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

(57) A control method and apparatus for an air conditioning device (110), a device, a medium, and a program product. The method comprises: starting a linkage mode of an air conditioning device (110) (S410); and in the linkage mode, in response to a control instruction for a target adjustment dimension combination in a plurality of adjustment dimensions of the air conditioning device (110), controlling a started adjustment dimension other than the target adjustment dimension combination among the plurality of adjustment dimensions in the case that the target adjustment dimension combination is controlled (S420).

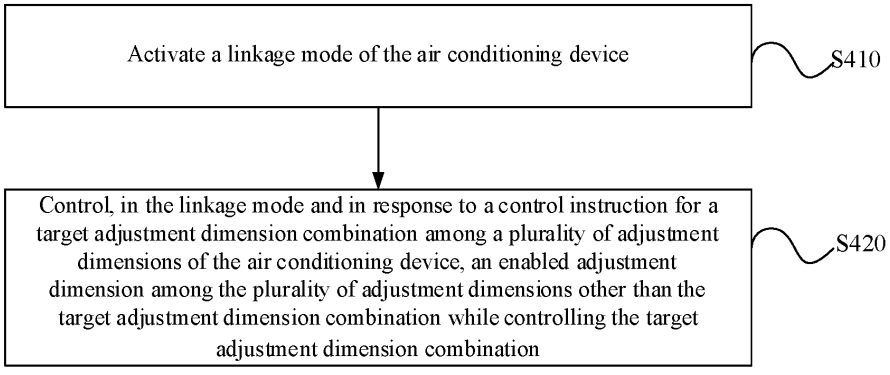

FIG. 4

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to Chinese Patent Application No. 202210657564.7 filed on June 10, 2022, and titled "METHOD AND APPARATUS FOR CONTROLLING AIR CONDITIONING DEVICE, DEVICE, MEDIUM, AND PROGRAM PRODUCT," which is incorporated herein by reference in its entirety.

FIELD

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

BACKGROUND

[0003] At present, a user can adjust dimensions of an air conditioning device including temperature, airflow speed, humidity, purification, fresh air, and the like, so that the air conditioning device can provide the user with a comfortable environment. However, at present, temperature, airflow 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 low user experience.

SUMMARY

[0004] The present disclosure 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 disclosure is to provide a method for controlling an air conditioning device. Subsequent to the air conditioning device entering the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination is controlled while controlling the target adjustment dimension combination.

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

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

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

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

[0010] To achieve the above objectives, embodiments of a first aspect of the present disclosure provide a method for controlling an air conditioning device. The method includes steps as follows: activating a linkage mode of the air conditioning device; and controlling, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination.

[0011] According to an embodiment of the present disclosure, the controlling the enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination includes: for a second adjustment dimension among the enabled adjustment dimension, controlling the second adjustment dimension to change while controlling the target adjustment dimension combination; or controlling, when a priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination; or controlling, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination.

[0012] According to an embodiment of the present disclosure, when the target adjustment dimension combination includes one first adjustment dimension, the controlling the second adjustment dimension to change while controlling the target adjustment dimension combination includes: determining an adjustment amount of the first adjustment dimension; determining a first mapping relationship between the adjustment amount of the first adjustment dimension and an adjustment amount of the second adjustment dimension; determining the adjustment amount of the second adjustment dimension based on the adjustment amount of the first adjustment dimension and the first mapping relationship; and adjusting the second adjustment dimension based on the adjustment amount of the second adjustment dimension.

[0013] According to an embodiment of the present disclosure, when the target adjustment dimension combination includes one first adjustment dimension, the controlling the second adjustment dimension to change while controlling the target adjustment dimension combination includes: determining a target value of the first adjustment dimension;

determining a second mapping relationship between the target value of the first adjustment dimension and an adjusted value corresponding to the second adjustment dimension; determining the adjusted value corresponding to the second adjustment dimension based on the target value of the first adjustment dimension and the second mapping relationship; and adjusting the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension.

[0014] According to an embodiment of the present disclosure, when the target adjustment dimension combination includes a plurality of first adjustment dimensions, the controlling the second adjustment dimension to change while controlling the target adjustment dimension combination includes: determining an adjustment amount of each of the plurality of first adjustment dimensions; determining a third mapping relationship between the adjustment amount of each of the plurality of first adjustment dimensions and an adjustment amount of the second adjustment dimension; determining a plurality of adjustment amounts of the second adjustment dimension based on respective adjustment amounts of the plurality of first adjustment dimensions and the third mapping relationship; determining a target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension; and adjusting the second adjustment dimension based on the target adjustment amount of the second adjustment dimension.

[0015] According to an embodiment of the present disclosure, the determining the target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension includes: calculating an average value of the plurality of adjustment amounts of the second adjustment dimension; and determining the target adjustment amount of the second adjustment dimension based on the average value of the plurality of adjustment amounts of the second adjustment dimension.

[0016] According to an embodiment of the present disclosure, when the target adjustment dimension combination includes a plurality of first adjustment dimensions, the controlling the second adjustment dimension to change while controlling the target adjustment dimension combination includes: determining a target value of each of the plurality of first adjustment dimensions; determining a fourth mapping relationship between the target value of each of the plurality of first adjustment dimensions and an adjusted value corresponding to the second adjustment dimension; determining a plurality of adjusted values corresponding to the second adjustment dimension based on respective target values of the plurality of first adjustment dimensions and the fourth mapping relationship; determining a target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second adjustment dimension; and adjusting the second adjustment dimension based on the target adjusted value corresponding to the second adjustment dimension.

[0017] According to an embodiment of the present disclosure, the determining the target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second adjustment dimension includes: calculating an average value of the plurality of adjusted values corresponding to the second adjustment dimension; and determining the target adjusted value corresponding to the second adjustment dimension based on the average value of the plurality of adjusted values corresponding to the second adjustment dimension.

[0018] According to an embodiment of the present disclosure, the plurality of adjustment dimensions includes temperature, airflow speed, humidity, purification, and fresh air. Under a cooling condition, the temperature has a negative linkage relationship with the airflow speed. Under a heating condition, the temperature has a positive linkage relationship with the airflow speed. The temperature has a positive linkage relationship with the humidity. The temperature has no linkage relationship with the purification. The temperature has a negative linkage relationship with the fresh air. The airflow speed has a negative linkage relationship with the humidity. The airflow speed has a positive linkage relationship with the purification. The airflow speed has a negative linkage relationship with the fresh air. The humidity has no linkage relationship with the purification. The humidity has a negative linkage relationship with the fresh air. The purification has a negative linkage relationship with the fresh air.

[0019] According to an embodiment of the present disclosure, the method further includes: enabling, in response to a power-on instruction or a linkage instruction, at least one adjustment dimension among the plurality of adjustment dimensions.

[0020] According to an embodiment of the present disclosure, the at least one adjustment dimension is any one of: an adjustment dimension to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; and an adjustment dimension determined to be enabled based on a current environment.

[0021] According to an embodiment of the present disclosure, 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 to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; an adjustment dimension that is enabled in the normal mode; and an adjustment dimension determined to be enabled based on a current environment.

[0022] According to an embodiment of the present disclosure, 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.

[0023] According to an embodiment of the present disclosure, 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.

[0024] To achieve the above objectives, embodiments of a second aspect of the present disclosure provide the apparatus for controlling the air conditioning device. The apparatus includes: an activation module configured to activate a linkage mode of the air conditioning device; and a control module configured to control, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination.

[0025] To achieve the above objectives, embodiments of a third aspect of the present disclosure 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 above method for controlling the air conditioning device described above.

[0026] To achieve the above objectives, embodiments of a fourth aspect of the present disclosure provide the computer-readable storage medium. The computer-readable storage medium is configured to store a computer program. The computer program causes a computer to perform the above method for controlling the air conditioning device described above.

[0027] To achieve the above objectives, embodiments of a fifth aspect of the present disclosure provide the computer program product including a computer program or computer instructions. A processor, when executing the computer program or the computer instructions, performs the above method for controlling the air conditioning device described above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028]

FIG. 1 is a schematic diagram showing an application scenario according to an embodiment of the present disclosure.
FIG. 2 is a schematic diagram showing an application scenario according to another embodiment of the present disclosure.
FIG. 3 is a schematic diagram showing an application scenario according to another embodiment of the present disclosure.
FIG. 4 is a flowchart of a method for controlling an air conditioning device according to an embodiment of the present disclosure.
FIG. 5 is a schematic diagram showing an interface according to an embodiment of the present disclosure.
FIG. 6 is a schematic diagram showing an interface according to another embodiment of the present disclosure.
FIG. 7 is a schematic diagram showing an interface according to another embodiment of the present disclosure.
FIG. 8 is a schematic diagram showing an interface according to another embodiment of the present disclosure.
FIG. 9 is a schematic diagram showing an interface according to an embodiment of the present disclosure.
FIG. 10 is a schematic diagram showing an interface according to another embodiment of the present disclosure.
FIG. 11 is a schematic diagram showing an interface according to another embodiment of the present disclosure.
FIG. 12 is a flowchart of a method for controlling an air conditioning device according to another embodiment of the present disclosure.
FIG. 13 is a flowchart of a method for controlling an air conditioning device according to another embodiment of the present disclosure.
FIG. 14 is a schematic diagram of an apparatus 1400 for controlling an air conditioning device according to an embodiment of the present disclosure.
FIG. 15 is a schematic block diagram of an electronic device 1500 according to an embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0029] Technical solutions according to embodiments of the present disclosure will be described below in combination with accompanying drawings of the embodiments of the present disclosure. Obviously, the embodiments described below are only some rather than all of the embodiments of the present disclosure. On a basis of the embodiments in the present disclosure, all other embodiments obtained by a person skilled in the art without creative labor shall fall within the protection scope of the present disclosure.

[0030] It should be noted that terms such as "first," "second," and the like, in detailed description of the embodiments, the claims of the present disclosure, and the accompanying drawings, 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 disclosure 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.

[0031] 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 low user experience.

[0032] In order to solve the above technical problems, the embodiments of the present disclosure provide a linkage control solution. In an exemplary embodiment of the present disclosure, in response to being in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination is controlled while controlling the target adjustment dimension combination.

[0033] In some embodiments of the present disclosure, the target adjustment dimension combination may include one or more adjustment dimensions among the plurality of adjustment dimensions of the air conditioning device. In order to distinguish the target adjustment dimension combination from the enabled adjustment dimension, an adjustment dimension included in the target adjustment dimension combination is referred to as a first adjustment dimension.

[0034] For example, the technical solution of the present disclosure may be applied to the following scenarios, but is not limited thereto.

