified, or added according to the type and characteristic of the image display apparatus 100b. For example, a location based module that supports a location based service in cooperation with hardware such as a Global Positioning System (GPS) chip may be further included.

[144] FIG. 5 is a block diagram showing a configuration of the control apparatus 200, according to an exemplary embodiment.

[145] Referring to FIG. 5, the control apparatus 200 includes a wireless communication interface 220, a user input interface 230, a sensor portion 240, an output interface 250, a power supply 260, a storage 270, and a controller 280.

[146] The wireless communication interface 220 may transmit/receive signals to/from any one of the above-described image display apparatuses according to exemplary embodiments. The wireless communication interface 220 includes an RF transceiver 221 that may transmit and/or receive signals to and/or from the image display apparatus 100 according to an RF communication standard. In addition, the control apparatus 200 may include an IR transceiver 223 that may transmit and/or receive signals to and/or from the image display apparatus 100 according to an IR communication standard.

[147] In an exemplary embodiment, the control apparatus 200 transmits a signal containing information regarding movement of the control apparatus to the image display apparatus 100 through the RF transceiver 221.

[148] In addition, the control apparatus 200 may receive a signal transmitted by the image display apparatus 100 through the RF transceiver 221. The control apparatus 200 may transmit a command for power on/off, channel change, volume adjustment, or the like to the image display apparatus 100 through the IR transceiver 223.

[149] The user input interface 230 may include a keypad, a button, a touch pad, or a touch screen. A user may manipulate the user input interface 230 to input a command associated with the image display apparatus 100 to the control apparatus 200. When the user input interface 230 includes a hard key button, the user may input a command associated with the image display apparatus 100 to the control apparatus 200 through an operation of pushing the hard key button. When the user input interface 230 includes a touch screen, the user may touch a soft key of the touch screen to input a command associated with the image display apparatus 100 to the control apparatus 200.

[150] For example, the user input interface 230 may include four direction buttons or keys. The four direction buttons or keys may be used to control a window, region, application, or item that is displayed on the display 120. The four direction keys or buttons may be used to indicate up, down, left, and right movements. It will be understood by those skilled in the art that the user input interface 230 may include two

direction keys or buttons, instead of the four direction keys or buttons.

[151] In addition, the user input interface 230 may include various types of input interfaces, such as a scroll key or a jog key, which may be manipulated by the user.

[152] The user input interface 230 may include a touch pad. The user input interface 230 according to an exemplary embodiment may receive a user input such as a drag, touch, or flip through the touch pad of the control apparatus 200. The image display apparatus 100 may be controlled according to the type of the received user input (e.g., a direction in which a drag command is input, or a period in which a touch command is input).

[153] The sensor portion 240 includes a gyro sensor 241 and an acceleration sensor 243. The gyro sensor 241 may sense information regarding movement of the control apparatus 200. As an example, the gyro sensor 241 may sense information regarding an operation of the control apparatus 200 with respect to x, y, and z axes. The acceleration sensor 243 may sense information regarding a moving speed of the control apparatus 200. The sensor portion 240 may further include a distance measuring sensor and thus may sense a distance from the image display apparatus 100.

[154] The output interface 250 may output a video or voice signal corresponding to manipulation of the user input interface 230 or corresponding to a signal received from the image display apparatus 100. Through the output interface 250, the user may determine whether to adjust the user input interface 230 or whether to control the image display apparatus 100.

[155] As an example, the output interface 250 may include an LED 251, a vibrator 253, a speaker 255, or a display 257. When the user input interface 230 is manipulated, or signals are transmitted to and/or received from the image display apparatus 100 through the wireless communication interface 220, the LED 251 is lit up, the vibrator 253 generates vibration, the speaker 255 outputs a sound, and the display 257 outputs an image.

[156] The power supply 260 supplies power to the control apparatus 200. When the control apparatus 200 has not moved for a period of time, the power supply 260 may stop supplying power, thus reducing power dissipation. The power supply 260 may resume the power supply when a predetermined key included in the control apparatus 200 is manipulated.

[157] The storage 270 may store various types of programs and application data used in the control or operation of the control apparatus 200.

[158] The controller 280 controls an overall operation associated with the control of the control apparatus 200. The controller 280 may transmit a signal corresponding to manipulation of a predetermined key of the user input interface 230 or a signal corresponding to movement of the control apparatus 200 sensed by the sensor portion 240 to the image display apparatus 100 through the wireless communication interface 220.

- [159] The image display apparatus 100 may include a coordinate calculator that may calculate coordinates of the cursor corresponding to the operation of the control apparatus 200.
- [160] The coordinate calculator may correct a hand tremble or error from a signal corresponding to a sensed operation of the control apparatus 200 to calculate coordinates (x, y) of the cursor to be displayed on the display 120.
- [161] In addition, a transmission signal of the control apparatus 200 that is sensed through the sensor 130 is transmitted to the controller 110 of the image display apparatus 100. The controller 110 may determine information regarding the operation and key manipulation of the control apparatus 200 on the basis of the signal transmitted by the control apparatus 200, and may control the image display apparatus 100 according to a result of the determination.
- [162] As another example, the control apparatus 200 may calculate coordinates of the cursor corresponding to the operation and transmit the calculated coordinates to the image display apparatus 100. In this case, the image display apparatus 100 may transmit information regarding the coordinates of the cursor, which is received without a separate operation of correcting a hand tremble or error, to the controller 110.
- [163] FIGS. 6A, 6B, 6C, and 6D are views illustrating an example in which an item list is zoomed out on, according to an exemplary embodiment.
- [164] Referring to FIG. 6A, a display 120 displays an item list 310 including a plurality of items at the bottom of the display 120. The item list 310 has a form in which a plurality of items is arranged in a transverse direction. However, exemplary embodiments are not limited thereto. The item list may be a list in which the plurality of items is arranged in a longitudinal direction.
- [165] The plurality of items may each be a category item indicating a category. For example, as shown in FIG. 6A, the plurality of items includes category item "CHANNEL," category item "HISTORY," category item "GAME," category item "CLIPS," and category item "APPS." However, exemplary embodiments are not limited thereto.
- [166] In addition, each category item may include, as lower items, items indicating content classified into a corresponding category. For example, category item "CHANNEL" may include items indicating broadcast channels (e.g., an item corresponding to a first channel, an item corresponding to a second channel, an item corresponding to a third channel, etc.) as lower items.
- [167] In addition, category item "HISTORY" may include, as lower items, items corresponding to an application that a user has recently executed. In addition, category item "GAME" may include, as lower items, items indicating game content. In addition, category item "APPS" may include, as lower items, items corresponding to an ap-

plication installed in the image display apparatus.

[168] As shown in FIG. 6A, the plurality of items included in the item list 310 are represented as quadrangles, which may have the same size or different sizes. For example, the quadrangles may have different widths or heights depending on the number and characteristics of lower items included in each of the plurality of items. In addition, the quadrangles may include squares in which the height is the same as the width, or rectangles in which the height is different from the width. However, exemplary embodiments are not limited thereto.

[169] Referring again to FIG. 6A, a first item 321 positioned at the center of the display 120 among the plurality of items is highlighted, and the highlighted first item 321 is visibly displayed. For example, the color of the highlighted first item 321 may be changed, or a quadrangular box may be further displayed around the border of the first item 321. Alternatively, the size (e.g., width or height) of the highlighted first item 321 may be changed.

[170] Upon sensing a user input of moving the item list 310, the image display apparatus 100 may move the item list 310 to change the first item 321 positioned at the center of the display 120 in accordance with a direction of the user input.

[171] For example, as shown in FIG. 6A, when the item list 310 is a list in which items are transversely arranged, the image display apparatus 100 may sense an input of moving the item list 310 left or right and thus change the first item 321 positioned at the center of the display 120.

[172] On a condition that the control apparatus 200 includes a touch pad 235, the control apparatus 200 may sense a touch input of dragging left or right on the touch pad 235. Alternatively, on a condition that the control apparatus 200 is a pointing device, the control apparatus 200 may sense a movement or tilt to the left or right using a motion sensor (e.g., an acceleration sensor or a gyro sensor). Alternatively, on a condition that the control apparatus 200 includes four direction keys, the control apparatus 200 may sense a left-key or right-key input among the four direction keys.

[173] As shown in FIG. 6A, when a touch input of dragging right on the touch pad 235 is sensed, the image display apparatus 100 moves the item list 310 left, i.e., in a direction opposite to the right. When the item list 310 is moved left, as shown in FIG. 6B, a second item 322 having been positioned at a right side of the first item 321 is moved to the center of the display 120 and then highlighted.

[174] The image display apparatus 100 may sense a user input of zooming out on the item list. For example, on a condition that the control apparatus 200 includes the touch pad 235, the control apparatus 200 may sense a touch input of dragging in a direction corresponding to the zoom-out on the touch pad 235. Alternatively, on a condition that the control apparatus 200 is the pointing device, the image display apparatus 100 may

sense a user input of moving or tilting the control apparatus 200 in a direction corresponding to the zoom-out. Alternatively, on a condition that the control apparatus 200 includes four direction keys, the image display apparatus 100 may sense an input of pressing a direction key corresponding to the zoom-out among the four direction keys.

[175] As shown in FIG. 6B, when a touch input of dragging down on the touch pad 235 (e.g., a user input for the zoom-out) is sensed, as shown in FIG. 6C, the image display apparatus 100 displays lower items included in the highlighted second item 322 in the item list 310.

[176] For example, when a user input of zooming out on the item list 310 (e.g., a touch input of dragging down on the touch pad 235) is sensed while category item "CHANNEL" 322 is highlighted, as shown in FIG. 6C, the image display apparatus 100 displays items indicating broadcast channels included in category item "CHANNEL" 322 (e.g., an item 331 corresponding to a first channel (channel No. 1), an item 332 corresponding to a second channel (channel No. 2), and an item 333 corresponding to a third channel (channel No. 3)) in the item list 310. In this case, a channel name and a channel number of the broadcast channel may be displayed in the item indicating the broadcast channel. Alternatively, a screen image that a user watched last on the corresponding channel or an image indicating a program that is currently broadcast on the corresponding channel may be displayed in the item.

[177] Even when the image display apparatus 100 senses a user input of selecting the highlighted second item 322 in the item list 310 of FIG. 6B, the image display apparatus 100 may display lower items 331, 332, and 333 included in the second item 322, as shown in FIG. 6C.

[178] The image display apparatus 100 highlights the item 331 positioned at the center of the display 120 among the lower items displayed in the item list 310, and displays a channel number (e.g., No. 1) corresponding to the highlighted item 331 at an upper portion of the item 331.

[179] In addition, the image display apparatus 100 may sense a user input of moving the item list 310 while the lower items 331, 332, and 333 of category item "CHANNEL" 322 are displayed. For example, the image display apparatus 100 may sense a touch input of dragging left or right on the touch pad 235 of the control apparatus 200. Alternatively, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 left or right, or may sense an input of pressing a left or right key among the four direction keys of the control apparatus 200.

[180] The image display apparatus 100 may move the item list and change the highlighted item in response to the sensed user input of moving the item list. For example, as shown in FIG. 6C, when a touch input of dragging right on the touch pad 235 is sensed, the image display apparatus 100 moves the item list 310 left, i.e., in a direction

opposite to the right. When the item list 310 is moved left, as shown in FIG. 6D, an item 338 corresponding to channel No. 8 is positioned at the center of the display 120 and then highlighted.

[181] Upon sensing a user input of selecting the highlighted item (e.g., the item 338 corresponding to channel No. 8), the image display apparatus 100 may display a screen of the corresponding channel (e.g., channel No. 8) on the entirety of the display 120.

[182] FIGS. 7A, 7B, 7C, 7D, 7E, and 7F are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to an exemplary embodiment.

[183] Referring to FIG. 7A, a display 120 displays an item list 410 including a plurality of items. The plurality of items may each be an item indicating content. For example, the item indicating content may include an item indicating video content such as a movie or soap opera, an item indicating audio content such as music, an item indicating an application, an item indicating a broadcast channel, and an item indicating history information of content that a user has executed.

[184] In this case, a content name of content corresponding to the item, an image indicating the content, and a screen image having been executed last in the content may be displayed in each of the plurality of items. For example, when the plurality of items are items indicating the broadcast channels, a channel name and a channel number of the broadcast channel may be displayed in each of the plurality of items. Alternatively, a screen image that a user watched last on the corresponding channel or an image indicating a program that is currently broadcast on the corresponding channel may be displayed in the item.

[185] Referring to FIG. 7A, an item 438 positioned at the center of the display 120 among the plurality of items is highlighted, and the highlighted item is visibly displayed.

[186] The image display apparatus 100 may sense a user input of zooming out on the item list. For example, as shown in FIG. 7A, the image display apparatus 100 senses a touch input of dragging down, i.e., in a direction corresponding to the zoom-out, on the touch pad 235 of the control apparatus 200. Alternatively, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 in the direction corresponding to the zoom-out, or may sense an input of pressing a direction key corresponding to the zoom-out among the four direction keys of the control apparatus 200.

[187] The image display apparatus 100 may gradually decrease the size of the plurality of items included in the item list in response to the sensed user input. For example, as shown in FIG. 7B, the image display apparatus 100 gradually decreases the width of the plurality of items from a first width W1 to a second width W2 in response to the zoom-out input. In this case, the image display apparatus 100 may decrease the width of the plurality of items on the basis of the size of the zoom-out input. For example, the image display apparatus 100 may further decrease the width of the plurality of items as

a distance in a drag input on the touch pad 235, a distance in which the control apparatus 200 moves, a tilted angle, or a period during which a direction key is pressed increases.

[188] In addition, when the zoom-out input is consecutively sensed while the width of the plurality of items is decreased to the second width W_2 , as shown in FIG. 7C, the image display apparatus 100 displays an upper item region 450 including a plurality of items in the item list 410. For example, when the plurality of items is items indicating broadcast channels, its upper item may be category item "CHANNEL." Thus, the image display apparatus 100 may display a category item "CHANNEL" region as the upper item region 450 in the item list 410. In addition, the image display apparatus 100 may display another category item (e.g., category item "APPS," category item "HISTORY," and category item "GAME") having the same depth as category item "CHANNEL" in the item list 410.

[189] The image display apparatus 100 displays lines corresponding to the plurality of items in the upper item region 450 such that the lines are listed in succession. In this case, the lines displayed in the upper item region are lines perpendicular to a direction in which the plurality of items is arranged.

[190] For example, as shown in FIG. 7C, for the item list 410 in which category items are arranged in a transverse direction, the image display apparatus 100 displays longitudinal lines 460 corresponding to the plurality of items indicating the broadcast channels in the upper item region 450.

[191] In this case, a longitudinal line 465 positioned at the center of the display 120 among the plurality of longitudinal lines 460 is highlighted, and the highlighted longitudinal line 465 may be displayed with a different thickness or color from the other longitudinal lines. In addition, a channel number (e.g., No. 8) of a broadcast channel corresponding to the highlighted longitudinal line 465 is displayed at the top of the longitudinal line 465.

[192] While the upper item region and the lines are displayed, the image display apparatus 100 may sense a user input of moving the item list 410.

