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(71) Applicants:
- **Foshan Shunde Midea Electric Science and Technology Co., Ltd.**
  Foshan, Guangdong 528311 (CN)
- **GD Midea Air-Conditioning Equipment Co., Ltd.**
  Foshan, Guangdong 528311 (CN)

(72) Inventors:
- **MA, Ruida**
  Foshan, Guangdong 528311 (CN)
- **ZHU, Kunyan**
  Foshan, Guangdong 528311 (CN)
- **FANG, Wei**
  Foshan, Guangdong 528311 (CN)
- **QIU, Jielong**
  Foshan, Guangdong 528311 (CN)
- **ZHOU, Hongming**
  Foshan, Guangdong 528311 (CN)

(74) Representative: **Ran, Handong**
Maucher Jenkins
Seventh Floor Offices
Artillery House
11-19 Artillery Row
London SW1P 1RT (GB)

(54) CONTROL METHOD AND APPARATUS FOR AIR CONDITIONING DEVICE, AND DEVICE, MEDIUM AND PROGRAM PRODUCT

(57) Provided are a control method and apparatus for an air-conditioning device, and a device, a medium and a program product. The method comprises: enabling a linkage mode of an air-conditioning device, and then pushing first prompt information, so as to give a prompt to a user that the air-conditioning device has entered the linkage mode; and in the linkage mode, in response to a control instruction for a first adjustment dimension, controlling enabled adjustment dimensions, other than the first adjustment dimension, in a plurality of adjustment dimensions while controlling the first adjustment dimension. application

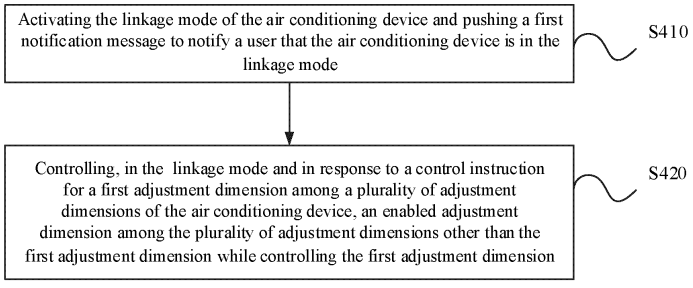

FIG. 4

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Applications No. 202210658351.6 filed on June 10, 2022, and No. 202310633193.3 filed on May 30, 2023, both titled "METHOD AND APPARATUS FOR CONTROLLING AIR CONDITIONING DEVICE, DEVICE, MEDIUM, AND PROGRAM PRODUCT", the entire contents of two applications are incorporated herein by reference.

FIELD

[0002] The present application relates to the field of air-conditioning technologies, and more particularly, to a method and apparatus for controlling an air-conditioning device, a device, a medium, and a program product.

BACKGROUND

[0003] At present, a user can adjust temperature, wind speed, humidity, purification, fresh air, and other dimensions of an air-conditioning device, so that the air-conditioning device can provide the user with a comfortable environment. However, at present, temperature, wind speed, humidity, purification, fresh air, and other adjustment dimensions of the air-conditioning device can only be individually controlled, which results in low control efficiency and poor user experience.

SUMMARY

[0004] The present application aims to solve one of the technical problems in the related art at least to some extent.

[0005] To this end, a first objective of the present application is to provide a method for controlling an air-conditioning device. Subsequent to the air-conditioning device being in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension is controlled while controlling the first adjustment dimension. Therefore, control efficiency and user experience can be improved. In addition, by pushing a notification message, a user can be notified that the air-conditioning device is in the linkage mode, and the user experience can further be improved.

[0006] A second objective of the present application is to provide an apparatus for controlling an air-conditioning device.

[0007] A third objective of the present application is to provide an electronic device.

[0008] A fourth objective of the present application is to provide a computer-readable storage medium.

[0009] A fifth objective of the present application is to provide a computer program product.

[0010] To achieve the above objectives, embodiments of a first aspect of the present application provide a method for controlling the air-conditioning device. The method includes: activating the linkage mode of the air-conditioning device and pushing a first notification message to notify a user that the air-conditioning device is in the linkage mode; and controlling, in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

[0011] According to an embodiment of the present application, the first notification message is any one of: an indicator light corresponding to the linkage mode being turned on; the indicator light corresponding to the linkage mode being in a turn-on state for a first predetermined duration; the indicator light corresponding to the linkage mode presenting a first predetermined color; the indicator light corresponding to the linkage mode presenting the first predetermined color and being in the turn-on state for the first predetermined duration; and the indicator light corresponding to the linkage mode flashing according to a first predetermined mode.

[0012] According to an embodiment of the present application, the method further includes pushing, in response to the control instruction, a second notification message corresponding to the first adjustment dimension to notify the user that the first adjustment dimension is a primary adjustment dimension.

[0013] According to an embodiment of the present application, the second notification message is any one of: an indicator light corresponding to the first adjustment dimension presenting a second predetermined color; the indicator light corresponding to the first adjustment dimension presenting the second predetermined color and being in a turn-on state for a second predetermined duration; the indicator light corresponding to the first adjustment dimension flashing according to a second predetermined mode; and the indicator light corresponding to the first adjustment dimension presenting a breathing light effect.

[0014] According to an embodiment of the present application, the method further includes displaying a control progress of the first adjustment dimension in response to the control instruction.

[0015] According to an embodiment of the present application, the method further includes pushing, for any one adjustment dimension among the plurality of adjustment dimensions, when the any one adjustment dimension is in an enabled state, a third notification message corresponding to the any one adjustment dimension to notify the user that the any one adjustment dimension is in the enabled state.

[0016] According to an embodiment of the present

application, the third notification message is any one of: an indicator light corresponding to the any one adjustment dimension presenting a third predetermined color; the indicator light corresponding to the any one adjustment dimension presenting the third predetermined color and is in a turn-on state for a third predetermined duration; and the indicator light corresponding to the any one adjustment dimension flashing according to a third predetermined mode.

[0017] According to an embodiment of the present application, the second notification message is different from the third notification message.

[0018] According to an embodiment of the present application, the method further includes displaying, for any one adjustment dimension among the plurality of adjustment dimensions, a current progress of the any one adjustment dimension when the any one adjustment dimension is in an enabled state.

[0019] According to an embodiment of the present application, the method further includes pushing, for any one adjustment dimension among the plurality of adjustment dimensions, when the any one adjustment dimension is in a disabled state, a fourth notification message to notify the user that the any one adjustment dimension is in the disabled state.

[0020] According to an embodiment of the present application, the fourth notification message is any one of: an indicator light corresponding to the any one adjustment dimension being turned off; the indicator light corresponding to the any one adjustment dimension presenting a fourth predetermined color; and the indicator light corresponding to the any one adjustment dimension being turned on to a predetermined brightness. The predetermined brightness is lower than a full brightness of the indicator light corresponding to the any one adjustment dimension.

[0021] According to an embodiment of the present application, the activating the linkage mode of the air-conditioning device includes activating, in response to a power-on instruction or a linkage instruction, the linkage mode of the air-conditioning device.

[0022] According to an embodiment of the present application, the method further includes enabling, in response to the power-on instruction or the linkage instruction, at least one adjustment dimension among the plurality of adjustment dimensions.

[0023] According to an embodiment of the present application, the at least one adjustment dimension is any one of: an adjustment dimension that needs to be enabled by default; an adjustment dimension that is historically enabled in the linkage mode; and an adjustment dimension that needs to be enabled based on a current environment.

[0024] According to an embodiment of the present application, when the air-conditioning device switches from a normal mode to the linkage mode in response to the linkage instruction, the at least one adjustment dimension is any one of: an adjustment dimension that needs to be enabled by default; an adjustment dimension that is historically enabled in the linkage mode; an adjustment dimension that is enabled in the normal mode; and an adjustment dimension that needs to be enabled based on a current environment.

[0025] According to an embodiment of the present application, the activating the linkage mode of the air-conditioning device includes activating, in response to a selection instruction and a linkage instruction for at least one adjustment dimension among the plurality of adjustment dimensions, the linkage mode of the air-conditioning device.

[0026] According to an embodiment of the present application, the method further includes enabling the at least one adjustment dimension in response to the selection instruction and the linkage instruction for the at least one adjustment dimension.

[0027] According to an embodiment of the present application, the method further includes, subsequent to the activating the linkage mode of the air-conditioning device: pushing a fifth notification message to notify the user of a state of the air-conditioning device.

[0028] According to an embodiment of the present application, the fifth notification message is any one of: when the state of the air-conditioning device is a refrigeration state, a progress bar corresponding to the linkage mode presenting a fifth predetermined color; when the state of the air-conditioning device is a heating state, the progress bar corresponding to the linkage mode presenting a sixth predetermined color; when the state of the air-conditioning device is an air supply state, the progress bar corresponding to the linkage mode presenting a seventh predetermined color; and when the state of the air-conditioning device is a dehumidification state, the progress bar corresponding to the linkage mode presenting an eighth predetermined color.

[0029] According to an embodiment of the present application, the air-conditioning device includes a printed circuit board (PCB) and a display panel. The PCB includes a processing unit and a light board. The light board forms a predetermined angle with the display panel. A reflection plate is disposed between the light board and the display panel. The reflection plate is configured to reflect light from the light board to the display panel. The activating the linkage mode of the air-conditioning device and pushing the first notification message to notify the user that the air-conditioning device is in the linkage mode includes: activating, by the processing unit, the linkage mode of the air-conditioning device, and controlling the light board to allow the display panel to push the first notification message to notify the user that the air-conditioning device is in the linkage mode. The controlling, in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjust-

ment dimension includes: controlling, by the processing unit in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

[0030] According to an embodiment of the present application, the predetermined angle ranges from 30 degrees to 45 degrees.

[0031] According to an embodiment of the present application, the reflection plate is an arc-shaped reflection plate protruding outwardly.

[0032] According to an embodiment of the present application, the reflection plate is white and has a smoothness greater than a predetermined smoothness.

[0033] According to an embodiment of the present application, an area ratio of the display panel to a panel of the air-conditioning device is 20%.

[0034] According to an embodiment of the present application, the air-conditioning device further includes a photosensitive sensor. The method further includes: acquiring, by the processing unit, data collected by the photosensitive sensor; and controlling, by the processing unit, a brightness of the light board based on the data collected by the photosensitive sensor.

[0035] According to an embodiment of the present application, the controlling, by the processing unit, the brightness of the light board based on the data collected by the photosensitive sensor includes: controlling, by the processing unit when the data collected by the photosensitive sensor is greater than a predetermined threshold, the brightness of the light board to be a first brightness; and controlling, by the processing unit when the data collected by the photosensitive sensor is smaller than or equal to the predetermined threshold, the brightness of the light board to be a second brightness. The first brightness is greater than the second brightness.

[0036] To achieve the above objectives, embodiments of a second aspect of the present application provide the apparatus for controlling the air-conditioning device. The apparatus includes: an activation module configured to activate the linkage mode of the air-conditioning device; a push module configured to push a first notification message to notify a user that the air-conditioning device is in the linkage mode; a control module configured to control, in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

[0037] To achieve the above objectives, embodiments of a third aspect of the present application provide the electronic device. The electronic device includes: a processor; and a memory configured to store a computer program. The processor is configured to invoke and execute the computer program stored in the memory to perform the method for controlling the air-conditioning device described above.

[0038] To achieve the above objectives, embodiments of a fourth aspect of the present application provide the computer-readable storage medium. The computer-readable storage medium is configured to store a computer program. The computer program allows a computer to perform the method for controlling the air-conditioning device described above.

[0039] To achieve the above objectives, embodiments of a fifth aspect of the present application provide the computer program product including a computer program or a computer instruction. A processor, when executing the computer program or the computer instruction, performs the method for controlling the air-conditioning device described above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040]

FIG. 1 is a schematic diagram of an application scenario according to an embodiment of the present application.

FIG. 2 is a schematic diagram of another application scenario according to an embodiment of the present application.

FIG. 3 is a schematic diagram of another application scenario according to an embodiment of the present application.

FIG. 4 is a flowchart of a method for controlling an air-conditioning device according to an embodiment of the present application.

FIG. 5 is a schematic diagram of an interface according to an embodiment of the present application.

FIG. 6A is a schematic diagram of another interface according to an embodiment of the present application.

FIG. 6B is a schematic diagram of an interface according to an embodiment of the present application.

FIG. 7 is a schematic diagram of another interface according to an embodiment of the present application.

FIG. 8 is a schematic diagram of another interface according to an embodiment of the present application.

FIG. 9 is a schematic diagram of an interface according to an embodiment of the present application.

FIG. 10 is a schematic diagram of another interface according to an embodiment of the present application.

FIG. 11 is a schematic diagram of another interface according to an embodiment of the present application.

FIG. 12 is a flowchart of another method for control-

ling an air-conditioning device according to an embodiment of the present application.

FIG. 13A is a flowchart of another method for controlling an air-conditioning device according to an embodiment of the present application.

FIG. 13B is a sectional view of a light assembly according to an embodiment of the present application.

FIG. 13C is a flowchart of another method for controlling an air-conditioning device according to an embodiment of the present application.

FIG. 14 is a schematic diagram of an apparatus 1400 for controlling an air-conditioning device according to an embodiment of the present application.

FIG. 15A is a schematic block diagram of an air-conditioning device according to an embodiment of the present application.

FIG. 15B is a schematic block diagram of an air-conditioning device according to another embodiment of the present application.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0041] Technical solutions according to embodiments of the present application will be described clearly and completely below in combination with accompanying drawings of the embodiments of the present application. Apparently, the embodiments described below are only a part of the embodiments of the present application, rather than all of the embodiments. On a basis of the embodiments in the present application, all other embodiments obtained by a person skilled in the art without creative labor shall fall within the protection scope of the present application.

[0042] It should be noted that terms such as "first", "second" in detailed description of the description, the claims and the accompanying drawings of the present application are used to distinguish between similar objects, rather than to describe a particular order or sequence. It should be understood that the terms may be interchanged where appropriate, to enable the embodiments of the present application described herein to be implemented in an order other than that illustrated or described herein. In addition, terms "include", "have", and any variations thereof are intended to cover non-exclusive inclusions. For example, a process, method, system, product, or server that includes a series of steps or units is not necessarily limited to those clearly listed steps or units, but may also include other steps or units that are not clearly listed or are inherent to the process, method, product, or device.

[0043] As mentioned above, at present, a plurality of adjustment dimensions for an air-conditioning device can only be controlled individually, resulting in low control efficiency and poor user experience.

[0044] In order to solve the above technical problems, the embodiments of the present application provide a linkage control solution. In an exemplary embodiment of the present application, in response to being in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension is controlled while controlling the first adjustment dimension.

[0045] For example, the technical solution of the present application may be applied to the following scenarios, but is not limited thereto.

[0046] FIG. 1 is a schematic diagram of an application scenario according to an embodiment of the present application. As shown in FIG. 1, the application scenario may include an air-conditioning device 110 and a remote controller 120. A user can operate the remote controller 120 to realize remote control of the air-conditioning device 110.

[0047] In some embodiments of the present application, the remote controller 120 may be an infrared remote controller. The infrared remote controller may have an infrared emitting unit, and the air-conditioning device 110 may have an infrared receiving unit. The infrared remote controller transmits an infrared signal to the air-conditioning device 110 through the infrared emitting unit, and the air-conditioning device 110 receives an infrared signal through the infrared receiving unit, thereby realizing the remote control of the air-conditioning device 110.

[0048] FIG. 2 is a schematic diagram of another application scenario according to an embodiment of the present application. As shown in FIG. 2, the application scenario may include an air-conditioning device 210 and a terminal device 220. An application (APP) configured to control the air-conditioning device 210 may be mounted at the terminal device 220. The user can operate the APP to realize the remote control of the air-conditioning device 210.

