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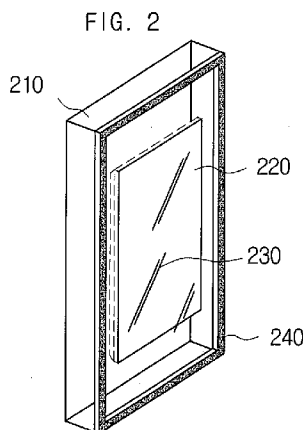
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(54) Title: INTERACTIVE DIGITAL MULTIMEDIA INFORMATION MIRROR DEVICE



(57) Abstract: The present invention relates to an interactive digital multimedia information mirror that provides a variety of multimedia information by using a half mirror, a display apparatus and a touch sensor. In accordance with an embodiment of the present invention, the interactive digital multimedia information mirror device can include a system case unit, configured to form a frame; a display unit, placed at one surface of the system case unit and configured to output a predetermined image; a half mirror, placed at one surface of the display unit and configured to penetrate the image outputted from the display unit and to reflect an external beam of light; a touch sensor, placed at one surface of the half mirror and configured to sense an object and to extract position information related to a position of the object; and a processing unit, configured to receive the position information extracted from the touch sensor and to control a predetermined image to be outputted on a display area corresponding to the position information.

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**【DESCRIPTION】****【Invention Title】**

INTERACTIVE DIGITAL MULTIMEDIA INFORMATION MIRROR

DEVICE

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**【Technical Field】**

The present invention relates to an interactive digital multimedia information mirror device that provides a variety of multimedia information by using a half mirror, a display apparatus and a touch sensor.

10

**【Background Art】**

Today's development of Ubiquitous technologies and the evolution of a network and information display technologies has increased information terminals having various shapes. Also, the highly developed information technologies has made various types of information over-flowed. The enhancement of those technologies has raised the trend that users want to get a user-customized in various spaces regardless of space and time.

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Moreover, users are increasingly demanding on devices that provide information required by the users rather than the conventional information at the provider's disposal.

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Typically, information transferring apparatuses using half-mirrors are mainly used for signboards. Those conventional technologies manufacture the signboards by using single film-shaped images or simple videos. Accordingly, it is difficult to provide a variety of information and to form the user-customized contents.

5 The conventional technologies also control an image to be displayed by using an only power control device that is placed in back of a display apparatus when a user approaches the display apparatus as an effort for advertisement.

FIG. 1 shows the structure of an information transferring device using a half-  
10 mirror. Referring to FIG. 1, the information transferring device using the half-mirror can be configured to include a system case 110, a display 120, a half-mirror 130 and a proximity sensor 140.

The display 120, which is placed at the center part of the system case 110, provides an image. The half-mirror 130, which is placed at an upper part of the display  
15 120, has regular transmissivity and reflectivity. The proximity sensor 140 recognizes the proximity of a user.

Below is described some disadvantage of the device using the proximity sensor 140, which is employed for the conventional device as shown in FIG. 1.

In the case of a large sized display such as a PDP, a standby time of about 10  
20 second or more is generated when a power is turned on or off. Accordingly, a user is

required to wait for a certain time at a settled position, to thereby make it difficult to effectively transfer contents.

As described above, the conventional information transferring device using the half-mirror simply functions as a display apparatus by controlling the power of a display  
5 unit. The information transferring device using the half-mirror also performs the function of a mirror or the function as a signboard of a simple and one-way image by automatically sensing the proximity of a user. In the structure of the mirror, the half mirror mainly features the weakened function as a mirror and the provided simple image as a signboard. Accordingly, it is difficult to provide a variety of user based  
10 information.

#### **【Disclosure】**

Accordingly, an interactive digital multimedia information mirror device in accordance with the embodiments of present invention, which is contrived to solve the  
15 aforementioned problems, can be mounted in typical homes and various public places. The interactive digital multimedia information mirror device can allow a user to directly select a variety of multimedia information that the user needs.

In particular, when the interactive digital multimedia information mirror devices in accordance with the embodiments of present invention are placed at various  
20 spaces, users can be allowed not only to use a simple function of a mirror but also to be

provided with a variety of helpful information by selecting it for themselves.

The interactive digital multimedia information mirror in accordance with the embodiments of present invention is also possible to be combined with various wireless communication technologies in order to provide various services. For example, it is possible to be connected to users' personal information communication terminals or personal computers by employing various transmission technologies using wireless Internet, Bluetooth, RFID and mobile phone information communication network. This allows the users to download or transmit the helpful information selected by them in the interactive digital multimedia information mirror device to their terminals or their personal information storage device.

The interactive digital multimedia information mirror in accordance with the embodiments of present invention is also possible to control long-distanced peripheral devices by being combined with various wire or wireless communication technologies. For example, it is possible to control peripheral devices connected through Internet or a home network by being connected to the Internet or the home network by use of LAN, wireless Internet, Bluetooth and mobile communication.

#### **【Mode for Invention】**

According to an embodiment of the present invention, the interactive digital multimedia information mirror can include a system case unit, configured to form a

frame; a display unit, placed at one surface of the system case unit and configured to output a predetermined image; a half mirror, placed at one surface of the display unit and configured to penetrate the image outputted from the display unit and to reflect an external beam of light; a touch sensor, placed at one surface of the half mirror and  
5 configured to sense an object and to extract position information related to a position of the object; and a processing unit, configured to receive the position information extracted from the touch sensor and to control a predetermined image to be outputted on a display area corresponding to the position information.

Here, the system case unit can be formed with a hole capable of  
10 accommodating the display unit.

The touch sensor can be formed to include a frame corresponding to a shape of the system case unit, and the touch sensor can include a light source, placed at one side part of the frame and configured to output a beam of light; and a light receiver, placed at another side part of the frame and configured to receive the beam of light outputted  
15 from the light source.

The beam of light can include an infrared beam or a beam having a shorter wavelength than the infrared beam.

The touch sensor can be a sensor having a high transmissivity, which is one of a wave vibration sensor, a resistive layer type sensor, an electrostatic capacitive type  
20 sensor, a pressure type sensor, an imaging sensor and a proximity sensor.

The half-mirror can include a glass substrate; and a reflective material, formed at one surface of the glass substrate.

The half-mirror can have the transmissivity of 20 to 30%.

The interactive digital multimedia information mirror can further include a communication unit, configured to receive and transmit a control signal from and to an outside by having wire or wireless coupling to the outside.

If the processing unit receives the control signal from the outside through the communication unit, the processing unit can control an image to be outputted to the display area to correspond to the control signal.

The processing unit remotely can control the electronic device by transmitting the control signal corresponding to an input signal, inputted through the touch sensor, to an external electronic device through the communication unit.

The display unit can have at least one of a PDP, an LCD, an OLED, a projector and a 3-dimensional image device.

The display unit can include a plurality of display devices.