[193] For example, when an input of dragging down on the touch pad 235 of the control apparatus 200 is sensed as the zoom-out input, the image display apparatus 100 may sense an input of dragging left or right while maintaining a touch on a point where the drag ends. Alternatively, when an input of moving or tilting the control apparatus 200 down is sensed as the zoom-out input, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 left or right while maintaining an inclined angle of the control apparatus 200 at a point where the movement (e.g., the zoom-out input) of the control apparatus 200 ends. Alternatively, when an input of pressing a down key among four direction keys of the control apparatus 200 is sensed

as the zoom-out input, the image display apparatus 100 may sense an input of pressing a left key or right key among the four direction keys while pressing the down key.

[194] The image display apparatus 100 may move the item list 410 to change the highlighted item (e.g., the highlighted longitudinal line) in response to the sensed user input. For example, as shown in FIG. 7C, when an input of dragging right from a point where the zoom-out input ends on the touch pad 235 is sensed by the touch pad 235, the image display apparatus 100 moves the item list 410 left, i.e., in a direction opposite to the right. When the item list 410 is moved left, as shown in FIG. 7D, a longitudinal line 467 corresponding to channel No. 25 is positioned at the center of the display 120 and then highlighted.

[195] In addition, the image display apparatus 100 may set at least one of the plurality of items as a bookmark item. For example, an item corresponding to a user's preferred channel or a frequently-watched channel among the plurality of items indicating the broadcast channels may be set as the bookmark item.

[196] The image display apparatus 100 may sense a user input of moving a longitudinal line corresponding to the bookmark item in a direction toward the center (a position where the longitudinal line is highlighted) of the display 120. In this case, when a distance between the longitudinal line corresponding to the bookmark item and the center (highlighted point) of the display 120 is equal to or less than a predetermined distance, the image display apparatus 100 may quickly move the longitudinal line corresponding to the bookmark item to the center (highlighted point) of the display 120. Thus, when the longitudinal line corresponding to the bookmark item becomes close to the highlighted point, the image display apparatus 100 may move the item list such that a user feels like the longitudinal line corresponding to the bookmark item is attached to the highlighted point like a magnet.

[197] When the sensed user input is disengaged while the item list is zoomed in or out on, the image display apparatus 100 may gradually spring the zoomed-in or zoomed-out item list back to an original item list.

[198] For example, as shown in FIG. 7B, when the sensed user input is disengaged (e.g., when a user takes the hand off the touch pad 235) while the width of the plurality of items are decreased, the image display apparatus 100 may gradually increase the width of the plurality of items, thus springing the item list back to the item list of the FIG. 7A.

[199] In addition, as shown in FIG. 7C or 7D, when the sensed user input is disengaged (e.g., when a user takes the hand off the touch pad 235) while the lines corresponding to the plurality of items are displayed, the image display apparatus 100 may change the plurality of lines into the plurality of items corresponding to the lines and gradually increase the width of the plurality of items, thus springing the item list 410 back to the

item list of FIG. 7A.

[200] Alternatively, when a predetermined user input (e.g., a flip input) is sensed while the item list is zoomed out on, the image display apparatus 100 may maintain the zoom-out although the sensed user input is disengaged.

[201] While the item list is zoomed out on, the image display apparatus 100 may sense a user input of zooming back in on the item list. For example, as shown in FIG. 7D, the image display apparatus 100 senses a touch input of dragging up (e.g., in a direction corresponding to the zoom-in) on the touch pad 235 of the control apparatus 200. Alternatively, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 in the direction corresponding to the zoom-in, or may sense an input of pressing a direction key corresponding to the zoom-in among the four direction keys of the control apparatus 200.

[202] The image display apparatus 100 may gradually increase the width of lines displayed in the upper item region in response to the sensed zoom-in input. When the width of the lines exceeds a predetermined width, as shown in FIG. 7E, the image display apparatus 100 changes the lines into the plurality of items corresponding to the lines and then displays the changed items. In this case, the predetermined width may be different from the second width W2 described above in FIG. 7B.

[203] In addition, when the zoom-in input is consecutively sensed while the plurality of items are displayed, as shown in FIG. 7F, the image display apparatus 100 displays the plurality of items with a gradual increase in width.

[204] FIGS. 8A, 8B, 8C, and 8D are views illustrating an example in which an item list is zoomed in on, according to an exemplary embodiment.

[205] Referring to FIG. 8A, a display 120 displays an item list 510 including a plurality of items. The item list 510 of FIG. 8A may be the same as the item list 410 of FIG. 7A. The item list has been described in detail with reference to FIG. 7A, and thus its repetitive description will be omitted.

[206] In addition, an item 531 positioned at the center of the display 120 among the plurality of items is highlighted, and the highlighted item is visibly displayed.

[207] The image display apparatus 100 may sense a user input of zooming in on the item list 510. For example, as shown in FIG. 8A, the image display apparatus 100 senses a touch input of dragging up (i.e., in a direction corresponding to the zoom-in) on the touch pad 235 of the control apparatus 200. Alternatively, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 in the direction corresponding to the zoom-in, or may sense an input of pressing a direction key corresponding to the zoom-in among the four direction keys of the control apparatus 200.

[208] The image display apparatus 100 may gradually increase the size of the highlighted item in response to the sensed user input. For example, as shown in FIG. 8B, the image

display apparatus 100 gradually increases the width of the highlighted first item 531 from the first width W1 to a third width W3 in response to the zoom-in input. In addition, when the zoom-in input is consecutively sensed while the width of the first item 531 is increased to the third width W3, as shown in FIG. 8C, the image display apparatus 100 displays detailed information about content corresponding to the first item 531 while gradually increasing the width of the first item 531 to a fourth width W4.

[209] In this case, the detailed information about content may include a screen image obtained by executing the content last, a date at which the content is executed last, a type of the content, and a person present in the content. For example, when the content is a broadcast channel, the detailed information about the content may include information about a program that is broadcast on the broadcast channel in real time.

[210] While the highlighted item is displayed with an increase in width, the image display apparatus 100 may sense a user input of moving the item list 510.

[211] For example, when an input of dragging up on the touch pad of the control apparatus 200 is sensed as the zoom-in input, the image display apparatus 100 may sense an input of dragging left or right while maintaining a touch on a point where the drag ends. Alternatively, when an input of moving or tilting the control apparatus 200 up is sensed as the zoom-in input, the image display apparatus 100 may sense an input of moving or tilting the control apparatus 200 left or right while maintaining an inclined angle of the control apparatus 200 at a point where the movement (e.g., the zoom-in input) of the control apparatus 200 ends and may move the item list. Alternatively, when an input of pressing an up key among four direction keys of the control apparatus 200 is sensed as the zoom-in input, the image display apparatus 100 may sense an input of pressing a left key or right key among the four direction keys while pressing the up key.

[212] The image display apparatus 100 may move the item list 510 to change the highlighted item in response to the sensed user input. For example, as shown in FIG. 8C, when an input of dragging right on the touch pad of the control apparatus 200 is sensed, the image display apparatus 100 moves the item list 510 left, i.e., in a direction opposite to the right. When the item list 510 is moved left, as shown in FIG. 8D, a second item 532 having been positioned at a right side of the first item 531 is moved to the center of the display 120 and then highlighted.

[213] In this case, the width of the first item 531 is decreased from the fourth width W4 to the first width W1, and the width of the second item 532 is increased from the first width W1 to the fourth width W4. In addition, detailed information having been displayed in the first item 531 is not displayed, and detailed information about a second item 532 is displayed in the second item 532.

- [214] When the sensed user input is disengaged while the width of the highlighted item is increased or detailed information is displayed, the image display apparatus 100 may spring the item list back to its original state.
- [215] For example, as shown in FIG. 8C, when the sensed user input is disengaged (e.g., when a user takes the hand off the touch pad) while the item list is zoom in on, the image display apparatus 100 may spring the item list 510 back to the item list of FIG. 8A by gradually decreasing the width of the highlighted item and not displaying the detailed information.
- [216] FIGS. 9A and 9B are views illustrating an example in which an item list is zoomed in on, according to another exemplary embodiment.
- [217] Referring to FIG. 9A, a display 120 displays an item list 610 including a plurality of items. The item list 610 of FIG. 9a may be the same as the item list 410 of FIG. 7A. The item list has been described in detail with reference to FIG. 7A, and thus its repetitive description will be omitted.
- [218] In addition, an item 631 positioned at the center of the display 120 among the plurality of items is highlighted, and the highlighted item is visibly displayed.
- [219] The image display apparatus 100 may sense a user input of zooming in on the item list. For example, as shown in FIG. 9A, the image display apparatus 100 senses a touch input of dragging up (e.g., in a direction corresponding to the zoom-in) on the touch pad 235 of the control apparatus 200.
- [220] The image display apparatus 100 may display an upper item including a plurality of items in response to the sensed zoom-in input.
- [221] For example, when the plurality of items included in the item list 610 of FIG. 9A are items indicating broadcast channels, as shown in FIG. 9B, the image display apparatus 100 displays category item "CHANNEL" 641 including the items indicating the broadcast channels in the item list 610. In addition, the image display apparatus 100 displays another category item (e.g., category item "APPS," category item "HISTORY," and category item "GAME") having the same depth as category item "CHANNEL" in the item list 610. In this case, category item "CHANNEL" 641 is positioned at the center of the display 120 and then highlighted.
- [222] FIGS. 10A, 10B, 10C, 10D, 10E, and 10F are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to another exemplary embodiment.
- [223] Referring to FIG. 10A, a display 120 displays an item list 710 including a plurality of items at the bottom of the display 120. The item list 710 of FIG. 10A may be the same as the item list 310 of FIG. 6A, and thus its repetitive description will be omitted.
- [224] Referring again to FIG. 10A, any one item 715 is highlighted among the plurality of items, and the highlighted item 715 is visibly displayed. For example, the image

display apparatus 100 may highlight any one of the plurality of items by changing the color of the item or displaying a quadrangular box around the border of the item.

[225] When a user input of moving the highlight is sensed, the image display apparatus 100 may move the highlight to change the highlighted item in accordance with a direction of the user input. For example, as shown in FIG. 10A, when the item list 710 is a list in which items are transversely arranged, the image display apparatus 100 may sense an input of moving the highlight left or right and change the highlighted item.

[226] In addition, when the image display apparatus 100 senses a user input of zooming out on the item list 710, as shown in FIG. 10B, the image display apparatus 100 displays lower items included in the highlighted item in the item list 710.

[227] For example, when an input of zooming out on the item list (e.g., a touch input of dragging down on the touch pad 235 of the control apparatus 200) is sensed while category item "CHANNEL" 715 is highlighted, as shown in FIG. 10B, the image display apparatus 100 displays items 731, 732, and 733 indicating broadcast channels included in category item "CHANNEL" 715 in the item list 710.

[228] In addition, the image display apparatus 100 may sense a user input of moving the highlight while the lower items of category item "CHANNEL" are displayed. The image display apparatus 100 may move the highlight to change the highlighted item in response to the sensed user input.

[229] For example, as shown in FIG. 10B, when a touch input of dragging right on the touch pad 235 is sensed, the image display apparatus 100 moves the highlight right. When the highlight is moved right, as shown in FIG. 10C, an item 738 corresponding to channel No. 8 is highlighted.

[230] In addition, when a user input of zooming out on the item list is sensed while the lower items of category item "CHANNEL" are displayed, the image display apparatus 100 may gradually decrease the size (e.g., width) of the lower items. In addition, when the zoom-out input is consecutively sensed while the width of the items is decreased to a predetermined width (e.g., the second width W2), as shown in FIG. 10D, the image display apparatus 100 displays an upper item region 750 including lower items in the item list 710.

[231] In addition, the image display apparatus 100 displays lines 760 corresponding to the lower items in the upper item region 750 such that the lines are listed in succession. This has been described in detail with reference to FIG. 7C, and its repetitive description will be omitted.

[232] In this case, any one line 765 is highlighted among the plurality of lines 760, and the highlighted line 765 may be displayed with a different thickness or color from the other lines.

[233] While the upper item region and the lines are displayed, the image display apparatus

100 may sense a user input of moving the highlight. The user input of moving the highlight may be the same as the user input of moving the item list described in FIG. 7C.

- [234] The image display apparatus 100 may move the highlight to change the highlighted item (e.g., the highlighted longitudinal line) in response to the sensed user input. For example, as shown in FIG. 10D, when an input of dragging right from a point where the zoom-out input ends on the touch pad 235 is sensed, the image display apparatus 100 moves the highlight right. When the highlight is moved right, as shown in FIG. 10E, a longitudinal line 767 corresponding to channel No. 25 is highlighted.
- [235] The image display apparatus 100 may sense a user input of zooming in on the item list. For example, as shown in FIG. 10E, the image display apparatus 100 senses a touch input of dragging up (e.g., in a direction corresponding to the zoom-in) on the touch pad 235 of the control apparatus 200.
- [236] The image display apparatus 100 may gradually increase the width of lines displayed in the upper item region 750 in response to the sensed zoom-in input. When the width of the lines exceeds a predetermined width, as shown in FIG. 10F, the image display apparatus 100 changes the lines into the plurality of items corresponding to the lines and then displays the changed items.
- [237] In addition, when the zoom-in input (e.g., a touch input of dragging up on the touch pad) is consecutively sensed while the plurality of items are displayed, as shown in FIG. 10F, the image display apparatus 100 displays the plurality of items with a gradual increase in width. In addition, when the zoom-in input is consecutively sensed, as shown in FIG. 10G, the image display apparatus 100 displays, in the highlighted item, detailed information about content corresponding to the item.
- [238] FIGS. 11A, 11B, 11C, 11D, 11E, 11F, and 11G are views illustrating an example in which an item list is zoomed out on and then zoomed in on, according to another exemplary embodiment.
- [239] Referring to FIG. 11A, a display 120 displays an item list 810 including a plurality of items at the bottom of the display 120. The item list 810 of FIG. 11A may be the same as the item list 310 of FIG. 6A.
- [240] Referring again to FIG. 11A, the display 120 displays a cursor 820 indicating a position of a user input. The cursor 820 may be moved on the display 120 in response to the sensed user input.
- [241] In FIG. 11A, the cursor 820 is shown to be a circle, but is not limited thereto. The cursor 820 may have various shapes and sizes. The shape and size of the cursor 820 may be set variously on the basis of a user input.
- [242] The cursor 820 may be positioned in any one of a plurality of items included in the item list 810. When the cursor 820 is positioned in any one of the plurality of items, an

item 815 is highlighted, and the highlighted item 815 is visibly displayed. For example, the image display apparatus 100 may highlight the item by changing the color of the highlighted item or displaying a quadrangular box around the border of the item.

[243] When a user input of moving the cursor is sensed, the image display apparatus 100 may move the cursor to change the highlighted item in accordance with a direction of the user input. For example, as shown in FIG. 11A, when the item list 810 is a list in which items are transversely arranged, the image display apparatus 100 may move the cursor 820 and change the highlighted item according to the position of the cursor 820 in response to an input of moving the cursor 820 left or right.

[244] In addition, when the image display apparatus 100 senses a user input of zooming out on the item list 810, as shown in FIG. 11B, the image display apparatus 100 displays lower items included in the highlighted item in the item list 810.

[245] For example, when an input of zooming out on the item list (e.g., an input of moving the cursor 820 down) is sensed while category item "CHANNEL" 815 is highlighted, as shown in FIG. 11B, the image display apparatus 100 displays lower items (e.g., items indicating broadcast channels) included in category item "CHANNEL" in the item list 810. When the cursor 820 is positioned in any one of the plurality of items, an item 836 is highlighted, and the highlighted item 836 is visibly displayed.