[0049] In some embodiments of the present application, the terminal device may be a mobile phone, a computer, etc., but is not limited thereto.

[0050] It should be understood that the air-conditioning device in FIG. 1 and FIG. 2 may be a hanging air-conditioning device or a cabinet air-conditioning device.

[0051] FIG. 3 is a schematic diagram of another application scenario according to an embodiment of the present application. As shown in FIG. 3, the application scenario may include the air-conditioning device. The air-conditioning device is provided with a touch panel, and the user can control the air-conditioning device through an operation on the touch panel.

[0052] It should be understood that the present application is further applicable to voice or gesture control scenarios for air-conditioning devices.

[0053] The technical solution of the present application will be described in detail below.

[0054] FIG. 4 is a flowchart of a method for controlling an air-conditioning device according to an embodiment of the present application. The method may be performed

by the air-conditioning device. The air-conditioning device may be the cabinet air-conditioning device or the hanging air-conditioning device and the like. As shown in FIG. 4, this method may include operations at blocks.

[0055] At block S410, the linkage mode of the air-conditioning device is activated and a first notification message is pushed to notify a user that the air-conditioning device is in the linkage mode.

[0056] At block S420, in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension is controlled while controlling the first adjustment dimension

[0057] It should be understood that the linkage mode refers to that when the air-conditioning device acquires the control instruction for the first adjustment dimension among the plurality of adjustment dimensions, the air-conditioning device controls the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension, and the first adjustment dimension may be any one adjustment dimension among the plurality of adjustment dimensions. For example, when the user adjusts a temperature dimension, an enabled wind speed adjustment dimension can be automatically adjusted. For another example, when the user enables the wind speed adjustment dimension, an enabled humidity adjustment dimension can also be automatically adjusted. For another example, when the user disables the humidity adjustment dimension, the enabled adjustment dimension can remain unchanged.

[0058] In some embodiments of the present application, the linkage mode is for the plurality of adjustment dimensions, which may be system defaults.

[0059] In some embodiments of the present application, the plurality of adjustment dimensions may include, but are not limited to, adjustment dimensions such as a temperature adjustment dimension, a wind speed adjustment dimension, a humidity adjustment dimension, a purification adjustment dimension, a fresh air adjustment dimension. The wind speed adjustment dimension here may include a no-wind condition. The humidity adjustment dimension may include humidification and dehumidification conditions.

[0060] In some embodiments of the present application, the activating the linkage mode of the air-conditioning device includes, but is not limited to, the following cases.

[0061] In a first case, a power-on instruction is acquired by the air-conditioning device, and in response to the power-on instruction, the linkage mode of the air-conditioning device is activated. For example, when the user turns on the air-conditioning device, the air-conditioning device automatically is in the linkage mode.

[0062] In some embodiments of the present application, the power-on instruction may be generated based on a user's operation on a power-on button on the remote controller or the touch panel, or generated based on a user's operation on a power-on icon on the APP, or the power-on instruction may be a voice instruction, a gesture instruction or a posture instruction or the like.

[0063] In a second case, the linkage instruction is acquired by the air-conditioning device, and in response to the linkage instruction, the linkage mode of the air-conditioning device is activated. For example, when the user turns on the air-conditioning device, the user can click a linkage icon or button to allow the air-conditioning device to automatically be in the linkage mode.

[0064] In some embodiments of the present application, the linkage instruction may be generated based on a user's operation on the linkage button on the remote controller or the touch panel, or generated based on a user's operation on the linkage icon on the APP, or the linkage instruction may be the voice instruction, the gesture instruction or the posture instruction or the like.

[0065] In a third case, a selection instruction and the linkage instruction for at least one adjustment dimension is acquired by the air-conditioning device, and in response to the selection instruction and the linkage instruction, the linkage mode of the air-conditioning device is activated. For example, when the user turns on the air-conditioning device, the user can select five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, and then the user can click the linkage icon or button to allow the air-conditioning device to be in the linkage mode.

[0066] In some embodiments of the present application, in the third case, assuming that the user selects the plurality of adjustment dimensions, thus the air-conditioning device can determine whether a maximum interval duration of the selection instructions for the plurality of adjustment dimensions is smaller than a predetermined duration. When the maximum interval duration is smaller than the predetermined duration, the linkage mode of the air-conditioning device is activated in response to the selection instruction and the linkage instruction.

[0067] In some embodiments of the present application, the predetermined duration may be 5 seconds or 10 seconds, etc., which is not limited by the present application.

[0068] It should be understood that a reason for setting the predetermined duration is that it can reduce misjudgment of the air-conditioning device. For example, assuming that the predetermined duration is not set. The user selects the fresh air adjustment dimension at time t, and subsequent to half an hour, the user selects three adjustment dimensions including the temperature adjustment dimension, the humidity adjustment dimension, and the wind speed adjustment dimension. Then the user can click or touch the linkage button or icon, etc. In fact, the user expects to link the three adjustment dimensions

including the temperature adjustment dimension, the humidity adjustment dimension, and the wind speed adjustment dimension. However, when the predetermined duration is not set, the air-conditioning device may link four adjustment dimensions including the fresh air adjustment dimension, the temperature adjustment dimension, the humidity adjustment dimension, and the wind speed adjustment dimension.

[0069] The maximum interval duration of the selection instructions is illustrated as follows. Assuming that the user selects three adjustment dimensions including the temperature adjustment dimension, the humidity adjustment dimension, and the wind speed adjustment dimension, and their corresponding selection times are t, t+1s, and t+2s respectively. Then for the three adjustment dimensions, the maximum interval duration of the corresponding selection instructions is t+2-t=2s.

[0070] It should be understood that there are two scenarios in the second case and the third case. One scenario is that when the air-conditioning device is turned on, the air-conditioning device is in a normal mode by default. In this case, when the linkage instruction, or the selection instruction and the linkage instruction for at least one adjustment dimension are acquired by the air-conditioning device, the air-conditioning device can switch from the normal mode to the linkage mode. Another scenario is that when the air-conditioning device is turned on, the air-conditioning device is not in any mode, and this mode can be called an idle mode, or this state can be called an idle state. When the linkage instruction, or the selection instruction and the linkage instruction for at least one adjustment dimension are acquired by the air-conditioning device, the air-conditioning device can directly be in the linkage mode.

[0071] It should be understood that the normal mode may also be referred to as a non-linkage mode, which refers to a mode in which the plurality of adjustment dimensions are independently controlled, i.e., when the user controls any one adjustment dimension, other adjustment dimensions are not controlled.

[0072] It should be understood that the linkage instruction is used to activate the linkage mode of the air-conditioning device.

[0073] When the air-conditioning device is in the linkage mode, the air-conditioning device may enable at least one adjustment dimension. The following describes at least one adjustment dimension enabled in the above three cases of activating the linkage mode.

[0074] In some embodiments of the present application, in the above first case, or in the above second case and when the air-conditioning device directly is in the linkage mode subsequent to being powered on, the at least one adjustment dimension enabled by the air-conditioning device may be any one of, but is not limited to: an adjustment dimension that needs to be enabled by default; an adjustment dimension that is historically enabled in the linkage mode; and an adjustment dimension that needs to be enabled based on a current environment.

[0075] For example, the system enables five adjustment dimensions including the temperature adjustment dimension, the humidity adjustment dimension, the wind speed adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension by default. Based on this, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the system can automatically enable the five adjustment dimensions.

[0076] For example, the system enables two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension by default. Based on this, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the system can automatically enable the two adjustment dimensions.

[0077] For example, assuming that adjustment dimensions that are enabled by the user last time in the linkage mode are three adjustment dimensions including the temperature adjustment dimension, the humidity adjustment dimension, and the wind speed adjustment dimension. Based on this, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the three adjustment dimensions can be automatically enabled.

[0078] For example, the air-conditioning device may collect current environmental data, such as temperature, humidity, pollution index. Further, the air-conditioning device may determine adjustment dimensions that needs to be enabled based on the current environmental data. Based on this, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the adjustment dimensions that needs to be enabled above may be automatically enabled.

[0079] In some embodiments of the present application, if the air-conditioning device is never be used, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the air-conditioning device can enable the adjustment dimension that needs to be enabled by default or enable the adjustment dimension that needs to be enabled based on the current environment. If the air-conditioning device has been used, when the power-on instruction or the linkage instruction is acquired by the air-conditioning device, the air-conditioning device can enable the adjustment dimension that needs to be enabled by default, or enable the adjustment dimension that is historically enabled in the linkage mode, or enable the adjustment dimension that needs to be enabled based on the current environment.

[0080] In some embodiments of the present application, in the above second case, when the air-conditioning device is switched from the normal mode to the linkage mode, at least one adjustment dimension enabled by the air-conditioning device may be any one of, but is not limited to: an adjustment dimension that needs to be enabled by default; an adjustment dimension that is historically enabled in the linkage mode; an adjustment

dimension that is enabled in the normal mode; and an adjustment dimension that needs to be enabled based on a current environment.

[0081] For example, assuming that subsequent to the air-conditioning device being turned on, it firstly is in the normal mode. In the normal mode, assuming that the user enables two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension, and in this case, when the linkage instruction is acquired by the air-conditioning device, the two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension can be automatically enabled.

[0082] In some embodiments of the present application, in the third case above, the air-conditioning device can enable at least one adjustment dimension selected by the user.

[0083] For example, the user can select at least one adjustment dimension through the remote controller, the APP or the touch panel. For example, when two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension are selected, the user can click or touch the linkage button or icon, so as to enable the two adjustment dimensions.

[0084] It should be understood that the first notification message is used to notify the user that the air-conditioning device is in the linkage mode.

[0085] In some embodiments of the present application, the first notification message is any one of, but not limited to: an indicator light corresponding to the linkage mode being turned on; the indicator light corresponding to the linkage mode being in a turn-on state for a first predetermined duration; the indicator light corresponding to the linkage mode presenting a first predetermined color; the indicator light corresponding to the linkage mode presenting the first predetermined color and being in the turn-on state for the first predetermined duration; and the indicator light corresponding to the linkage mode flashing according to a first predetermined mode; and a voice message.

[0086] In some embodiments of the present application, the indicator light corresponding to the linkage mode may be disposed in a cabinet touch panel (also referred to as a cabinet display panel) or an on-hook display panel.

[0087] It should be understood that, in embodiments of the present application, the indicator light may also be referred to as an icon.

[0088] In some embodiments of the present application, the number of the indicator lights corresponding to the linkage mode may be one or more.

[0089] In some embodiments of the present application, the first predetermined duration may be 10 minutes, 30 minutes, etc.

[0090] In some embodiments of the present application, the first predetermined color may be blue, green, red, or the like.

[0091] In some embodiments of the present application, flashing according to the first predetermined mode may be flashing once every N seconds, where N is a positive integer, or an interval between two adjacent flashes is 1 second, 2 seconds, 1 second, 2 seconds, and so on in sequence.

[0092] For example, as shown in FIG. 5, an icon corresponding to the linkage mode is displayed in the interface, and the icon indicates that the indicator light corresponding to the linkage mode is turned on, which means that the linkage mode is activated. In other embodiments, only one of these two icons may exist. As shown in FIG. 6A, the icon corresponding to the linkage mode is not displayed in this interface, which means that the linkage mode is deactivated.

[0093] For example, the indicator light corresponding to the linkage mode being in the turn-on state for 10 minutes indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off indicates that the linkage mode is deactivated.

[0094] For example, the indicator light corresponding to the linkage mode presenting green indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off or presenting red indicates that the linkage mode is deactivated.

[0095] For example, the indicator light corresponding to the linkage mode presenting green and being in the turn-on state for 10 minutes indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off or presenting red indicates that the linkage mode is deactivated.

[0096] For example, the indicator light corresponding to the linkage mode flashing every 2 seconds indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off or presenting red indicates that the linkage mode is deactivated.

[0097] For example, the air-conditioning device can also use a voice broadcast mode to announce to the user that "the linkage mode is activated", which indicates that the linkage mode is activated.

[0098] In order to facilitate the user to know the state of the air-conditioning device, in the embodiments of the present application, the air-conditioning device may further push a fifth notification message to notify the user of the state of the air-conditioning device.

[0099] In some embodiments of the present application, the fifth notification message is any one of: when the state of the air-conditioning device is a refrigeration state, a progress bar corresponding to the linkage mode presenting a fifth predetermined color; when the state of the air-conditioning device is a heating state, the progress bar corresponding to the linkage mode presenting a sixth predetermined color; when the state of the air-conditioning device is an air supply state, the progress bar corresponding to the linkage mode presenting a seventh predetermined color; and when the state of the air-conditioning device is a dehumidification state, the progress bar corresponding to the linkage mode presenting an eighth

predetermined color.

[0100] In some implementations, the fifth predetermined color may be blue, but is not limited thereto.

[0101] In some implementations, the sixth predetermined color may be orange, but is not limited thereto.

[0102] In some implementations, the seventh predetermined color may be green, but is not limited thereto.

[0103] In some implementations, the eighth predetermined color may be yellow, but is not limited thereto.

[0104] For example, FIG. 6B is a schematic diagram of an interface according to an embodiment of the present application. As shown in FIG. 6B, the linkage icon includes two parts: a five-dimensional linkage and a progress bar. In FIG. 6B, a striped frame indicates that the progress bar is blue, which indicates that the air-conditioning device is in the refrigeration state.

[0105] In order to facilitate the user to distinguish which adjustment dimensions are in an enabled state and which adjustment dimensions are in a disabled state. In the embodiments of the present application, the air-conditioning device may push a third notification message or a fourth notification message respectively for the plurality of adjustment dimensions. The third notification message is configured to notify the user that the corresponding adjustment dimension is in the enabled state, and the fourth notification message is configured to notify the user that the corresponding adjustment dimension is in the disabled state.

[0106] In some embodiments of the present application, for any one adjustment dimension among the plurality of adjustment dimensions, the third notification message corresponding thereto may be any one of, but not limited to: an indicator light corresponding to the any one adjustment dimension presenting a third predetermined color; the indicator light corresponding to the any one adjustment dimension presenting the third predetermined color and is in a turn-on state for a third predetermined duration; and the indicator light corresponding to the any one adjustment dimension flashing according to a third predetermined mode.

[0107] In some embodiments of the present application, the indicator light corresponding to the adjustment dimension may be disposed at the cabinet touch panel (also referred to as the cabinet display panel) or the on-hook display panel.

[0108] In some embodiments of the present application, the number of the indicator lights corresponding to the adjustment dimension may be one or more.

[0109] In some embodiments of the present application, the third predetermined duration may be 1 second or 2 seconds, etc.

[0110] In some embodiments of the present application, the third predetermined color may be white, blue, green, red, or the like.

[0111] In some embodiments of the present application, flashing according to the third predetermined mode may be flashing once every P seconds, where P is a positive integer, or an interval between two adjacent flashes is 2 seconds, 1 second, 2 seconds, 1 second, and so on in sequence.

[0112] In some embodiments of the present application, for any one adjustment dimension among the plurality of adjustment dimensions, the fourth notification message corresponding thereto may be any one of, but not limited to: an indicator light corresponding to the any one adjustment dimension being turned off; the indicator light corresponding to the any one adjustment dimension presenting a fourth predetermined color; and the indicator light corresponding to the any one adjustment dimension being turned on to a predetermined brightness. The predetermined brightness is lower than a full brightness of the indicator light corresponding to the any one adjustment dimension.

[0113] In some embodiments of the present application, the fourth predetermined color may be red, purple, etc.