The interactive digital multimedia information mirror can further include a speaker, configured to output a predetermined sound if the touch sensor senses an object.

The interactive digital multimedia information mirror can further include a camera unit, configured to photograph the external image and to output the photographed image to the display unit.

Hereinafter, the present invention will be described in detail through the drawings.

FIG. 2 briefly shows an interactive digital multimedia information mirror in accordance with an embodiment of the present invention. Referring to FIG. 2, a system case unit 210, a display unit 220, a half-mirror 230 and a touch sensor 240 are illustrated.

The system case unit 210 wholly forms a frame of the system including the display unit 220, the half-mirror 230 and the touch sensor 240. Accordingly, the interactive digital multimedia information mirror can be formed as a frame type to be located on a wall or a space.

The system case unit 210 can be formed with a hole capable of accommodating the display unit 220.

The display unit 220 outputs an image corresponding to an image signal.

The half-mirror 230 has a regular reflectivity to function as a mirror at normal times. Also, the half-mirror 230 has a regular transmissivity to allow an image outputted from the display unit 220 to be penetrated.

The touch sensor 240 can recognize the position of an object in front of the half-mirror 230. Through the recognition of the position of the object, the touch sensor 240 can display corresponding contents on the display unit 220 or generate a corresponding control signal for controlling a multimedia.



FIG. 3 and FIG. 4 briefly show elements of an interactive digital multimedia information mirror device in accordance with an embodiment of the present invention.

The system case unit 210 forms a space in which the display unit 220 and a processing unit can be mounted. Here, the processing unit can control the display unit 220, the touch sensor 240, a speaker and an image camera. The processing unit will be described in detail later.

Additionally, a blowhole and a fan for transferring the heat of the display unit 220 and the processing unit to the outside can be placed at one end part (e.g. an upper part) in back of the system case unit 210.

A door or an access opening for modification and repair of the device can be formed at another end part (e.g. a lower part) in back of the system case unit 210.

The outside of the system case unit 210 can be processed by using a black sheet or black coating in order to improve the reflective effect of the half-mirror 230.

The display unit 220 can output an image corresponding to an image signal and can be a thin-film display. For example, the display unit 220 can employ various displays such as PDP, LCD, OLED and projectors. Especially, it is possible to use about 2 ~ 100 inched PDP or LCD having high brightness. Although the display unit 220 having the size of 2 ~ 100 inches is described, for example, it shall be obvious that the display unit 220 can have various sizes.

The half-mirror 230, which has the transmissivity of 20 to 30%, is placed at an upper part of the system case unit 210 equipped with a display.

The half-mirror 230 in accordance with an embodiment of the present invention has the transmissivity of about 25%. The transmissivity of the half-mirror 230 can be adjusted within the range between 20 and 30% according to each case. In case that the half-mirror 230 has the transmissivity of 20% or less, the half-mirror 230 has the good function as the mirror in the front. However, the overall brightness of the displayed image penetrating through the rear surface of the half-mirror is decreased, to thereby make it difficult to view the image. In case that the half-mirror 230 has the transmissivity of 30% or more, the half-mirror 230 has the structure of the display placed in back of the half-mirror is seen and has the low reflectivity, to thereby lower the function of the mirror.

In particular, Ag-Multilayer coating can be used to allow the half-mirror 230 to have good function as the mirror and the displayed image penetrating through the rear surface of the half-mirror to have the transmissivity having good visibility. In the Ag-Multilayer coating, a protective masking process is performed in order to prevent an area used as the display unit 220 of the overall half mirror 230 from being firstly coated. Then, the Ag coating is performed with a thickness or more on the remaining area. After that, the protective masking is removed from the area used as the display unit 220. Later, Ag coating with a thickness is performed on the overall half mirror 230. Accordingly,

the half mirror 230 can maintain the high reflectance when acting as the mirror. The half mirror also maintains the high transmissivity, to thereby improve the visibility of the pertinent image, when performing the display function of the display unit 220.

The touch sensor 240, which is an optical sensor for recognizing an object, can  
5 be an infrared touch sensor, for example. The touch sensor 240 is provided in one surface of the half-mirror 230. Also, the touch sensor 240 recognizes an object such that the display unit 220 placed in another surface of the half-mirror 230 can display a corresponding image. In particular, the touch sensor 240 specifies a particular area in the area displayed with a display image of the overall frame. The touch sensor 240 helps  
10 to control an image of the display unit 220 to be exactly identical to a touched point. Herein, a processing unit can be mounted to control the display unit 220 and the touch sensor 240.

As shown in FIG. 4, the sectional structure of an interactive digital multimedia  
15 information mirror device in accordance with an embodiment of the present invention will be described. In a rear surface, the system case unit 210 and the display unit 220, which is mounted in the system case unit 210, are placed. The half-mirror 230 for functioning as a mirror on the display unit 230 is formed by allowing an Ag-Multilayer 233 to be coated on a glass substrate 236. A frame of the touch sensor 240 for  
20 recognizing a position of an external object and a corresponding event is placed at an

upper part of the half-mirror 230.

As such, the interactive digital multimedia information mirror device is possible to be formed to be mounted inside a wall surface or a space. The interactive digital multimedia information mirror device can be formed as a built-in case type  
5 considering the surrounding interior design or aesthetics. Alternatively, the interactive digital multimedia information mirror device can be formed as an external type placed on a typical wall surface.

The interactive digital multimedia information mirror device can also include a wall support to make it easy to be mounted inside the wall. Here, the wall support can be  
10 placed at an edge part of the device. Further, the interactive digital multimedia information mirror device can include an external support for an additional half-mirror and an infrared touch sensor to perform the replacement and repair.

FIG. 5 shows the structure of a touch sensor used in an interactive digital  
15 multimedia information mirror device. The below description focuses on an infrared touch sensor. As shown in FIG. 5, the infrared touch sensor 240 is formed to have a rectangular frame shape. Infrared LEDs are arranged in a line at left sides A1, A2, A3 ... and An and upper sides B1, B2, B3 ... and Bn, respectively. Reversely, infrared receivers for receiving the light signals of the infrared LEDs are arranged in a line at  
20 right sides R1, R2, R3 ... and Rn and lower sides r1, r2, r3 ... and rn, respectively. As

shown in FIG. 5, R1 corresponding to A1 and r1 corresponding to B1, respectively, is received and transmitted from and to a matrix. If a user approaches his or her hand or an object within a predetermined area, transmitting and receiving the infrared beam is stopped. This makes it possible to detect the pertinent position. The detected position is sent to a pertinent control device and is connected to an input device such as a mouse of a computer. If the infrared touch sensor 240, as shown in FIG. 5, is used, the interactive digital multimedia information mirror device can clearly display an image by allowing the displayed image to pass through the half-mirror. Also, the interactive digital multimedia information mirror device can control accurate positioned contents and information screen by using a matrix-type infrared touch sensor. Another touch sensor can use a high-transmissivity beam having the shorter wavelength (e.g. a visible beam and an ultraviolet beam) than the infrared beam instead of the infrared beam.