[0035] FIG. 1 is a schematic diagram showing an application scenario according to an embodiment of the present disclosure. 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.

[0036] In some embodiments of the present disclosure, 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 is configured to transmit an infrared signal to the air conditioning device 110 through the infrared emitting unit, and the air conditioning device 110 is configured to receive the infrared signal through the infrared receiving unit, thereby realizing the remote control of the air conditioning device 110.

[0037] FIG. 2 is a schematic diagram showing an application scenario according to another embodiment of the present disclosure. 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 installed on the terminal device 220. The user can operate the APP to realize the remote control of the air conditioning device 210.

[0038] In some embodiments of the present disclosure, the terminal device may be a mobile phone, a computer, etc., but is not limited thereto.

[0039] 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.

[0040] FIG. 3 is a schematic diagram showing an application scenario according to another embodiment of the present disclosure. As shown in FIG. 3, the application scenario may include an 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.

[0041] It should be understood that the present disclosure is further applicable to voice or gesture control scenarios for air conditioning devices.

[0042] The technical solution of the present disclosure will be described in detail below.

[0043] FIG. 4 is a flowchart of a method for controlling an air conditioning device according to an embodiment of the present disclosure. The method may be executed 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 S410 to S420.

[0044] At block S410, a linkage mode of the air conditioning device is activated.

[0045] At block S420, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination is controlled while controlling the target adjustment dimension combination.

[0046] It should be understood that the linkage mode refers to that when the air conditioning device acquires the control instruction for the target adjustment dimension combination among the plurality of adjustment dimensions, the air conditioning device controls the enabled adjustment dimension other than the target adjustment dimension combination among the plurality of adjustment dimensions while controlling the target adjustment dimension combination. For example, when the user adjusts a temperature dimension, an enabled airflow speed adjustment dimension can be automatically adjusted. For example, when the user adjusts the temperature dimension and the airflow speed dimension, enabled purification, humidity, and fresh air adjustment dimensions can be automatically adjusted. For another example, when the user enables the airflow speed adjustment dimension, an enabled humidity adjustment dimension can also be

automatically adjusted. For another example, when the user disables the humidity adjustment dimension, other enabled adjustment dimensions can remain unchanged.

[0047] In some embodiments of the present disclosure, the linkage mode is for a plurality of adjustment dimensions, which may be system defaults.

[0048] In some embodiments of the present disclosure, the plurality of adjustment dimensions may include, but are not limited to, a temperature adjustment dimension, an airflow speed adjustment dimension, a humidity adjustment dimension, a purification adjustment dimension, a fresh air adjustment dimension, and the like. The airflow speed adjustment dimension here may include a no-airflow condition. The humidity adjustment dimension may include humidification and dehumidification conditions.

[0049] In some embodiments of the present disclosure, the activating the linkage mode of the air conditioning device includes, but is not limited to, the following cases.

[0050] 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 enters the linkage mode.

[0051] In some embodiments of the present disclosure, 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.

[0052] 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 enter the linkage mode.

[0053] In some embodiments of the present disclosure, the linkage instruction may be generated based on a user's operation on the linkage button on a remote controller or the touch panel, or generated based on a user's operation on a linkage icon on the APP, or the linkage instruction may be a voice instruction, a gesture instruction or a posture instruction.

[0054] In a third case, a selection instruction and a 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 temperature, airflow speed, humidity, purification, and fresh air, and then the user can click a linkage icon or button to allow the air conditioning device to enter the linkage mode.

[0055] In some embodiments of the present disclosure, in the third case, assuming that the user selects a plurality of adjustment dimensions, the air conditioning device may determine whether a maximum interval between selection instructions among selection instructions of the plurality of adjustment dimensions is smaller than a predetermined time length. When the maximum interval is smaller the predetermined time length, the linkage mode of the air conditioning device is activated in response to the selection instruction and the linkage instruction.

[0056] In some embodiments of the present disclosure, the predetermined time length may be 5 seconds or 10 seconds, etc., which is not limited by the present disclosure.

[0057] It should be understood that, by setting the predetermined time length, misjudgment of the air conditioning device can be reduced. For example, assuming that the predetermined time length is not set. The user selects the fresh air adjustment dimension at time t, and after half an hour, the user selects three adjustment dimensions of temperature, humidity and airflow speed. Then the user can click or touch the linkage button or icon, etc. In fact, the user expects to interlink the three adjustment dimensions of temperature, humidity and airflow speed, but when the predetermined time length is not set, the air conditioning device may interlink four adjustment dimensions of fresh air, temperature, humidity, and airflow speed.

[0058] The maximum interval between the selection instructions is illustrated as follows. Assuming that the user selects the three adjustment dimensions of temperature, humidity, and airflow speed at time points of t, t+1s, and t+2s respectively. Then for the three adjustment dimensions, the maximum interval between the corresponding selection instructions is t+2-t=2s.

[0059] It should be understood that there are two scenarios in each of the second case and the third case. One scenario is that when the air conditioning device is turned on, the air conditioning device enters a normal mode by default. In this case, when the linkage instruction, or the selection instruction and linkage instruction for at least one adjustment dimension is 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 does not enter any mode, which may be referred to as 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 is acquired by the air conditioning device, the air conditioning device can directly enter the linkage mode.

[0060] 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

adjustment dimension, linkage control is not performed on other adjustment dimensions.

[0061] It should be understood that the linkage instruction is used to activate the linkage mode of the air conditioning device.

[0062] When the air conditioning device is in the linkage mode, the air conditioning device will enable at least one adjustment dimension. The following describes at least one enabled adjustment dimension in the above three cases of activating the linkage mode.

[0063] **In** some embodiments of the present disclosure, in the above first case, or in the above second case, when the air conditioning device directly enters 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 to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; and an adjustment dimension determined to be enabled based on a current environment.

[0064] For example, the system enables five adjustment dimensions of temperature, humidity, airflow speed, purification, and fresh air by default. Based on this, when the power-on instruction or the linkage instruction is acquired by the air conditioning device, the air conditioning device can automatically enable the five adjustment dimensions.

[0065] For example, the system enables the two adjustment dimensions of temperature and airflow speed by default. Based on this, when the power-on instruction or the linkage instruction is acquired by the air conditioning device, the air conditioning device can automatically enable the two adjustment dimensions.

[0066] For example, assuming that adjustment dimensions that the user enabled last time in the linkage mode are three adjustment dimensions of temperature, humidity, and airflow speed. Based on this, when the power-on instruction or the linkage instruction is acquired by the air conditioning device, the air conditioning device can automatically enable the three adjustment dimensions.

[0067] For example, the air conditioning device may collect current environmental data, such as temperature, humidity, pollution index, etc. Further, the air conditioning device may determine adjustment dimensions 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 air conditioning device can automatically enable adjustment dimensions to be enabled based on the current environmental data.

[0068] In some embodiments of the present disclosure, in a case that the air conditioning device has never been used before, and when the power-on instruction or the linkage instruction is acquired by the air conditioning device, the air conditioning device may enable the adjustment dimension to be enabled by default or enable the adjustment dimension to be enabled based on the current environment. In a case that the air conditioning device has been used before, and when the power-on instruction or the linkage instruction is acquired by the air conditioning device, the air conditioning device may enable the adjustment dimension to be enabled by default, or enable the adjustment dimension that was historically enabled in the linkage mode, or enable the adjustment dimension determined to be enabled based on the current environment.

[0069] In some embodiments of the present disclosure, 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 to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; an adjustment dimension that is enabled in the normal mode; and an adjustment dimension determined to be enabled based on a current environment.

[0070] For example, assuming that subsequent to the air conditioning device being turned on, the air conditioning device first enters the normal mode, and in the normal mode, the user enables two adjustment dimensions of temperature and airflow speed, when the linkage instruction is acquired by the air conditioning device, the air conditioning device can automatically enable the two adjustment dimensions of temperature and airflow speed.

[0071] In some embodiments of the present disclosure, in the above third case, the air conditioning device may enable at least one adjustment dimension selected by the user.

[0072] For example, the user can select at least one adjustment dimension through the remote controller, the APP or the touch panel. For example, when the two adjustment dimensions of temperature and airflow speed are selected, the user can click or touch the linkage button or icon, to enable the two adjustment dimensions.

[0073] In some embodiments of the present disclosure, the air conditioning device may push a first notification message to notify the user that the air conditioning device is in the linkage mode.

[0074] It should be understood that the first notification message is configured to notify the user that the air conditioning device is in the linkage mode.

[0075] In some embodiments of the present disclosure, 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 the on state for a first predetermined duration; the indicator light corresponding to the linkage mode exhibiting a first predetermined color; the indicator light corresponding to the linkage mode exhibiting the first predetermined color and being in the on state for the first predetermined duration; and the indicator light corresponding to the linkage mode flashing in a first predetermined mode and a voice message being provided.

[0076] In some embodiments of the present disclosure, the indicator light corresponding to the linkage mode may be disposed in a touch panel of a cabinet air conditioning device or a display panel of a hanging air conditioning device.

[0077] In some embodiments of the present disclosure, there may be one or plurality of indicator lights corresponding to the linkage mode.

[0078] In some embodiments of the present disclosure, the first predetermined duration may be 10 minutes, 30 minutes, etc.

[0079] In some embodiments of the present disclosure, the first predetermined color may be blue, green, red, or the like.

[0080] In some embodiments of the present disclosure, flashing in the first predetermined mode flashing may be flashing once every N seconds, where N is a positive integer, or intervals between two adjacent flashes are 1 second and 2 seconds, where 1 second and 2 seconds may be cycled in the order as listed.

[0081] 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 linkage mode is activated when the indicator light corresponding to the linkage mode is activated. In other embodiments, only one of these two icons may exist. As shown in FIG. 6, the icon corresponding to the linkage mode is not displayed in this interface, which means that the linkage mode is deactivated.

[0082] For example, the indicator light corresponding to the linkage mode being in the 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.

[0083] For example, the indicator light corresponding to the linkage mode being green indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off or red indicates that the linkage mode is deactivated.

[0084] For example, the indicator light corresponding to the linkage mode being green and in the on state for 10 minutes indicates that the linkage mode is activated. The indicator light corresponding to the linkage mode being turned off or red indicates that the linkage mode is deactivated.

[0085] 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 red indicates that the linkage mode is non-activated.

[0086] 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.

[0087] In order that the user can distinguish which adjustment dimensions are in the enabled state and which adjustment dimensions are in the disabled state. In the embodiments of the present disclosure, 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.