[0114] For example, as shown in FIG. 5, a striped frame indicates that the indicator light is white, which indicates that the corresponding adjustment dimension is in the enabled state. A blank frame indicates that the indicator light is turned off, which indicates that the corresponding adjustment dimension is in the disabled state. In this way, FIG. 5 shows that the temperature conditioning dimension and the wind speed conditioning dimension are currently in the enabled state, while the humidity conditioning dimension, the purification conditioning dimension, and the fresh air-conditioning dimension are currently in the disabled state.

[0115] For example, it is assumed the humidity dimension is in the disabled state, an indicator light corresponding to the humidity dimension may be turned on to 10% of the full brightness.

[0116] It should be understood that, in the embodiments of the present application, the indicator light corresponding to the adjustment dimension in the disabled state may not be turned off, but turned on to the predetermined brightness. Therefore, the display panel does not have a visual fault problem. For example, an indicator light corresponding to the enabled adjustment dimension is turned on, and an indicator light corresponding to the disabled adjustment dimension is turned off, resulting in the visual fault problem of the whole display panel.

[0117] In some embodiments of the present application, in order to facilitate the user to know a respective progress of the plurality of adjustment dimensions, for any one adjustment dimension among the plurality of adjustment dimensions, when the any one adjustment dimension is in the enabled state, the air-conditioning device may further display a current progress of the any one adjustment dimension.

[0118] For example, as shown in FIG. 7, a striped frame indicates that the indicator light is white, which indicates that the corresponding adjustment dimension is in the enabled state, and a length of the striped frame indicates the current progress of the adjustment dimension.

[0119] As shown in FIG. 7, it should be understood that both the enabled/disabled state and the current progress of one adjustment dimension are indicated through the same indicator light. In fact, it is also possible to indicate the enabled/disabled state and current progress of one adjustment dimension through different indicator lights.

[0120] For example, as shown in FIG. 8, a striped frame indicates that the indicator light is white, which indicates that the corresponding adjustment dimension is in the enabled state, and a shaded height indicates the current progress of the adjustment dimension.

[0121] As shown in FIG. 8, it should be understood that the indicator light indicated by the striped frame indicates the enabled/disabled state of the adjustment dimension and the indicator light indicated by a shaded part indicates the current progress of the adjustment dimension. In fact, it is also possible to indicate the enabled/disabled state of the adjustment dimension with the indicator light indicated by the shaded part and to indicate the current progress of the adjustment dimension with the indicator light indicated by the striped frame. Alternatively, both two indicators can indicate both the enabled/disabled state and the current progress of the adjustment dimension.

[0122] It should be understood that, in the embodiments of the present application, for the linkage mode, the first adjustment dimension may be referred to as a primary adjustment dimension, and any one of the enabled adjustment dimensions among the plurality of adjustment dimensions other than the first adjustment dimension, which is controlled while controlling the first adjustment dimension, may be referred to as a second adjustment dimension.

[0123] For example, assuming that the user controls the temperature adjustment dimension through the remote controller, the APP, or the touch panel, then the temperature adjustment dimension may be referred to as a primary adjustment dimension. Based on the control of the temperature adjustment dimension, the enabled wind speed adjustment dimension, humidity adjustment dimension, fresh air adjustment dimension, and purification adjustment dimension also controlled by the air-conditioning device may be called the second adjustment dimension.

[0124] In order to enable the user to intuitively feel the adjustment dimension controlled by the user, in the embodiments of the present application, the air-conditioning device can push a second notification message for the first adjustment dimension to notify the user that the first adjustment dimension is the primary adjustment dimension.

[0125] In some embodiments of the present application, the second notification message is any one of, but not limited to: an indicator light corresponding to the first adjustment dimension presenting a second predetermined color; the indicator light corresponding to the first adjustment dimension presenting the second predetermined color and being in a turn-on state for a second predetermined duration; the indicator light corresponding to the first adjustment dimension flashing according to a second predetermined mode; and the indicator light corresponding to the first adjustment dimension presenting a breathing light effect.

[0126] In some embodiments of the present application, the indicator light corresponding to the first adjustment dimension may be disposed at the cabinet touch panel (also referred to as the cabinet display panel) or the on-hook display panel.

[0127] In some embodiments of the present application, the number of the indicator lights corresponding to the first adjustment dimension may be one or more.

[0128] In some embodiments of the present application, the second predetermined duration may be 3 seconds or 5 seconds.

[0129] In some embodiments of the present application, the second predetermined color may be blue, green, red, or the like.

[0130] In some embodiments of the present application, flashing according to the second predetermined mode may be flashing once every M seconds, where M is a positive integer, or an interval between two adjacent flashes is 1 second, 3 seconds, 1 second, 3 seconds, and so on in sequence.

[0131] For example, as shown in FIG. 9, assuming that the temperature adjustment dimension is the primary adjustment dimension. When the user is currently controlling the temperature adjustment dimension, the indicator light corresponding to the temperature adjustment dimension may present blue for 1 second. In FIG. 9, the indicator light presenting blue is indicated by a black dot frame.

[0132] For example, assuming that the temperature adjustment dimension is the primary adjustment dimension. When the user is currently controlling the temperature adjustment dimension, the indicator light corresponding to the temperature adjustment dimension may present red for 1 second and then be turned off.

[0133] In some embodiments of the present application, the air-conditioning device may further display a control progress of the first adjustment dimension in response to the control instruction.

[0134] For example, as shown in FIG. 10, assuming that the temperature adjustment dimension is the primary adjustment dimension. When the user is currently controlling the temperature adjustment dimension, the indicator light corresponding to the temperature adjustment dimension may present blue for 1 second. In FIG. 10, the indicator light presenting blue is indicated by a black dot frame, and a length change of the black dot frame represents a control progress of the temperature adjustment dimension.

[0135] For example, as shown in FIG. 11, assuming that the temperature adjustment dimension is the primary adjustment dimension. When the user is currently controlling the temperature adjustment dimension, the indicator light corresponding to the temperature adjustment dimension may present blue for 1 second. In FIG. 11, the

indicator light presenting blue is indicated by a black dot frame, and a height change of a shaded part represents the control progress of the temperature adjustment dimension.

[0136] In FIG. 11, it should be understood that the temperature adjustment dimension is indicated as the primary adjustment dimension by the black dot frame, and the control progress of the temperature adjustment dimension is indicated by the shaded part. In fact, it is also possible to use the shaded part to represent the temperature adjustment dimension as the primary adjustment dimension, and to use a length change of the striped frame to represent the control progress of the temperature adjustment dimension. Alternatively, both parts can indicate the temperature adjustment dimension as the primary adjustment dimension and the control progress of the temperature adjustment dimension.

[0137] In some embodiments of the present application, the second notification message is different from the third notification message. For example, the user is currently controlling the temperature adjustment dimension, the indicator light corresponding to the temperature adjustment dimension may be red for 1 second and then be turned off. Indicator lights for the temperature adjustment dimension and enabled adjustment dimensions associated with the temperature adjustment dimension and/or indicator lights for other adjustment dimensions that needs to be enabled may remain white to indicate that the temperature adjustment dimension and the enabled adjustment dimensions associated with the temperature adjustment dimension and/or the other adjustment dimensions that needs to be enabled are in the enabled state.

[0138] In the embodiments of the present application, the air-conditioning device can activate the linkage mode of the air-conditioning device. In the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension is controlled while controlling the first adjustment dimension. Therefore, the user does not need to individually control other adjustment dimensions, and this linkage control manner can improve the control efficiency, thus improving the user experience. In addition, the air-conditioning device can further push the first notification message to notify the user that the air-conditioning device is in the linkage mode, which can further improve the user experience.

[0139] Further, the air-conditioning device can push the third notification message or the fourth notification message for the plurality of adjustment dimensions respectively, to allow the user to distinguish which adjustment dimensions are in the enabled state and which adjustment dimensions are in the disabled state, thereby improving the user experience. The air-conditioning device can further show a current progress of each adjustment dimension, thereby further improving the user experience. The air-conditioning device can further push the second notification message for the primary adjustment dimension, to allow the user to know which adjustment dimension is the primary adjustment dimension, thereby further improving the user experience. The air-conditioning device can push the fifth notification message to notify the user of the state of the air-conditioning device, thereby further improving the user experience.

[0140] The method for controlling the air-conditioning device will be described in further detail below.

[0141] As shown in FIG. 12, the step S420 may include operations at blocks.

[0142] At block S1210, in the linkage mode and in response to the control instruction for the first adjustment dimension, for the second adjustment dimension in the enabled adjustment dimensions, the second adjustment dimension is controlled to change while controlling the first adjustment dimension; or, when a priority of the second adjustment dimension is lower than a priority of the first adjustment dimension, the second adjustment dimension is controlled to change while controlling the first adjustment dimension; or, the second adjustment dimension is controlled to remain unchanged while controlling the first adjustment dimension.

[0143] It should be understood that the second adjustment dimension may be any one of the enabled adjustment dimensions among the plurality of adjustment dimensions other than the first adjustment dimension.

[0144] In some embodiments of the present application, priorities of the plurality of adjustment dimensions may be set by the air-conditioning device at the factory, or the user may set priorities of the adjustment dimensions through the remote controller, the APP or the touch panel, which is not limited by the present application.

[0145] It should be understood that, as can be seen from the step S1210, a linkage control of the second adjustment dimension includes the following cases: controlling the second adjustment dimension to remain unchanged or change.

[0146] When the air-conditioning device is configured to control the second adjustment dimension to change, it may adjust the second adjustment dimension in the following implementable manner, but is not limited thereto.

[0147] In a first implementation manner, the air-conditioning device determines an adjustment amount of the first adjustment dimension, determines a mapping relationship between the adjustment amount of the first adjustment dimension and an adjustment amount of the second adjustment dimension, determines the adjustment amount of the second adjustment dimension based on the adjustment amount of the first adjustment dimension and the mapping relationship, and adjusts the second adjustment dimension based on the adjustment amount of the second adjustment dimension.

[0148] For example, assuming that the first adjustment dimension is the temperature adjustment dimension and the second adjustment dimension is the wind speed

adjustment dimension, when the user adjusts the temperature adjustment dimension from 25°C to 22°C, the air-conditioning device determines that an adjustment amount of the temperature adjustment dimension is -3°C. Assuming that an adjustment amount of the wind speed adjustment dimension corresponding to -3°C is increasing the wind speed by one level, and based on this, the air-conditioning device can automatically control the wind speed to increase by one level.

[0149] It should be understood that adjustment granularities for different adjustment dimensions are different. For example, the temperature adjustment dimension can be adjusted in increments of 1°C, and the adjustment granularity can even be 0.5°C. However, the wind speed adjustment dimension, the humidity adjustment dimension, the fresh air adjustment dimension, and the purification adjustment dimension can be adjusted by levels. Therefore, the mapping relationship between the adjustment amount of the first adjustment dimension and the adjustment amount of the second adjustment dimension can be a correspondence between a temperature adjustment amount interval and a level adjustment amount. For instance, when the adjustment amount of the temperature adjustment dimension is below -10°C, the adjustment amount of the wind speed adjustment dimension is an increment of three levels. When the adjustment amount of the temperature adjustment dimension is between -10°C and -5°C, the adjustment amount of the wind speed adjustment dimension is an increment of two levels. When the adjustment amount of the temperature adjustment dimension is between -5°C and -1°C, the adjustment amount of the wind speed adjustment dimension is an increment of one level. When the adjustment amount of the temperature adjustment dimension is between 1°C and 5°C, the adjustment amount of the wind speed adjustment dimension is a decrement of one level. When the adjustment amount of the temperature adjustment dimension is between 5°C and 10°C, the adjustment amount of the wind speed adjustment dimension is a decrement of two levels. When the adjustment amount of the temperature adjustment dimension is above 10°C, the adjustment amount of the wind speed adjustment dimension is a decrement of three levels. Alternatively, the mapping relationship between the adjustment amount of the first adjustment dimension and the adjustment amount of the second adjustment dimension can be a mapping relationship between a level adjustment amount and another level adjustment amount. For example, when the wind speed increases by one level, the humidity also increases by one level in the linkage mode. When the wind speed increases by two levels, the humidity also increases by two levels in the linkage mode.

[0150] It should be understood that when the first adjustment dimension is the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, or the fresh air adjustment dimension, and the second adjustment dimension is the temperature adjustment dimension, since temperature is a continuous value, subsequent to the air-conditioning device determining the adjustment amount of the first adjustment dimension, the temperature adjustment amount interval may be determined based on a mapping relationship between the adjustment amount of the first adjustment dimension and the temperature adjustment amount interval of the second adjustment dimension. In this case, the air-conditioning device can select an adjustment amount of the temperature adjustment dimension within the temperature adjustment amount interval based on certain predetermined rules, such as selecting a maximum value, a minimum value, or a middle value in the interval, which is not limited by the present application.

[0151] In some embodiments of the present application, subsequent to the air-conditioning device determining the adjustment amount of the second adjustment dimension based on the adjustment amount of the first adjustment dimension and the mapping relationship, it can determine whether the adjustment amount of the second adjustment dimension determined based on the mapping relationship is smaller than or equal to a maximum adjustable amount of the second adjustment dimension. When the adjustment amount of the second adjustment dimension determined based on the mapping relationship is smaller than or equal to the maximum adjustable amount of the second adjustment dimension, then the second adjustment dimension is adjusted based on the adjustment amount of the second adjustment dimension determined based on the mapping relationship. When the adjustment amount of the second adjustment dimension determined based on the mapping relationship is greater than the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension is adjusted based on the maximum adjustable amount of the second adjustment dimension. Alternatively, when the adjustment amount of the second adjustment dimension determined based on the mapping relationship is greater than the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension is adjusted based on the maximum adjustable amount of the second adjustment dimension, and a cycle adjustment is performed based on the minimum value of the second adjustment dimension to adjust the second adjustment dimension until the adjustment amount reaches the adjustment amount of the second adjustment dimension determined based on the mapping relationship.

[0152] For example, since each adjustment dimension has maximum and minimum limit values, assuming that a maximum wind speed is a fifth level and the current wind speed is at a third level. When it is required to increase the wind speed by three levels based on the aforementioned mapping relationship, it is clearly that the corresponding wind speed exceeds the maximum wind speed, in this case, the wind speed can be increased to the fifth level. Alternatively, the wind speed adjustment is a cyclic adjustment process, and when it reaches the fifth level, it

can continue to a first level.

[0153] In a second implementation manner, the air-conditioning device can determine a target value of the first adjustment dimension, determine an adjusted value corresponding to the second adjustment dimension based on the target value of the first adjustment dimension, and adjust the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension.

[0154] In some embodiments of the present application, when the control instruction for the first adjustment dimension is an enabled instruction, the target value may be a current enabled value of the first adjustment dimension, and when the control instruction for the first adjustment dimension is an adjustment instruction, the target value may be an adjusted value of the first adjustment dimension.

[0155] For example, assuming that the first adjustment dimension is the temperature adjustment dimension and the second adjustment dimension is the wind speed adjustment dimension, then an adjusted temperature is 25°C, and the wind speed corresponding to 25°C should be the first level. When a current wind speed of the air-conditioning device is at a second level, then the air-conditioning device can decrease the wind speed by one level.

[0156] In some embodiments of the present application, the air-conditioning device can determine a to-be-adjusted amount of the second adjustment dimension based on a current value of the second adjustment dimension and the adjusted value corresponding to the second adjustment dimension; determine a maximum adjustable amount of the second adjustment dimension; adjust, when the to-be-adjusted amount of the second adjustment dimension is smaller than or equal to the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension; adjust, when the to-be-adjusted amount of the second adjustment dimension is greater than the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension based on the maximum adjustable amount of the second adjustment dimension; or adjust, when the adjustment amount of the second adjustment dimension determined based on the mapping relationship is greater than the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension based on the maximum adjustable amount of the second adjustment dimension; and perform a cycle adjustment based on the minimum value of the second adjustment dimension to adjust the second adjustment dimension until the adjustment amount reaches the adjustment amount of the second adjustment dimension determined based on the mapping relationship.