The touch sensor can use the high transmissivity instead of the aforementioned beam. The touch sensor can also be placed at one side part of the half-mirror to function as a touch sensor. The touch sensor having the high transmissivity, which is placed at one side part of the half-mirror to function as a touch sensor, can be a resistive layer type sensor, an electrostatic capacitive type sensor, a pressure type sensor, a wave vibration sensor, a proximity sensor and an imaging sensor.

(a) of FIG. 6 is a front view showing an interactive digital multimedia

information mirror in accordance with an embodiment of the present invention. (b) of  
FIG. 6 is a side sectional view showing an interactive digital multimedia information  
mirror in accordance with an embodiment of the present invention. Here, the below  
description is related to a brief structure of an interactive digital multimedia information  
5 mirror in accordance with an embodiment of the present invention.

The positions and functions of the system case unit 210, the display unit 220,  
the half-mirror 230 and the touch screen 240 are the same as described above.

The system case unit 210 can have the internal structure arranged to be capable  
of mounting a processing unit 510 inside. The processing unit 510 can be connected to a  
10 cable in order to provide an image to the display unit 220 placed inside. The display unit  
220, the touch sensor 240 and the processing unit 510, respectively, can have a power  
port 520 and a power supply cable 530 for supplying a power thereto.

FIG. 7 shows how an interactive digital multimedia information mirror device  
15 is operated in accordance with an embodiment of the present invention. As shown in (a)  
of FIG. 7, interactive digital multimedia information mirror device functions as a typical  
mirror by the half-mirror at normal times. At this time, the display unit 220 placed in  
back of the half-mirror maintains a standby screen mode displaying a black screen.  
However, once a hand is lightly touched on the half-mirror, a frame of the infrared touch  
20 sensor 240 placed in front of the half-mirror recognizes the touch. Then, as shown in (b)

of FIG. 7, the idle screen mode is changed to an output screen mode to display a pertinent multimedia information screen.

At this time, the processing unit 510 computes upper, lower, left and right detection positions of A, B, C and D corresponding to each point touched on the half-  
5 mirror by a hand through the infrared touch sensor 240 in (b) of FIG. 7. Then, the point generated with an event is connected to a point on a screen of the display unit 220. Further, the display unit 220 can provide various contents by adding functions of mouse click and mouse double-click.

The interactive digital multimedia information mirror device can include a  
10 plurality of display devices including a big screen of the display unit 220, placed at an upper part. The plurality of display devices can form one big screen by connecting a plurality of displays. Alternatively, each independently sized display device can separately display a variety of videos and information. For example, in the case of being used by a family, it is possible to replay family video and to function as a digital frame  
15 or stock information.

The interactive digital multimedia information mirror device of the present invention can be connected to Internet or a home network by using a wire or wireless communication device. Also, it is possible to remotely control an electronic apparatus connected to the Internet or the home network by using the wire or wireless  
20 communication device.

(c) of FIG. 7 shows home electronic devices capable of being remotely controlled by the display unit 220 of the interactive digital multimedia information mirror device. A user can select the electronic devices listed on the display unit 220 of the interactive digital multimedia information mirror device. At this time, the selection of the electronic devices capable of being remotely controlled is performed by using the touch sensor 240. For example, the pertinent electronic device is selected by touching the touch sensor of a part in which the electronic devices are displayed. As described above, the function of selecting the electronic device through the electronic area of the touch sensor 240 in which the electronic device is displayed is controlled by the processing unit.

(d) of FIG. 7 shows a TV control menu for remotely controlling a TV displayed on the display unit 220 of the interactive digital multimedia information mirror device. For example, if a user selects the TV control menu in the (c) of FIG. 7 to remotely control the TV, TV control submenus of the TV control menu are displayed on the display unit 220 later. Then, the user can remotely control the TV by selecting desired ones of the displayed TV control submenus. Similarly, the selection of the TV control submenus is performed by using the touch sensor 240.

Even though the above description takes an example of remotely controlling the TV, it shall be obvious that it is possible to remotely control other electronic devices connected through the Internet or the home network with the interactive digital



multimedia information mirror device.

FIG. 8 shows an interactive digital multimedia information mirror device in accordance with another embodiment of the present invention. Referring to FIG. 8, the interactive digital multimedia information mirror device includes a system case unit 710, a display unit 720, a half mirror 730, a touch sensor 740 and a three-dimensional image 750. The below description focuses on the difference with the foregoing description with reference to FIG. 2.

Below is described the method of displaying a 3-dimensional image of the interactive digital multimedia information mirror device having an 3-dimensional image display device.

As shown in FIG. 8, when the interactive digital multimedia information mirror device acts as a mirror at a normal state, if a user approaches the mirror and puts his/her hand on the mirror, a 3-dimensional image is projected from the display unit 720 placed in back of the half mirror 730 by the touch sensor 740. The 3-dimensional image is projected on empty space in front of the half mirror 730.

FIG. 9 briefly shows how an interactive digital multimedia information mirror device is controlled in accordance with an embodiment of the present invention.

Referring to FIG. 9, the interactive digital multimedia information mirror device

includes the display unit 220, the touch sensor 240, the processing unit 510, a power source 810, a communication unit 820, an image providing cable 830, a speaker 840 and an image camera 850. The below description focuses on the difference with the foregoing description with reference to FIG. 6.

5           The power source 810 is connected to the display unit 220, the processing unit 510 and the communication unit 820.

          The processing unit 510 controls the touch sensor 240, the communication unit 820, the speaker 840 and the image camera 850. The processing unit 510 also transfers point information recognized by the touch sensor 240 to the display unit 220 in order to  
10 display corresponding contents.

          In more detail, if a user touches the touch sensor 240 of the present invention, a point signal corresponding to the touched point recognized by the touch sensor 240 is sent to the processing unit 510.

          At this time, the processing unit 510 controls the communication unit 820, the  
15 speaker 840 and the image camera 850.

          Also, the processing unit 510 supplies an image signal of the display unit 220.

          The processing unit 510 further generates a pertinent event on a point of a screen of the display unit 220 according to the point signal of the touch sensor 240. In order to perform an effective display, the processing unit 510 can display various  
20 multimedia screens with a variety of kinds of sounds when the event is generated.

In addition, in the case of controlling an external electronic device 870, the processing unit 510 can generate a control signal corresponding to a menu controlling the external electronic device 870 displayed on the display unit 220 in order to control the electronic device 870 through the communication unit 820.

5           The communication unit 820 receives a control signal for controlling the output of an image signal of the display unit 220. The communication unit 820 receives the control signal through a wire and/or wireless communication module. For example, the communication unit 820 can receive the control signal by various methods for wire and/or wireless communication such as LAN, RFID, near field communication (e.g. Bluetooth and Zigbee), Wi-Fi, Wibro and mobile communication.