[246] In addition, the image display apparatus 100 may sense a user input of moving the cursor 820 while the lower items of category item "CHANNEL" are displayed. The image display apparatus 100 may move the cursor 820 and change the highlighted item according to the position of the cursor 820, in response to the sensed user input.

[247] For example, when an input of moving the cursor right (e.g., a touch input of dragging right on the touch pad 235 of the control apparatus 200) is sensed, the image display apparatus 100 may move the cursor 820 displayed on the display 120 right in response to the sensed input. Thus, as shown in FIG. 11C, the cursor 820 is moved to an item 838 corresponding to channel No. 8, and the item 838 corresponding to No. 8 is highlighted.

[248] In addition, when a user input of zooming out on the item list is sensed while the lower items of category item "CHANNEL" are displayed, the image display apparatus 100 may gradually decrease the size (e.g., width) of the lower items. In addition, when the zoom-out input is consecutively sensed while the width of the items is decreased to a predetermined width (e.g., W2), as shown in FIG. 11D, the image display apparatus 100 displays an upper item region 850 including lower items in the item list 810.

[249] In addition, the image display apparatus 100 displays lines 860 corresponding to the lower items in the upper item region 850 such that the lines are listed in succession. This has been described in detail with reference to FIG. 7C, and its repetitive description will be omitted.

- [250] In this case, the cursor 820 may be positioned on any one line 865 among the plurality of lines. When the cursor 820 is positioned on any one line among the plurality of lines, a line 865 is highlighted, and the highlighted line 865 may be displayed with a different thickness or color from the other lines.
- [251] While the lines are displayed in the upper item region 850, the image display apparatus 100 may sense a user input of moving the cursor 820. The user input of moving the cursor 820 may be the same as the user input of moving the item list described in FIG. 7C.
- [252] The image display apparatus 100 may move the cursor 820 to change the highlighted line in response to the sensed user input. For example, as shown in FIG. 11D, when an input of dragging right from a point where the zoom-out input ends on the touch pad 235 is sensed, the image display apparatus 100 moves the cursor 820 right. When the cursor 820 is moved right, as shown in FIG. 11E, a longitudinal line 867 corresponding to channel No. 25 is highlighted.
- [253] The image display apparatus 100 may sense a user input of zooming in on the item list. For example, as shown in FIG. 11E, the image display apparatus 100 senses a touch input of dragging up (e.g., in a direction corresponding to the zoom-in) on the touch pad 235 of the control apparatus 200.
- [254] The image display apparatus 100 may gradually increase the width of lines displayed in the upper item region in response to the sensed zoom-in input. When the width of the lines exceeds a predetermined width, as shown in FIG. 11F, the image display apparatus 100 changes the lines into the plurality of items corresponding to the lines and then displays the changed items.
- [255] In addition, when the zoom-in input (e.g., a touch input of dragging up on the touch pad) is consecutively sensed while the plurality of items is displayed, the image display apparatus 100 may display the plurality of items with a gradual increase in width. In addition, when the zoom-in input is consecutively sensed, as shown in FIG. 11G, the image display apparatus 100 displays, in the highlighted item, detailed information about content corresponding to the item.
- [256] FIG. 12 is a flowchart showing an image display method according to an exemplary embodiment.
- [257] Referring to FIG. 12, the image display apparatus 100 displays an item list including a plurality of items (S910).
- [258] For example, the item list according to an exemplary embodiment may include an item indicating a category and an item indicating content. The category item may include, as lower items, items indicating content classified into a corresponding category. The item list may be a list in which a plurality of items is arranged in a transverse direction or a longitudinal direction.

- [259] The image display apparatus 100 senses a first input for zooming out on the item list or a second input for zooming in on the item list (S920).
- [260] For example, the first input for zooming out on the item list may include a touch input of dragging in a direction corresponding to the zoom-out (e.g., down) on the touch pad 235 on a condition that the control apparatus 200 includes the touch pad 235, a user input of moving or tilting the control apparatus 200 in a direction corresponding to the zoom-out on a condition that the control apparatus 200 is the pointing device, and an input of pressing a direction key corresponding to the zoom-out among four direction keys on a condition that the control apparatus 200 includes the four direction keys.
- [261] In addition, the second input for zooming in on the item list may include a touch input of dragging in a direction corresponding to the zoom-in (e.g., up) on the touch pad 235 of the control apparatus 200, an input of moving or tilting the control apparatus 200 in the direction corresponding to the zoom-in, and an input of pressing a direction key corresponding to the zoom-in among the four direction keys of the control apparatus 200.
- [262] The image display apparatus 100 displays the plurality of items with a decrease in size in response to the first input, or displays the plurality of items with an increase in size in response to the second input (S930).
- [263] For example, the image display apparatus 100 may gradually decrease the width of the plurality of items included in the item list in response to the first input. In this case, the image display apparatus 100 may further decrease the width of the plurality of items as the size of the first input increases. In addition, the image display apparatus 100 may display an upper item region including the plurality of items, and may display lines corresponding to the plurality of items in the upper item region such that the lines are listed in succession, in response to the first input.
- [264] The image display apparatus 100 may display lower items included in at least one of the plurality of items in response to the first input.
- [265] The image display apparatus 100 may gradually increase the width of the plurality of items included in the item list in response to the second input. In addition, the image display apparatus 100 may display detailed information about content corresponding to at least one of the plurality of items in response to the second input.
- [266] The image display apparatus 100 may gradually increase the width of lines displayed in the upper item region in response to the second input. When the width of the lines exceeds a predetermined width, the image display apparatus 100 may change the lines into the plurality of items corresponding to the lines and then display the changed items.
- [267] According to an exemplary embodiment, a user may easily and quickly retrieve an

item from an item list, or move between a plurality of items in the item list by zooming in/out on the item list.

[268] According to an exemplary embodiment, a user may easily and quickly search for content by setting a bookmark item.

[269] While not restricted thereto, an exemplary embodiment can be embodied as computer-readable code on a computer-readable recording medium. For example, a control program that controls the above-described operations may be embodied as computer-readable code on a computer-readable recording medium. The computer-readable recording medium is any data storage device that can store data that can be thereafter read by a computer system. Examples of the computer-readable recording medium include read-only memory (ROM), random-access memory (RAM), CD-ROMs, magnetic tapes, floppy disks, and optical data storage devices. The computer-readable recording medium can also be distributed over network-coupled computer systems so that the computer-readable code is stored and executed in a distributed fashion. Also, an exemplary embodiment may be written as a computer program transmitted over a computer-readable transmission medium, such as a carrier wave, and received and implemented in general-use or special-purpose digital computers that execute the programs. Moreover, it is understood that in exemplary embodiments, one or more units can include circuitry, a processor, a microprocessor, etc., and may execute a computer program stored in a computer-readable medium.

[270] The foregoing exemplary embodiments are examples and are not to be construed as limiting. The present teaching can be readily applied to other types of apparatuses. Also, the description of exemplary embodiments is intended to be illustrative, and not to limit the scope of the claims, and many alternatives, modifications, and variations will be apparent to those skilled in the art.

Claims

- [Claim 1] An image display apparatus comprising:
a display configured to display an item list including items;
a sensor configured to sense a first input for zooming out on the item list, and sense a second input for zooming in on the item list; and
a controller configured to control the display to display the items with a decrease in size in response to the sensor sensing the first input, and display the items with an increase in size in response to the sensor sensing the second input.
- [Claim 2] The image display apparatus of claim 1, wherein the first input includes at least one among an input of dragging in a first direction on a touch pad included in a control apparatus controlling the image display apparatus, an input of tilting the control apparatus in a second direction, and an input of pressing a first direction key among four direction keys included in the control apparatus.
- [Claim 3] The image display apparatus of claim 2, wherein the second input includes at least one among an input of dragging in a third direction opposite to the first direction on the touch pad, an input of tilting the control apparatus in a fourth direction opposite to the second direction, and an input of pressing a second direction key in a direction opposite to the first direction key among the four direction keys.
- [Claim 4] The image display apparatus of claim 1, wherein the controller is further configured to control the display to display lower items included in at least one among the items in response to the sensor sensing the first input.
- [Claim 5] The image display apparatus of claim 1, wherein the controller is further configured to control the display to display an upper item region including lines corresponding to the items, the lines being listed in succession, in response to the sensor sensing the first input.
- [Claim 6] The image display apparatus of claim 5, wherein the controller is further configured to control the display to change the lines into the items, and display the items, in response to the sensor sensing the second input while the lines are displayed.
- [Claim 7] The image display apparatus of claim 1, wherein the controller is further configured to set at least one among the items as a bookmark item,
the sensor is further configured to sense a user input of moving the

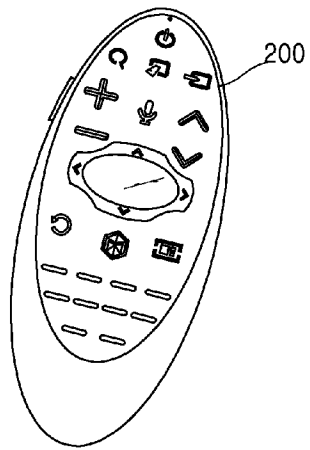
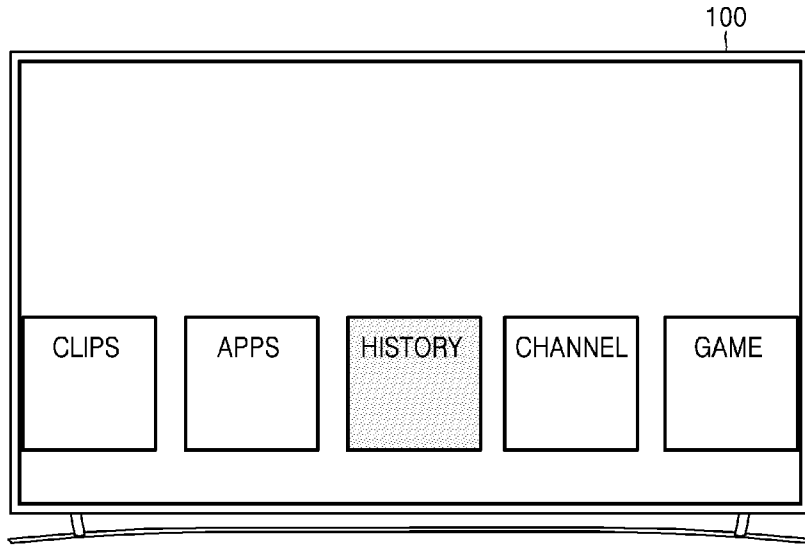
- bookmark item in a direction toward a point that is highlighted among the display, and
the controller is further configured to control the display to increase a moving speed of the bookmark item, and move the bookmark item to the highlighted point, in response to the sensor sensing the user input and a distance between the bookmark item and the highlighted point being equal to or less than a value.
- [Claim 8] The image display apparatus of claim 1, wherein the controller is further configured to control the display to display an upper item including the items in response to the sensor sensing the second input.
- [Claim 9] An image display method of an image display apparatus, the image display method comprising:
displaying an item list including items;
sensing a first input for zooming out on the item list, or a second input for zooming in on the item list;
displaying the items with a decrease in size in response to the sensing the first input; and
displaying the items with an increase in size in response to the sensing the second input.
- [Claim 10] The image display method of claim 9, wherein the first input includes at least one among an input of dragging in a first direction on a touch pad included in a control apparatus controlling the image display apparatus, an input of tilting the control apparatus in a second direction, and an input of pressing a first direction key among four direction keys included in the control apparatus.
- [Claim 11] The image display method of claim 10, wherein the second input includes at least one among an input of dragging in a third direction opposite to the first direction on the touch pad, an input of tilting the control apparatus in a fourth direction opposite to the second direction, and an input of pressing a second direction key in a direction opposite to the first direction key among the four direction keys.
- [Claim 12] The image display method of claim 9, further comprising displaying lower items included in at least one among the items in response to the sensing the first input.
- [Claim 13] The image display method of claim 9, further comprising displaying an upper item region including lines corresponding to the items, the lines being listed in succession, in response to the sensing the first input.
- [Claim 14] The image display method of claim 13, further comprising changing the

lines into the items, and displaying the items, in response to the sensing the second input while the lines are displayed.

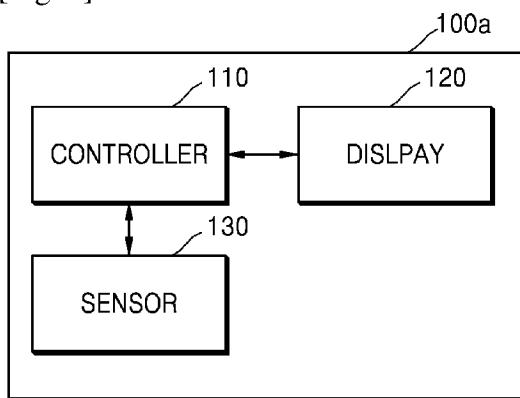
[Claim 15]

The image display method of claim 9, further comprising:
setting at least one among the items as a bookmark item;
sensing a user input of moving the bookmark item in a direction toward a point that is highlighted among a display; and
increasing a moving speed of the bookmark item, and moving the bookmark item to the highlighted point, in response to the sensing the user input and a distance between the bookmark item and the highlighted point being equal to or less than a value.

