



- (51) **International Patent Classification:** Not classified
- (21) **International Application Number:** PCT/IB2013/053884
- (22) **International Filing Date:** 13 May 2013 (13.05.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:** PCT/CN2012/075974 24 May 2012 (24.05.2012) CN
- (71) **Applicant:** KONINKLIJKE PHILIPS N.V. [NL/NL]; High Tech Campus 5, NL-5656 AE Eindhoven (NL).
- (72) **Inventors:** ZHONG, Jimmy; c/o High Tech Campus, Building 5, NL-5656 AE Eindhoven (NL). WEI, Jia; c/o High Tech Campus, Building 5, NL-5656 AE Eindhoven (NL).
- (74) **Agents:** KROEZE, Johannes, Antonius et al.; High Tech Campus, Building 5, NL-5656 AE Eindhoven (NL).
- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,

DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

- without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) **Title:** METHOD AND APPARATUS FOR CONTROLLING MULTIPLE DEVICES

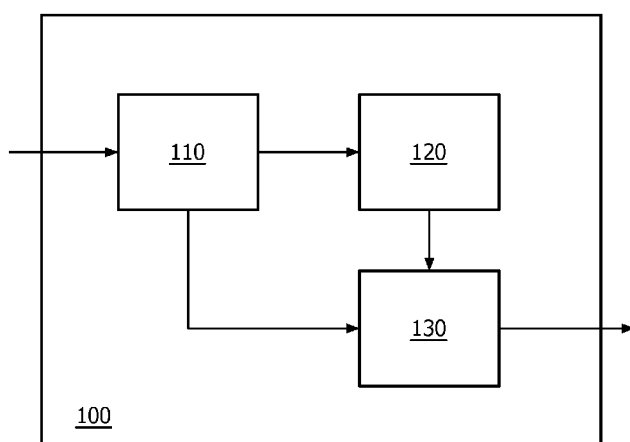


FIG. 1

(57) **Abstract:** This invention provides an apparatus and a method of controlling a first device and/or a second device. The apparatus comprises a first unit, a second unit and a third unit. The first unit is for obtaining data representing a physical place where there is a user and a user's gesture in the physical space. The physical place comprises a first zone associated with the first device, a second zone associated with the second device and a third zone associated with the first device and the second device. The second unit is for identifying the user's gesture and a position of the user's gesture among the first zone, the second zone and the third zone on the basis of the obtained data. The third unit is for generating, on the basis of the user's gesture and the position of the user's gesture, a control signal for controlling the first device and/or the second device. In this way, by properly define the interaction gestures in these three zones, the balance between less gestures and small movement area can be achieved.



METHOD AND APPARATUS FOR CONTROLLING MULTIPLE DEVICES

FIELD OF THE INVENTION

5 The invention relates to gesture control, more particularly, to control at least two devices via gesture control.

BACKGROUND OF THE INVENTION

10 People have more and more digital devices, desktop computers, laptop computers, portable media players, mobile phones and so on. It is common that people use multiple devices at the same time to improve the user experience. For example, a laptop is used as a primary device for web browsing and a portable media player connected with the laptop is used as a secondary device for viewing videos on line.

15 US2011/0119640A1 discloses techniques for scaling and translating gestures such that the applicable gestures for control may vary depending on the user's distance from a gesture-based system. In an example embodiment, the physical space is divided into virtual zones of interaction, and the system may scale or translate a gesture based on the zones.

20 However, US2011/0119640A1 does not discuss about how to handle multiple devices via gesture control when the multiple devices are connected with each other.

SUMMARY OF THE INVENTION

25 It would be advantageous to provide a gesture control solution which can control multiple devices. It would also be desirable that the gesture control solution does not require the users to remember too many gestures or to move in a very large scale of area.

 According to an embodiment of a first aspect of the present invention, an apparatus for controlling a first device and/or a second device is provided. The apparatus comprises:

 a first unit for obtaining data representing a physical place where there is a user and a user's gesture in the physical space, the physical place comprising a first zone associated with the

first device, a second zone associated with the second device and a third zone associated with the first device and the second device;

a second unit for identifying the user's gesture and a position of the user's gesture among the first zone, the second zone and the third zone on the basis of the obtained data; and

5 a third unit for generating, on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device and/or the second device.