[0088] In some embodiments of the present disclosure, for any adjustment dimension among the plurality of adjustment dimensions, the third notification message corresponding to the adjustment dimension may be any one of, but not limited to: an indicator light corresponding to the adjustment dimension exhibiting a third predetermined color; the indicator light corresponding to the adjustment dimension exhibiting the third predetermined color and being in the on state for a third predetermined duration; and the indicator light corresponding to the adjustment dimension flashing in a third predetermined mode.

[0089] In some embodiments of the present disclosure, the indicator light corresponding to the adjustment dimension may be disposed at a touch panel of a cabinet air conditioning device or a display panel of a hanging air conditioning device.

[0090] In some embodiments of the present disclosure, there may be one or a plurality of indicator lights corresponding to the adjustment dimension.

[0091] In some embodiments of the present disclosure, the third predetermined duration may be 1 second or 2 seconds, etc.

[0092] In some embodiments of the present disclosure, the third predetermined color may be white, blue, green, red, or the like.

[0093] In some embodiments of the present disclosure, flushing in the third predetermined mode may be flashing once every P seconds, where P is a positive integer, or intervals between two adjacent flashes are 2 seconds and 1 second, where 2 seconds and 1 second may be cycled in the order as listed.

[0094] In some embodiments of the present disclosure, for any adjustment dimension among the plurality of adjustment dimensions, the fourth notification message corresponding the adjustment dimension may be any one of, but not limited to: an indicator light corresponding to the adjustment dimension being turned off; the indicator light corresponding to the adjustment dimension exhibiting a fourth predetermined color.

[0095] In some embodiments of the present disclosure, the fourth predetermined color may be red, purple, etc.

[0096] 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 temperature and airflow adjustment dimensions are currently in the enabled state, while the humidity, purification, and fresh air conditioning dimensions are in the disabled state.

[0097] In some embodiments of the present disclosure, in order that the user knows respective progresses of the plurality of adjustment dimensions, for any adjustment dimension among the plurality of adjustment dimensions, when the adjustment dimension is in the enabled state, the air conditioning device may further display a current progress of the adjustment dimension.

[0098] 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.

[0099] 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.

[0100] For example, as shown in FIG. 8, a striped frame represents that the indicator light is white, which indicates that the corresponding adjustment dimension is in the enabled state, and a height of a shaded part indicates the current progress of the adjustment dimension.

[0101] As shown in FIG. 8, it should be understood that the indicator light represented by the striped frame indicates the enabled/disabled state of the adjustment dimension and an indicator light represented by the 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 represented by the shaded part and indicate the current progress of the adjustment dimension with the indicator light represented by the striped frame. In another embodiment, both two indicator lights can indicate both the enabled/disabled state and the current progress of the adjustment dimension.

[0102] It should be understood that, in the embodiments of the present disclosure, for the linkage mode, the first adjustment dimension may be referred to as a primary adjustment dimension, and any enabled adjustment dimension other than the first adjustment dimension among the plurality of adjustment dimensions that is controlled while controlling the first adjustment dimension may be referred to as a second adjustment dimension.

[0103] For example, assuming that the user controls the temperature adjustment dimension through the remote controller, the APP, or the touch panel, the temperature adjustment dimension may be referred to as the primary adjustment dimension. Based on the control of the temperature adjustment dimension, the enabled airflow speed, humidity, fresh air, or purification adjustment dimension controlled by the air conditioning device in the linkage mode may be referred to as the second adjustment dimension.

[0104] For example, assuming that the user controls the temperature and airflow speed adjustment dimensions through the remote controller, the APP, or the touch panel, the temperature and airflow speed adjustment dimensions are both primary adjustment dimensions. Based on the control of the temperature and airflow speed adjustment dimensions, the enabled airflow speed, humidity, fresh air, or purification adjustment dimension controlled by the air conditioning device in the linkage mode may be referred to as the second adjustment dimension.

[0105] In order to enable the user to intuitively know the adjustment dimension controlled by the user, in the embodiments of the present disclosure, the air conditioning device may push a second notification message for the first adjustment dimension to notify the user that the first adjustment dimension is the primary adjustment dimension.

[0106] In some embodiments of the present disclosure, the second notification message is any one of, but not limited to: an indicator light corresponding to the first adjustment dimension exhibiting a second predetermined color; the indicator light corresponding to the first adjustment dimension exhibiting the second predetermined color and being in the on state for a second predetermined duration; and the indicator light corresponding to the first adjustment dimension flashing in a second predetermined mode.

[0107] In some embodiments of the present disclosure, the indicator light corresponding to the first adjustment dimension may be disposed at a touch panel of a cabinet air conditioning device or a display panel of a hanging air conditioning device.

[0108] In some embodiments of the present disclosure, there may be one or a plurality of indicator lights corresponding to the first adjustment dimension.

[0109] In some embodiments of the present disclosure, the second predetermined duration may be 3 seconds or 5 seconds.

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

[0111] In some embodiments of the present disclosure, flashing in the second predetermined mode may be flashing once every M seconds, where M is a positive integer, or intervals between two adjacent flashes are 1 second and 3 seconds, where 1 second, 3 seconds may be cycled in the order as listed.

[0112] 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 adjustment dimension, the indicator light corresponding to the

adjustment dimension may exhibit blue for 1 second. In FIG. 9, the indicator light exhibiting blue is represented by a black dotted frame.

[0113] In some embodiments of the present disclosure, the air conditioning device may further display a control progress of the first adjustment dimension in response to the control instruction.

[0114] 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 adjustment dimension, the indicator light corresponding to the adjustment dimension may exhibit blue for 1 second. In FIG. 10, the indicator light exhibiting blue is represented by a black dotted frame, and a length change of the black dotted frame represents a control progress of the temperature adjustment dimension.

[0115] 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 adjustment dimension, the indicator light corresponding to the adjustment dimension may exhibit blue for 1 second. In FIG. 11, the indicator light exhibiting blue is indicated by a black dotted frame, and a height change of a shaded part indicates the control progress of the temperature adjustment dimension.

[0116] In FIG. 11, it should be understood that the temperature adjustment dimension is indicated as the primary adjustment dimension by the black dotted frame, and the control progress of the temperature adjustment dimension is represented by the shaded part. In fact, it is also possible to use the shaded part to indicate that the temperature adjustment dimension is the primary adjustment dimension, and to use a length change of the striped frame to indicate the control progress of the temperature adjustment dimension. In another embodiment, both parts indicate the temperature adjustment dimension being the primary adjustment dimension and the control progress of the temperature adjustment dimension.

[0117] In the embodiments of the present disclosure, the air conditioning device may activate the linkage mode of the air conditioning device. In the linkage mode and in response to the control instruction for the target adjustment dimension combination among the plurality of adjustment dimensions of the air conditioning device, the enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination is controlled while controlling the target adjustment dimension combination. Therefore, the user does not need to individually control other adjustment dimensions. The linkage control method 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.

[0118] Further, the air conditioning device may 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 dimension is in the enabled state and which adjustment dimension is in the disabled state, thereby improving the user experience. The air conditioning device may further show a current progress of each adjustment dimension, thereby further improving the user experience. The air conditioning device may 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.

[0119] The method for controlling the air conditioning device will be described in further detail below.

[0120] As shown in FIG. 12, the step S420 may include operations at block S1210.

[0121] At block S1210, in the linkage mode and in response to the control instruction for the target adjustment dimension combination, for a second adjustment dimension among the enabled adjustment dimension, the second adjustment dimension is controlled to change while controlling the target adjustment dimension combination; or when a priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension is controlled to change while controlling the target adjustment dimension combination; or when the second adjustment dimension is linked with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension is controlled to change while controlling the target adjustment dimension combination.

[0122] In some embodiments of the present disclosure, priorities of the plurality of adjustment dimensions may be set when the air conditioning device leaves 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 disclosure.

[0123] In some embodiments of the present disclosure, the plurality of adjustment dimensions may include temperature, airflow speed, humidity, purification, and fresh air. A linkage relationship among the five adjustment dimensions may be as follows, but is not limited thereto: the temperature has a negative linkage relationship with the airflow speed under a cooling condition, the temperature has a positive linkage relationship with the airflow speed under a heating condition, the temperature has a positive linkage relationship with the humidity, the temperature has no linkage relationship with the purification, the temperature has a negative linkage relationship with the fresh air, the airflow speed has a negative linkage relationship with the humidity, the airflow speed has a positive linkage relationship with the purification, the airflow speed has a negative linkage relationship with the fresh air, the humidity has no linkage relationship with the purification, the humidity has a negative linkage relationship with the fresh air, and the purification has a negative linkage relationship with

the fresh air, as shown in Table 1.

Table 1

Five dimensions	Temperature	Airflow speed	Humidity	Purification	Fresh air
Temperature	/	↓	↑	→	↓
Airflow speed	↓	/	↓	↑	↓
Humidity	↑	↓	/	→	↓
Purification	→	↑	→	/	↓
Fresh air	↓	↓	↓	↓	/

[0124] In Table 1, "↓" indicates the negative linkage relationship, "↑" indicates the positive linkage relationship, and "→" indicates no linkage relationship.

[0125] It should be understood that any two adjustment dimensions having the linkage relationship therebetween means that when the user actively controls any one of the two adjustment dimensions, or any one of the two adjustment dimensions is automatically controlled, another of the two adjustment dimensions can be automatically controlled in response to controlling the one adjustment dimension. For example, when the user actively controls the temperature adjustment dimension, the air conditioning device may control the airflow speed adjustment dimension while controlling the temperature adjustment dimension. For another example, when the user actively enables the temperature adjustment dimension and the air conditioning device automatically enables the airflow speed adjustment dimension based on the enabled temperature adjustment dimension, the air conditioning device may control the humidity adjustment dimension with the enabled airflow speed adjustment dimension.

[0126] It should be understood that any two adjustment dimensions having the positive linkage relationship therebetween means that when the user actively controls any one of the two adjustment dimensions, or any one of the two adjustment dimensions is automatically controlled, another of the two adjustment dimensions can be automatically controlled in response to controlling the one adjustment dimension, and signs of adjustment amounts of the two adjustment dimensions are consistent. For example, when an adjustment amount of the temperature adjustment dimension controlled by the user is 3°C, an adjustment amount of the airflow speed adjustment dimension controlled in the linkage mode under the heating condition should be 2 levels. When the adjustment amount of the temperature adjustment dimension controlled by the user is -3°C, the adjustment amount of the airflow speed adjustment dimension controlled in the linkage mode under the heating condition should be -2 levels.