[0157] It should be understood that, in the embodiment corresponding to FIG. 12, the control method according to this embodiment may be adopted for each second adjustment dimension, that is to say, there may be several cases as follows.

[0158] In a first case, the air-conditioning device may control all of the second adjustment dimensions to change while controlling the first adjustment dimension in response to the control instruction for the first adjustment dimension in the linkage mode.

[0159] For example, for the five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, assuming that the user adjusts the temperature adjustment dimension from 20°C to 23°C, the air-conditioning device can also control the wind speed adjustment dimension to increase by one level, the humidity adjustment dimension to increase by one level, the purification adjustment dimension to increase by two levels, and the fresh air to increase by two levels.

[0160] In a second case, the air-conditioning device may control all of the second adjustment dimensions to remain unchanged while controlling the first adjustment dimension in response to the control instruction for the first adjustment dimension in the linkage mode.

[0161] For example, for the five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, assuming that the user disables the temperature adjustment dimension, the air-conditioning device can keep four adjustment dimensions including the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension unchanged.

[0162] In a third case, the air-conditioning device may control the second adjustment dimension, having a lower priority than the first adjustment dimension, to change while controlling the first adjustment dimension in response to the control instruction for the first adjustment dimension in the linkage mode.

[0163] For example, for five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, assuming that the user adjusts the wind speed adjustment dimension, and three adjustment dimensions including the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension have lower priority than the wind speed adjustment dimension. In this case, the air-conditioning device can adjust the three adjustment dimensions including the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension to change.

[0164] In a fourth case, the air-conditioning device may control a part of the second adjustment dimensions to remain unchanged and a part of the second adjustment

dimensions to change while controlling the first adjustment dimension in response to the control instruction for the first adjustment dimension in the linkage mode.

[0165] The difference between the fourth case and the third case is that the priorities of the plurality of adjustment dimensions are not considered in the fourth case.

[0166] For example, for five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, assuming that the user adjusts the temperature adjustment dimension, then the air-conditioning device can adjust the wind speed to change, and other three adjustment dimensions including the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension remain unchanged.

[0167] In some embodiments of the present application, the control instruction may be the enabled instruction, a disabled instruction, or the adjustment instruction.

[0168] In some embodiments of the present application, the adjustment instruction is configured to adjust a value of the corresponding adjustment dimension, for example, to adjust a value of temperature, wind speed, humidity, fresh air, purification, etc.

[0169] In some embodiments of the present application, the air-conditioning device may control, when the priority of the second adjustment dimension is lower than the priority of the first adjustment dimension, the second adjustment dimension to change while controlling the first adjustment dimension in response to the enabled instruction for the first adjustment dimension in the linkage mode.

[0170] For example, assuming that the plurality of adjustment dimensions are five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, and these adjustment dimensions are enabled. The temperature adjustment dimension is the first adjustment dimension, and its priority is higher than that of other adjustment dimensions. Then when the user adjusts the temperature adjustment dimension, the air-conditioning device can adjust four adjustment dimensions including the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension in a linking manner.

[0171] In some embodiments of the present application, the air-conditioning device may also control the second adjustment dimension to remain unchanged in response to the disabled instruction for the first adjustment dimension.

[0172] For example, assuming that the plurality of adjustment dimensions are five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, and these adjustment dimensions are enabled. When the user disables the temperature adjustment dimension, the air-conditioning device can keep four adjustment dimensions including the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension unchanged.

[0173] In some embodiments of the present application, the air-conditioning device may also control the second adjustment dimension to change in response to the adjustment instruction for the first adjustment dimension in the linkage mode.

[0174] For example, assuming that the plurality of adjustment dimensions are five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, and these adjustment dimensions are enabled. When the user adjusts the temperature adjustment dimension, the air-conditioning device can also adjust the value of four adjustment dimensions including the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension.

[0175] In the embodiments of the present application, subsequent to the air-conditioning device being in the linkage mode, the air-conditioning device may also control the second adjustment dimension to change in response to the control instruction; or also control, when the priority of the second adjustment dimension is lower than the priority of the first adjustment dimension, the second adjustment dimension to change in response to the control instruction; or also control the second adjustment dimension to remain unchanged in response to the control instruction. Therefore, the user has no need to control other adjustment dimensions individually, and this control method can improve control efficiency and flexibility, thus improving the user experience.

[0176] FIG. 13A is a flowchart of another method for controlling the air-conditioning device according to an embodiment of the present application. As shown in FIG. 13A, on a basis of FIG. 4, subsequent to S420, the method may further include operations at blocks.

[0177] At block S430, a mode-switching instruction is acquired.

[0178] At block S440, the linkage mode is switched to the normal mode in response to the mode-switching instruction.

[0179] In some embodiments of the present application, the mode-switching instruction may be generated based on a deactivating operation of the linkage mode, or the mode-switching instruction may be generated based on an activating operation of the normal mode, or the mode-switching instruction may be generated based on a click or touch operation of a mode-switching identifier or button, and the mode-switching identifier or button may

be provided on the remote controller, the APP, or the touch panel.

[0180] It should be understood that subsequent to the air-conditioning device being switched to the normal mode, the user can only control each adjustment dimension independently. For example, when the user adjusts the temperature adjustment dimension, other adjustment dimensions including the wind speed adjustment dimension, the fresh air adjustment dimension, and the purification adjustment dimension will not be controlled.

[0181] In some embodiments of the present application, subsequent to the air-conditioning device being switched to the normal mode, it may be switched to the linkage mode again, and subsequent to being in the linkage mode, the air-conditioning device may control the plurality of adjustment dimensions according to the control method of the present application.

[0182] In the embodiments of the present application, the air-conditioning device can flexibly switch between the linkage mode and the normal mode, thereby improving the user experience.

[0183] The control method of the present application can be exemplarily illustrated by several examples as follows.

[0184] In a first example, when the user turns on the air-conditioning device, the air-conditioning device automatically activates the linkage mode and enables two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension by default. The air-conditioning device can notify the user that the two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension are in the enabled state, and notify the user that three adjustment dimensions including the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension are in the disabled state. It can also display the current progress of the two adjustment dimensions including the temperature adjustment dimension and the wind speed adjustment dimension. When the user adjusts the temperature, the air-conditioning device can adjust the wind speed based on a temperature change and can display a progress change of the temperature adjustment dimension and the wind speed adjustment dimension. In addition, it can also notify that the temperature adjustment dimension is the primary adjustment dimension. Further, when the user enables the humidity adjustment dimension, assuming that a priority of the temperature adjustment dimension is higher than a priority of the humidity adjustment dimension and the priority of the humidity adjustment dimension is higher than a priority of the wind speed adjustment dimension, the air-conditioning device can adjust a wind speed change and also display a progress change of the wind speed adjustment dimension. Further, when the user disables the humidity adjustment dimension, the air-conditioning device can control the temperature adjustment dimension and the wind speed adjustment dimension to remain unchanged.

[0185] In a second example, when the user turns on the air-conditioning device, the air-conditioning device automatically activates the linkage mode, and determines that four adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, and the fresh air adjustment dimension are used in the linkage mode last time. The air-conditioning device can notify the user that the four adjustment dimensions are in the enabled state and the purification adjustment dimension is in the disabled state, and can also display the current progress of the four adjustment dimensions. When the user adjusts the temperature adjustment dimension, the air-conditioning device can adjust three adjustment dimensions including the wind speed adjustment dimension, the humidity adjustment dimension, and the fresh air adjustment dimension based on the temperature change, and can display a progress change of these four adjustment dimensions. It can also notify that the temperature adjustment dimension is the primary adjustment dimension. Further, when the user enables the purification adjustment dimension, assuming that the priority of the purification adjustment dimension is lower than the priorities of all other adjustment dimensions, the air-conditioning device controls the other adjustment dimensions to remain unchanged. Further, when the user disables the temperature adjustment dimension, the air-conditioning device can control the wind speed adjustment dimension, the humidity adjustment dimension, the fresh air adjustment dimension, and the purification adjustment dimension to remain unchanged.

[0186] In a third example, the user turns on the air-conditioning device, and the air-conditioning device is in the normal mode first. Assuming that in the normal mode, the user enables the temperature adjustment dimension, the fresh air adjustment dimension, and the wind speed adjustment dimension. Then the user activates the linkage mode, and the air-conditioning device determines that the temperature adjustment dimension, the fresh air adjustment dimension, and the wind speed adjustment dimension enabled in the normal mode are taken as the enabled adjustment dimensions. The air-conditioning device may notify the user that the three adjustment dimensions are in the enabled state and the purification adjustment dimension and the humidity adjustment dimension are in the disabled state, and may also display the current progress of the three adjustment dimensions. When the user adjusts the temperature adjustment dimension, the air-conditioning device can adjust the wind speed adjustment dimension and the fresh air adjustment dimension based on the temperature change, and can display the progress change of the temperature adjustment dimension, the wind speed adjustment dimension, and the fresh air adjustment dimension. It can also notify that the temperature adjustment dimension is the primary adjustment dimension. Further, when the user enables the purification adjustment dimension, assuming that the priority of the purification adjustment

dimension is lower than the priorities of all other adjustment dimensions, in this case, the air-conditioning device controls the other adjustment dimensions to remain unchanged. Further, when the user disables the temperature adjustment dimension, the air-conditioning device can control the wind speed adjustment dimension, the humidity adjustment dimension, the fresh air adjustment dimension, and the purification adjustment dimension to remain unchanged.

[0187] In a fourth example, when the user turns on the air-conditioning device, the user selects five adjustment dimensions including the temperature adjustment dimension, the wind speed adjustment dimension, the humidity adjustment dimension, the purification adjustment dimension, and the fresh air adjustment dimension, and then the user clicks the linkage icon or button to allow the air-conditioning device to be in the linkage mode. The air-conditioning device can notify the user that the five adjustment dimensions are in the enabled state, and can also display a current progress of the five adjustment dimensions. When the user adjusts the temperature adjustment dimension, the air-conditioning device can adjust other four adjustment dimensions based on the temperature change and can display the progress change of the five adjustment dimensions. It can also notify that the temperature adjustment dimension is the primary adjustment dimension. Further, when the user disables the temperature adjustment dimension, the air-conditioning device can control the wind speed adjustment dimension, the humidity adjustment dimension, the fresh air adjustment dimension, and the purification adjustment dimension to remain unchanged.

[0188] In some implementation manners, the air-conditioning device includes a printed circuit board (PCB) and a display panel. The PCB includes a processing unit and a light board, and the light board may be provided with a light emitting diode (LED) light. It should be understood that in response to calling an assembly composed of the light board, the display panel, and a subsequent reflection plate as a light strip assembly, FIG. 13B is a sectional view of a light assembly according to an embodiment of the present application. As shown in FIG. 13B, the light board forms a predetermined angle with the display panel. The reflection plate is disposed between the light board and the display panel, and the reflection plate is configured to reflect light from the light board to the display panel.

[0189] It should be understood that, in order to improve a display effect of the display panel, it is considered to increase an area of the display panel. However, in response to increasing the area of the display panel, a problem of large cost and large power consumption of the air-conditioning device will be caused. In order to simultaneously satisfy the display effect and reduce the cost and power consumption of the air-conditioning device, the present application provides a structure of the air-conditioning device. Since the reflection plate reflects the light on the light board to the display panel, the light does not enter the display panel directly, but enters the display panel with a certain diffusion angle, thereby the icon or indicator light on the display panel having an amplification effect for the user.

[0190] In some embodiments of the present application, in order to further improve a diffusion effect of the display panel, an expansion film may be laid on an outer side of the display panel, and the expansion film may further diffuse light.

[0191] It should be understood that, when an angle between the light board and the display panel is 0 degree, that is, the light board is parallel to the display panel. On the one hand, the light on the light board will be directed into the display panel, to allow the icon or indicator light on the display panel not to present the amplification effect, and on the other hand, the display panel will have a problem of a thicker thickness and a larger volume. When the angle between the light board and the display panel is 90 degrees, the reflected light reflected to the display panel will be uneven, affecting the display effect. Based on this, in some embodiments of the present application, a predetermined angle between the light board and the display panel ranges from 30 degrees to 45 degrees, which is not limited thereto.

[0192] In some embodiments of the present application, the reflection plate is an arc-shaped reflection plate protruding outwardly.

[0193] In some embodiments of the present application, the reflection plate is white and has a smoothness greater than a predetermined smoothness. Based on this, the brightness of the reflected light is more uniform, and it is beneficial to enhance a brightness of light, so as to achieve a purpose of energy saving.

[0194] After experiments, compared with the scheme that the light board is parallel to the display panel (which is called as solution 1), when the angle between the light board and the display panel ranges from 30 degrees to 45 degrees, the reflection plate is white, and the smoothness is greater than the predetermined smoothness (which is called as solution 2), a light board needs to be provided with 300 LED lights in the solution 1, but only 150 LED lights need to be provided in the solution 2, so as to achieve the purpose of energy saving. In addition, an area of the PCB in the solution 2 is 2/3 of the area of the PCB in the solution 1, thus achieving the purpose of reducing costs.

[0195] In some implementations, an area ratio of the display panel to a panel of the air-conditioning device is 20%. Based on this, the display effect of the display panel can further be improved.

[0196] Based on a structure shown in FIG. 13B, correspondingly, as shown in FIG. 13C, the above S410 may include operations at blocks.

[0197] At block S410a, the processing unit activates the linkage mode of the air-conditioning device, and the light board is controlled to allow the display panel to push the first notification message to notify the user that the air-conditioning device is in the linkage mode.

[0198] The above S420 may include operations at blocks.

[0199] At block S420a, the processing unit controls, in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

[0200] It should be noted that the method executed by the air-conditioning device in the above method embodiment may be executed by the processing unit.

[0201] For example, pushing the second notification message corresponding to the first adjustment dimension to notify the user that the first adjustment dimension is the primary adjustment dimension includes: controlling, by the processing unit and in response to the control instruction, the light board to allow the display panel to push the second notification message corresponding to the first adjustment dimension to notify the user that the first adjustment dimension is the primary adjustment dimension.

[0202] For example, displaying the control progress of the first adjustment dimension in response to the control instruction includes: controlling, by the processing unit, the light board to allow the display panel to display the control progress of the first adjustment dimension.

[0203] For example, pushing, for any one adjustment dimension among the plurality of adjustment dimensions and when the any one adjustment dimension is in the enabled state, the third notification message corresponding to the any one adjustment dimension to notify the user that the any one adjustment dimension is in the enabled state includes: for any one adjustment dimension among the plurality of adjustment dimensions and when the any one adjustment dimension is in the enabled state, controlling, by the processing unit, the light board to allow the display panel to push the third notification message corresponding to any one adjustment dimension, so as to notify the user that the any one adjustment dimension is in the enabled state.

[0204] For example, displaying, for any one adjustment dimension among the plurality of adjustment dimensions, a current progress of the any one adjustment dimension when the any one adjustment dimension is in the enabled state includes: for the any one adjustment dimension among the plurality of adjustment dimensions and when the any one adjustment dimension is in the enabled state, controlling, by the processing unit, the light board to allow the display panel to display the current progress of the any one adjustment dimension.