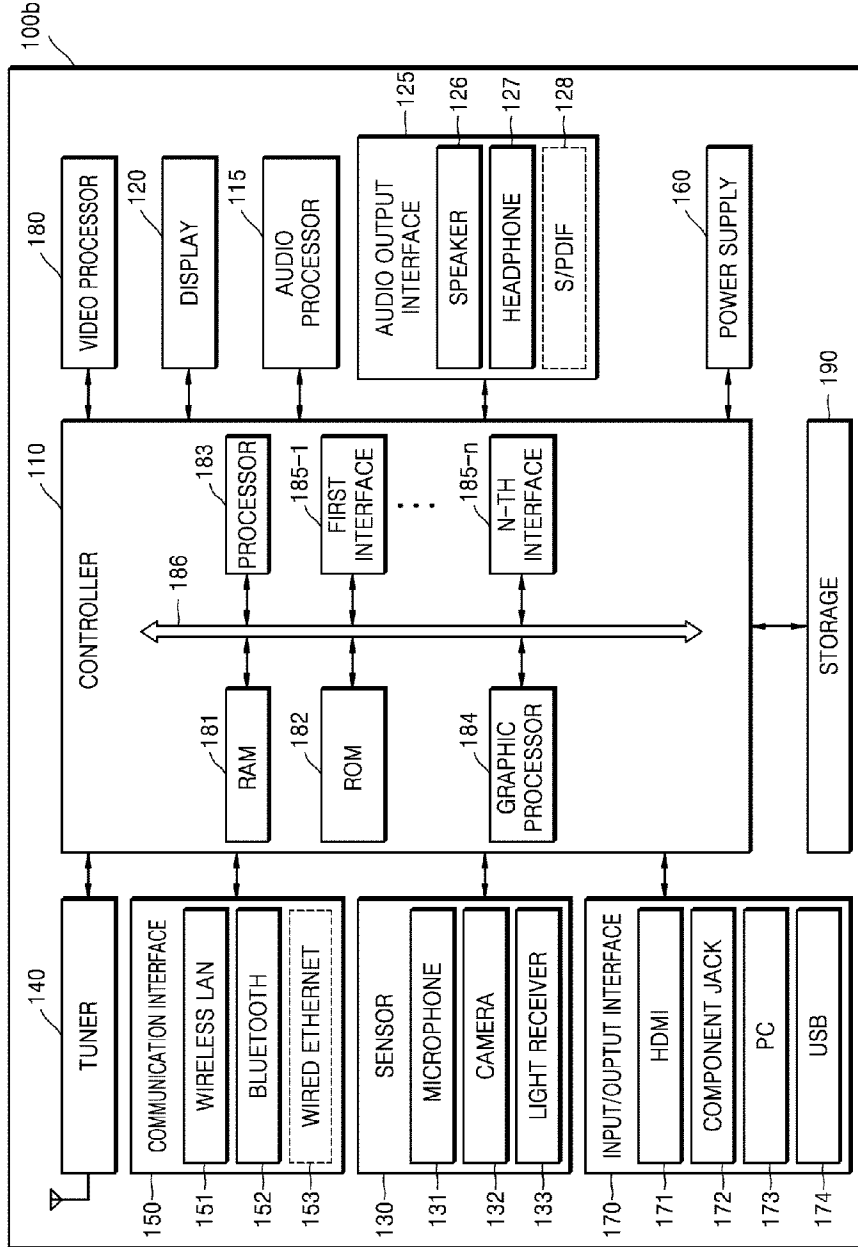
[Fig. 1]



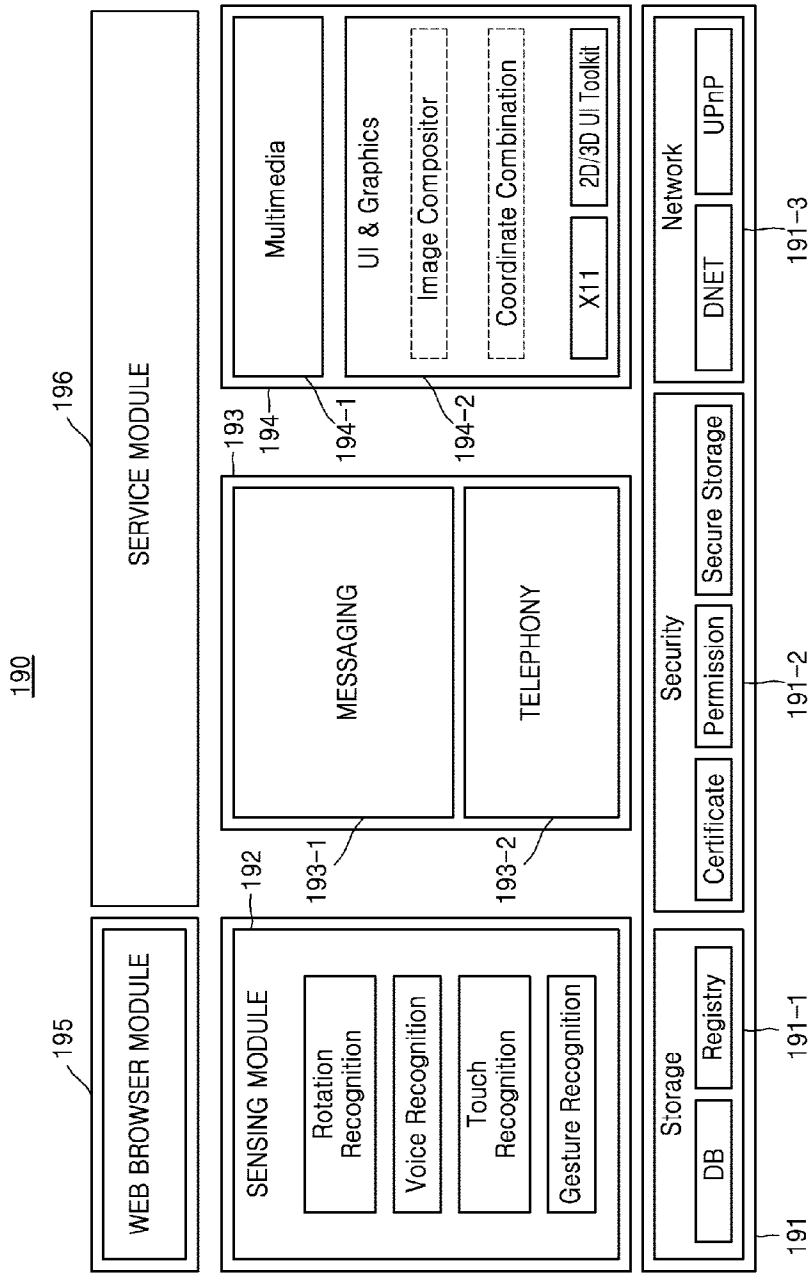
[Fig. 2]



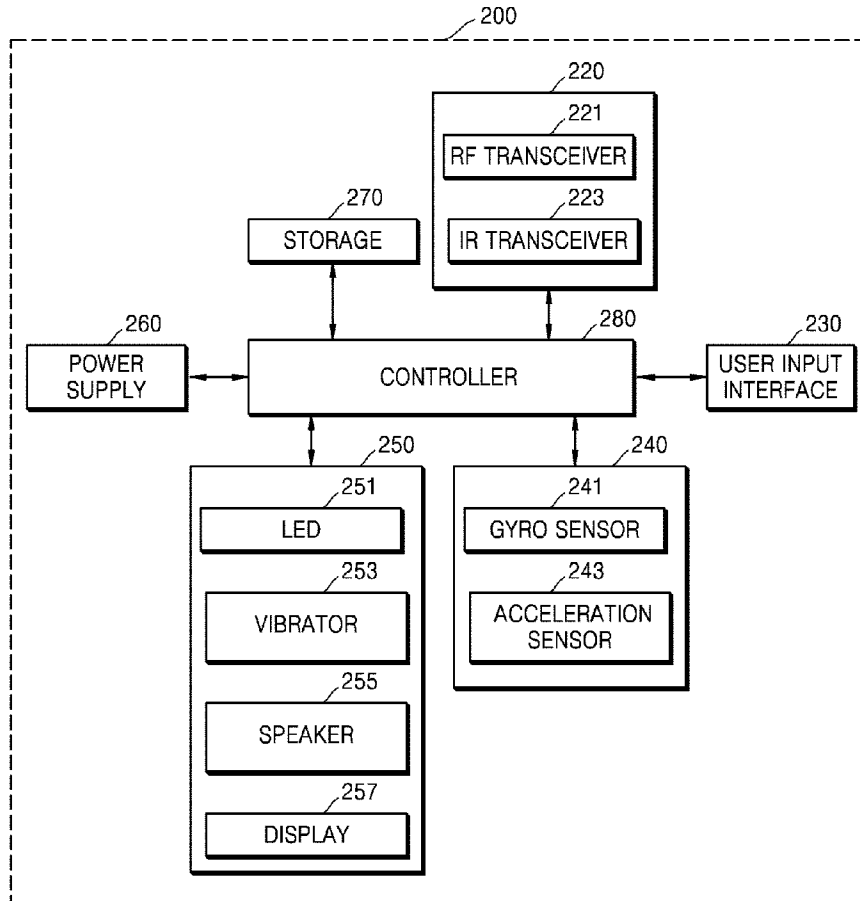
[Fig. 3]



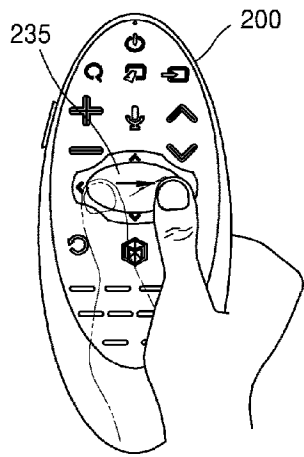
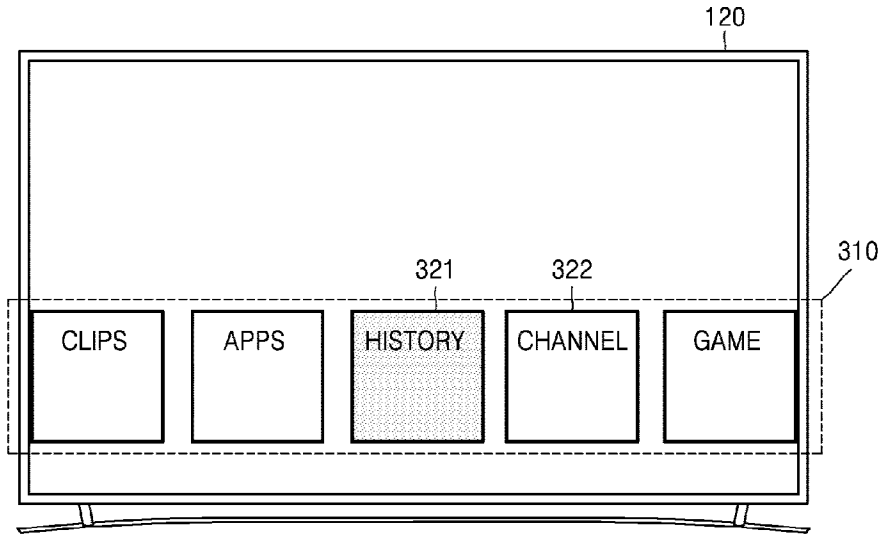
[Fig. 4]



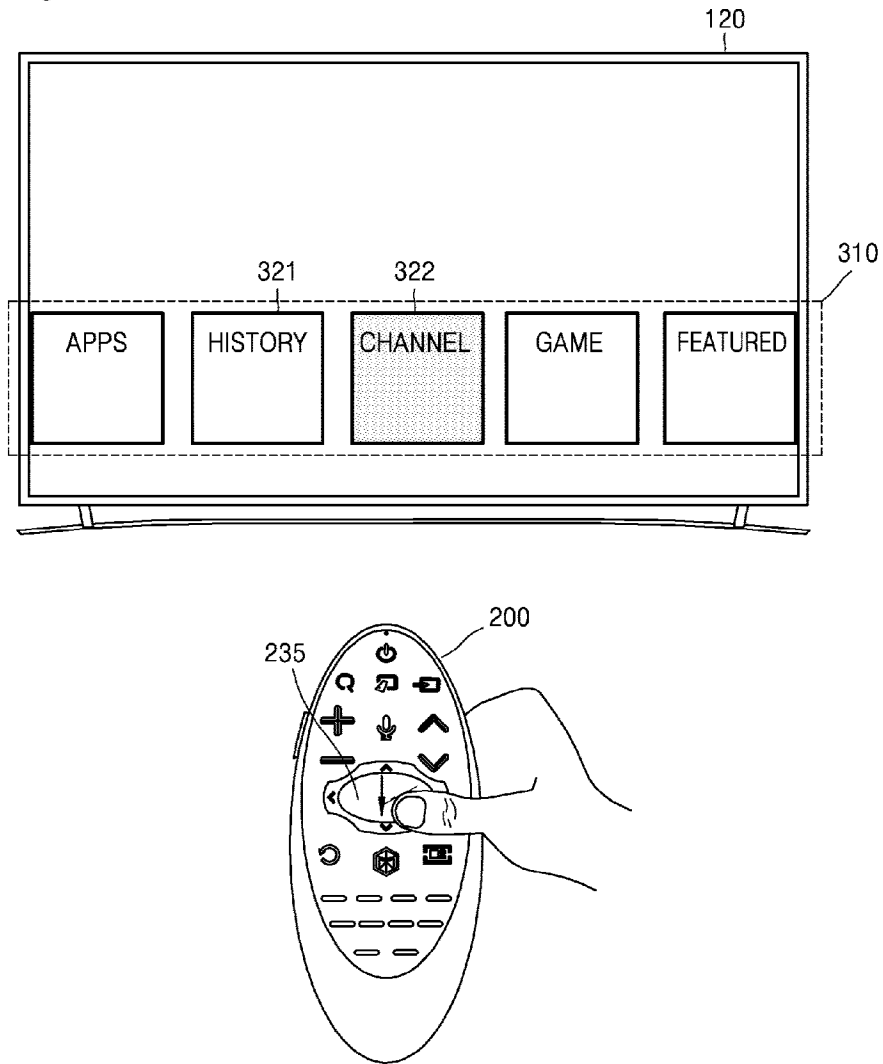
[Fig. 5]



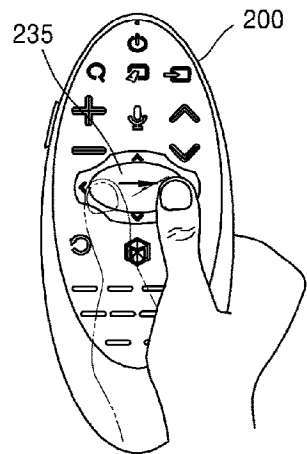
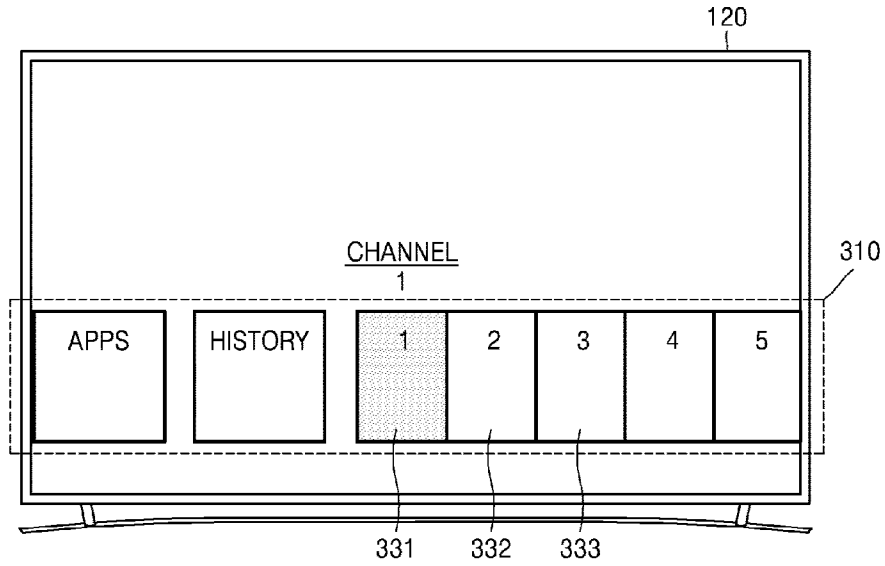
[Fig. 6A]