The basic idea is to have a zone corresponding to all of the devices besides having multiple zones corresponding to each device respectively. In the third zone associated with both
10 the first and second devices, the user can interact with both the first and second devices with the same or different sets of gestures so that the user need not move in a large scale area to interact with the devices. In the first and second zones associated with the first and second devices respectively, the user can interact with the first and second devices respectively with the same set of gestures so that the user need not remember lots of gestures for interaction with the devices. In
15 this way, by properly define the interaction gestures in these three zones, the balance between less gestures and small movement area can be achieved.

According to an embodiment of a second aspect of the present invention, the first device comprising the above described apparatus for controlling the first device and/or a second device is provided.

20 According to an embodiment of a third aspect of the present invention, a system comprising a first device, a second device and the above described apparatus for controlling the first device and/or the second device is provided.

According to an embodiment of a fourth aspect of the present invention, a method of controlling a first device and/or a second device is provided. The method comprises the steps of:

25 obtaining data representing a physical place where there is a user and a user's gesture in the physical space, the physical place comprising a first zone associated with the first device, a second zone associated with the second device and a third zone associated with the first device and the second device;

30 identifying the user's gesture and a position of the user's gesture among the first zone, the second zone and the third zone on the basis of the obtained data; and

generating, on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device and/or the second device.

5 According to an embodiment of a fifth aspect of the present invention, a set of computer-executable instructions configured to perform the above described method is provided.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

10 DESCRIPTION OF THE DRAWINGS

The above and other objects and features of the present invention will become more apparent from the following detailed description considered in connection with the accompanying drawings, in which:

15 Fig.1 depicts a schematic diagram of an apparatus in accordance with an embodiment of the present invention;

Fig. 2a and Fig. 2b depict a schematic diagram of the zones associated with the devices in accordance with an embodiment of the present invention; and

20 Fig.3 depicts a flow chart of a method in accordance with an embodiment of the present invention.

The same reference numerals are used to denote similar parts throughout the figures.

25 DETAILED DESCRIPTION

Detailed description of the present invention is given below in connection with the accompanying drawings.

30 Fig.1 depicts a schematic diagram of an apparatus in accordance with an embodiment of the present invention. According to an embodiment of a first aspect of the present invention, an

apparatus for controlling a first device and/or a second device is provided. As shown in Fig.1, the apparatus 100 comprises a first unit 110, a second unit 120 and a third unit 130.

The first and second devices can be any kinds of devices, such as desktop computers, laptop computers, portable media players, mobile phones and etc. In an embodiment, the first device is a computer and the second device is a digital photo frame or a portable media play which can play 3D contents. The first device can be connected with the second device via wire or wireless interface so that they can share the same information. The first device can also not be connected with the second device.

The first unit 110 is for obtaining data representing a physical place where there is a user and the user's gesture in the physical space. The physical place comprises a first zone associated with the first device, a second zone associated with the second device and a third zone associated with the first device and the second device. Each of the first, second and third zones represents a three-dimensional physical space.

Because the user is in the physical space, the data representing the physical place comprises both the data of the physical space and the data of the user in the physical place. That is to say, the obtained data represents the physical space, the user in the physical space and the user's gesture in the physical space. The gesture may include any kinds of user motion, dynamic or static, such as running, jumping, moving a finger, waving a hand or a static pose.

The first unit can be implemented in many kinds of ways.

In an embodiment, the first unit is a receiver for receiving the data from other units which can capture the data. In another embodiment, the first unit comprises a camera for capturing image data of the physical place and the user's motion. The image data of the user's motion represents the user's gesture.

In a further embodiment, the first unit comprises an accelerometer and a GPS module. The accelerometer is attached to the body of the user for measuring the acceleration of a part of the user and the measured acceleration represents the user's gesture. The GPS module is attached to the body of the user to measure the position of a part of the user, and the measured position represents the user in the physical space.