10           Accordingly, the processing unit 510 can receive the control signal from an outside through the communication unit 820 and allows the display unit 220 to output an image corresponding to the pertinent control signal.

15           Also, the communication unit 820 can transmit a control signal, generated by the processing unit 510 according to an input signal inputted from the touch sensor 240, to the electronic device 870 through an Internet or the home network 860. In case that the communication unit 820 transmits the control signal, the wire and/or wireless communication module can be used. For example, it is possible to transmit the control signal by various methods for wire and/or wireless communication such as LAN, near field communication (e.g. Bluetooth and Zigbee), Wi-Fi, Wibro and mobile

20

communication.

Accordingly, the processing unit 510 can control the electronic device 870 connected through the Internet or the home network 860 by using the control signal transmitted through the communication unit 820. For example, the processing unit 510  
5 can remotely control the electronic device 870 such as a TV, a refrigerator, a washing machine, an audio system and a computer by being connected to the home network equipped in a home.

FIG. 10 and FIG. 11 are flow charts showing how an interactive digital  
10 multimedia information mirror device is controlled in accordance with an embodiment of the present invention. In case that no external touch is recognized in a step represented by S930, a display unit acts as a simple mirror by maintaining a standby screen mode of a black screen at a normal state in a step represented by S930.

However, if an event is generated according to the generation of external touch  
15 recognition in the step represented by S910, the display unit variously functions as an interactive digital multimedia information mirror device by displaying a pertinent image on a pertinent area in the step represented by 920.

In a step represented by 940, if a user touches a predetermined display area of the display unit, a touch sensor detects an accurate point corresponding to the touched  
20 area by a touch sensor position recognition algorithm.

In a step represented by S950, a user can select a menu allowing an image to be displayed or an electronic device to be remotely controlled by connecting it through Internet or a home network. If the user selects the menu allowing an image to be displayed, a step represented by S960 is performed. If the user selects the menu  
5 allowing an electronic device to be remotely controlled, a step represented by S970 is performed.

In the step represented by S960, a processing unit displays a menu capable of being clicked by the user on the display unit, and the user can select a menu by touching a pertinent position and view pertinent information by directly selecting various  
10 multimedia informational contents.

In the step represented by S970, the processing unit can display a controllable electronic device, connected through the Internet or the home network, on the display unit and display the control menu of controlling the pertinent electronic device. The user can remotely control the pertinent electronic device by selecting the displayed control  
15 menu. For example, if remote-controllable electronic devices such as a TV, a refrigerator, a washing machine, an audio system and a computer, the user selects a desired electronic device. Then, the control menu of controlling the selected electronic device is displayed. After that, the user control the pertinent electronic device by selecting the control menu.

20 The selection of an electronic device and a control menu of controlling the

selected electronic device is performed by using a touch sensor as described with reference to FIG. 7.

The present invention is not limited to the aforementioned embodiments. As  
5 described above, the infrared touch sensor used in accordance with an embodiment of the present invention include each infrared transmission unit and receipt unit arranged upper, lower, left and right at the left and right square frame. In accordance with another embodiment of the present invention, the function of a touch sensor can be performed by allowing a touch sensor having the high transmissivity to be arranged at one surface  
10 of a half mirror. The image camera can employ a webcam for a typical computer or a low-priced camera for CCTV. An interactive digital multimedia information mirror device can be configured in a vertical or horizontal form or to have a changeable form. It will be appreciated by any person of ordinary skill in the art that a large number of modifications, permutations and additions are possible within the principles and spirit of  
15 the invention, the scope of which shall be defined by the appended claims and their equivalents.

#### **【Description of Drawings】**

FIG. 1 shows a brief structure of the conventional device.

20 FIG. 2 briefly shows an interactive digital multimedia information mirror in

accordance with an embodiment of the present invention.

FIG. 3 and FIG. 4 briefly show elements of an interactive digital multimedia information mirror device in accordance with an embodiment of the present invention.

FIG. 5 shows the structure of an infrared touch sensor used in an interactive  
5 digital multimedia information mirror in accordance with an embodiment of the present invention.

FIG. 6 is a sectional view showing the structure of an interactive digital multimedia information mirror device in accordance with an embodiment of the present invention.

FIG. 7 briefly shows how an interactive digital multimedia information mirror  
10 is operated in accordance with an embodiment of the present invention.

FIG. 8 shows an interactive digital multimedia information mirror device in accordance with another embodiment of the present invention.

FIG. 9 briefly shows how an interactive digital multimedia information mirror  
15 is controlled in accordance with an embodiment of the present invention.

FIG. 10 and FIG. 11 are flow charts showing how an interactive digital multimedia information mirror is controlled in accordance with an embodiment of the present invention.

In an interactive digital multimedia information mirror device of the present invention, a display unit placed in back of a half mirror acts as a simple mirror by maintaining a standby screen mode of a black screen at a normal state. However, if a user lightly touches an area on the mirror by using his or her hand, an infrared touch sensor placed in front of the half mirror detects pertinent position information and transfers the detected information to a computer processing unit. Then, a pertinent event is generated at the same position on a screen of the display unit, to thereby provide a variety of multimedia information.

Instead of viewing a predetermined image or video like the conventional art, the interactive digital multimedia information mirror device can allow a user to directly select desired information through an image recognition sensor to view a corresponding image or video, to thereby stimulate user's curiosity.

The present invention can provide easy assembly or disassembly and minimum setting space, to thereby apply to an existing various spaces or places.

The interactive digital multimedia information mirror device is possible to be applied in various forms for offices, restrooms, public spaces and interactive advertising apparatuses.

The interactive digital multimedia information mirror device can also remotely control various home electronic devices by being connected through Internet or a home network.



**【CLAIMS】****【Claim 1】**

An interactive digital multimedia information mirror device comprising:

a system case unit, configured to form a frame;

5 a display unit, placed at one surface of the system case unit and configured to output a predetermined image;

a half mirror, placed at one surface of the display unit and configured to penetrate the image outputted from the display unit and to reflect an external beam of light;

10 a touch sensor, placed at one surface of the half mirror and configured to sense an object and to extract position information related to a position of the object; and

a processing unit, configured to receive the position information extracted from the touch sensor and to control a predetermined image to be outputted on a display area corresponding to the position information.

15

**【Claim 2】**

2. The mirror device of Claim 1, wherein the system case unit is formed with a hole capable of accommodating the display unit.

20

**【Claim 3】**

3. The mirror device of Claim 1, wherein the touch sensor is formed to include a frame corresponding to a shape of the system case unit, and

the touch sensor comprises a light source, placed at one side part of the frame and configured to output a beam of light; and

5 a light receiver, placed at another side part of the frame and configured to receive the beam of light outputted from the light source.