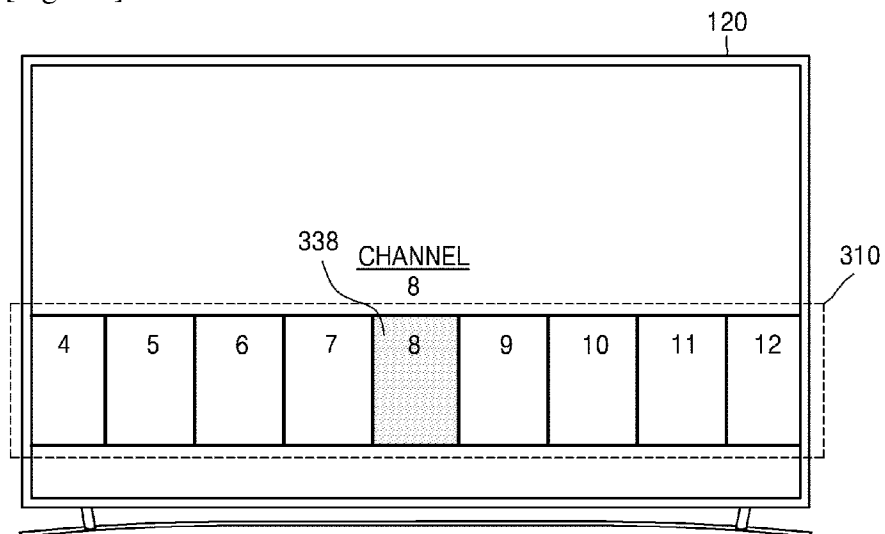
[Fig. 6B]



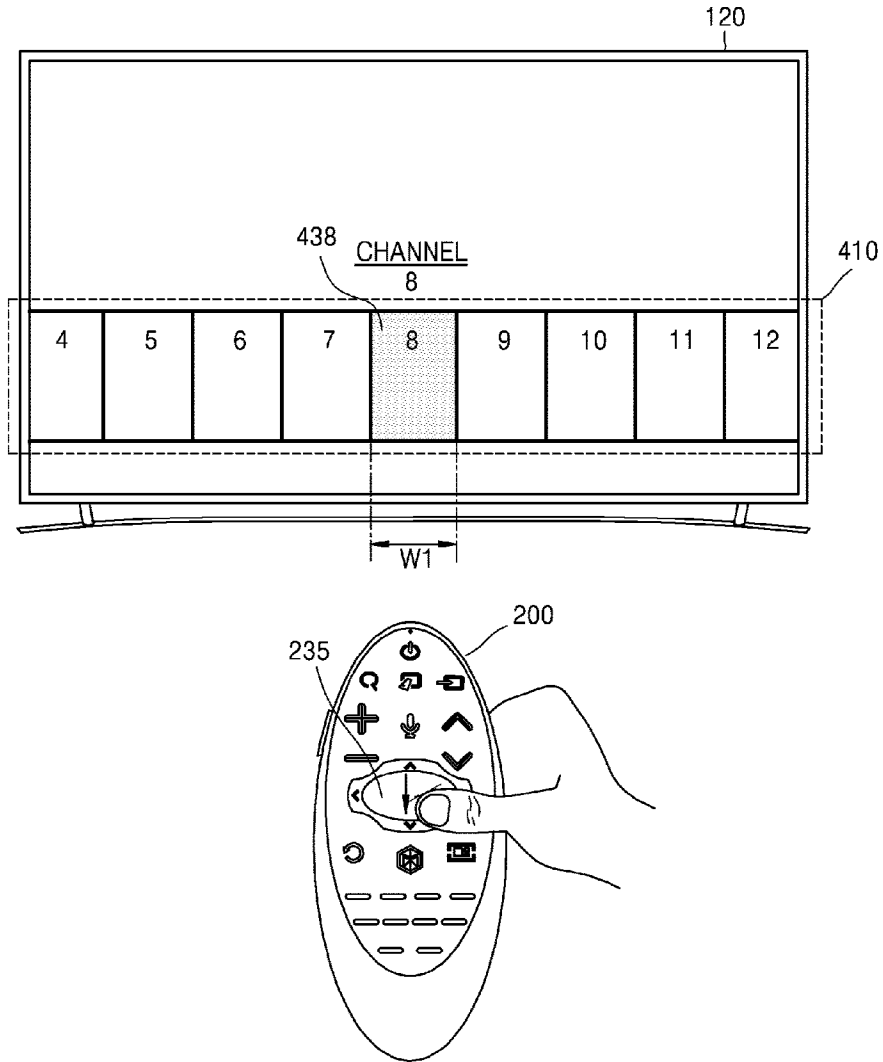
[Fig. 6C]



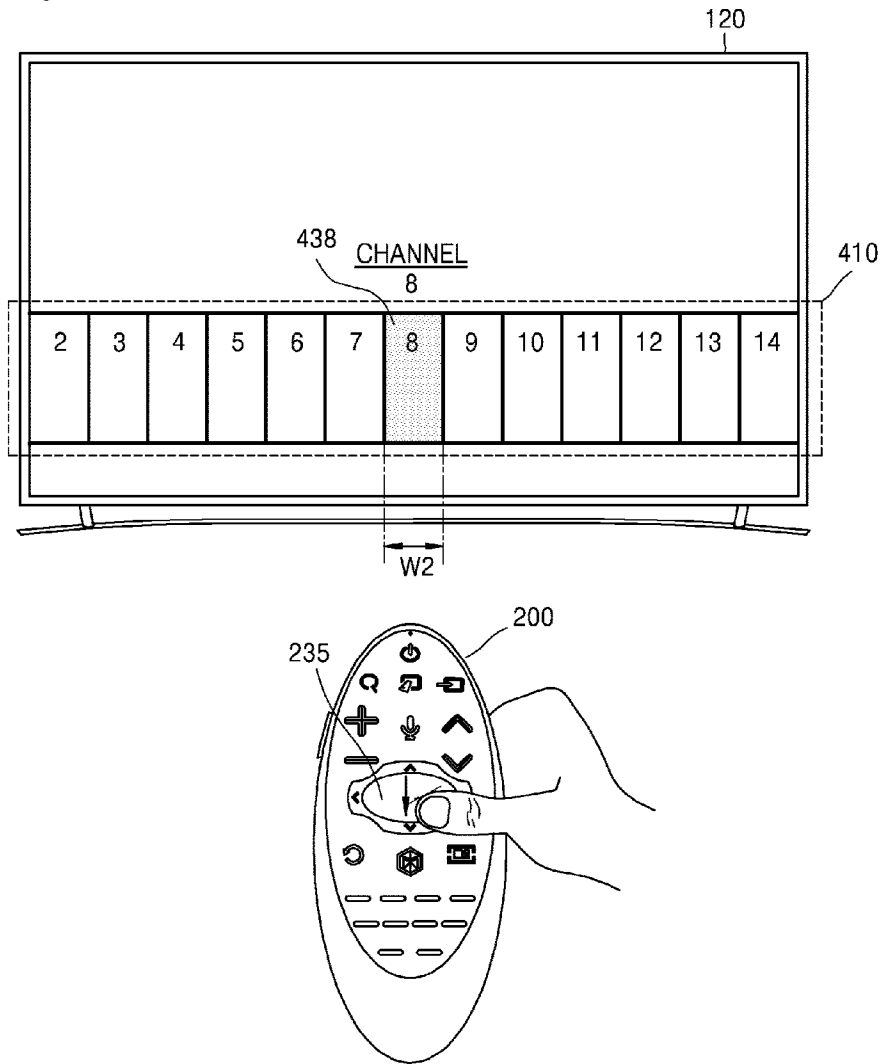
[Fig. 6D]



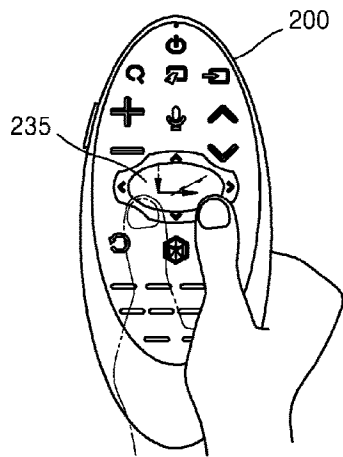
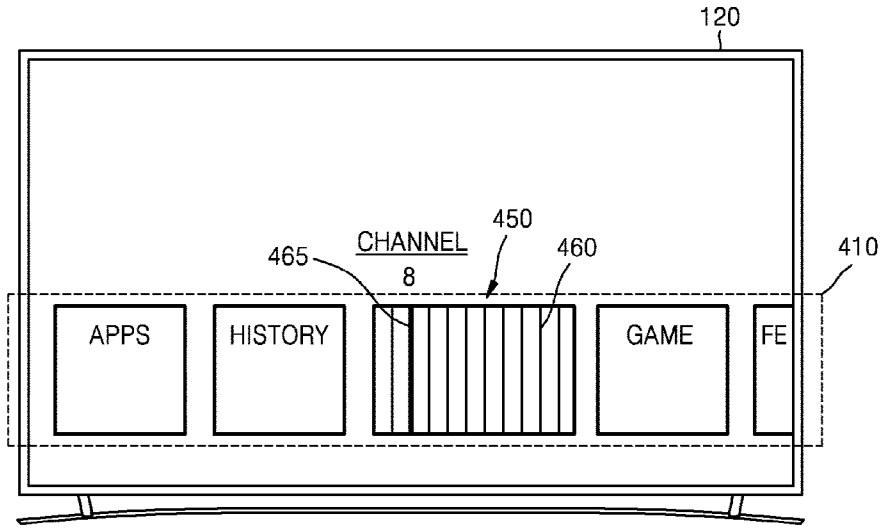
[Fig. 7A]



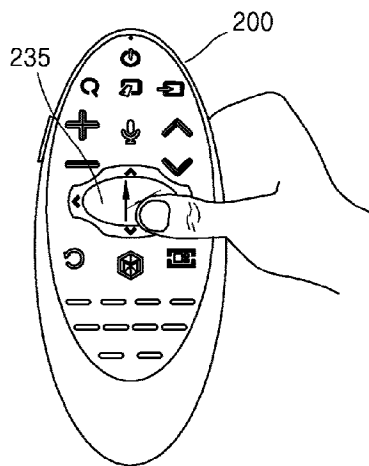
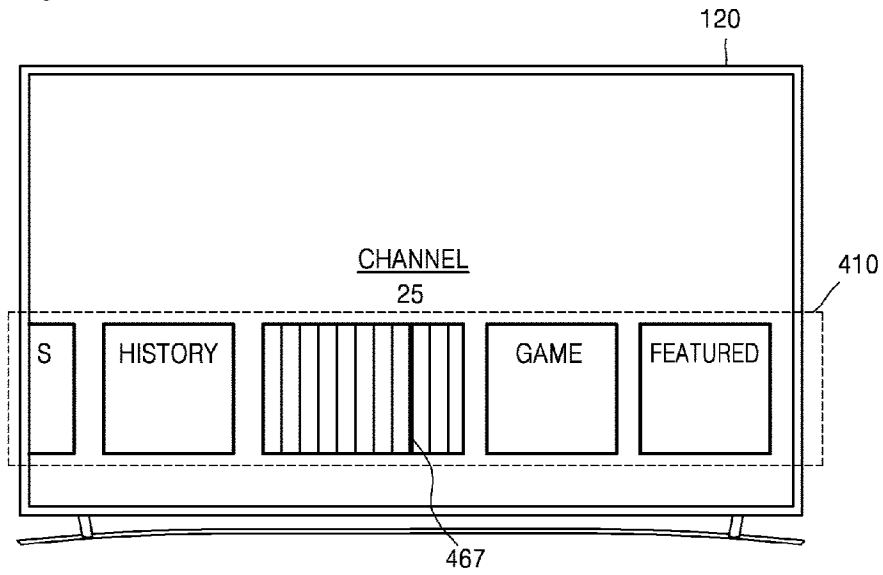
[Fig. 7B]



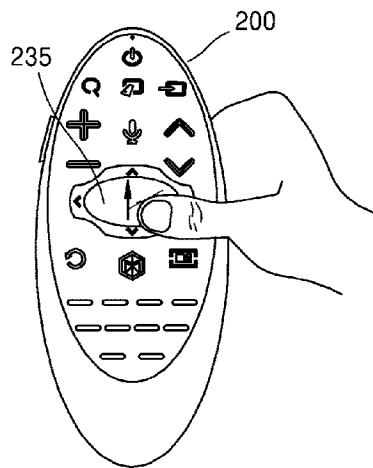
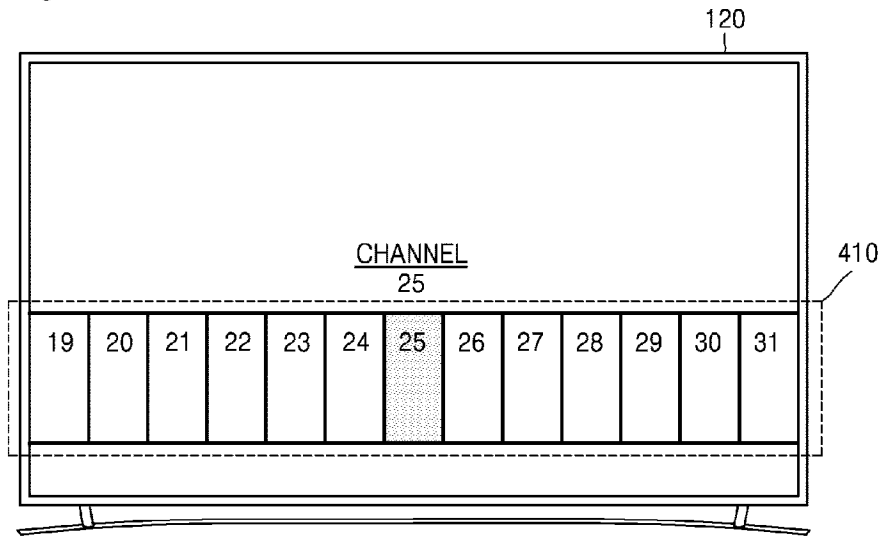
[Fig. 7C]



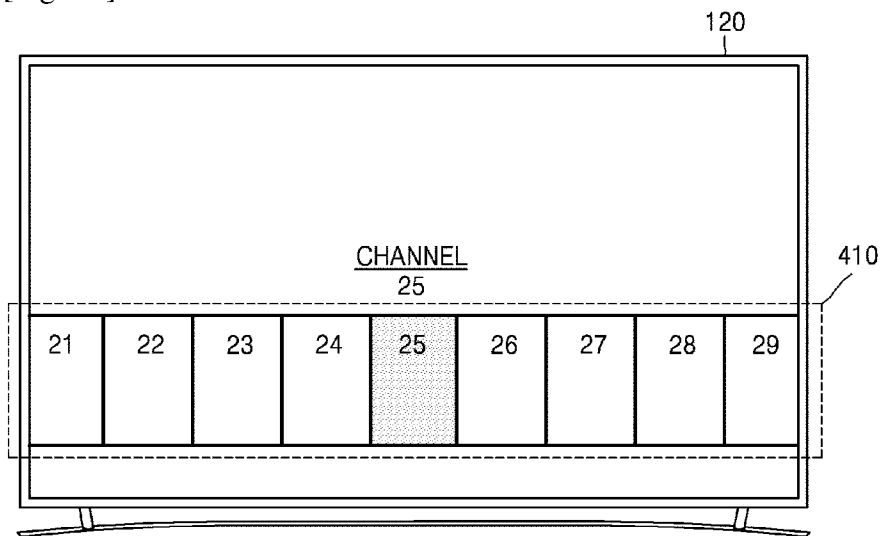
[Fig. 7D]