It is known to the person skilled in the art how to obtain the data representing the physical space, the user in the physical space and the user's gesture in the physical space, and it will not be elaborated here.

5 The second unit 120 is for identifying the user's gesture and a position of the user's gesture among the first zone, the second zone and the third zone on the basis of the obtained data. The identified position can be in one of the first zone, the second zone and the third zone.

10 The second unit 120 can be implemented in many ways. In an embodiment, the data representing the user's gesture is captured image data. The second unit identifies the user's gesture by comparing the captured image data with pre-stored gesture information, and identifies the position of the user's gesture by comparing the captured image data with pre-stored physical space information.

15 In another embodiment, the data representing the user's gesture is the measured acceleration, and the second unit identifies the user's gesture based on the measured acceleration and pre-stored gesture information.

20 In a further embodiment, the data representing the user in the physical space is the measured position, and the second unit identifies the position of the user's gesture based on the measured position.

It is known to the person skilled in the art how to identify the user's gesture and the position of the user's gesture, and it will not be elaborated here.

25 The third unit 130 is for generating, on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device and/or the second device.

30 The control signal mapping table is about the mapping relationship among multiple control signals, multiple gestures and multiple positions of the user's gestures. The control signal mapping table can be pre-stored or generated according to the user's input. The third unit 130 can be implemented in many ways.

In an embodiment, if the identified position is in the first zone associated with the first device, the control signal is for controlling the first device; if the identified position is in the second zone associated with the second device, the control signal is for controlling the second device; and if the identified position is in the third zone associated with the first device and the

second device, the control signal is for controlling both the first device and the second device. For example, waving a hand in the first zone is to close the first device; waving a hand in the second zone is to close the second device; and waving a hand in the third zone is to close both the first and second devices.

5 In another embodiment, if the identified position is in the first zone associated with the first device, the control signal is for controlling the first device; if the identified position is in the second zone associated with the second device, the control signal is for controlling the second device; and if the identified position is in the third zone associated with the first device and the second device, the control signal is for controlling one of the first device and the second device.
10 For example, waving a hand up and down in the first zone is to close the first device; waving a hand up and down in the second zone is to close the second device; waving a hand up and down in the third zone is to close the first device; waving a hand left and right in the third zone is to close the second device.

15 In this way, the user can interact with the first and the second device separately with the same set of gestures in the first zone and the second zone so that the user need not remember lots of gestures for interaction with the devices, and the user can interact with both the first and second devices with the same or different sets of gestures in the third zone so that the user need not move in a large scale area to interact with the devices.

20 In a further embodiment, if the identified position is in the third zone, the control signal is for data transmission between the first device and the second device. For example, waving a hand from left to right is to send data from the first device to the second device, and waving a hand from right to left is to send data from the second device to the first device. For another example, waving a hand from left to right is to make the second device play the content stored in the first device.

25 In another embodiment, if the identified position is in the third zone, the control signal is for controlling both the first and second devices. The control signal may be for many kinds of applications, such as adjusting the audio volume or adjusting the displayed fonts, etc. For example, waving a hand from up to down is to close both the first device and the second device, and waving a hand from down to up is to open both the first device and the second device.

In a further another embodiment, if the identified position is in the third zone, the control signal is for controlling one of the first device and the second device. For example, waving up and down in the third zone is to adjust the brightness of the first device, and waving left and right in the third zone is to adjust the brightness of the second device.

5 The zones can be associated with the first and second devices in many ways. Fig.2a and Fig.2b depict schematic diagram of the zones associated with the devices in accordance with an embodiment of the present invention.

10 In an embodiment as shown in Fig.2a, the third zone 250 associated with the first device 210 and the second device 220 is between the first zone 230 associated with the first device 210 and the second zone 240 associated with the second device 220. In this way, it would be easy for the user to remember the position of the zones.

 In another embodiment, the first zone 231 associated with the first device 210, the second zone 241 associated with the second device 220 and the third zone 251 associated with the first device 210 and the second device 220 lay out as shown in Fig.2b.