[0205] For example, pushing, for any one adjustment dimension among the plurality of adjustment dimensions and when the any one adjustment dimension is in the disabled state, the fourth notification message to notify the user that the any one adjustment dimension is in the disabled state includes: for the any one adjustment dimension among the plurality of adjustment dimensions, when the any one adjustment dimension is in the disabled state, controlling, by the processing unit, the light board to allow the display panel to push the fourth notification message to notify the user that the any one adjustment dimension is in the disabled state.

[0206] For example, pushing the fifth notification message to notify the user of the state of the air-conditioning device includes: controlling, by the processing unit, the light board to allow the display panel to push the fifth notification message to notify the user of the state of the air-conditioning device.

[0207] In some implementations, the air-conditioning device further includes a photosensitive sensor. The method for controlling the air-conditioning device further includes: acquiring, by the processing unit, data collected by the photosensitive sensor; and controlling a brightness of the light board based on the data collected by the photosensitive sensor.

[0208] In some embodiments of the present application, when the data collected by the photosensitive sensor is greater than a predetermined threshold, the processing unit is configured to control the brightness of the light board to be a first brightness. When the data collected by the photosensitive sensor is smaller than or equal to the predetermined threshold, the processing unit is configured to control the brightness of the light board to be a second brightness. The first brightness is greater than the second brightness.

[0209] In some embodiments of the present application, when the data collected by the photosensitive sensor is greater than or equal to a predetermined threshold, the processing unit is configured to control the brightness of the light board to be the first brightness. When the data collected by the photosensitive sensor is smaller than the predetermined threshold, the processing unit is configured to control the brightness of the light board to be the second brightness. The first brightness is greater than the second brightness.

[0210] For example, when the data collected by the photosensitive sensor is greater than or equal to the predetermined threshold, it indicates that the current light is sufficient, and the processing unit may control the brightness of the light board to be 80% of the full brightness. When the data collected by the photosensitive sensor is smaller than the predetermined threshold, it indicates that the current light is insufficient, and the processing unit may control the brightness of the light board to be 30% of the full brightness.

[0211] It should be understood that the processing unit adjusts the brightness of the light board based on the data collected by the photosensitive sensor, and this adaptive brightness adjustment method can improve the user experience.

[0212] FIG. 14 is a schematic diagram of an apparatus 1400 for controlling the air-conditioning device according to an embodiment of the present application. The apparatus 1400 for controlling the air-conditioning device may

include an activation module 1410, a push module 1420, and a control module 1430. The activation module 1410 is configured to activate the linkage mode of the air-conditioning device. The push module 1420 is configured to push the first notification message to notify the user that the air-conditioning device is in the linkage mode. The control module 1430 is configured to control, in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

[0213] According to some embodiments of the present application, the first notification message is any one of: the indicator light corresponding to the linkage mode being turned on; the indicator light corresponding to the linkage mode being in the turn-on state for the first predetermined duration; the indicator light corresponding to the linkage mode presenting the first predetermined color; the indicator light corresponding to the linkage mode presenting the first predetermined color and being in the turn-on state for the first predetermined duration; and the indicator light corresponding to the linkage mode flashing according to the first predetermined mode.

[0214] According to some embodiments of the present application, the push module 1420 is further configured to push, in response to the control instruction, the second notification message corresponding to the first adjustment dimension to notify the user that the first adjustment dimension is the primary adjustment dimension.

[0215] According to some embodiments of the present application, the second notification message is any one of: the indicator light corresponding to the first adjustment dimension presenting the second predetermined color; the indicator light corresponding to the first adjustment dimension presenting the second predetermined color and being in the turn-on state for the second predetermined duration; the indicator light corresponding to the first adjustment dimension flashing according to the second predetermined mode; and the indicator light corresponding to the first adjustment dimension presenting the breathing light effect.

[0216] According to some embodiments of the present application, the apparatus 1400 further includes the display module configured to display the control progress of the first adjustment dimension in response to the control instruction.

[0217] According to some embodiments of the present application, the push module 1420 is further configured to push, for any one adjustment dimension among the plurality of adjustment dimensions and when the any one adjustment dimension is in the enabled state, the third notification message corresponding to the any one adjustment dimension to notify the user that the any one adjustment dimension is in the enabled state.

[0218] According to some embodiments of the present application, the third notification message is any one of: the indicator light corresponding to the any one adjustment dimension presenting the third predetermined color; the indicator light corresponding to the any one adjustment dimension presenting the third predetermined color and is in the turn-on state for the third predetermined duration; and the indicator light corresponding to the any one adjustment dimension flashing according to the third predetermined mode.

[0219] According to some embodiments of the present application, the second notification message is different from the third notification message.

[0220] According to some embodiments of the present application, the display module 1440 is further configured to display, for any one adjustment dimension among the plurality of adjustment dimensions, the current progress of the any one adjustment dimension when the any one adjustment dimension is in the enabled state.

[0221] According to some embodiments of the present application, the push module 1420 is further configured to push, for any one adjustment dimension among the plurality of adjustment dimensions, when the any one adjustment dimension is in the disabled state, the fourth notification message to notify the user that the any one adjustment dimension is in the disabled state.

[0222] According to some embodiments of the present application, the fourth notification message is any one of: the indicator light corresponding to the any one adjustment dimension being turned off; the indicator light corresponding to the any one adjustment dimension presenting the fourth predetermined color; and the indicator light corresponding to the any one adjustment dimension being turned on to the predetermined brightness. The predetermined brightness is lower than the full brightness of the indicator light corresponding to the any one adjustment dimension.

[0223] According to some embodiments of the present application, the activation module 1410 is further configured to activate, in response to the power-on instruction or the linkage instruction, the linkage mode of the air-conditioning device.

[0224] According to some embodiments of the present application, the activation module 1410 is further configured to enable, in response to the power-on instruction or the linkage instruction, at least one adjustment dimension among the plurality of adjustment dimensions.

[0225] According to some embodiments of the present application, the at least one adjustment dimension is any one of: the adjustment dimension that needs to be enabled by default; the adjustment dimension that is historically enabled in the linkage mode; and the adjustment dimension that needs to be enabled based on the current environment.

[0226] According to some embodiments of the present application, when the air-conditioning device switches from the normal mode to the linkage mode in response to the linkage instruction, the at least one adjustment dimension is any one of: the adjustment dimension that

needs to be enabled by default; the adjustment dimension that is historically enabled in the linkage mode; the adjustment dimension that is enabled in the normal mode; and the adjustment dimension that needs to be enabled based on the current environment.

[0227] According to some embodiments of the present application, the activation module 1410 is further configured to activate, in response to the selection instruction and the linkage instruction for at least one adjustment dimension among the plurality of adjustment dimensions, the linkage mode of the air-conditioning device.

[0228] According to some embodiments of the present application, the activation module 1410 is further configured to enable the at least one adjustment dimension in response to the selection instruction and the linkage instruction for the at least one adjustment dimension.

[0229] According to some embodiments of the present application, subsequent to the activation module 1410 activating the linkage mode of the air-conditioning device, the push module 1420 is further configured to push the fifth notification message to notify the user of the state of the air-conditioning device.

[0230] According to some embodiments of the present application, the fifth notification message is any one of: when the state of the air-conditioning device is the refrigeration state, the progress bar corresponding to the linkage mode presenting the fifth predetermined color; when the state of the air-conditioning device is the heating state, the progress bar corresponding to the linkage mode presenting the sixth predetermined color; when the state of the air-conditioning device is an air supply state, the progress bar corresponding to the linkage mode presenting the seventh predetermined color; and when the state of the air-conditioning device is the dehumidification state, the progress bar corresponding to the linkage mode presenting an eighth predetermined color.

[0231] According to some embodiments of the present application, from a perspective of hardware and software combination, the air-conditioning device includes the PCB and the display panel. The PCB includes the processing unit and the light board. The light board forms the predetermined angle with the display panel. The reflection plate is disposed between the light board and the display panel. The reflection plate is configured to reflect light from the light board to the display panel. In an exemplary embodiment of the present application, the processing unit includes the activation module and the control module. It can be understood that the activation module is the activation module 1410, and the push module 1420 can include the control module, the light board, and the display panel.

[0232] Correspondingly, the activation module is configured to activate the linkage mode of the air-conditioning device. The control module is configured to control the light board to enable the display panel to push the first notification message to notify the user that the air-conditioning device is in the linkage mode. In the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension is controlled while controlling the first adjustment dimension.

[0233] According to some embodiments of the present application, the predetermined angle ranges from 30 degrees to 45 degrees.

[0234] According to some embodiments of the present application, the reflection plate is the arc-shaped reflection plate protruding outwardly.

[0235] According to some embodiments of the present application, the reflection plate is white and has a smoothness greater than the predetermined smoothness.

[0236] According to some embodiments of the present application, the area ratio of the display panel to the panel of the air-conditioning device is 20%.

[0237] According to some embodiments of the present application, the air-conditioning device further includes the photosensitive sensor. The control module is configured to: acquire the data collected by the photosensitive sensor; and control the brightness of the light board based on the data collected by the photosensitive sensor.

[0238] According to some embodiments of the present application, the control module is configured to: when the data collected by the photosensitive sensor is greater than the predetermined threshold, the brightness of the light board is controlled to be the first brightness; and when the data collected by the photosensitive sensor is smaller than or equal to the predetermined threshold, the brightness of the light board is controlled to be the second brightness. The first brightness is greater than the second brightness.

[0239] It should be understood that the apparatus embodiments may correspond to the method embodiments, and reference may be made to the method embodiments for similar description of the apparatus embodiments, and thus details thereof will be omitted here to avoid repetition. Specifically, the apparatus 1400 illustrated in FIG. 14 may perform the method embodiments, and the above and other operations and/or functions of each of modules in the apparatus 1400 are respectively configured to perform the corresponding processes in each of the above methods, and thus details thereof will be omitted here for conciseness.

[0240] The apparatus 1400 according to the embodiments of the present application are described above from the perspective of functional modules in conjunction with the accompanying drawings. It should be understood that the functional modules may be implemented in a form of hardware, by instructions in a form of software, or by a combination of hardware and software modules. Specifically, steps of the method embodiments in the embodiments of the present application may be implemented by hardware integrated logic circuits in a processor and/or instructions in the form of software. The

steps of the method that are disclosed in combination with the embodiments of the present application may be directly embodied as being executed by a hardware decoding processor, or executed by a combination of hardware and software modules in the decoding processor. Optionally, the software module may be located in a mature storage medium in the art such as a random access memory, a flash memory, a Read-Only Memory (ROM), a Programmable ROM (PROM), an electrically erasable programmable memory, and a register. The storage medium is located in a memory. The processor reads information from the memory, and implements the steps in the above method embodiments in combination with hardware thereof.

[0241] FIG. 15A is a schematic block diagram of an electronic device 1500 according to an embodiment of the present application.

[0242] As shown in FIG. 15A, the electronic device 1500 may include a memory 1510 and a processor 1520. The memory 1510 is configured to store a computer program and transmit a program code to the processor 1520. In other words, the processor 1520 is configured to invoke and execute the computer program stored in the memory 1510 to perform the method in the embodiments of the present application.

[0243] For example, the processor 1520 may be configured to perform the method embodiments described above based on instructions in the computer program.

[0244] In some embodiments of the present application, the processor 1520 may include, but is not limited to a general-purpose processor, a Digital Signal Processor (DSP), an Application Specific Integrated Circuit (ASIC), a Field Programmable Gate Array (FPGA), or another programmable logic device, a discrete gate or a transistor logic device, a discrete hardware component, etc.

[0245] In some the embodiments of the present application, the memory 1510 may include, but is not limited to, a volatile memory and/or a non-volatile memory. Here, the non-volatile memory may be a Read-Only Memory (ROM), a Programmable ROM (PROM), an Erasable PROM (EPROM), an Electrically EPROM (EEPROM), or a flash memory. The volatile memory may be a Random Access Memory (RAM), which serves as an external cache. By way of illustration rather than limitation, RAMs in many forms are available, e.g., a Static RAM (SRAM), a Dynamic RAM (DRAM), a Synchronous DRAM (SDRAM), a Double Data Rate SDRAM (DDR SDRAM), an Enhanced SDRAM (ESDRAM), a Synch link DRAM (SLDRAM)), and a Direct Rambus RAM (DR RAM).

[0246] In some embodiments of the present application, the computer program may be divided into one or more modules. The one or more modules may be stored in the memory 1510 and executed by the processor 1520 to implement the method according to the present application. The one or more modules may be a series of computer program instruction segments capable of completing specific functions. The instruction segments are used to describe an execution process of the computer program in the electronic device.

[0247] As illustrated in FIG. 15A, the electronic device 1500 may further include a transceiver 1530 connectable to the processor 1520 or the memory 1510.

[0248] Here, the processor 1520 may control the transceiver 1530 to communicate with other devices, specifically, to transmit information or data to other devices, or receive information or data transmitted from other devices. The transceiver 1530 may include a transmitter and a receiver. The transceiver 1530 may further include one or more antennas.

[0249] It should be understood that various components in the electronic device are connected to each other via a bus system. Here, in addition to a data bus, the bus system also includes a power bus, a control bus, and a status signal bus.

[0250] In some embodiments of the present application, FIG. 15B is a schematic block diagram of an electronic device according to another embodiment of the present application. As shown in FIG. 15B, the electronic device may include a PCB 1500 and a display panel 1540. The PCB 1500 includes a processor 1520 and a light board 1550. In combination with the light strip assembly shown in FIG. 13B, the light plate and the display panel form the predetermined angle, and the reflection plate is disposed between the light plate and the display panel. The reflection plate is configured to reflect light from the light plate to the display panel.

[0251] The present application further provides a computer storage medium. The computer storage medium has a computer program stored thereon. The computer program, when executed by a computer, causes the computer to perform the method according to the above method embodiments. Or, the embodiments of the present application further provide a computer program product including instructions. The instructions, when executed by a computer, cause the computer to perform the method according to the above method embodiments.

[0252] When implemented by software, the above embodiments can be entirely or partially implemented in the form of a computer program product. The computer program product includes one or more computer instructions. When the computer program instructions are loaded and executed on a computer, the processes or functions described in the embodiments of the present application are provided in whole or in part. The computer may be a general purpose computer, an application specific computer, a computer network, or any other programmable device. The computer instructions may be stored in a computer-readable storage medium or transmitted from one computer-readable storage medium to another computer-readable storage medium. For example, the computer instructions may be transmitted from one website, computer, server, or data center to another website, computer, server, or data center via a wired manner (such as a coaxial cable, an optical fiber, a Digital Subscriber Line (DSL)) or a wireless manner (such

as infrared, wireless, microwave, etc.). The computer-readable storage medium may be any usable medium that can be accessed by a computer or a data storage device such as a server or a data center integrated with one or more usable medium. The usable medium may be a magnetic medium (for example, a floppy disk, a hard disk, a magnetic tape), an optical medium (for example, a Digital Video Disc (DVD)), or a semiconductor medium (for example, a Solid State Disk (SSD)), etc.

[0253] It can be appreciated by those of ordinary skill in the art that the modules and the steps of the algorithm of various examples described in combination with the embodiments disclosed herein may be implemented in electronic hardware or a combination of computer software and electronic hardware, which depends on specific applications and design constraint conditions of technical solutions. For each specific application, professionals and technicians can use different methods to implement the described functions, and such an implementation should not be considered as going beyond the scope of the present application.

[0254] In several embodiments according to the present application, it should be understood that the disclosed systems, apparatuses and methods can be implemented in other ways. For example, the apparatus embodiments described above are merely exemplary. For example, the modules are merely divided based on logic functions. In practical implementation, the modules may be divided in other manners. For example, multiple modules or components may be combined or integrated into another system, or some features may be omitted or not executed. In addition, mutual coupling or direct coupling or communication connection displayed or discussed may be implemented as indirect coupling or communication connection via some interfaces, apparatuses or modules, and may be electrical, mechanical or in other forms.