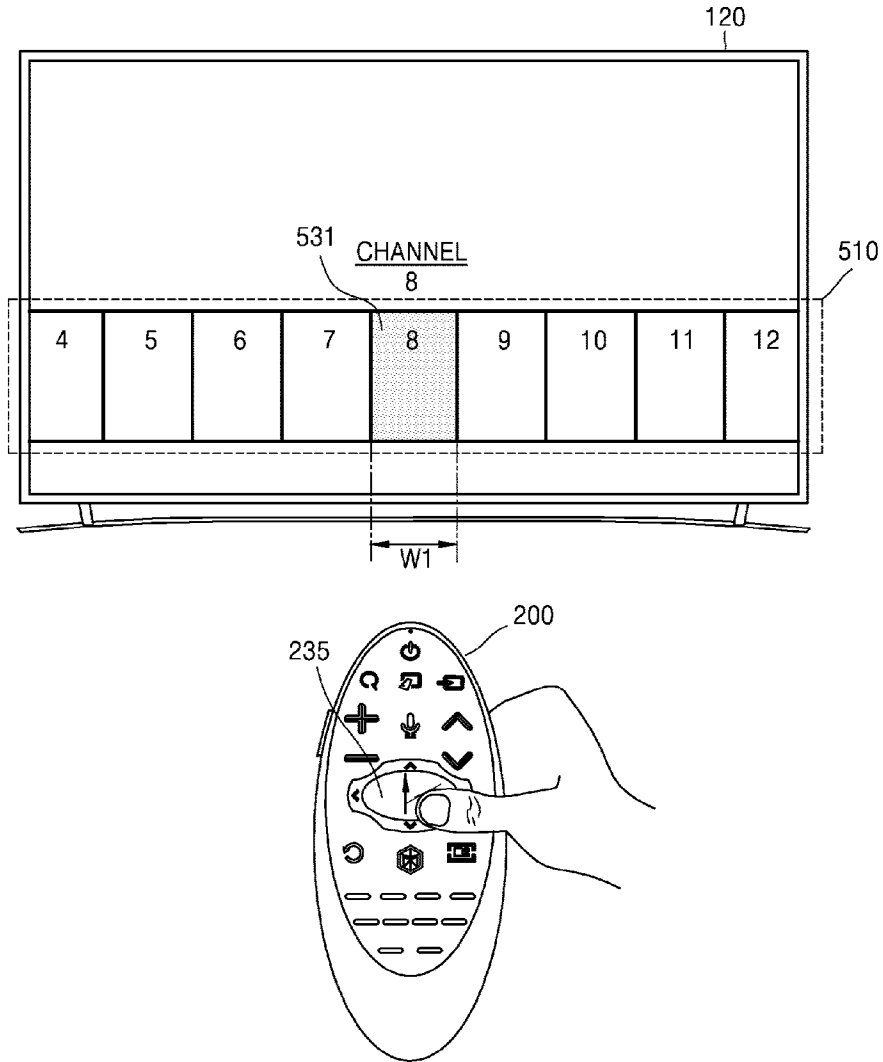
[Fig. 7E]



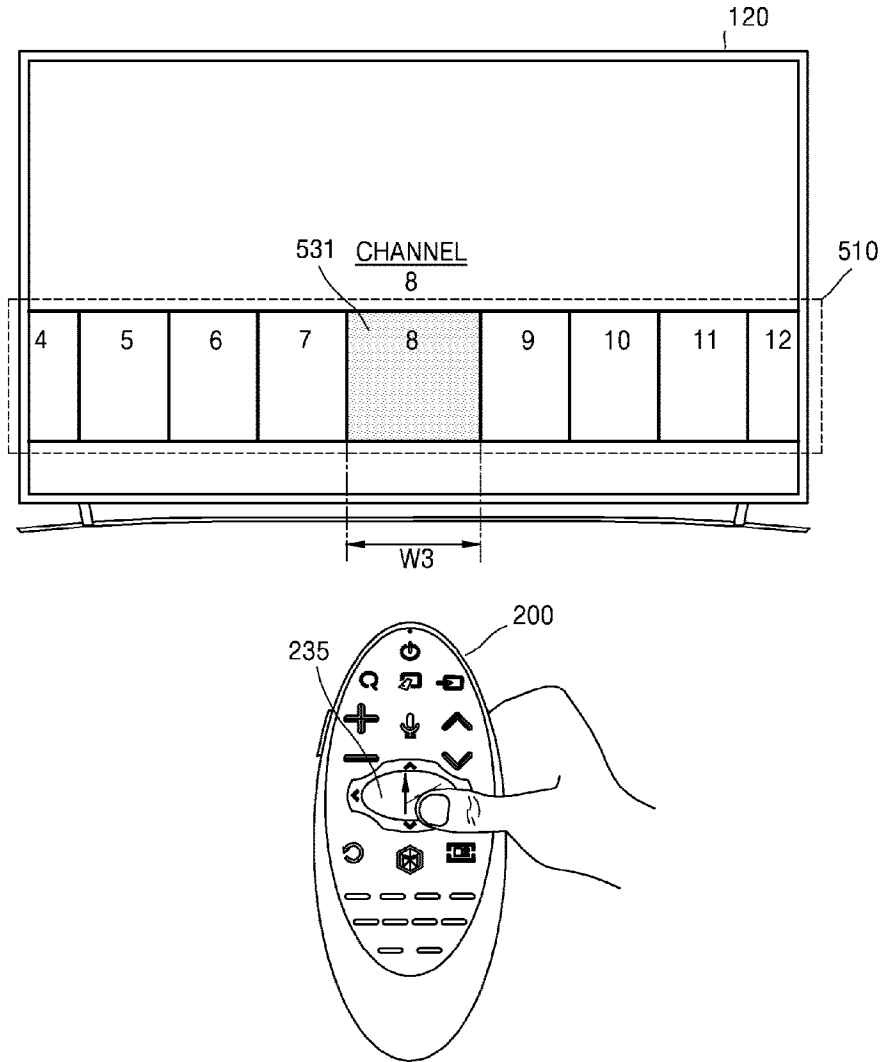
[Fig. 7F]



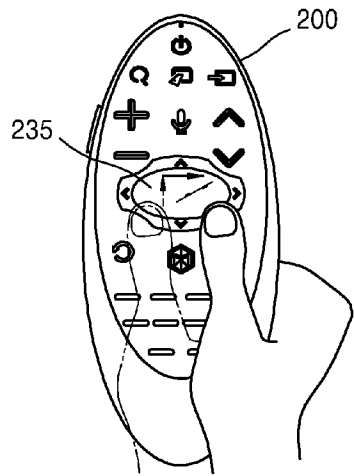
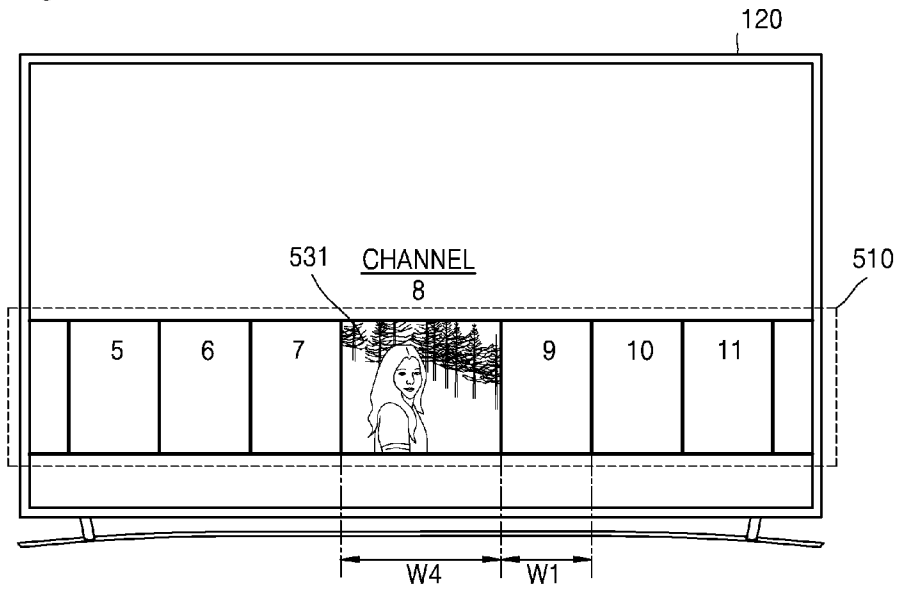
[Fig. 8A]



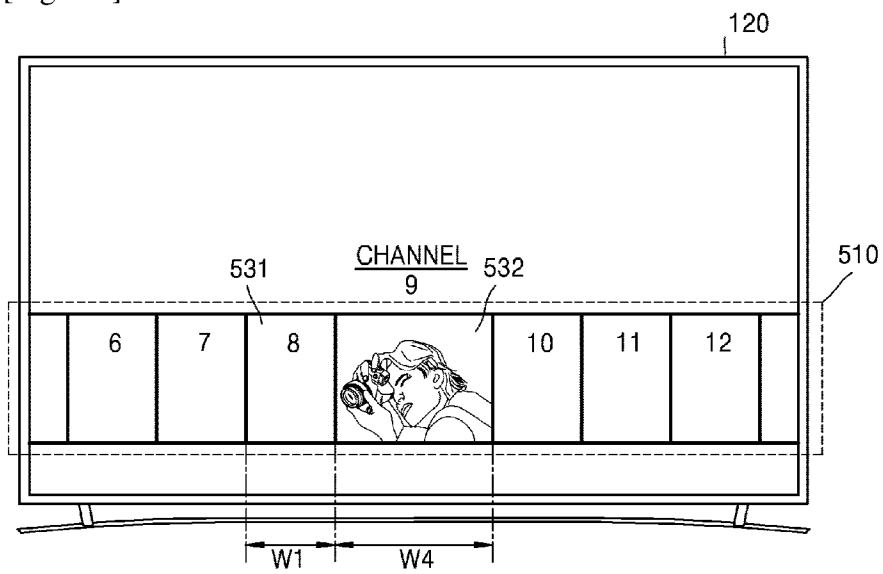
[Fig. 8B]



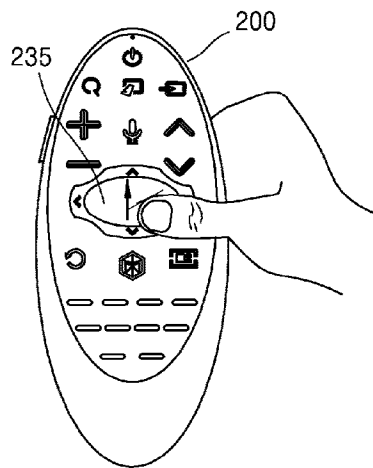
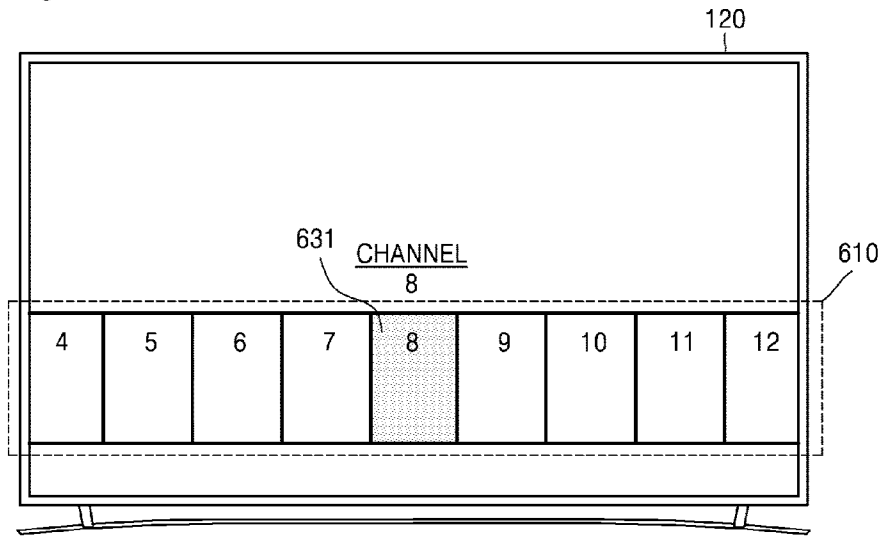
[Fig. 8C]



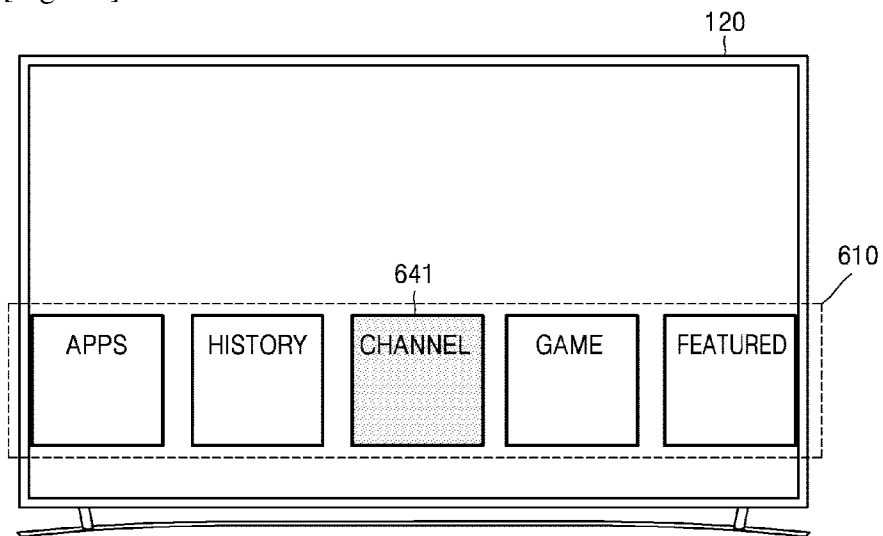
[Fig. 8D]



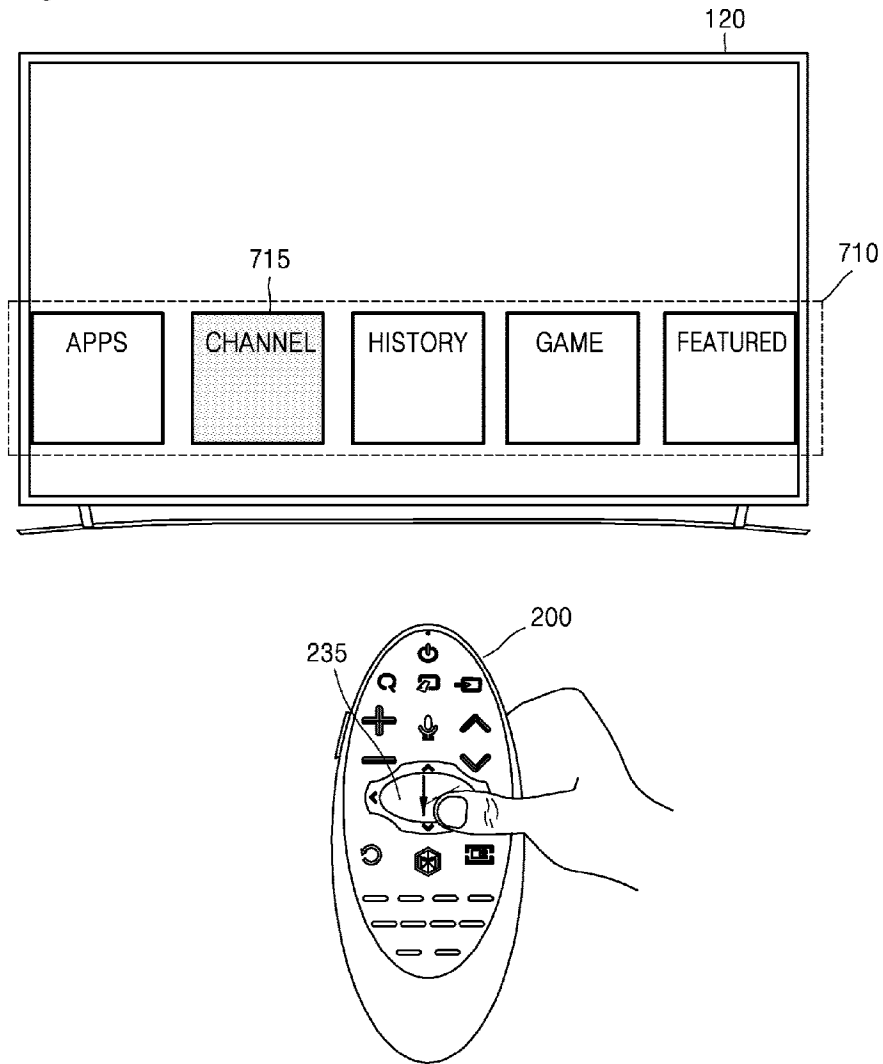
[Fig. 9A]