[0127] It should be understood that any two adjustment dimensions having the negative linkage relationship therebetween means that when the user actively controls or automatically controls any one of the two adjustment dimensions, or any one of the two adjustment dimensions is automatically controlled, another of the two adjustment dimensions may be controlled in response to controlling the one adjustment dimension, and signs of the adjustment amounts of the two adjustment dimensions are opposite. For example, when an adjustment amount of the temperature adjustment dimension controlled by the user is 3°C, an adjustment amount of the airflow speed adjustment dimension controlled in the linkage mode under the cooling condition should be -2 levels. When the adjustment amount of the temperature adjustment dimension controlled by the user is -3°C, then the adjustment amount of the airflow speed adjustment dimension controlled in the linkage mode under the cooling condition should be 2 levels.

[0128] It should be understood that the target adjustment dimension combination may include one first adjustment dimension in an embodiment, and may include a plurality of first adjustment dimensions in other embodiments. The target adjustment dimension combination including a plurality of first adjustment dimensions refers to the case where the plurality of first adjustment dimensions may be controlled simultaneously.

[0129] For example, subsequent to the air conditioning device entering the linkage mode, the user adjusts the temperature and airflow speed adjustment dimensions and clicks a "confirm" or "combine" icon or button, it is indicated that the user actively controls the two adjustment dimensions simultaneously.

[0130] For example, subsequent to the air conditioning device entering the linkage mode, the user adjusts the temperature adjustment dimension, and adjusts the airflow speed adjustment dimension within a predetermined time range such as 3 seconds, it is indicated that the user actively controls the two adjustment dimensions simultaneously.

[0131] For example, subsequent to the air conditioning device entering the linkage mode, the user can select a scenario, such as a pregnant mode, in which the user adjusts the temperature and airflow speed adjustment dimensions, indicating that the user actively controls the two adjustment dimensions simultaneously.

[0132] For example, subsequent to the air conditioning device entering the linkage mode, assuming that the temperature and airflow speed adjustment dimensions are disabled, and humidity, fresh air, and purification adjustment dimensions are enabled, when the user actively enables the temperature adjustment dimension, the air conditioning device may

take an instruction for enabling the temperature adjustment dimension as an instruction for enabling the temperature adjustment dimension in combination with the airflow speed adjustment dimension, and the air conditioning device will automatically enable the airflow speed adjustment dimension, indicating that the two adjustment dimensions are controlled simultaneously. The control here includes user-active control and automatic control of the air conditioning device.

[0133] For example, subsequent to the air conditioning device entering the linkage mode, assuming that the fresh air and humidity adjustment dimensions are disabled, and the temperature, purification, and airflow speed adjustment dimensions are enabled, when the user actively enables the fresh air adjustment dimension, the air conditioning device may take an instruction for enabling the fresh air adjustment dimension as an instruction for enabling the fresh air adjustment dimension in combination with the humidity adjustment dimension, and the air conditioning device will automatically enable the humidity adjustment dimension, indicating that the two adjustment dimensions are controlled simultaneously. The control here also includes the user-active control and the automatic control of the air conditioning device.

[0134] The method for controlling the second adjustment dimension by the air conditioning device when the target adjustment dimension combination includes one first adjustment dimension is described below.

[0135] In a first implementation, the air conditioning device determines an adjustment amount of the first adjustment dimension; determines a first 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 first mapping relationship; and adjusts the second adjustment dimension based on the adjustment amount of the second adjustment dimension.

[0136] For example, assuming that the first adjustment dimension is the temperature adjustment dimension and the second adjustment dimension is the airflow speed adjustment dimension, when the user adjusts the temperature from 25°C to 22°C, the air conditioning device determines that an adjustment amount of the temperature is -3°C. Assuming that an adjustment amount of the airflow speed corresponding to -3°C is increasing the airflow speed adjustment dimension by one level, the air conditioning device can automatically control the airflow speed to increase by one level.

[0137] It should be understood that the adjustment granularity may vary depending on different adjustment dimensions. For example, the temperature can be adjusted by 1°C each time, and the adjustment granularity can even be 0.5°C. However, airflow speed, humidity, fresh air, and purification adjustment dimensions can be adjusted by levels.

[0138] In some embodiments of the present disclosure, 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 first mapping relationship, the air conditioning device may determine whether the adjustment amount of the second adjustment dimension determined based on the first mapping relationship is smaller than or equal to a maximum adjustable amount of the second adjustment dimension. When the second adjustment dimension determined based on the first mapping relationship is smaller than or equal to the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension is adjusted based on the adjustment amount of the second adjustment dimension determined based on the first mapping relationship. When the adjustment amount of the second adjustment dimension determined based on the first 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. In another embodiment, when the adjustment amount of the second adjustment dimension determined based on the first 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 then the second adjustment dimension is adjusted to a minimum value of the second adjustment dimension, and is continuously and cyclically adjusted until the adjustment amount reaches the adjustment amount of the second adjustment dimension determined based on the first mapping relationship.

[0139] Each adjustment dimension is restricted by upper and lower limit values. For example, assuming that a maximum airflow speed is level 5 and the current airflow speed is at level 3, when it is required to increase, based on the aforementioned mapping relationship, the airflow speed by three levels, clearly exceeding the maximum airflow speed value, the airflow speed can be increased to level 5. In another embodiment, the airflow speed adjustment is a cyclic adjustment process, and when the airflow speed reaches level 5, the airflow speed may be adjusted to level 1, from which the airflow speed may be continuously and cyclically adjusted.

[0140] In a second implementation, the air conditioning device may determine a target value of the first adjustment dimension; determine a second mapping relationship between the target value of the first adjustment dimension and an adjusted value corresponding to the second adjustment dimension; determine the adjusted value corresponding to the second adjustment dimension based on the target value of the first adjustment dimension and the second mapping relationship; and adjust the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension.

[0141] In some embodiments of the present disclosure, a control instruction for any first adjustment dimension may be an enabling instruction or an adjustment instruction, but is not limited thereto.

[0142] In some embodiments of the present disclosure, the adjustment instruction is used to adjust a magnitude of the

corresponding adjustment dimension, for example, to adjust the magnitude of temperature, airflow speed, humidity, fresh air, and purification adjustment dimensions.

[0143] In some embodiments of the present disclosure, when the control instruction for the first adjustment dimension is the enabling 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 the adjustment instruction, the target value may be an adjusted value of the first adjustment dimension.

[0144] For example, it is assumed that the first adjustment dimension is the temperature adjustment dimension and the second adjustment dimension is the airflow speed adjustment dimension, an adjusted temperature is 25°C, and the airflow speed corresponding to 25°C should be level 1. When a current airflow speed of the air conditioning device is at level 2, the air conditioning device can reduce the airflow speed by one level.

[0145] In some embodiments of the present disclosure, the air conditioning device may determine an amount to be adjusted 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 amount to be adjusted 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 amount to be adjusted 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 second 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 return to the minimum value of the second adjustment dimension and cyclically adjust the second adjustment dimension until the adjustment amount reaches the adjustment amount of the second adjustment dimension determined based on the second mapping relationship.

[0146] A method for controlling the second adjustment dimension by the air conditioning device when the target adjustment dimension combination includes a plurality of first adjustment dimensions will be described below.

[0147] In a first implementation, the air conditioning device determines an adjustment amount of each of the plurality of first adjustment dimensions; determines a third mapping relationship between the adjustment amount of each of the plurality of first adjustment dimensions and the adjustment amount of the second adjustment dimension; determines a plurality of adjustment amounts of the second adjustment dimension based on respective adjustment amounts of the plurality of first adjustment dimensions and the third mapping relationship; determines a target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension; and adjusts the second adjustment dimension based on the target adjustment amount of the second adjustment dimension.

[0148] It should be understood that when the priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the air conditioning device controls the second adjustment dimension to change while controlling the plurality of first adjustment dimensions, for a first adjustment dimension that has a priority lower than the priority of the second adjustment dimension among the plurality of first adjustment dimensions, the third mapping relationship between the adjustment amount of the first adjustment dimension and the adjustment amount of the second adjustment dimension may be a mapping relationship between the adjustment amount of the first adjustment dimension and 0. That is, in this case, the adjustment amount of the second adjustment dimension is 0.

[0149] For example, assuming that the user simultaneously controls the temperature and airflow speed adjustment dimensions, 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 airflow speed adjustment dimension, in this case the adjustment amount of the humidity adjustment dimension needs to be determined based on only the adjustment amount of the temperature adjustment dimension.

[0150] It should be understood that, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the air conditioning device controls the second adjustment dimension to change while controlling the plurality of first adjustment dimensions, for a first adjustment dimension that has no linkage relationship with the second adjustment dimension among the plurality of first adjustment dimensions, the third mapping relationship between the adjustment amount of the first adjustment dimension and the adjustment amount of the second adjustment dimension may be a mapping relationship between the adjustment amount of the first adjustment dimension and 0. That is, in this case, the adjustment amount of the second adjustment dimension is 0.

[0151] For example, assuming that the user simultaneously controls the temperature and airflow speed adjustment dimensions, the temperature adjustment dimension has no linkage relationship with the purification adjustment dimension, and the airflow speed adjustment dimension has a positive linkage relationship with the purification adjustment dimension, in this case the adjustment amount of the purification adjustment dimension needs to be determined based on

only the adjustment amount of the airflow speed adjustment dimension.

[0152] In some embodiments of the present disclosure, the air conditioning device may calculate an average value of the plurality of adjustment amounts of the second adjustment dimension. When the average value conforms to the adjustment granularity of the second adjustment dimension, the average value may be used as the target adjustment amount corresponding to the second adjustment dimension, and when the average value does not conform to the adjustment granularity of the second adjustment dimension, the average value may be rounded up or down, and an obtained rounding result may be used as the target adjustment amount corresponding to the second adjustment dimension.

[0153] For example, it is assumed that the user controls the temperature and airflow speed adjustment dimensions simultaneously. When the user adjusts the temperature adjustment dimension from 25°C to 22°C, the air conditioning device determines that the adjustment amount of the temperature adjustment dimension is -3°C. When the user adjusts the airflow speed adjustment dimension from level 2 to level 3, the air conditioning device determines that the adjustment amount of the airflow speed adjustment dimension is 1 level. Assuming that the adjustment amount of -3°C of the temperature adjustment dimension corresponds to the adjustment amount of -2 levels of the humidity adjustment dimension, and that the adjustment amount of 1 level of the airflow speed adjustment dimension corresponding to the adjustment amount of 1 level of the humidity adjustment dimension, the average value of the adjustment amount of the humidity adjustment dimension is -0.5 level, which however, does not exist, so -0.5 level can be rounded down, to obtain the adjustment amount of the humidity adjustment dimension of -1 level. Assuming that a current level of the humidity adjustment dimension is level 2, based on this, the air conditioning device can adjust the humidity adjustment dimension to level 1.