**【Claim 4】**

4. The mirror device of Claim 3, wherein the beam of light comprises an  
10 infrared beam or a beam having a shorter wavelength than the infrared beam.

**【Claim 5】**

5. The mirror device of Claim 1, wherein the touch sensor is a sensor having a high transmissivity, which is one of a wave vibration sensor, a resistive layer type  
15 sensor, an electrostatic capacitive type sensor, a pressure type sensor, an imaging sensor and a proximity sensor.

**【Claim 6】**

6. The mirror device of Claim 1, wherein the half mirror comprises  
20 a glass substrate; and

a reflective material, formed at one surface of the glass substrate.

**【Claim 7】**

7. The mirror device of Claim 6, wherein the half mirror comprises a  
5 transmissivity of 20 to 30%.

**【Claim 8】**

8. The mirror device of Claim 1, further comprising a communication unit,  
configured to receive and transmit a control signal from and to an outside by having  
10 wire or wireless coupling to the outside.

**【Claim 9】**

9. The mirror device of Claim 8, wherein, if the processing unit receives the  
control signal from the outside through the communication unit, the processing unit  
15 controls an image to be outputted to the display area to correspond to the control signal.

**【Claim 10】**

10. The mirror device of Claim 8, wherein the processing unit remotely  
controls the electronic device by transmitting the control signal corresponding to an  
20 input signal, inputted through the touch sensor, to an external electronic device through

the communication unit.

**【Claim 11】**

11. The mirror device of Claim 1, wherein the display unit comprises at least  
5 one of a PDP, an LCD, an OLED, a projector and a 3-dimensional image device.

**【Claim 12】**

12. The mirror device of Claim 1, wherein the display unit comprises a  
plurality of display devices.

10

**【Claim 13】**

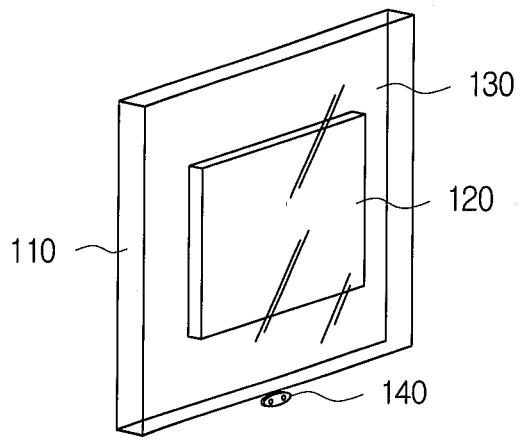
13. The mirror device of Claim 1, further comprising a speaker, configured to  
output a predetermined sound if the touch sensor senses an object.

15

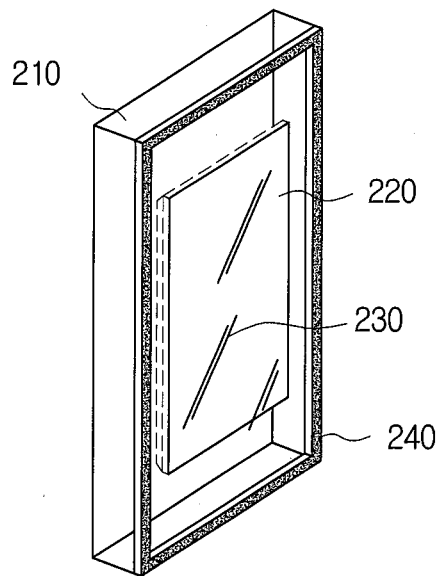
**【Claim 14】**

14. The mirror device of Claim 1, further comprising a camera unit, configured  
to photograph the external image and to output the photographed image to the display  
unit.

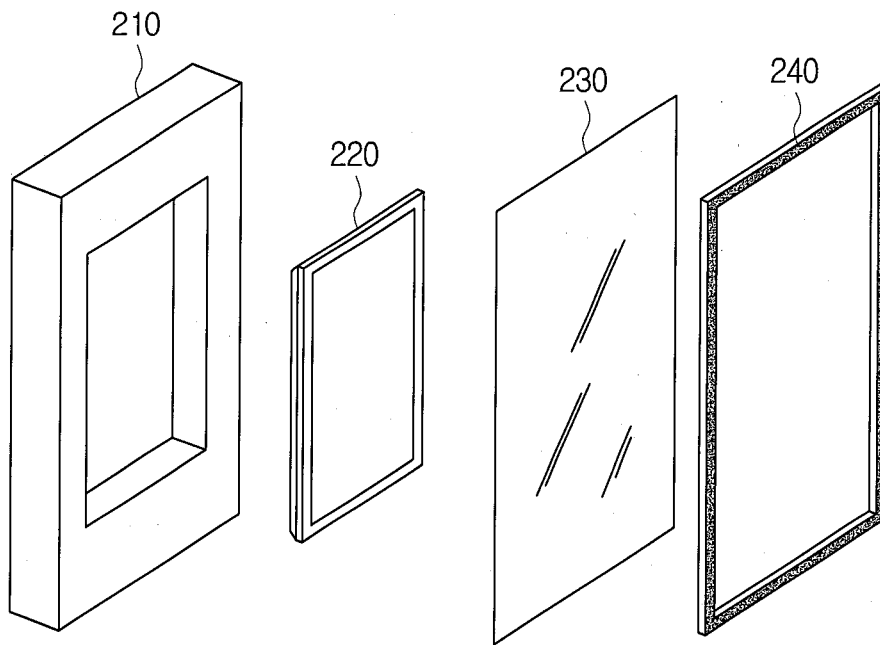
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FIG. 1