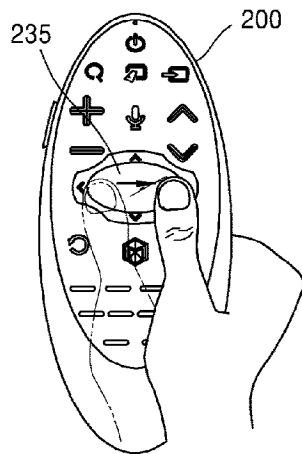
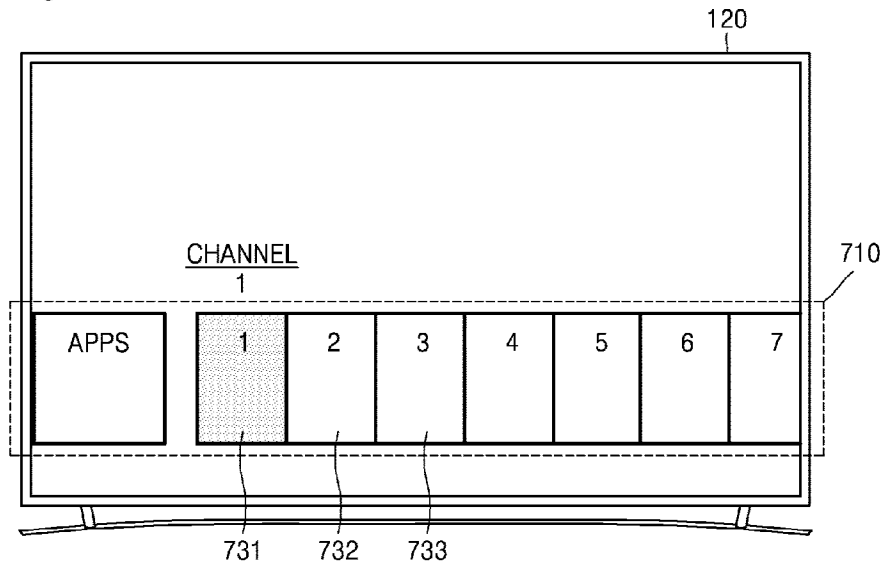
[Fig. 9B]



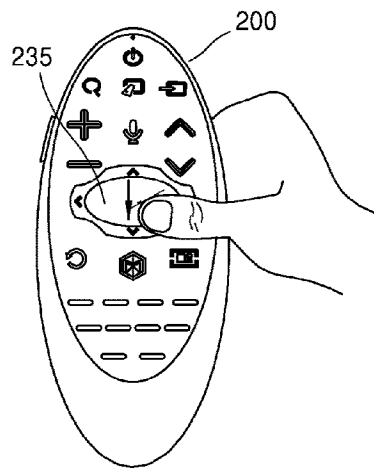
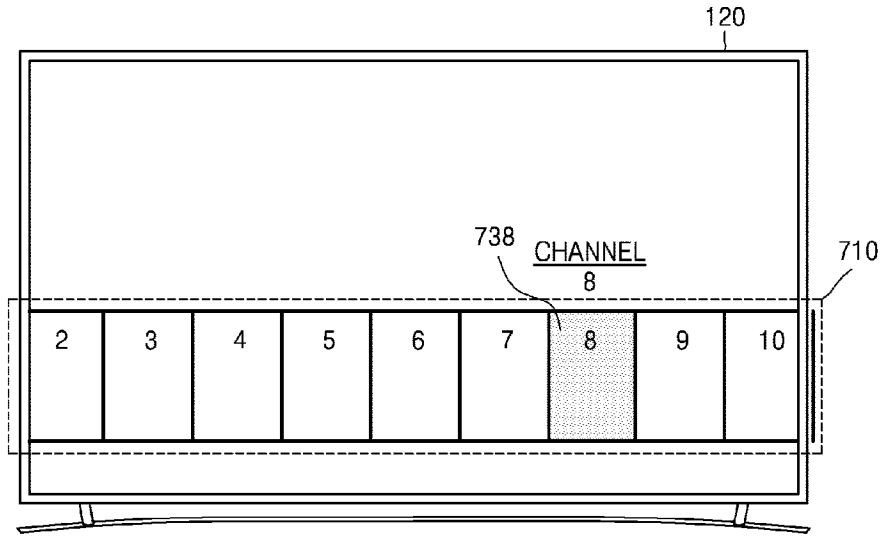
[Fig. 10A]



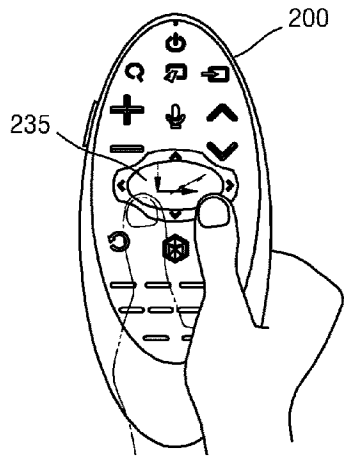
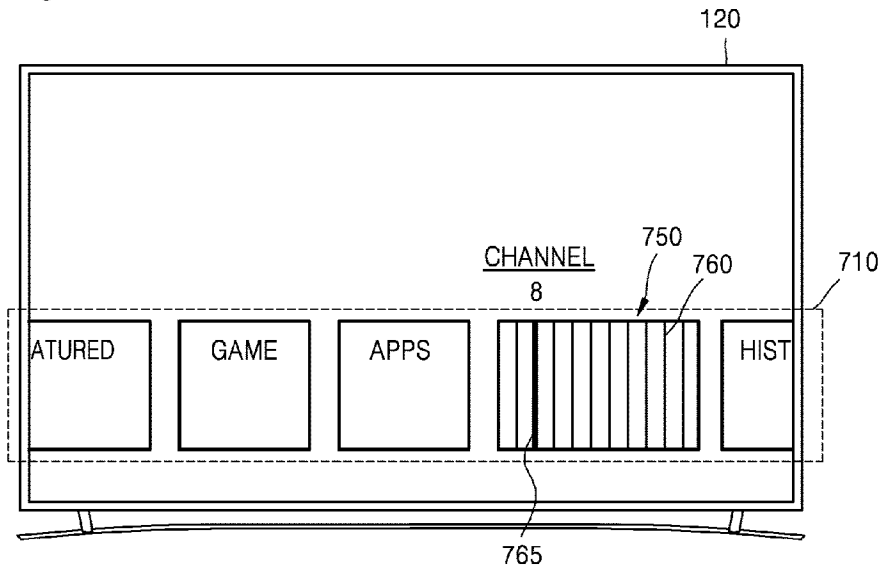
[Fig. 10B]



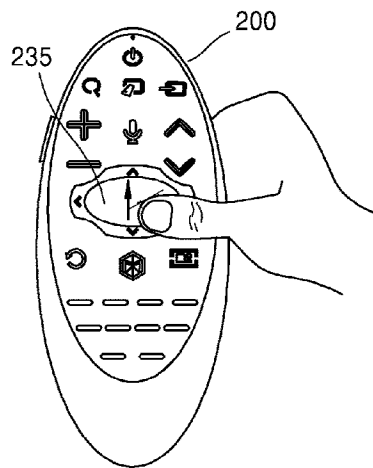
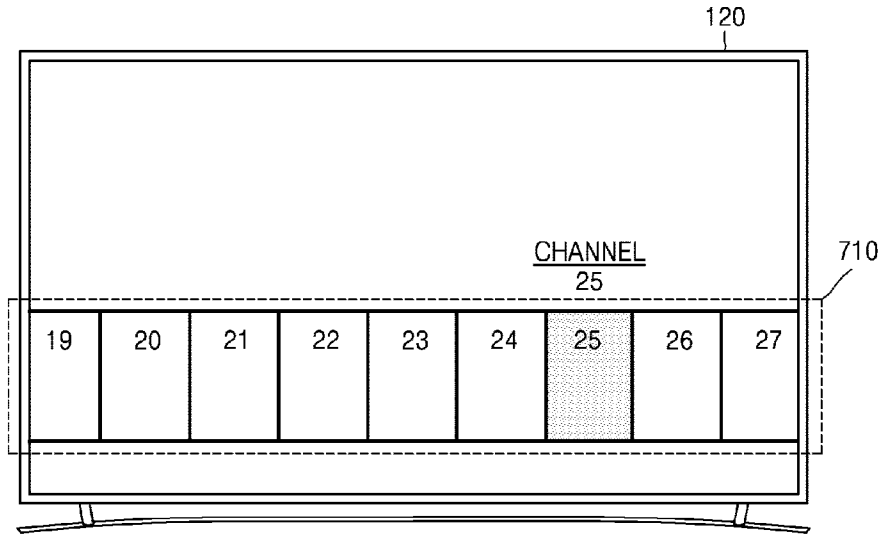
[Fig. 10C]



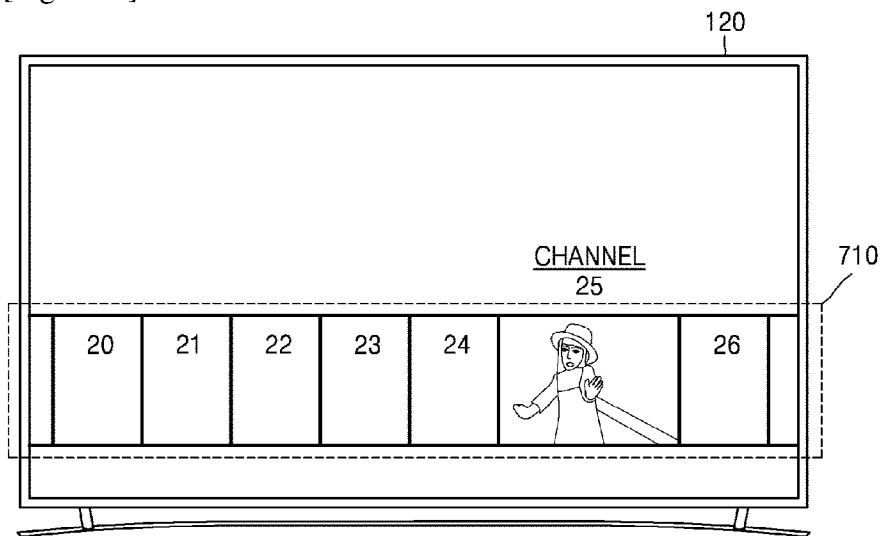
[Fig. 10D]



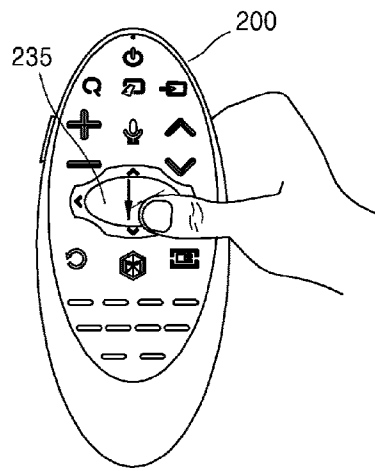
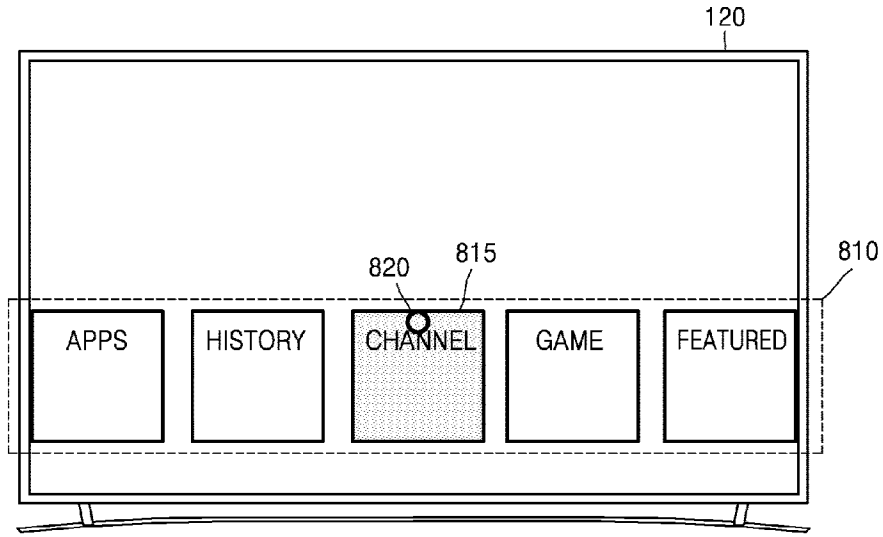
[Fig. 10F]



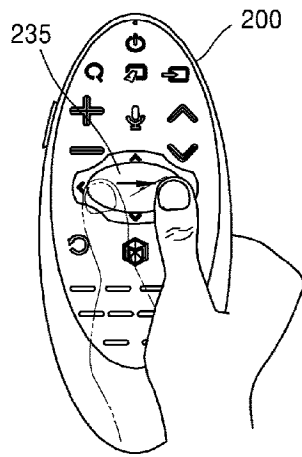
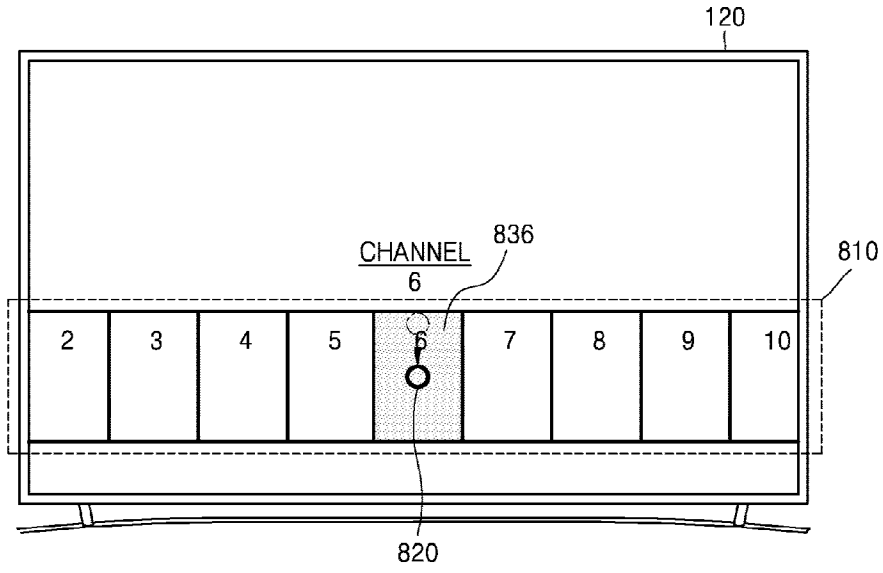
[Fig. 10G]