15 According to an embodiment of a second aspect of the present invention, the first device comprising the above described apparatus for controlling the first device and/or a second device is provided. That is to say, the apparatus for controlling the first device and/or the second device is embedded in the first device. The first device can be the primary device for controlling the second device or transmitting data to the second device, or can be the auxiliary device controlled by the second device or receiving data from the second device. The first device and the second device can also work independently. The first and second devices can be many kinds of devices described above.

20 According to an embodiment of a third aspect of the present invention, a system comprising a first device, a second device and the above described apparatus for controlling the first device and/or the second device is provided. The first and second devices can be many kinds of devices described above. The apparatus for controlling the first device and/or the second device can be a separate device, and can also be embedded in the first device or the second device.

25 In an embodiment of the system, the system comprises a desktop, a glassesless 3D portable media player and a camera. The camera captures the data representing a physical place where there is a user and a user's gesture in the physical space, identifies the user's gesture and a

30

position of the user's gesture among the first zone, the second zone and the third zone, and then generates on the basis of the user's gesture and the position of the user's gesture, a control signal for controlling the desktop and/or the 3D portable media player. If the camera captures a gesture of waving hand from left to right in the third zone associated with both the desktop and the portable media player, the desktop is controlled to send 3D content to the 3D portable media player and then the 3D portable media player can play the 3D content.

Fig.3 depicts a flow chart of a method in accordance with an embodiment of the present invention. According to an embodiment of a fourth aspect of the present invention, a method of controlling a first device and/or a second device is provided.

Referring to Fig.3, the method comprises step 310 of obtaining data representing a physical place where there is a user and a user's gesture in the physical space. The physical place comprises a first zone associated with the first device, a second zone associated with the second device and a third zone associated with the first device and the second device.

The method further comprises step 320 of identifying the user's gesture and a position of the user's gesture among the first zone, the second zone and the third zone on the basis of the obtained data.

The method further comprises step 330 of generating, on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device and/or the second device.

The step 330 of generating can be implemented in many ways. In an embodiment, the control signal is for data transmission between the first device and the second device if the identified position is in the third zone. In another embodiment, the control signal is for controlling both the first device and the second device if the identified position is in the third zone. In a further embodiment, the control signal is for controlling one of the first device and the second device if the identified position is in the third zone.

A set of computer-executable instructions is further proposed to perform the methods described above. The instructions can reside in the first, second and third units separately to perform any step of the above disclosed methods.

Although the present invention will be described with reference to the embodiment shown in the drawings, it should be understood that the present invention may be embodied in many alternate forms including any combination of hardware and software. In addition, any suitable size, shape or type of materials, elements, computer program elements, computer program code, or computer program modules could be used.

While discussed in the context of computer program code, it should be understood that the modules may be implemented in hardware circuitry, computer program code, or any combination of hardware circuitry and computer program code.

It should be noted that the above-mentioned embodiments illustrated rather than limit the invention and that those skilled in the art would be able to design alternative embodiments without departing from the scope of the appended claims. The embodiments are illustrative rather than restrictive. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The word “comprising” does not exclude the presence of elements or steps not listed in a claim or in the description. The word “a” or “an” preceding an element does not exclude the presence of a plurality of such elements. In the device claims enumerating several units, several of these units can be embodied by one and the same item of hardware or software. The usage of the words first, second and third, et cetera, does not indicate any ordering. These words are to be interpreted as names.

CLAIMS:

1. An apparatus for controlling a first device (210) and/or a second device (220),
5 comprising:

a first unit (110) for obtaining data representing a physical place where there is a user and a user's gesture in the physical space, the physical place comprising a first zone (230, 231) associated with the first device (210), a second zone (240, 241) associated with the second device (220) and a third zone (250, 251) associated with the first device (210) and the second device
10 (220);

a second unit (120) for identifying the user's gesture and a position of the user's gesture among the first zone (230, 231), the second zone (240, 241) and the third zone (250, 251) on the basis of the obtained data; and

a third unit (130) for generating, on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device
15 (210) and/or the second device (220).

2. An apparatus for controlling a first device (210) and/or a second device (220) as claim 1, wherein the control signal is for data transmission between the first device (210) and the second
20 device (220) if the identified position is in the third zone (250, 251).