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FIG. 2



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FIG. 3



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FIG. 4

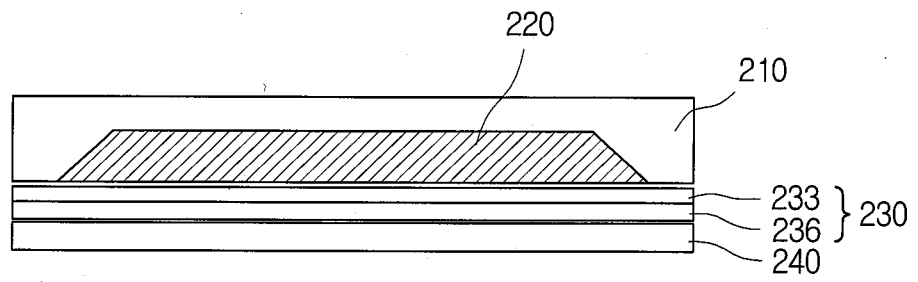
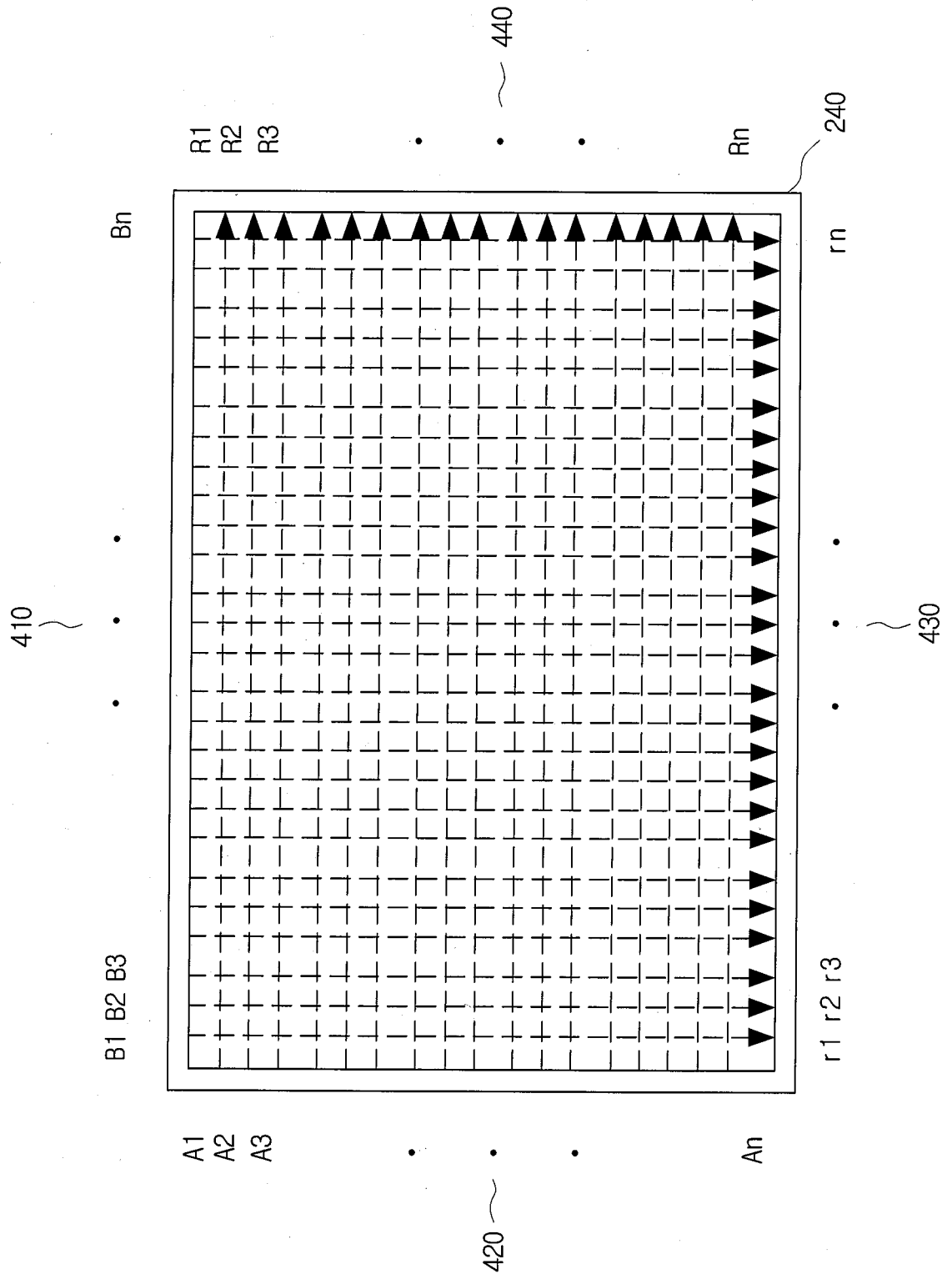
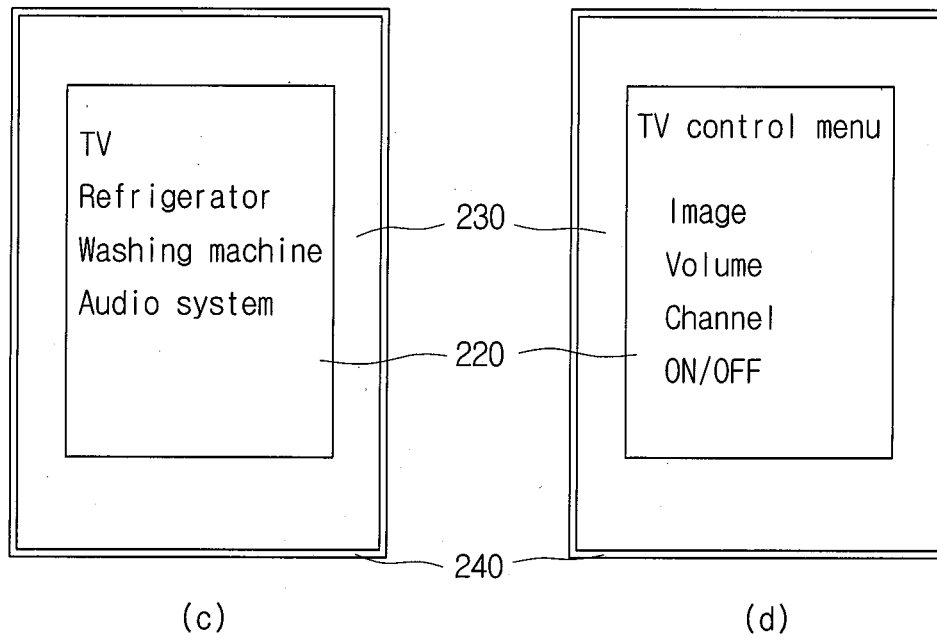
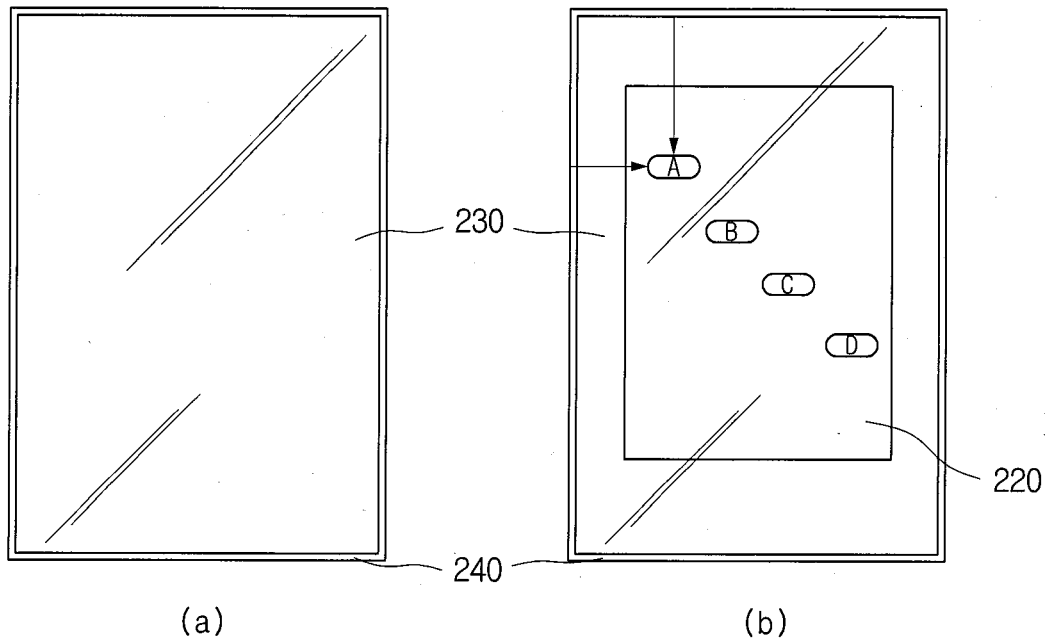