[0154] In some embodiments of the present disclosure, subsequent to the air conditioning device determining the final adjustment amount of the second adjustment dimension based on the adjustment amounts of the plurality of first adjustment dimensions and the third mapping relationship, the air conditioning device may determine whether the final adjustment amount is smaller than or equal to the maximum adjustable amount of the second adjustment dimension. The air conditioning device adjusts, when the final adjustment amount is smaller than or equal to the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension based on the final adjustment amount; adjusts, when the final adjustment amount 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 adjusts, when the final adjustment amount 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 return to the minimum value of the second adjustment dimension to cyclically adjust the second adjustment dimension until the adjustment amount reaches the final adjustment amount.

[0155] For example, assuming that the air conditioning device determines that the final adjustment amount of the humidity adjustment dimension is 1 level, and that the current level of the humidity adjustment dimension is the highest level 5, that is, the maximum adjustable amount of the humidity adjustment dimension is 0, the air conditioning device may not adjust the humidity adjustment dimension, or, the air conditioning device may adjust the humidity adjustment dimension to level 1.

[0156] In a second implementation, the air conditioning device may determine a target value of each of the plurality of first adjustment dimensions; determine a fourth mapping relationship between the target value of each of the plurality of first adjustment dimensions and an adjusted value corresponding to the second adjustment dimension; determine a plurality of adjusted values corresponding to the second adjustment dimension based on respective target values of the plurality of first adjustment dimensions and the fourth mapping relationship; determine a target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second adjustment dimension; and adjust the second adjustment dimension based on the target adjusted value corresponding to the second adjustment dimension.

[0157] In some embodiments of the present disclosure, when the control instruction for the first adjustment dimension is the enabling instruction, the target value may be the current enabled value of the first adjustment dimension, and when the control instruction for the first adjustment dimension is the adjustment instruction, the target value may be the adjusted value of the first adjustment dimension.

[0158] It should be understood that, when the priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the air conditioning device controls the second adjustment dimension to change while controlling the plurality of first adjustment dimensions, for the first adjustment dimension that has a priority lower than the priority of the second adjustment dimension among the plurality of first adjustment dimensions, the fourth mapping relationship between the target value of the first adjustment dimension and the adjusted value corresponding to the second adjustment dimension may be a mapping relationship between the target value of the first adjustment dimension and a null value. That is, in this case, the air conditioning device does not adjust the second adjustment dimension based on the first adjustment dimension that has a priority lower than the priority of the second adjustment dimension.

[0159] For example, assuming that the user simultaneously controls the temperature and airflow speed adjustment

dimensions, the priority of the temperature adjustment dimension is higher than the priority of the humidity adjustment dimension, and the priority of the humidity adjustment dimension is higher than the priority of the airflow speed adjustment dimension, in this case the adjusted value of the humidity adjustment dimension needs to be determined based on only the target value of the temperature adjustment dimension.

[0160] It should be understood that, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, and the air conditioning device controls the second adjustment dimension to change while controlling the plurality of first adjustment dimensions, for the first adjustment dimension that has no linkage relationship with the second adjustment dimension among the plurality of first adjustment dimensions, the fourth mapping relationship between the target value of the first adjustment dimension and the adjusted value corresponding to the second adjustment dimension may be a mapping relationship between the target value of the first adjustment dimension and a null value. That is, in this case, the air conditioning device does not adjust the second adjustment dimension based on the first adjustment dimension that has no linkage relationship with the second adjustment dimension.

[0161] For example, assuming that the user simultaneously controls the temperature and airflow speed adjustment dimensions, the temperature adjustment dimension has no linkage relationship with the purification adjustment dimension, and the airflow speed adjustment dimension has a positive linkage relationship with the purification adjustment dimension, in this case, the adjusted value of the humidity adjustment dimension needs to be determined based on only the target value of the airflow speed adjustment dimension.

[0162] In some embodiments of the present disclosure, the air conditioning device may calculate an average value of the plurality of adjusted values corresponding to the second adjustment dimension. When the average value conforms to the adjustment granularity of the second adjustment dimension, the average value may be used as the target adjusted value corresponding to the second adjustment dimension. When the average value does not conform to the adjustment granularity of the second adjustment dimension, the average value may be rounded up or rounded down, and an obtained rounding result may be used as the target adjusted value corresponding to the second adjustment dimension.

[0163] For example, it is assumed that the user controls the temperature and airflow speed adjustment dimensions simultaneously. When the user adjusts the temperature adjustment dimension from 25°C to 22°C, the air conditioning device determines that the target value of the temperature adjustment dimension is 22°C. When the user adjusts the airflow speed adjustment dimension from level 2 to level 3, the air conditioning device determines that the target value of the airflow speed adjustment dimension is level 3. Assuming that the target value of 22°C of the temperature adjustment dimension corresponds to the adjusted value of level 2 of the humidity adjustment dimension, and that the target value of level 3 of the airflow speed adjustment dimension corresponds to the adjusted value of level 1 of the humidity adjustment dimension, the average value of the adjusted value of the humidity adjustment dimension is level 1.5, which however, does not exist, so level 1.5 can be rounded up, to obtain the adjusted value of level 2 of the humidity adjustment dimension. Assuming that a current level of the humidity adjustment dimension is level 1, based on this, the air conditioning device can adjust the humidity adjustment dimension to level 2.

[0164] In some embodiments of the present disclosure, subsequent to the air conditioning device determining a target adjustment value of the second adjustment dimension based on target values of the plurality of first adjustment dimensions and the fourth mapping relationship, the air conditioning device may determine the amount to be adjusted of the second adjustment dimension based on the current value of the second adjustment dimension and the target adjustment value. Further, the air conditioning device may determine whether the amount to be adjusted is smaller than or equal to the maximum adjustable amount of the second adjustment dimension. The air conditioning device adjusts, when the amount to be adjusted is smaller than or equal to the maximum adjustable amount of the second adjustment dimension, the second adjustment dimension based on the amount to be adjusted; adjusts, when the amount to be adjusted 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 adjusts, when the final adjustment amount 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 return to the minimum value of the second adjustment dimension to adjust the second adjustment dimension cyclically until the adjustment amount reaches the amount to be adjusted.

[0165] For example, assuming that the air conditioning device determines that the target adjustment value of the humidity adjustment dimension is level 6, and that the current level of the humidity adjustment dimension is level 4, the amount to be adjusted of the humidity adjustment dimension is calculated to be 2 levels. The highest level of the humidity adjustment dimension is level 5, which means the maximum adjustable amount of the humidity adjustment dimension is 1 level. In this case, the air conditioning device can adjust the humidity adjustment dimension to the highest level, or adjust the humidity adjustment dimension to level 1.

[0166] It should be understood that, in the embodiment corresponding to FIG. 12, the control method according to this embodiment is applicable to each second adjustment dimension, that is to say, there may be several cases as follows.

[0167] In a first case, the air conditioning device may control all of the second adjustment dimensions to change while

controlling the target adjustment dimension combination in response to the control instruction for the target adjustment dimension combination in the linkage mode.

[0168] For example, for the five adjustment dimensions of temperature, airflow speed, humidity, purification, and fresh air, assuming that the user adjusts the temperature adjustment dimension from 20°C to 23°C, the air conditioning device can accordingly control the airflow 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.

[0169] In a second case, the air conditioning device may control a second adjustment dimension having a lower control priority than any first adjustment dimension to change while controlling the target adjustment dimension combination in response to a control instruction for the target adjustment dimension combination in the linkage mode.

[0170] For example, for the five adjustment dimensions of temperature, airflow speed, humidity, purification, and fresh air, it is assumed that the user adjusts the airflow speed adjustment dimension, and three adjustment dimensions of humidity, purification, and fresh air each a lower priority than the airflow speed adjustment dimension. In this case, the air conditioning device can adjust the three adjustment dimensions of humidity, purification, and fresh air.

[0171] In a third case, the air conditioning device may control the second adjustment dimension having a linkage relationship with the first adjustment dimension to change while controlling the target adjustment dimension combination in response to the control instruction for the target adjustment dimension combination in the linkage mode.

[0172] For example, for the five adjustment dimensions of temperature, airflow speed, humidity, purification, and fresh air, it is assumed that the user adjusts the temperature adjustment dimension, three adjustment dimensions of airflow speed, humidity, and fresh air have a linkage relationship with the temperature adjustment dimension, and the purification adjustment dimension does not have a linkage relationship with the temperature adjustment dimension. In this case, the air conditioning device can adjust the three adjustment dimensions of airflow speed, humidity, and fresh air to change.

[0173] It should be noted that, in the above embodiments, the control instruction may be the enabling instruction or the adjustment instruction. The embodiments of the present disclosure further provide the following scheme.

[0174] In some embodiments of the present disclosure, the air conditioning device may, in the linkage mode, control the second adjustment dimension to remain unchanged in response to a disabled instruction for the first adjustment dimension.

[0175] For example, assuming that the plurality of adjustment dimensions are the five adjustment dimensions of temperature, airflow speed, humidity, purification, and fresh air, and the five adjustment dimensions are enabled. When the user disables the temperature adjustment dimension, the air conditioning device can maintain four adjustment dimensions of airflow speed, humidity, purification, and fresh air unchanged.

[0176] In the embodiments of the present disclosure, subsequent to the air conditioning device entering the linkage mode, the air conditioning device may perform linkage control on the second adjustment dimension, to cause the second adjustment dimension to change in response to the control instruction for the target adjustment dimension combination; or control, when the priority of the second adjustment dimension is lower than the priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination; or control, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination. Therefore, the user has no need to control other adjustment dimensions separately, and this control method can improve the control efficiency, thus improving the user experience.

[0177] FIG. 13 is a flowchart of another method for controlling the air conditioning device according to an embodiment of the present disclosure. As shown in FIG. 13, based on FIG. 4, the method may further include operations at blocks S430 and S440 subsequent to S420.

[0178] At block S430, a mode switching instruction is acquired.

[0179] At block S440, the air conditioning device is switched from the linkage mode to the normal mode in response to the mode switching instruction.

[0180] In some embodiments of the present disclosure, 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 instruction of the normal mode, or the mode switching instruction may be generated based on a click or touch operation on a mode switching icon or button, which may be arranged on the remote controller, the APP, or the touch panel.

[0181] 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 of airflow speed, fresh air, and purification will not be controlled accordingly.