3. An apparatus for controlling a first device (210) and/or a second device (220) as claim 1, wherein the control signal is for controlling both the first device (210) and the second device (220) if the identified position is in the third zone (250, 251).

4. An apparatus for controlling a first device (210) and/or a second device (220) as claim 1, wherein the control signal is for controlling one of the first device (210) and the second device (220) if the identified position is in the third zone (250, 251).
25

5. An apparatus for controlling a first device and/or a second device as claim 1, wherein the third zone (250) is between the first zone (230) and the second zone (240).

5 6. A first device comprising an apparatus for controlling the first device and/or a second device as claimed in any one of claims 1 to 5.

7. A system comprising a first device, a second device and an apparatus for controlling the first device and/or the second device as claimed in any one of claims 1 to 5.

10 8. A method of controlling a first device (210) and/or a second device (220), comprising the steps of:

obtaining (310) data representing a physical place where there is a user and a user's gesture in the physical space, the physical place comprising a first zone (230, 231) associated with the first device (210), a second zone (240, 241) associated with the second device (220) and a third zone (250, 251) associated with the first device (210) and the second device (220);

15 identifying (320) the user's gesture and a position of the user's gesture among the first zone (230, 231), the second zone (240, 241) and the third zone (250, 251) on the basis of the obtained data; and

20 generating (330), on the basis of the user's gesture, the position of the user's gesture and a control signal mapping table, a control signal for controlling the first device (210) and/or the second device (220).

25 9. A method of controlling a first device (210) and/or a second device (220) as claim 8, wherein the control signal is for data transmission between the first device (210) and the second device (220) if the identified position is in the third zone (250, 251).

30 10. A method of controlling a first device (210) and/or a second device (220) as claim 8, wherein the control signal is for controlling both the first device (210) and the second device (220) if the identified position is in the third zone (250, 251).

11. A method of controlling a first device (210) and/or a second device (220) as claim 8, wherein the third zone (250) is between the first zone (230) and the second zone (240).

5 12. A set of computer-executable instructions, configured to perform any one of the claims 8 to 11.