[0255] The modules illustrated as separate components may be or not be separated physically, and components shown as modules may be or not be physical modules, i.e., may be located at one position, or distributed onto multiple network units. It is possible to select some or all of the modules according to actual needs, for achieving the objective of the embodiments of the present application. For example, respective functional modules in respective embodiments of the present application may be integrated into one processing module, or may be present as separate physical entities. It is also possible to integrate two or more modules into one module.

[0256] The above description merely illustrates specific implementations of the present application, and the scope of the present application is not limited thereto. Change or replacement within the technical scope disclosed by the present application that can be easily conceived by those skilled in the art shall fall within the scope of the present application. Thus, the scope of the present application should be defined by claims.

Claims

1. A method for controlling an air-conditioning device, comprising:

   activating a linkage mode of the air-conditioning device and pushing a first notification message to notify a user that the air-conditioning device is in the linkage mode; and
   controlling, in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

2. The method according to claim 1, wherein the first notification message comprises any one of:

   an indicator light corresponding to the linkage mode being turned on;
   the indicator light corresponding to the linkage mode being in a turn-on state for a first predetermined duration;
   the indicator light corresponding to the linkage mode presenting a first predetermined color;
   the indicator light corresponding to the linkage mode presenting the first predetermined color and being in the turn-on state for the first predetermined duration; and
   the indicator light corresponding to the linkage mode flashing according to a first predetermined mode.

3. The method according to claim 1 or 2, further comprising:
   pushing, in response to the control instruction, a second notification message corresponding to the first adjustment dimension to notify the user that the first adjustment dimension is a primary adjustment dimension.

4. The method according to claim 3, wherein the second notification message comprises any one of:

   an indicator light corresponding to the first adjustment dimension presenting a second predetermined color;
   the indicator light corresponding to the first adjustment dimension presenting the second predetermined color and being in a turn-on state for a second predetermined duration;
   the indicator light corresponding to the first adjustment dimension flashing according to a second predetermined mode; and
   the indicator light corresponding to the first ad-

justment dimension presenting a breathing light effect.

5. The method according to any one of claims 1 to 4, further comprising:
displaying a control progress of the first adjustment dimension in response to the control instruction.

6. The method according to claim 3, further comprising:
for any one adjustment dimension among the plurality of adjustment dimensions, pushing, when the any one adjustment dimension is in an enabled state, a third notification message corresponding to the any one adjustment dimension to notify the user that the any one adjustment dimension is in the enabled state.

7. The method according to claim 6, wherein the third notification message comprises any one of:

an indicator light corresponding to the any one adjustment dimension presenting a third predetermined color;
the indicator light corresponding to the any one adjustment dimension presenting the third predetermined color and is in a turn-on state for a third predetermined duration; and
the indicator light corresponding to the any one adjustment dimension flashing according to a third predetermined mode.

8. The method according to claim 6 or 7, wherein the second notification message is different from the third notification message.

9. The method according to any one of claims 1 to 8, further comprising:
displaying, for any one adjustment dimension among the plurality of adjustment dimensions, a current progress of the any one adjustment dimension when the any one adjustment dimension is in an enabled state.

10. The method according to any one of claims 1 to 9, further comprising:
for any one adjustment dimension among the plurality of adjustment dimensions, pushing, when the any one adjustment dimension is in a disabled state, a fourth notification message to notify the user that the any one adjustment dimension is in the disabled state.

11. The method according to claim 10, wherein the fourth notification message comprises any one of:

an indicator light corresponding to the any one adjustment dimension being turned off;
the indicator light corresponding to the any one adjustment dimension presenting a fourth predetermined color; and
the indicator light corresponding to the any one adjustment dimension being turned on to a predetermined brightness, wherein the predetermined brightness is lower than a full brightness of the indicator light corresponding to the any one adjustment dimension.

12. The method according to any one of claims 1 to 11, wherein said activating the linkage mode of the air-conditioning device comprises:
activating, in response to a power-on instruction or a linkage instruction, the linkage mode of the air-conditioning device.

13. The method according to claim 12, further comprising:
enabling, in response to the power-on instruction or the linkage instruction, at least one adjustment dimension among the plurality of adjustment dimensions.

14. The method according to claim 13, wherein the at least one adjustment dimension comprises any one of:

an adjustment dimension that needs to be enabled by default;
an adjustment dimension that is historically enabled in the linkage mode; and
an adjustment dimension that needs to be enabled based on a current environment.

15. The method according to claim 13, wherein when the air-conditioning device switches from a normal mode to the linkage mode in response to the linkage instruction, the at least one adjustment dimension comprises any one of:

an adjustment dimension that needs to be enabled by default;
an adjustment dimension that is historically enabled in the linkage mode;
an adjustment dimension that is enabled in the normal mode; and
an adjustment dimension that needs to be enabled based on a current environment;
wherein the normal mode is a mode in which the plurality of adjustment dimensions is independently controlled.

16. The method according to any one of claims 1 to 15, wherein said activating the linkage mode of the air-conditioning device comprises:
activating, in response to a selection instruction and a linkage instruction for at least one adjustment dimension among the plurality of adjustment dimen-

sions, the linkage mode of the air-conditioning device.

17. The method according to claim 16, further comprising:
enabling the at least one adjustment dimension in response to the selection instruction and the linkage instruction for the at least one adjustment dimension.

18. The method according to any one of claims 1 to 17, further comprising, subsequent to said activating the linkage mode of the air-conditioning device:
pushing a fifth notification message to notify the user of a state of the air-conditioning device.

19. The method according to claim 18, wherein the fifth notification message comprises any one of:

when the state of the air-conditioning device is a refrigeration state, a progress bar corresponding to the linkage mode presenting a fifth predetermined color;
when the state of the air-conditioning device is a heating state, the progress bar corresponding to the linkage mode presenting a sixth predetermined color;
when the state of the air-conditioning device is an air supply state, the progress bar corresponding to the linkage mode presenting a seventh predetermined color; and
when the state of the air-conditioning device is a dehumidification state, the progress bar corresponding to the linkage mode presenting an eighth predetermined color.

20. The method according to any one of claims 1 to 19, wherein the air-conditioning device comprises a printed circuit board, PCB, and a display panel, the PCB comprising a processing unit and a light board, the light board forming a predetermined angle with the display panel, a reflection plate being disposed between the light board and the display panel, and the reflection plate being configured to reflect light from the light board to the display panel;
said activating the linkage mode of the air-conditioning device and pushing the first notification message to notify the user that the air-conditioning device is in the linkage mode comprises:

activating, by the processing unit, the linkage mode of the air-conditioning device, and controlling the light board to allow the display panel to push the first notification message to notify the user that the air-conditioning device is in the linkage mode;
said controlling, in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension comprises:
controlling, by the processing unit in the linkage mode and in response to the control instruction for the first adjustment dimension among the plurality of adjustment dimensions of the air-conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

21. The method according to claim 20, wherein the predetermined angle ranges from 30 degrees to 45 degrees.

22. The method according to claim 20, wherein the reflection plate is an arc-shaped reflection plate protruding outwardly.

23. The method according to claim 22, wherein the reflection plate is white and has a smoothness greater than a predetermined smoothness.

24. The method according to claim 22, wherein an area ratio of the display panel to a panel of the air-conditioning device is 20%.

25. The method according to claim 22, wherein the air-conditioning device further comprises a photosensitive sensor, and the method further comprises:

acquiring, by the processing unit, data collected by the photosensitive sensor; and
controlling, by the processing unit, a brightness of the light board based on the data collected by the photosensitive sensor.

26. The method according to claim 25, wherein said controlling, by the processing unit, the brightness of the light board based on the data collected by the photosensitive sensor comprises:

controlling, by the processing unit when the data collected by the photosensitive sensor is greater than a predetermined threshold, the brightness of the light board to be a first brightness; and
controlling, by the processing unit when the data collected by the photosensitive sensor is smaller than or equal to the predetermined threshold, the brightness of the light board to be a second brightness,
wherein the first brightness is greater than the second brightness.

27. An apparatus for controlling an air-conditioning device, comprising:

an activation module configured to activate a linkage mode of the air-conditioning device;
a push module configured to push a first notification message to notify a user that the air-conditioning device is in the linkage mode;
a control module configured to control, in the linkage mode and in response to a control instruction for a first adjustment dimension among a plurality of adjustment dimensions of the air-conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the first adjustment dimension while controlling the first adjustment dimension.

28. An air-conditioning device, comprising:

a processor; and
a memory configured to store a computer program, wherein the processor is configured to invoke and execute the computer program stored in the memory to perform the method according to any one of claims 1 to 26.

29. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program, the computer program allowing a computer to perform the method according to any one of claims 1 to 26.

30. A computer program product, comprising a computer program or a computer instruction, wherein a processor, when executing the computer program or the computer instruction, performs the method according to any one of claims 1 to 26.

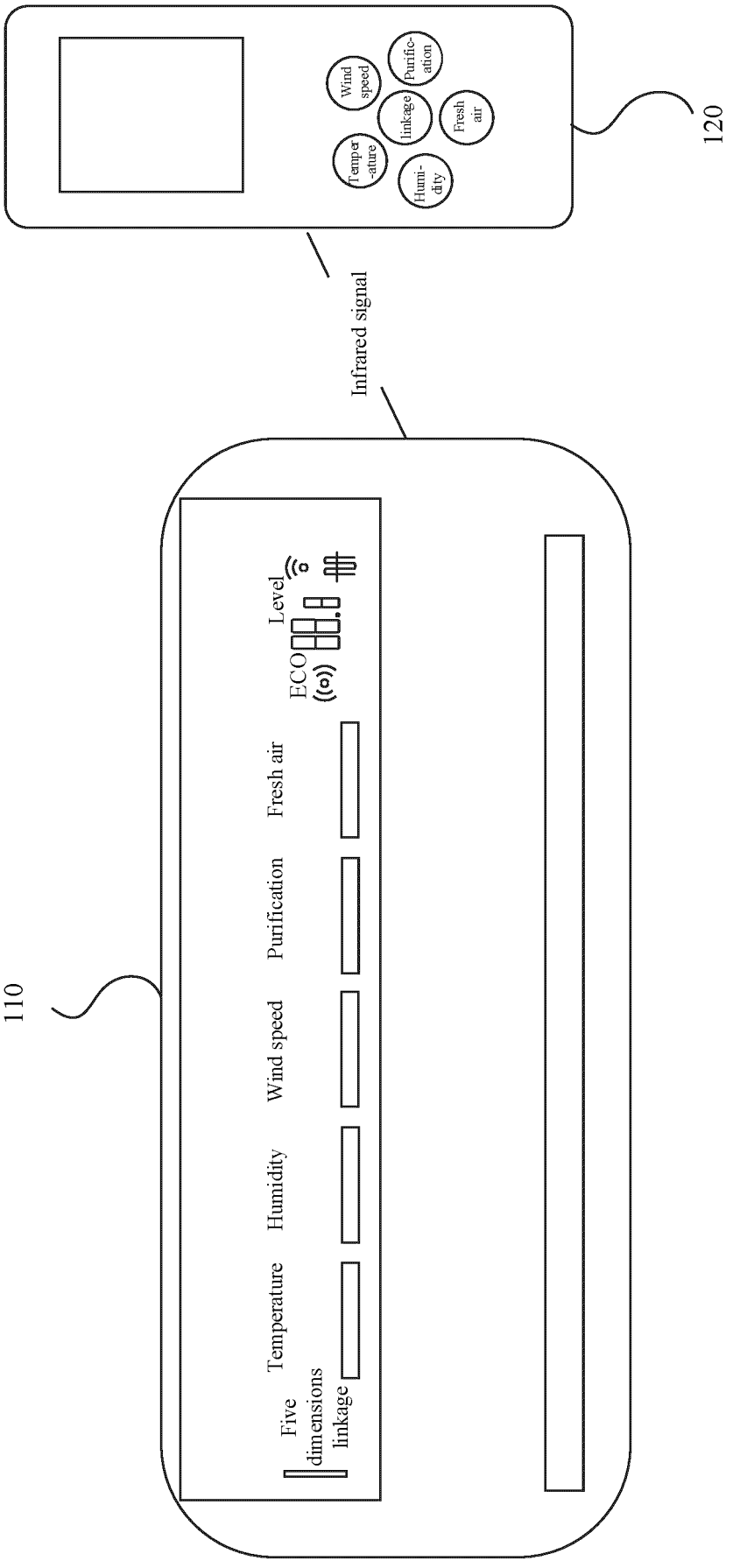
Wind speed
Purific-ation
linkage
Fresh air
Temper-ature
Humi-dity
120
Infrared signal
110
Level
ECO
Fresh air
Purification
Wind speed
Humidity
Temperature
Five dimensions linkage

FIG. 1

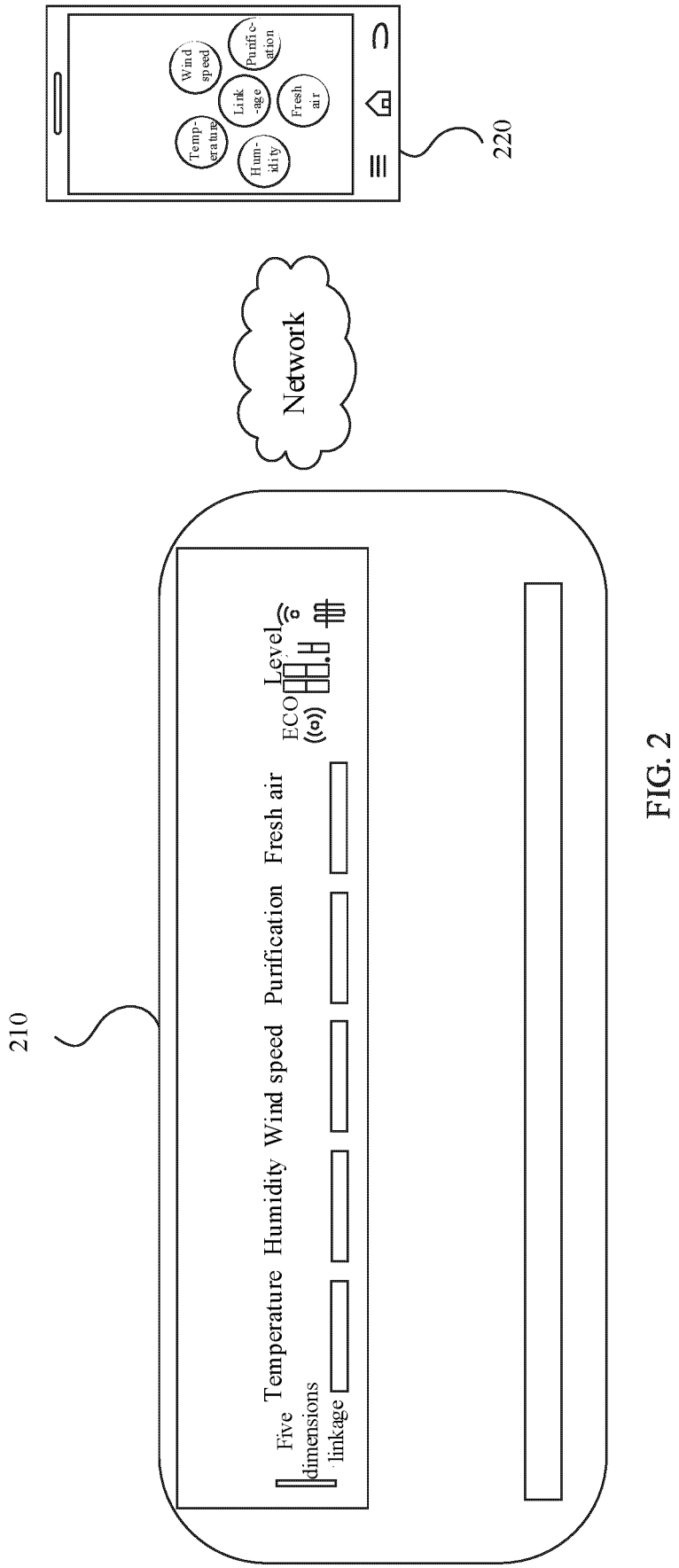
Wind speed
Purifi-cation
Link -age
Fresh air
Temp-erature
Hum-idity
220
Network
210
Five dimensions linkage
Temperature
Humidity
Wind speed
Purification
Fresh air
ECO
Level