[0182] In some embodiments of the present disclosure, subsequent to the air conditioning device being switched to the normal mode, the air conditioning device may be switched to the linkage mode again, and after entering the linkage mode, the air conditioning device may control the plurality of adjustment dimensions according to the control method of the present disclosure.

[0183] In the embodiments of the present disclosure, the air conditioning device can flexibly switch between the linkage mode and the normal mode, thereby improving the user experience.

[0184] The control method of the present disclosure can be exemplarily illustrated by several examples as follows.

[0185] 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 of temperature and airflow speed by default. The air conditioning device can notify the user that the two adjustment dimensions of temperature and airflow speed are in the enabled state, and notify the user that three adjustment dimensions of humidity, purification, and fresh air are in the disabled state. Further, the air conditioning device can also display the current progress of the two adjustment dimensions of temperature and airflow speed. When the user adjusts the temperature, the air conditioning device can adjust the airflow speed based on a temperature change and can display a change progress of the adjustment dimensions of temperature and airflow speed. In addition, the air conditioning device 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 airflow speed adjustment dimension, the air conditioning device can adjust the airflow speed adjustment dimension and display a change progress of the airflow speed adjustment dimension. Further, when the user disables the humidity adjustment dimension, the air conditioning device can control the temperature and airflow speed adjustment dimensions to remain unchanged.

[0186] 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 of temperature, airflow speed, humidity, and fresh air are controlled 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 of airflow speed, humidity, and fresh air based on the temperature change, and can display a change progress of these four adjustment dimensions. The air conditioning device 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 priorities of all other adjustment dimensions, the air conditioning device controls the other adjustment dimensions to remain unchanged. Further, when the user disabled the temperature adjustment dimension, the air conditioning device can control the airflow speed, humidity, fresh air and purification adjustment dimensions to remain unchanged.

[0187] In a third example, the user turns on the air conditioning device, and the air conditioning device is in the normal mode. Assuming that the user enables three adjustment dimensions of temperature, fresh air, and airflow speed in the normal mode, and then activates the linkage mode, the air conditioning device determines that the temperature, fresh air, and airflow speed adjustment dimensions enabled in the normal mode are taken as the enabled adjustment mode. The air conditioning device may notify the user that the three adjustment dimensions are in the enabled state and the adjustment dimensions of purification and humidity are in the disabled state, and may also display the current progress of the three adjustment dimensions. When the user adjusts the temperature, the air conditioning device can adjust the three adjustment dimensions of airflow speed and fresh air based on the temperature change, and can display the change progress of the three adjustment dimensions of temperature, airflow speed, and fresh air. The air conditioning device 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 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 airflow speed, humidity, fresh air, and purification to remain unchanged.

[0188] In a fourth example, when the user turns on the air conditioning device, the user selects five adjustment dimensions of temperature, airflow speed, humidity, purification, and fresh air, and then the user clicks the linkage icon or button to allow the air conditioning device to enter 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 the other four adjustment dimensions based on the temperature change and can display the change progress of the five adjustment dimensions. The air conditioning device 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 airflow speed, humidity, fresh air, and purification adjustment dimensions to remain unchanged.

[0189] In a fifth example, when the user turns on the air conditioning device, the air conditioning device automatically activates the linkage mode and enables three adjustment dimensions of temperature, airflow speed, and humidity by default. The air conditioning device may notify the user that the three adjustment dimensions of temperature, airflow speed, and humidity are in the enabled state and that adjustment dimensions of purification and fresh air are in the disabled state, and may also display the current progress of the three adjustment dimensions of temperature, airflow speed, and humidity. When the user adjusts the adjustment dimensions of temperature and airflow speed, the air conditioning device

may adjust the humidity adjustment dimension based on changes in temperature and airflow speed, and may display change progresses of the temperature, airflow speed, and humidity adjustment dimensions, and may also notify that the temperature and airflow speed adjustment dimensions are primary adjustment dimensions. Further, when the user enables the purification adjustment dimension, assuming that the purification adjustment dimension has no linkage relationship with the temperature adjustment dimension, but has a linkage relationship with the airflow speed adjustment dimension, in this case, the air conditioning device can control the humidity adjustment dimension to change based on the change in the airflow speed adjustment dimension, and can also display the change progress of the humidity adjustment dimension. Furthermore, when the user disables the purification adjustment dimension, the air conditioning device may control the temperature, airflow speed, and humidity adjustment dimensions to remain unchanged.

[0190] FIG. 14 is a schematic diagram of an apparatus 1400 for controlling an air conditioning device according to an embodiment of the present disclosure. The apparatus 1400 for controlling the air conditioning device may include an activation module 1410 and a control module 1420. The activation module 1410 is configured to activate a linkage mode of the air conditioning device. The control module 1420 is configured to control, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination.

[0191] In some embodiments of the present disclosure, the control module 1420 is further configured to for a second adjustment dimension among the enabled adjustment dimension: control the second adjustment dimension to change while controlling the target adjustment dimension combination; or control, when a priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination; or control, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination.

[0192] In some embodiments of the present disclosure, the control module 1420 is further configured to, when the target adjustment dimension combination includes one first adjustment dimension, determine an adjustment amount of the first adjustment dimension; determine a first mapping relationship between the adjustment amount of the first adjustment dimension and an adjustment amount of the second adjustment dimension; determine the adjustment amount of the second adjustment dimension based on the adjustment amount of the first adjustment dimension and the first mapping relationship; and adjust the second adjustment dimension based on the adjustment amount of the second adjustment dimension.

[0193] In some embodiments of the present disclosure, the control module 1420 is further configured to, when the target adjustment dimension combination includes one first adjustment dimension, determine a target value of the first adjustment dimension; determine a second mapping relationship between the target value of the first adjustment dimension and an adjusted value corresponding to the second adjustment dimension; determine the adjusted value corresponding to the second adjustment dimension based on the target value of the first adjustment dimension and the second mapping relationship; and adjust the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension.

[0194] In some embodiments of the present disclosure, the control module 1420 is further configured to, when the target adjustment dimension combination includes a plurality of first adjustment dimensions, determine an adjustment amount of each of the plurality of first adjustment dimensions; determine a third mapping relationship between the adjustment amount of each of the plurality of first adjustment dimensions and an adjustment amount of the second adjustment dimension; determine a plurality of adjustment amounts of the second adjustment dimension based on respective adjustment amounts of the plurality of first adjustment dimensions and the third mapping relationship; determine a target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension; and adjust the second adjustment dimension based on the target adjustment amount of the second adjustment dimension.

[0195] In some embodiments of the present disclosure, the control module 1420 is further configured to: calculate an average value of the plurality of adjustment amounts of the second adjustment dimension; and determine the target adjustment amount of the second adjustment dimension based on the average value of the plurality of adjustment amounts of the second adjustment dimension.

[0196] In some embodiments of the present disclosure, the control module 1420 is further configured to, when the target adjustment dimension combination includes a plurality of first adjustment dimensions, determine a target value of each of the plurality of first adjustment dimensions; determine a fourth mapping relationship between the target value of each of the plurality of first adjustment dimensions and an adjusted value corresponding to the second adjustment dimension; determine a plurality of adjusted values corresponding to the second adjustment dimension based on respective target values of the plurality of first adjustment dimensions and the fourth mapping relationship; determine a target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second

adjustment dimension; and adjust the second adjustment dimension based on the target adjusted value corresponding to the second adjustment dimension.

[0197] In some embodiments of the present disclosure, the control module 1420 is further configured to: calculate an average value of the plurality of adjusted values corresponding to the second adjustment dimension; and determine the target adjusted value corresponding to the second adjustment dimension based on the average value of the plurality of adjusted values corresponding to the second adjustment dimension.

[0198] In some embodiments of the present disclosure, the plurality of adjustment dimensions comprises temperature, airflow speed, humidity, purification, and fresh air. Under a cooling condition, the temperature has a negative linkage relationship with the airflow speed. Under a heating condition, the temperature has a positive linkage relationship with the airflow speed. The temperature has a positive linkage relationship with the humidity. The temperature has no linkage relationship with the purification. The temperature has a negative linkage relationship with the fresh air. The airflow speed has a negative linkage relationship with the humidity. The airflow speed has a positive linkage relationship with the purification. The airflow speed has a negative linkage relationship with the fresh air. The humidity has no linkage relationship with the purification. The humidity has a negative linkage relationship with the fresh air. The purification has a negative linkage relationship with the fresh air.

[0199] In some embodiments of the present disclosure, the activation module 1410 is further configured to activate, in response to a power-on instruction or a linkage instruction, the linkage mode of the air conditioning device.

[0200] In some embodiments of the present disclosure, 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.

[0201] In some embodiments of the present disclosure, the at least one adjustment dimension is any one of: an adjustment dimension to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; and an adjustment dimension determined to be enabled based on the current environment.

[0202] In some embodiments of the present disclosure, when the air conditioning device switches from a normal mode to the linkage mode in response to the linkage instruction, the at least one dimensional adjustment dimension is any one of: an adjustment dimension to be enabled by default; an adjustment dimension that was historically enabled in the linkage mode; an adjustment dimension that is enabled in the normal mode; and an adjustment dimension determined to be enabled based on a current environment.

[0203] In some embodiments of the present disclosure, the activation module 1410 is further configured to activate, 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.

[0204] In some embodiments of the present disclosure, 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.

[0205] 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. In an embodiment, the apparatus 1400 illustrated in FIG. 14 may perform the method embodiments, and the above and other operations and/or functions of the 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.

[0206] The apparatus 1400 according to the embodiments of the present disclosure 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. In some embodiments, steps of the method embodiments in the embodiments of the present disclosure 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 disclosure 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. In an embodiment, 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, a Programmable ROM, an electrically erasable programmable memory, and a register. The storage medium is located in a memory. The processor reads information from the memory, and completes the steps in the above method embodiments in combination with hardware thereof.

[0207] FIG. 15 is a schematic block diagram of an electronic device 1500 according to an embodiment of the present disclosure.

[0208] As shown in FIG. 15, 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 disclosure.

[0209] For example, the processor 1520 may be configured to perform the method embodiments described above based on instructions in the computer program.

[0210] In some embodiments of the present disclosure, 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.

[0211] In some the embodiments of the present disclosure, 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).

[0212] In some embodiments of the present disclosure, 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 complete the method according to the present disclosure. 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.

[0213] As illustrated in FIG. 15, the electronic device may further include a transceiver 1530 connectable to the processor 1520 or the memory 1510.

[0214] Here, the processor 1520 may control the transceiver 1530 to communicate with other devices, 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.

[0215] 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.

[0216] The present disclosure 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 disclosure 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.

[0217] 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 disclosure 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.

[0218] 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 disclosure.