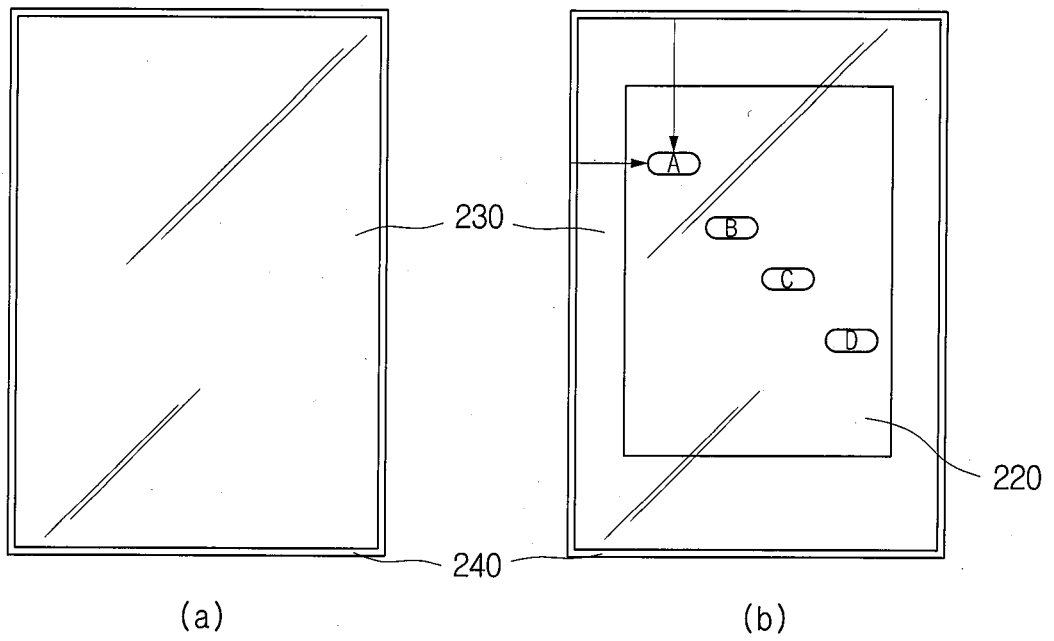
FIG. 5



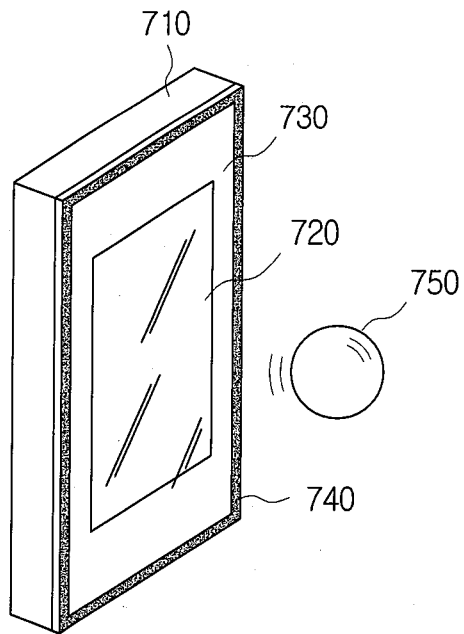
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FIG. 6