FIG. 2

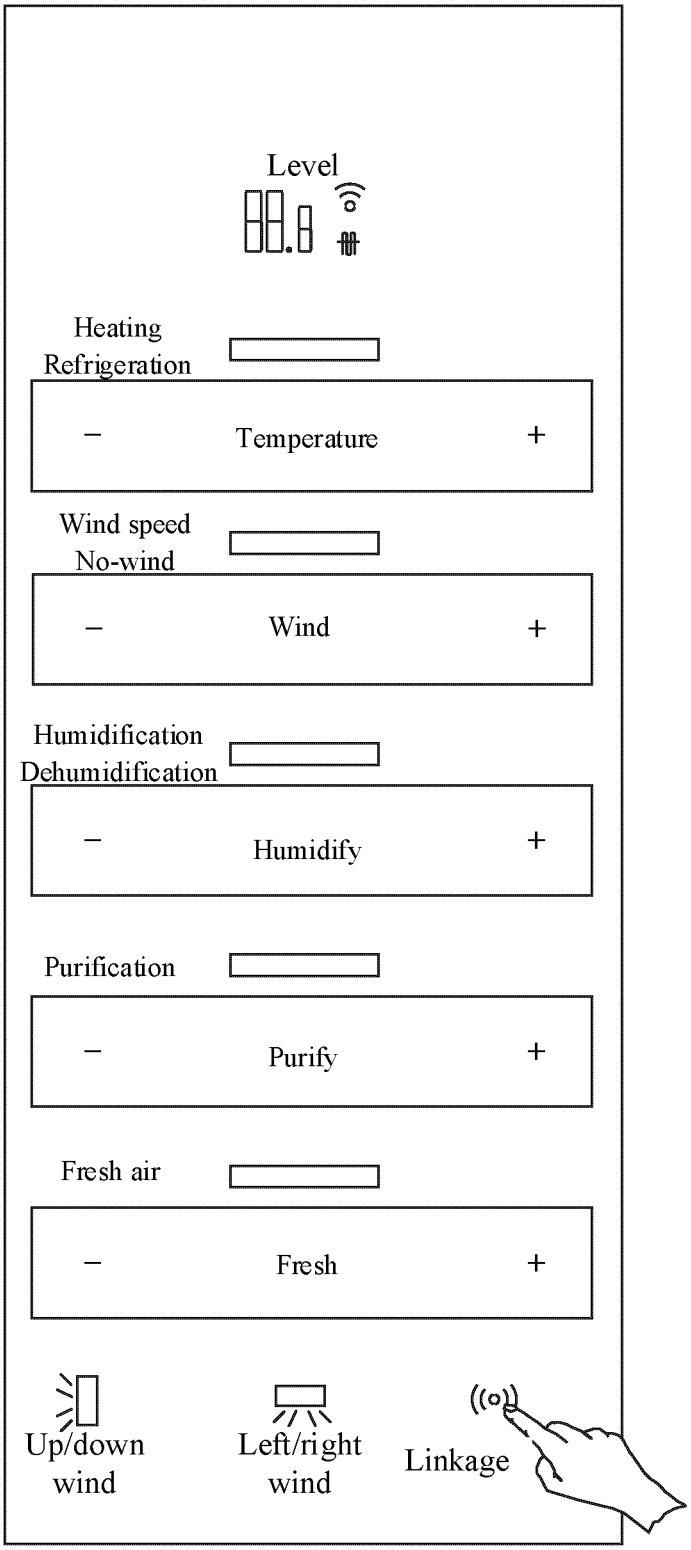
Level
Heating
Refrigeration
−
Temperature
+
Wind speed
No-wind
−
Wind
+
Humidification
Dehumidification
−
Humidify
+
Purification
−
Purify
+
Fresh air
−
Fresh
+
Up/down
wind
Left/right
wind
Linkage