[0219] In several embodiments according to the present disclosure, 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.

[0220] 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 disclosure. For example, respective functional modules in respective embodiments of the present disclosure 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.

[0221] The above description merely illustrates specific implementations of the present disclosure, and the scope of the present disclosure is not limited thereto. Change or replacement within the technical scope disclosed by the present disclosure that can be easily conceived by those skilled in the art shall fall within the scope of the present disclosure. Thus, the scope of the present disclosure 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
controlling, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination.

2. The method according to claim 1, wherein said controlling the enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination comprises: for a second adjustment dimension among the enabled adjustment dimension,

controlling the second adjustment dimension to change while controlling the target adjustment dimension combination; or
controlling, when a priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination; or
controlling, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination.

3. The method according to claim 2, wherein when the target adjustment dimension combination comprises one first adjustment dimension, said controlling the second adjustment dimension to change while controlling the target adjustment dimension combination comprises:

determining an adjustment amount of the first adjustment dimension;
determining a first mapping relationship between the adjustment amount of the first adjustment dimension and an adjustment amount of the second adjustment dimension;
determining the adjustment amount of the second adjustment dimension based on the adjustment amount of the first adjustment dimension and the first mapping relationship; and
adjusting the second adjustment dimension based on the adjustment amount of the second adjustment dimension.

4. The method according to claim 2, wherein when the target adjustment dimension combination comprises one first adjustment dimension, said controlling the second adjustment dimension to change while controlling the target adjustment dimension combination comprises:

determining a target value of the first adjustment dimension;
determining a second mapping relationship between the target value of the first adjustment dimension and an adjusted value corresponding to the second adjustment dimension;
determining the adjusted value corresponding to the second adjustment dimension based on the target value of the first adjustment dimension and the second mapping relationship; and
adjusting the second adjustment dimension based on the adjusted value corresponding to the second adjustment dimension.

5. The method according to claim 2, wherein when the target adjustment dimension combination comprises a plurality of first adjustment dimensions, said controlling the second adjustment dimension to change while controlling the target adjustment dimension combination comprises:

determining an adjustment amount of each of the plurality of first adjustment dimensions;
determining a third mapping relationship between the adjustment amount of each of the plurality of first adjustment dimensions and an adjustment amount of the second adjustment dimension;
determining a plurality of adjustment amounts of the second adjustment dimension based on respective adjustment amounts of the plurality of first adjustment dimensions and the third mapping relationship;
determining a target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension; and
adjusting the second adjustment dimension based on the target adjustment amount of the second adjustment dimension.

6. The method according to claim 5, wherein said determining the target adjustment amount of the second adjustment dimension based on the plurality of adjustment amounts of the second adjustment dimension comprises:

calculating an average value of the plurality of adjustment amounts of the second adjustment dimension; and
determining the target adjustment amount of the second adjustment dimension based on the average value of the plurality of adjustment amounts of the second adjustment dimension.

7. The method according to claim 2, wherein when the target adjustment dimension combination comprises a plurality of first adjustment dimensions, said controlling the second adjustment dimension to change while controlling the target adjustment dimension combination comprises:

determining a target value of each of the plurality of first adjustment dimensions;
determining a fourth mapping relationship between the target value of each of the plurality of first adjustment dimensions and an adjusted value corresponding to the second adjustment dimension;
determining a plurality of adjusted values corresponding to the second adjustment dimension based on respective target values of the plurality of first adjustment dimensions and the fourth mapping relationship;
determining a target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second adjustment dimension; and
adjusting the second adjustment dimension based on the target adjusted value corresponding to the second adjustment dimension.

8. The method according to claim 7, wherein said determining the target adjusted value corresponding to the second adjustment dimension based on the plurality of adjusted values corresponding to the second adjustment dimension comprises:

calculating an average value of the plurality of adjusted values corresponding to the second adjustment dimension; and
determining the target adjusted value corresponding to the second adjustment dimension based on the average value of the plurality of adjusted values corresponding to the second adjustment dimension.

9. The method according to any one of claims 2 to 8, wherein the plurality of adjustment dimensions comprises temperature, airflow speed, humidity, purification, and fresh air; and wherein:

under a cooling condition, the temperature has a negative linkage relationship with the airflow speed;
under a heating condition, the temperature has a positive linkage relationship with the airflow speed;
the temperature has a positive linkage relationship with the humidity;
the temperature has no linkage relationship with the purification;
the temperature has a negative linkage relationship with the fresh air;
the airflow speed has a negative linkage relationship with the humidity;
the airflow speed has a positive linkage relationship with the purification;
the airflow speed has a negative linkage relationship with the fresh air;
the humidity has no linkage relationship with the purification;
the humidity has a negative linkage relationship with the fresh air; and
the purification has a negative linkage relationship with the fresh air.

10. The method according to any one of claims 1 to 8, 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.

11. The method according to claim 10, 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.

12. The method according to claim 11, wherein the at least one adjustment dimension is any one of:

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

13. The method according to claim 11, 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 is any one of:

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

14. The method according to any one of claims 1 to 8, wherein 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 dimensions, the linkage mode of the air conditioning device.

15. The method according to claim 14, 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.

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

an activation module configured to activate a linkage mode of the air conditioning device; and
a control module configured to control, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination.

17. 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 16.

18. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program which causes a computer to perform the method according to any one of claims 1 to 16.

19. A computer program product, comprising a computer program or computer instructions, wherein a processor, when executing the computer program or the computer instructions, performs the method according to any one of claims 1 to 16.

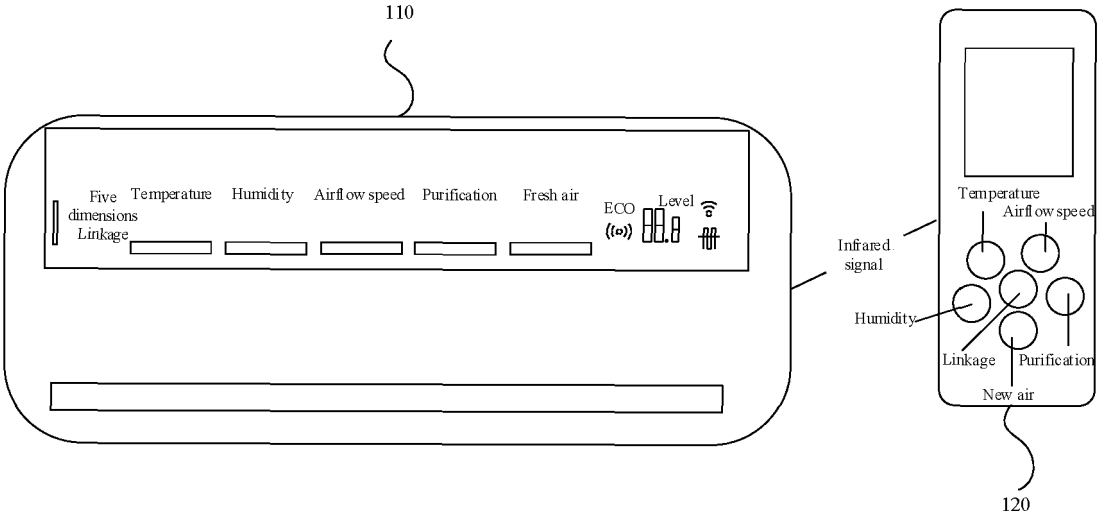

110
Five dimensions Linkage
Temperature
Humidity
Airflow speed
Purification
Fresh air
ECO
Level
Infrared signal
Temperature
Airflow speed
Humidity
Linkage
Purification
New air
120

FIG. 1

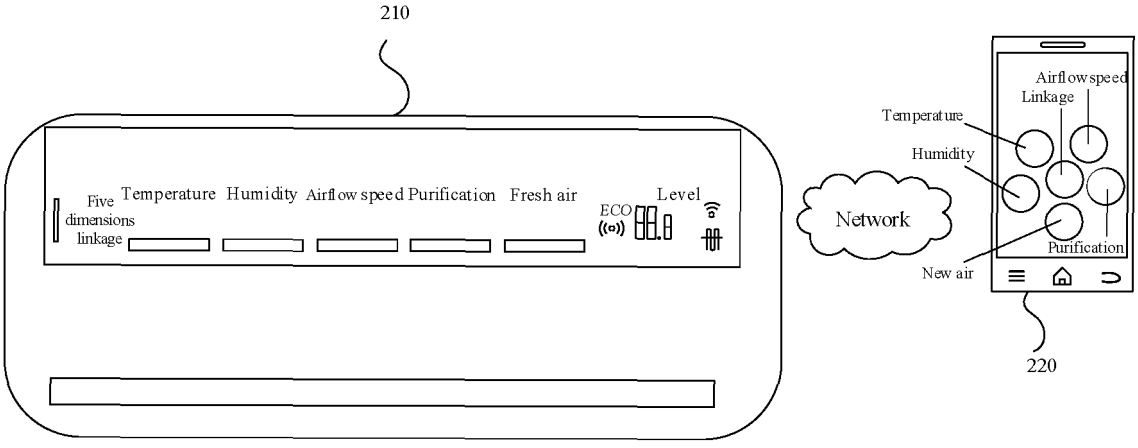
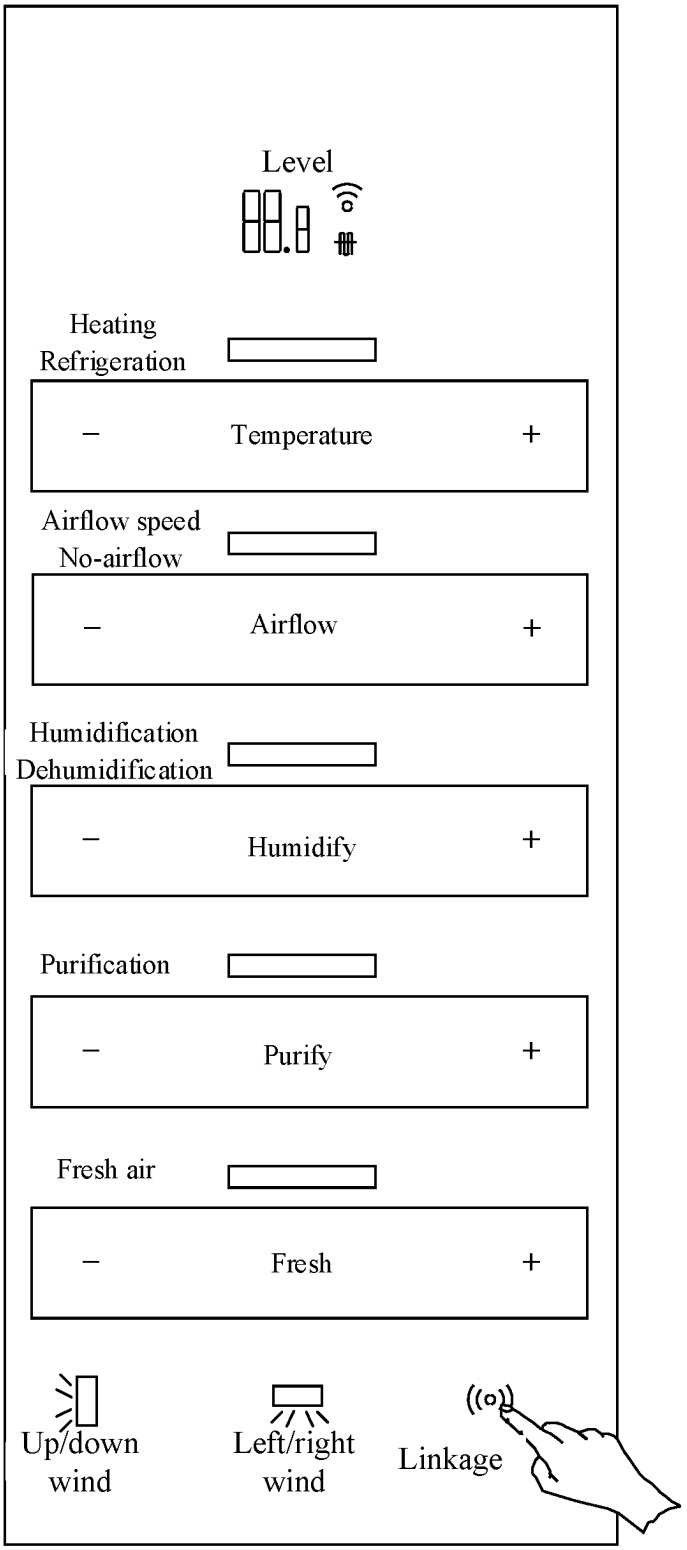