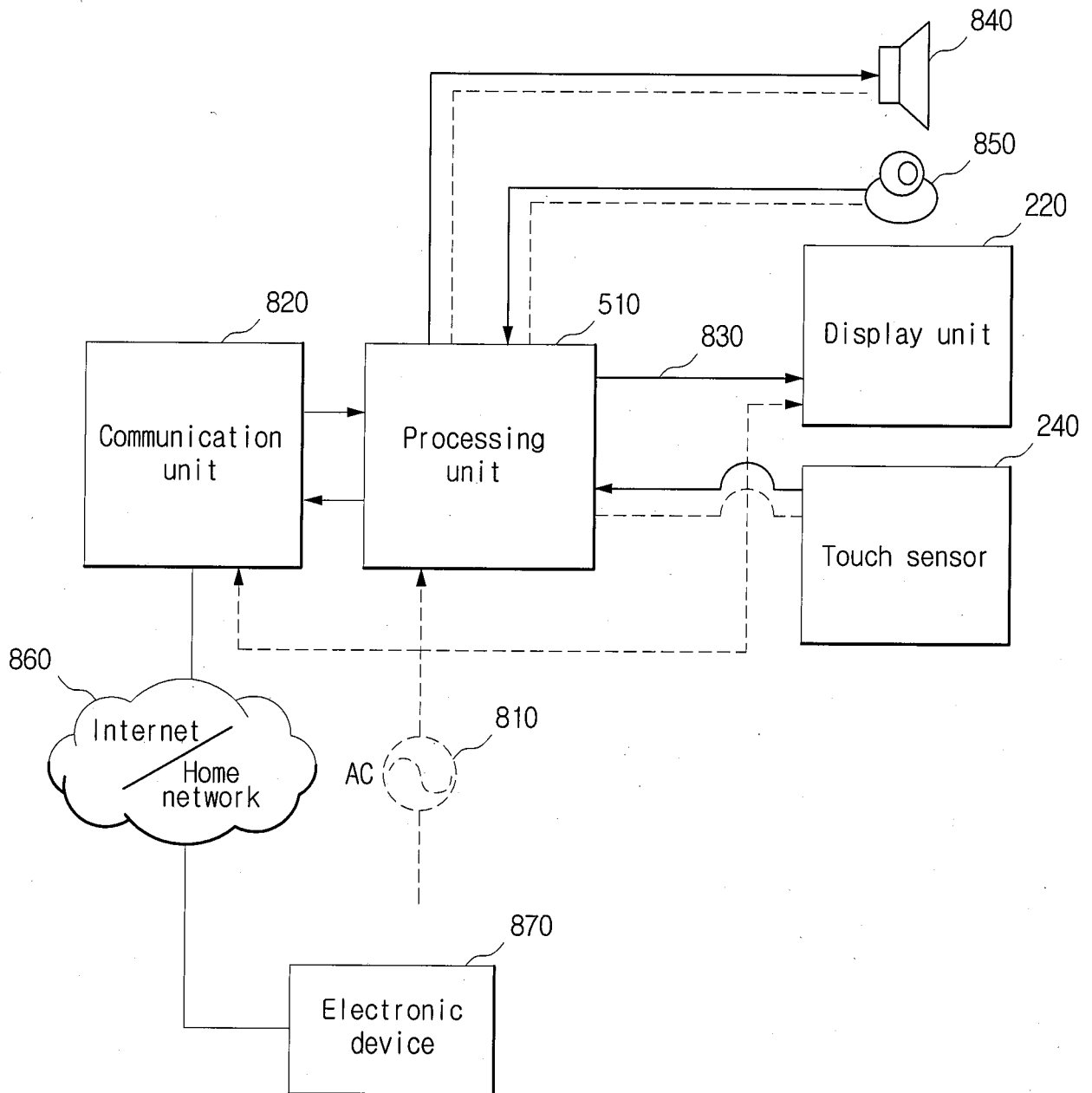
7/11  
FIG. 7



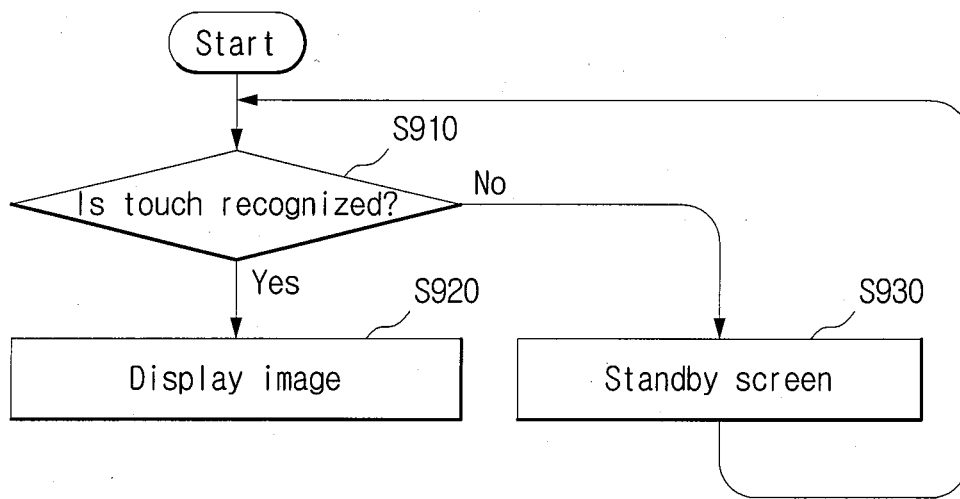
8/11  
FIG. 8



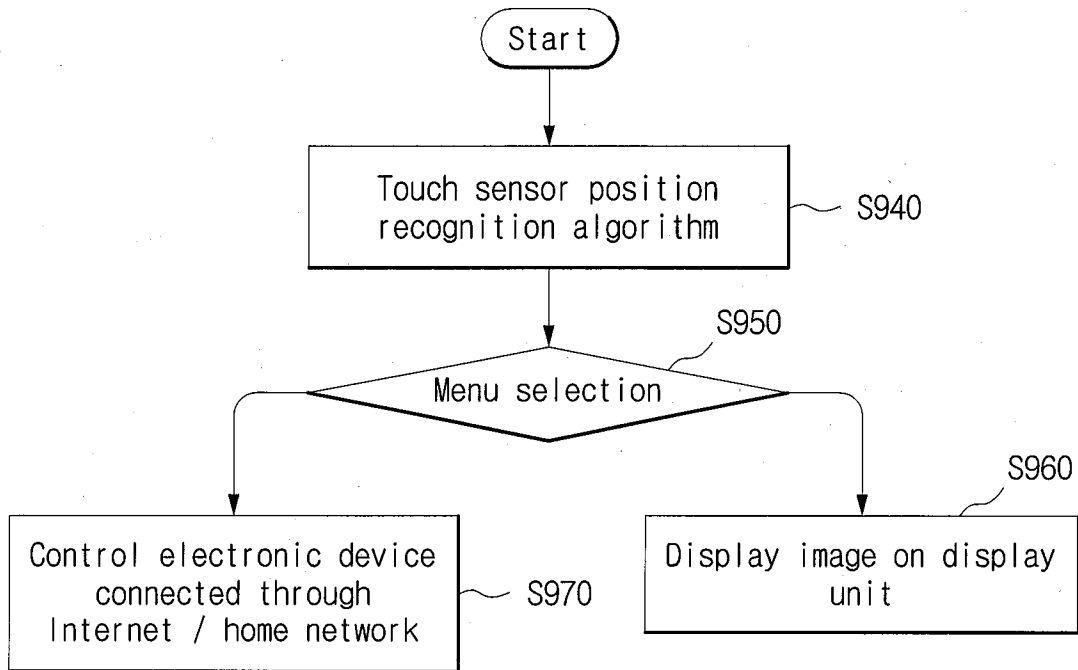
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FIG. 9



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FIG. 10



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FIG. 11



**A. CLASSIFICATION OF SUBJECT MATTER***G09F 9/00(2006.01)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)

IPC 8: G09F HO4N G02F G03B G06F G02G

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 since 1975  
Japanese Utility models and applications for Utility models since 1975

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

PAJ, FPD, USPAT, eKIPASS, IEEE "INTERACTIVE DISPLAY" "TOUCH SENSOR" "HALF MIRROR"

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP2006-053277A (SCALAR CORP) 23 FEB 2006 (2006-02-23) see the abstract, figure 1, * paragraph 12 - paragraph 40 *	1-14
Y	JP2004-347897A (SONY CORP) 09 DEC 2004 (2004-12-09) see the abstract, figure 1, * paragraph 24 - paragraph 81 *	1-14
A	JP2004-054065A (SAEILO JAPAN INC) 19 FEB 2004 (2004-02-19) see the abstract, figure 8, * paragraph 16 - paragraph 26 *	1-14
A	JP2006-126379A (SCALAR CORP) 18 MAY 2006 (2006-05-18) see the abstract, figure 1, * paragraph 12 - paragraph 39 *	1-14
A	JP2000-066610A (FUJITSU GENERAL LTD) 03 MAR 2000 (2000-03-03) see the abstract, figure 1, * paragraph 12 - paragraph 14 *	1-14

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

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

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

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

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

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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

12 JUNE 2008 (12.06.2008)

Date of mailing of the international search report

**12 JUNE 2008 (12.06.2008)**

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Telephone No. 82-42-481-5889





**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/KR2008/001194**

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JP2000-066610A	03.03.2000	JP2000-066610A2	03.03.2000