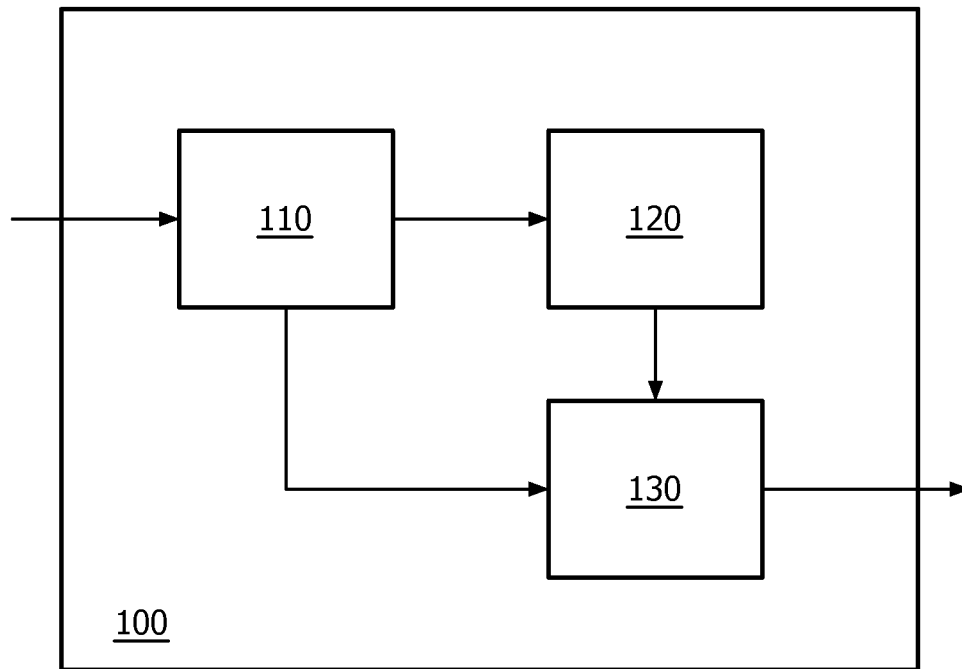


FIG. 1

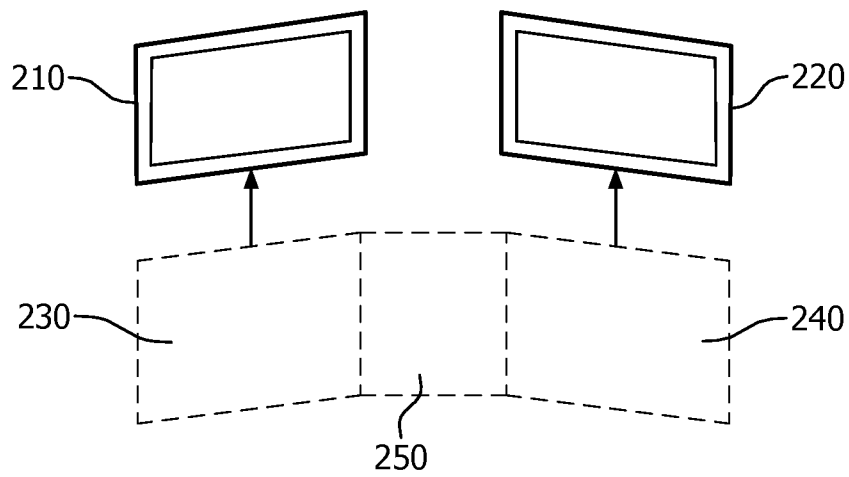


FIG. 2a

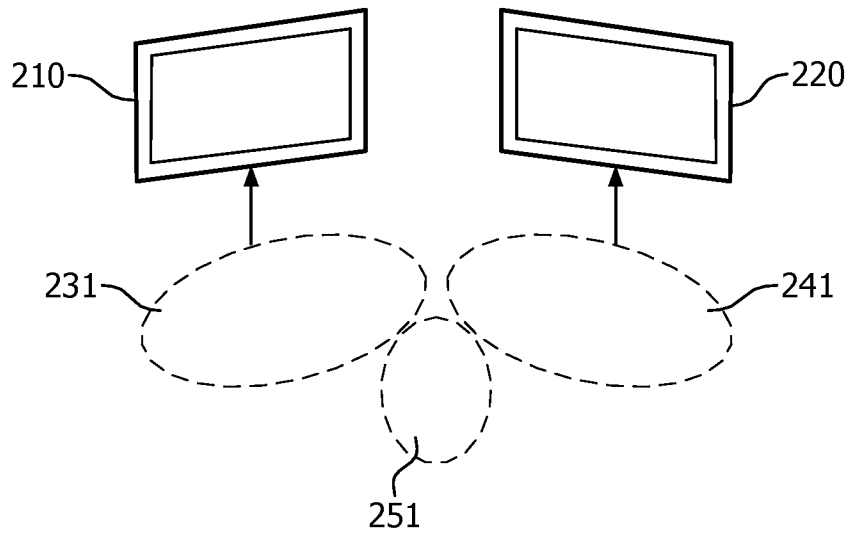


FIG. 2b

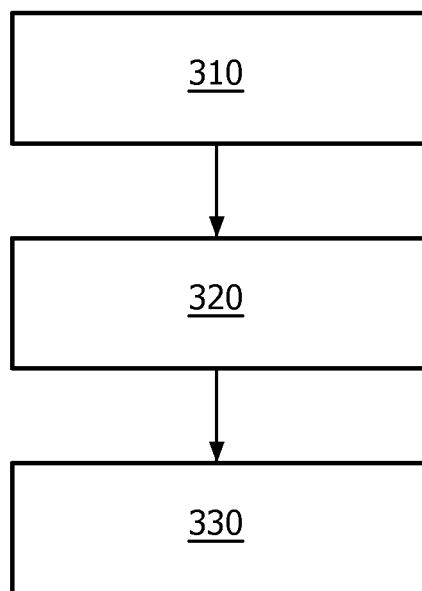


FIG. 3