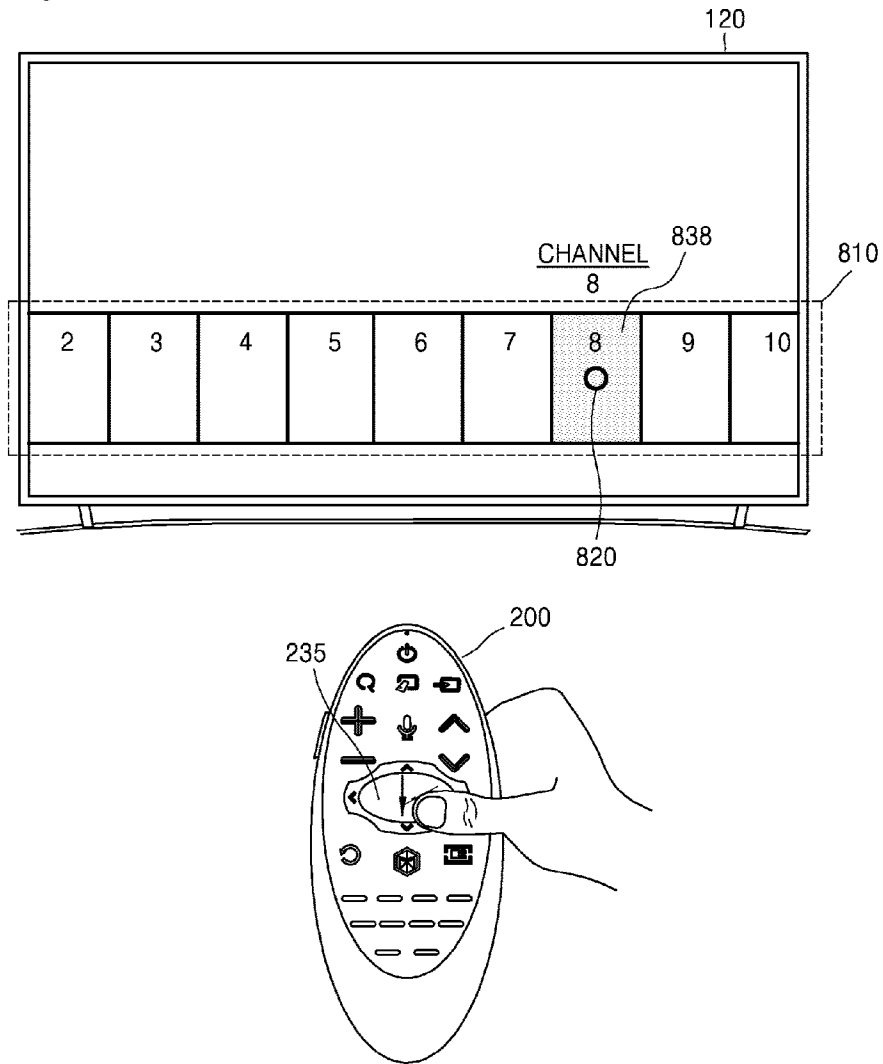
[Fig. 11A]



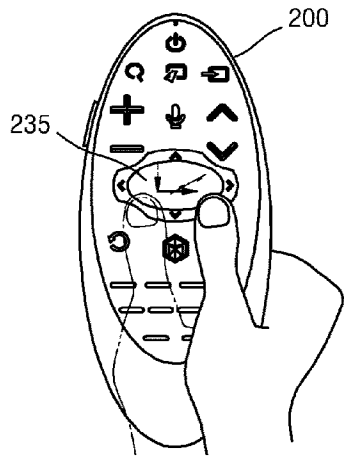
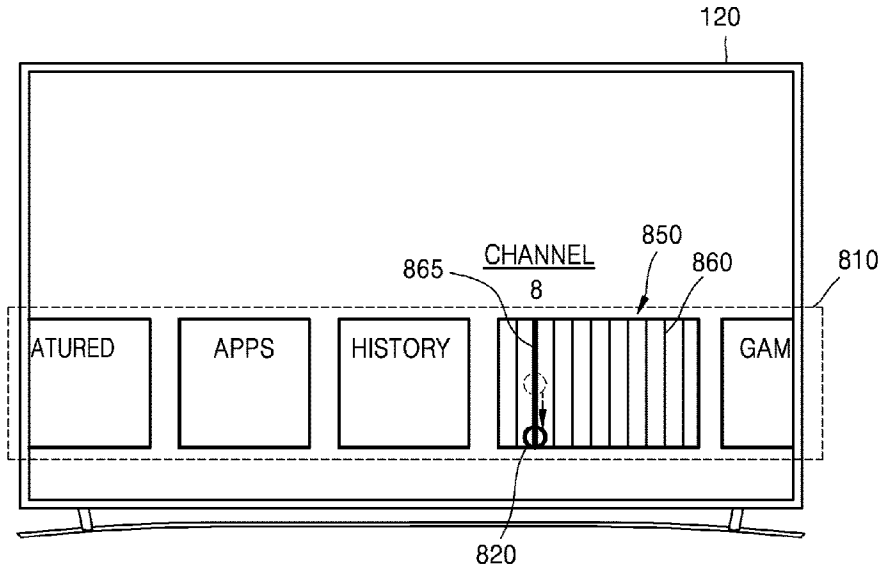
[Fig. 11B]



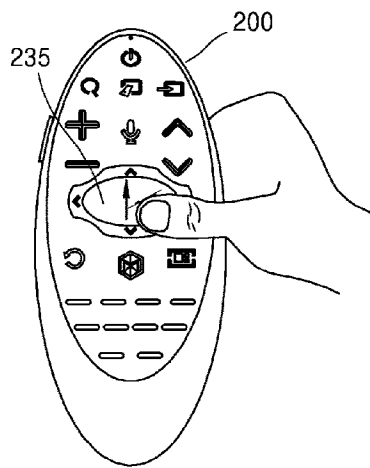
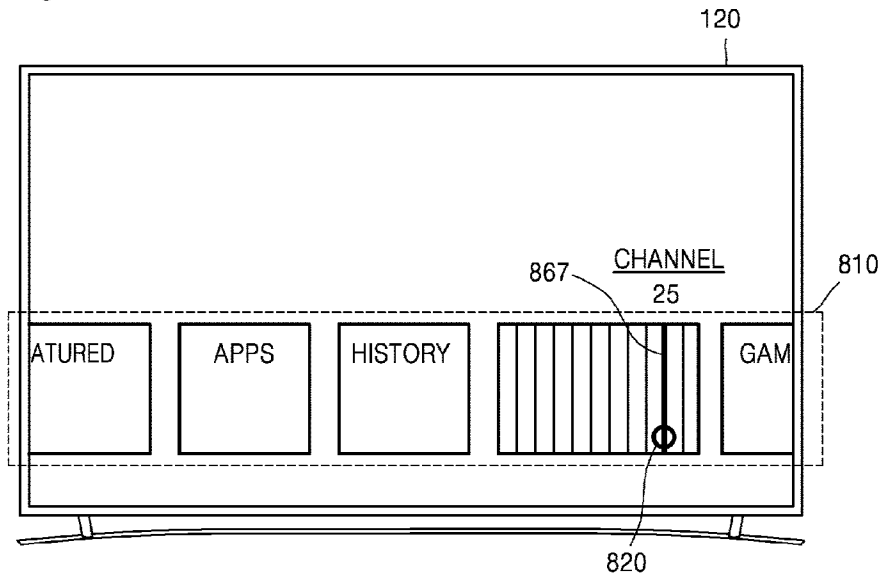
[Fig. 11C]



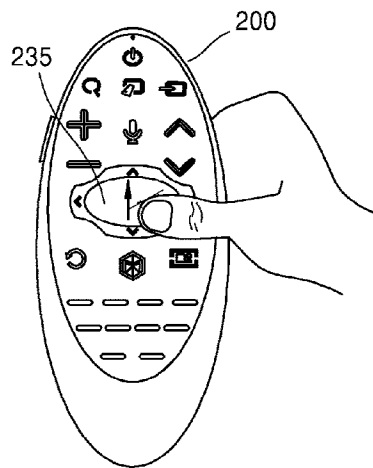
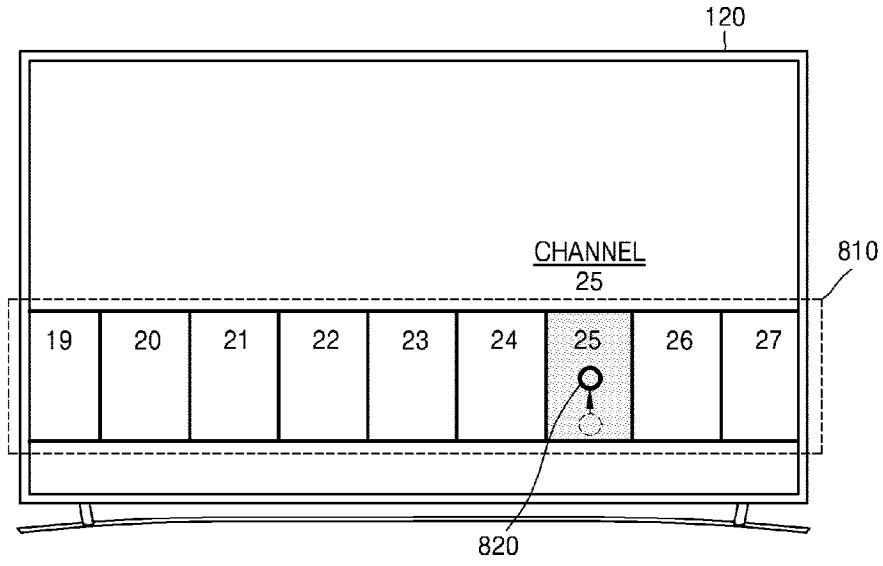
[Fig. 11D]



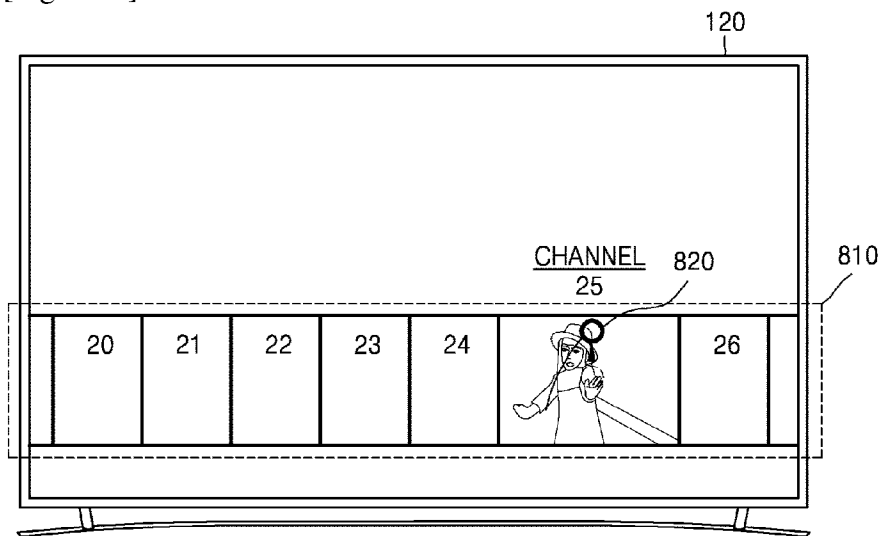
[Fig. 11E]



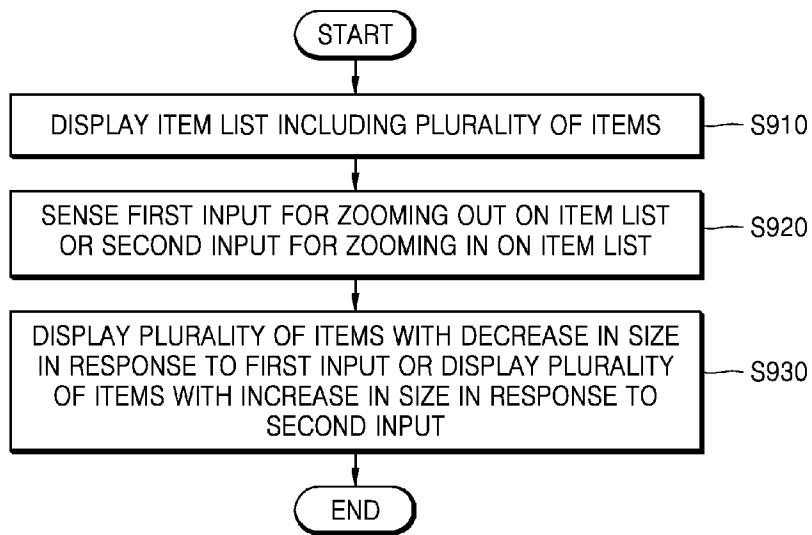
[Fig. 11F]



[Fig. 11G]



[Fig. 12]



A. CLASSIFICATION OF SUBJECT MATTER**H04N 21/4728(2011.01)i, H04N 21/4722(2011.01)i, H04N 21/472(2011.01)i**

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N 21/4728; G06F 3/033; G06K 9/46; G06F 3/0488; G06K 9/32; H04Q 9/00; G06F 3/0485; H04N 5/445; H04N 21/4722

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: image display apparatus, item list, sensor, zooming in/out, dragging, tilting, pressing, remote control**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2014-0292760 A1 (SAMSUNG ELECTRONICS CO., LTD.) 02 October 2014 See paragraphs [0058], [0144]; claims 1, 3, 5-6; and figure 8.	1-4, 8-12
A		5-7, 13-15
Y	KR 10-2013-0052461 A (HUTEK CO., LTD.) 22 May 2013 See paragraphs [0014]-[0018]; and figure 4.	1-4, 8-12
A	US 2010-0232704 A1 (KARL OLA THORN) 16 September 2010 See paragraphs [0007], [0014]; and figure 5.	1-15
A	US 2013-0057764 A1 (JINYOUNG CHOI et al.) 07 March 2013 See paragraphs [0006], [0184]; and figure 12.	1-15
A	US 2012-0060187 A1 (JI-BUM MOON et al.) 08 March 2012 See paragraphs [0014]-[0015]; and figure 3.	1-15

 Further documents are listed in the continuation of Box C. See patent family annex.

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"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

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Date of the actual completion of the international search

20 April 2016 (20.04.2016)

Date of mailing of the international search report

22 April 2016 (22.04.2016)

Name and mailing address of the ISA/KR

International Application Division

Korean Intellectual Property Office

189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer

KIM, KI HO

Telephone No. +82-42-481-8691



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2015/012438

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