FIG. 3

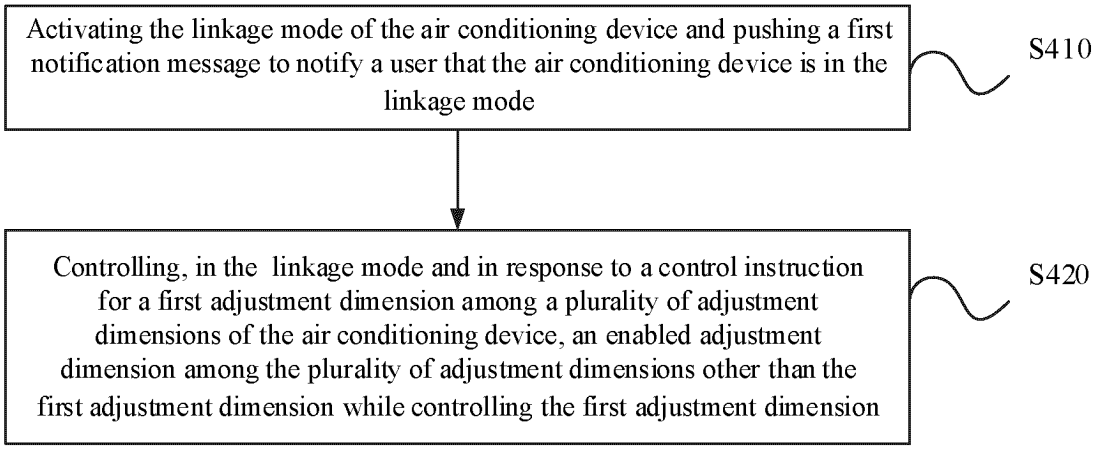

FIG. 4

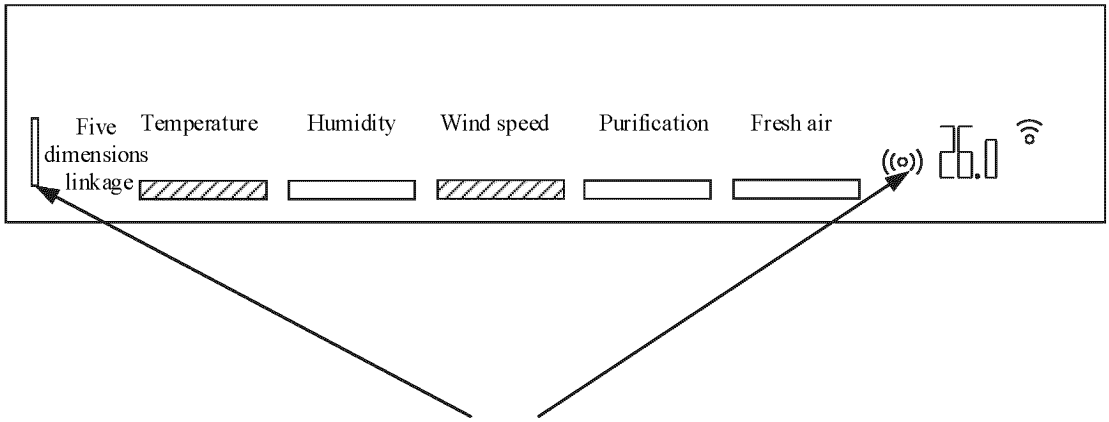

FIG. 5

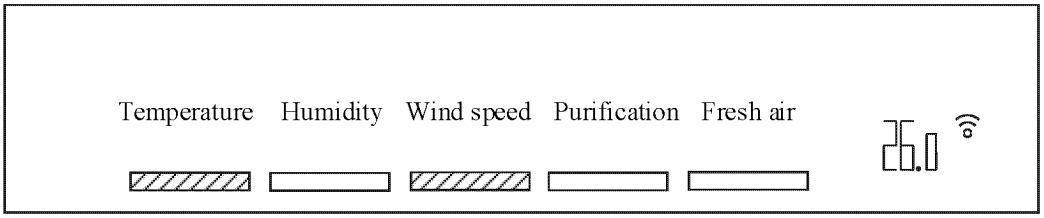

FIG. 6A

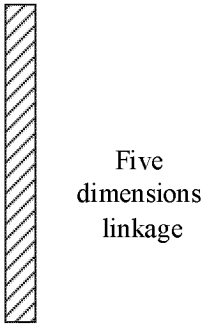

FIG. 6B

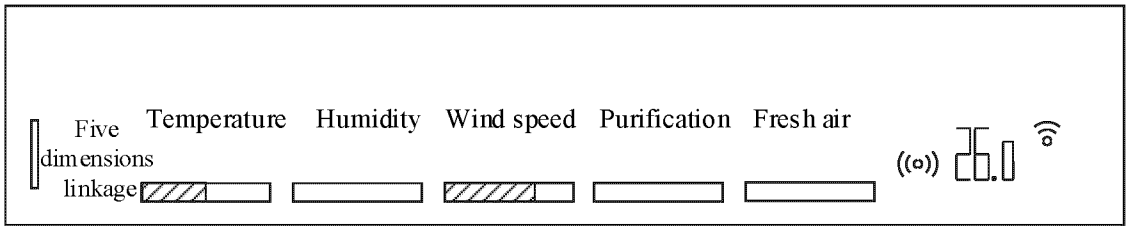

FIG. 7

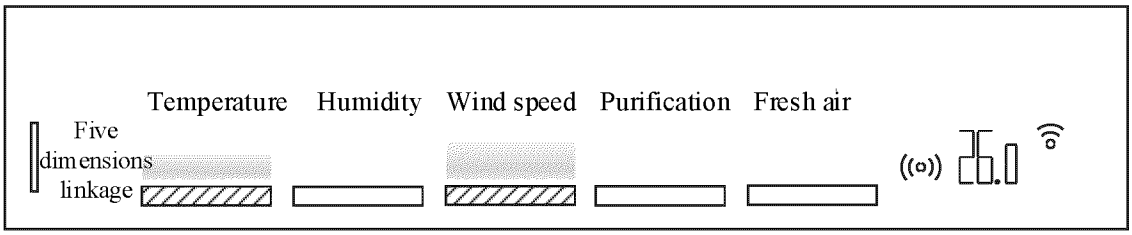

FIG. 8

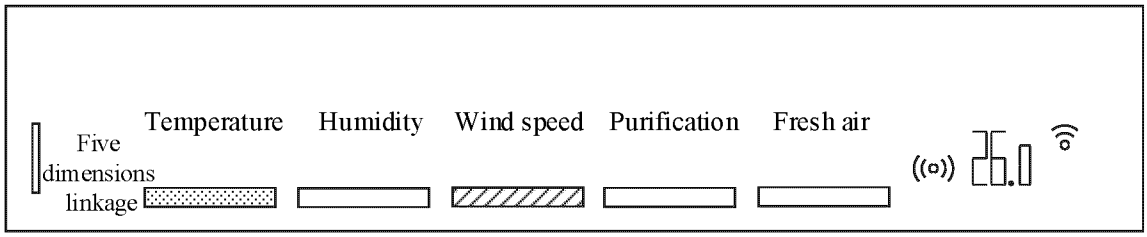

FIG. 9

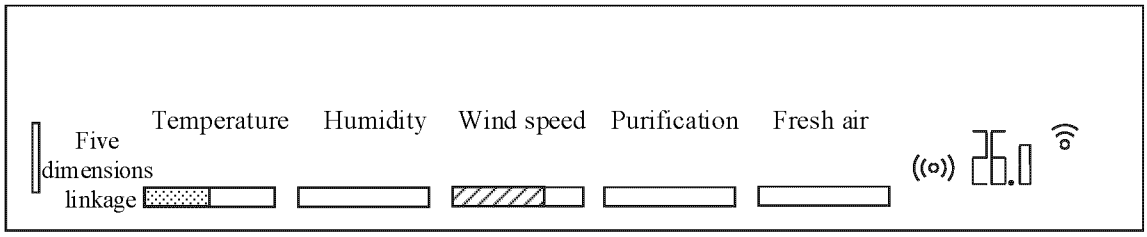

FIG. 10

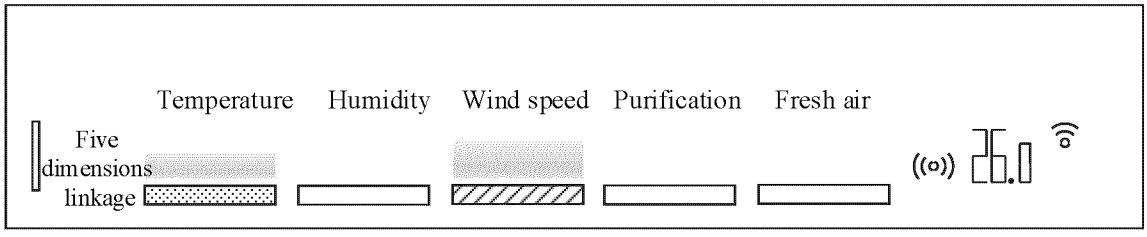

FIG. 11

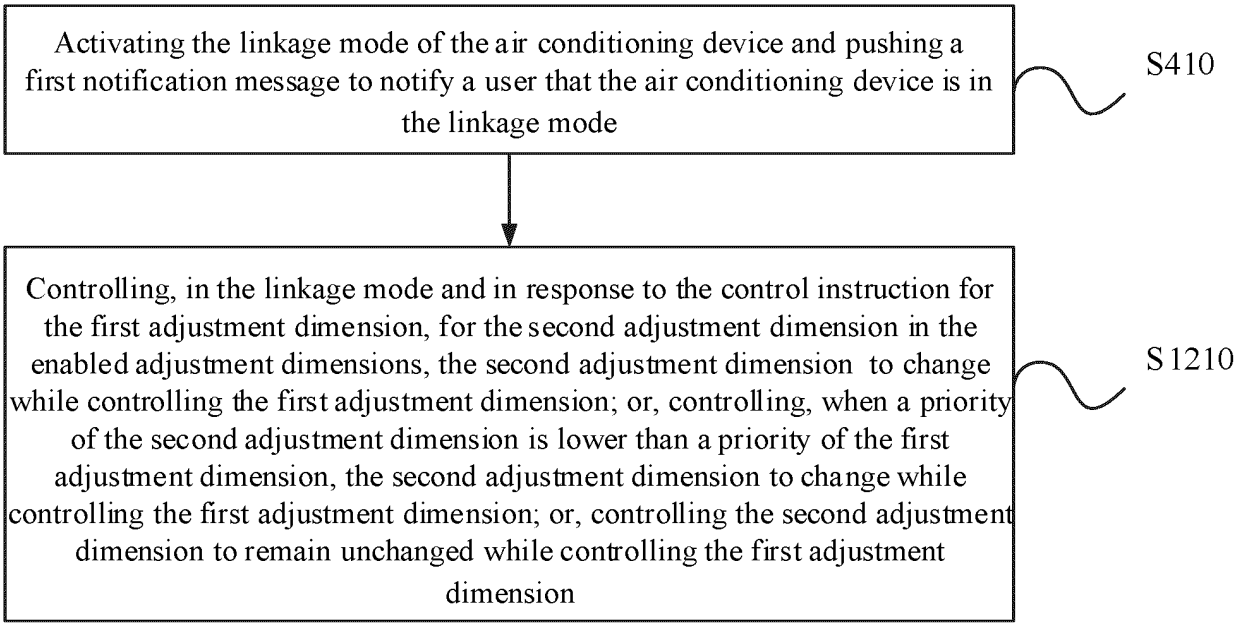

FIG. 12

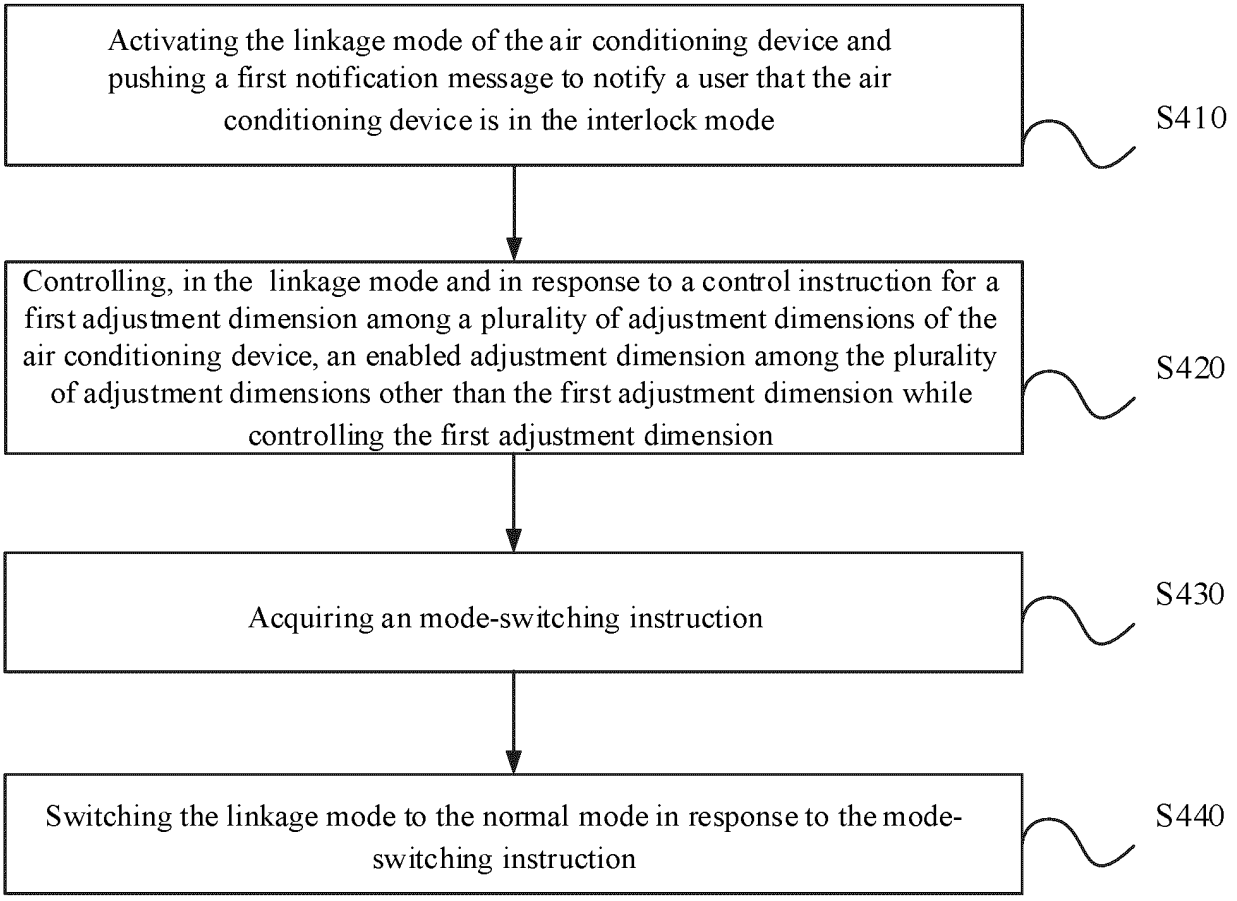

FIG. 13A

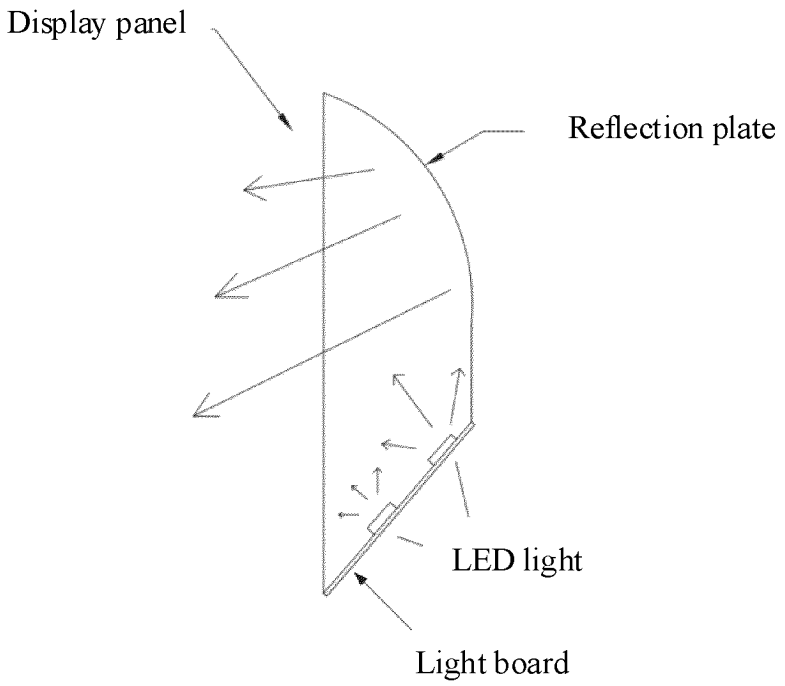

FIG. 13B

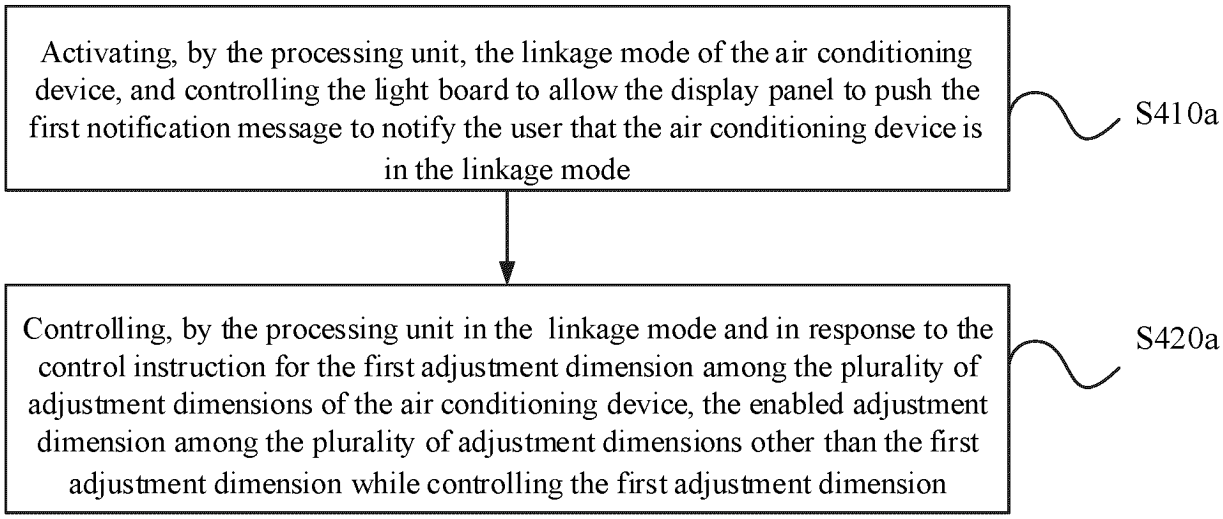

FIG. 13C

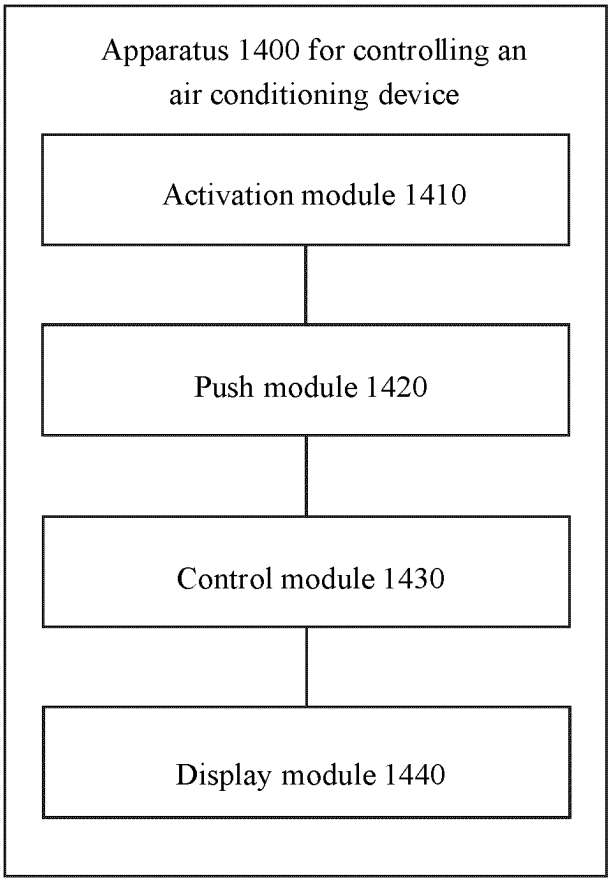

FIG. 14

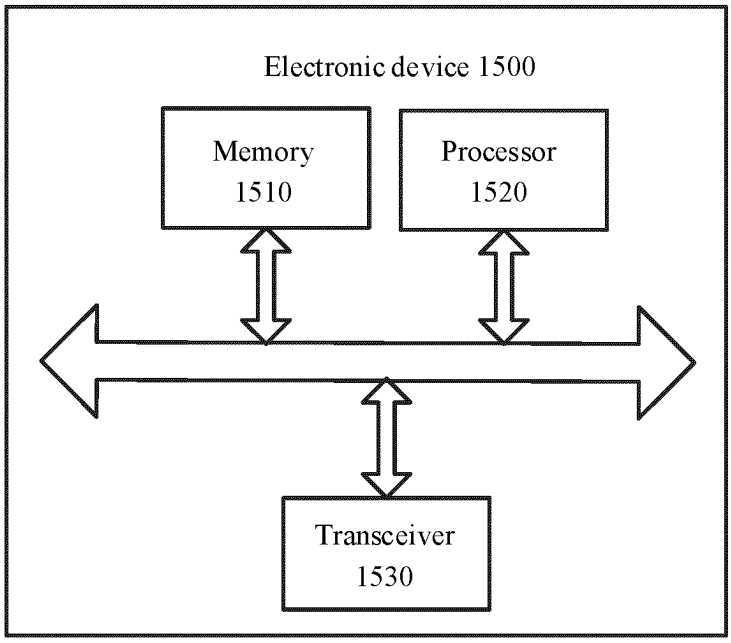

FIG. 15A

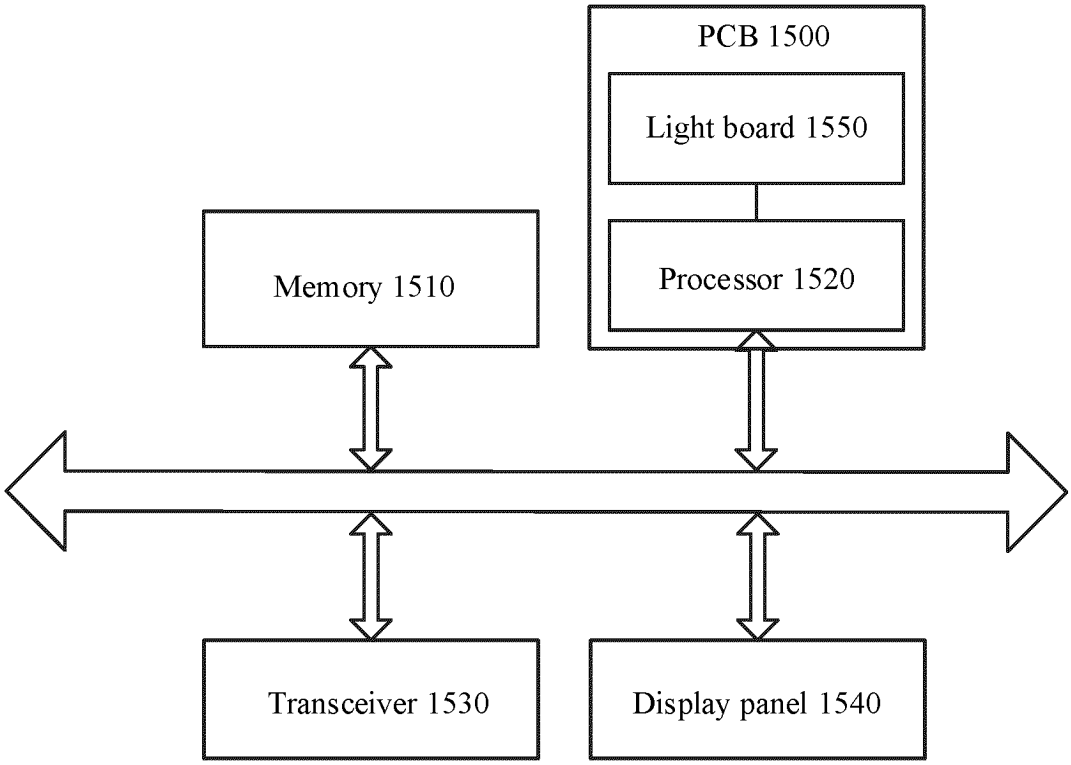
PCB 1500
Light board 1550
Processor 1520
Memory 1510
Transceiver 1530
Display panel 1540

FIG. 15B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/099517

A. CLASSIFICATION OF SUBJECT MATTER

F24F11/62(2018.01)i; F24F11/64(2018.01)i; F24F11/65(2018.01)i; F24F11/89(2018.01)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: F24F

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

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

CNTXT, ENTXTC, ENTXT, VEN: 空气调节, 空调, 联动, 多维, 调节, 控制, 关联, 指令, 参数, 维度, air conditioning, air conditioner, linkage, multi-dimensional, regulating, control, correlate, instruction, parameter, dimensions

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 111442482 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 24 July 2020 (2020-07-24) description, paragraphs [0063]-[0183], and figure 4	1-30
Y	CN 108489042 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 04 September 2018 (2018-09-04) description, paragraphs [0066]-[0087]	1-30
Y	CN 111397131 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 10 July 2020 (2020-07-10) description, paragraphs [0042]-[0119]	1-30
Y	CN 111397153 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 10 July 2020 (2020-07-10) description, paragraphs [0039]-[0107]	1-30
A	CN 109425076 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 05 March 2019 (2019-03-05) entire document	1-30

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 August 2023	**31 August 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/099517

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2021196483 A1 (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 07 October 2021 (2021-10-07) entire document	1-30

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2023/099517

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 111442482 A	24 July 2020	None	
CN 108489042 A	04 September 2018	None	
CN 111397131 A	10 July 2020	None	
CN 111397153 A	10 July 2020	None	
CN 109425076 A	05 March 2019	EP 3553400 A1	16 October 2019
		EP 3553400 A4	25 March 2020
		EP 3553400 B1	24 May 2023
		WO 2019114565 A1	20 June 2019
WO 2021196483 A1	07 October 2021	None	

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202210658351 **[0001]**
- CN 202310633193 **[0001]**