210
Five dimensions linkage
Temperature
Humidity
Airflow speed
Purification
Fresh air
ECO
Level
Network
Airflow speed
Linkage
Temperature
Humidity
Purification
New air
220

FIG. 2


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

FIG. 3

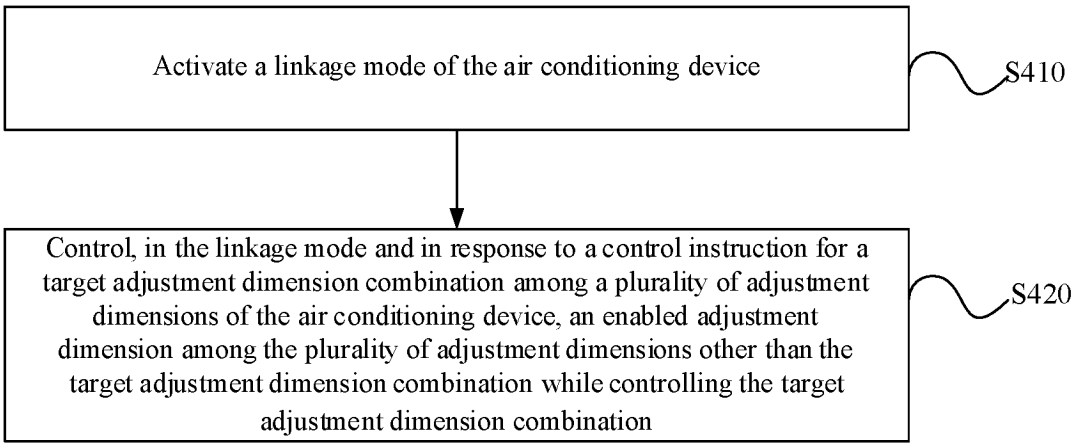

FIG. 4

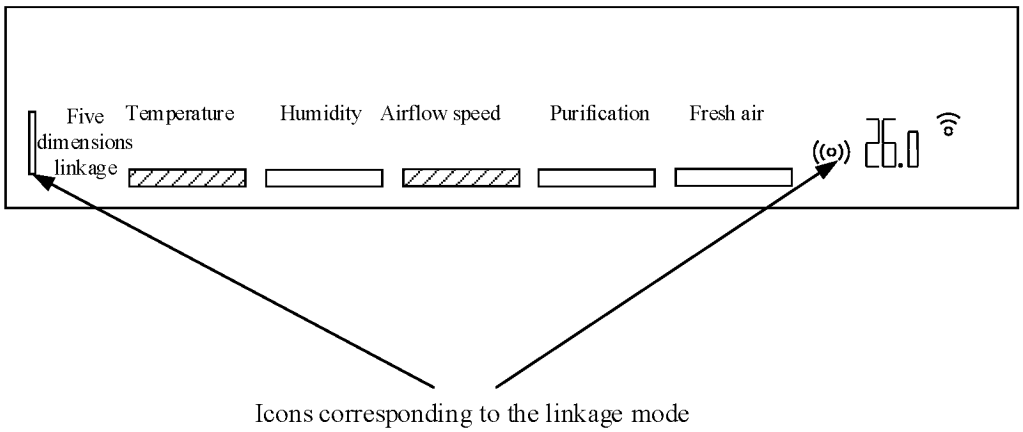

FIG. 5

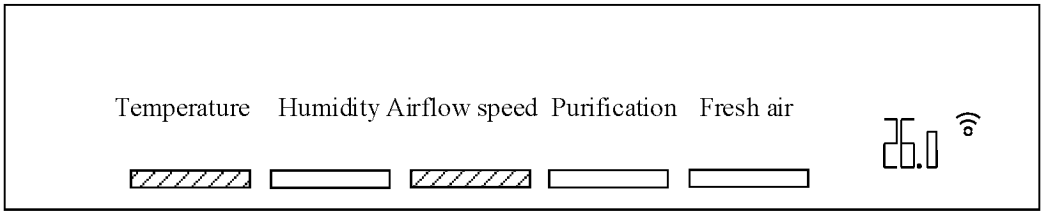

FIG. 6

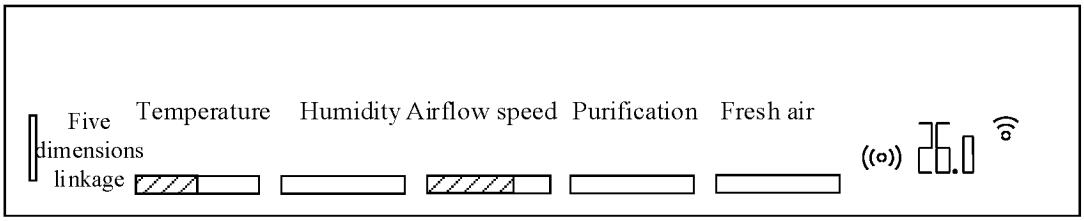

FIG. 7

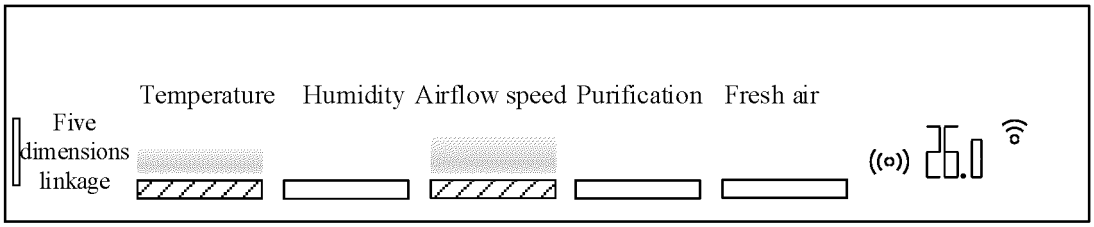

FIG. 8

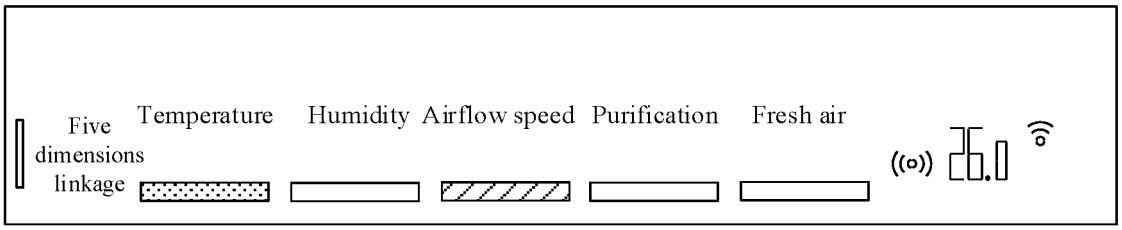

FIG. 9

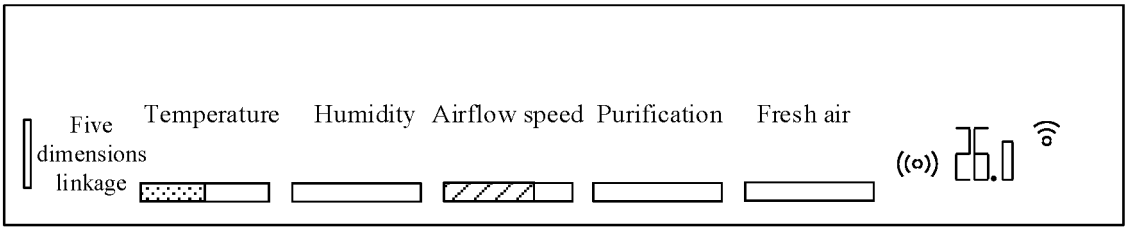

FIG. 10

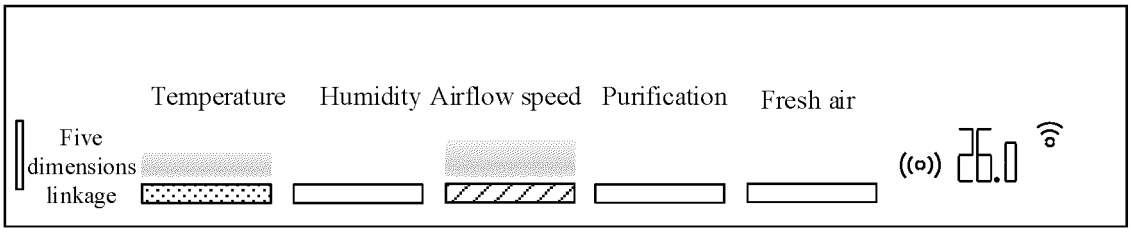

FIG. 11

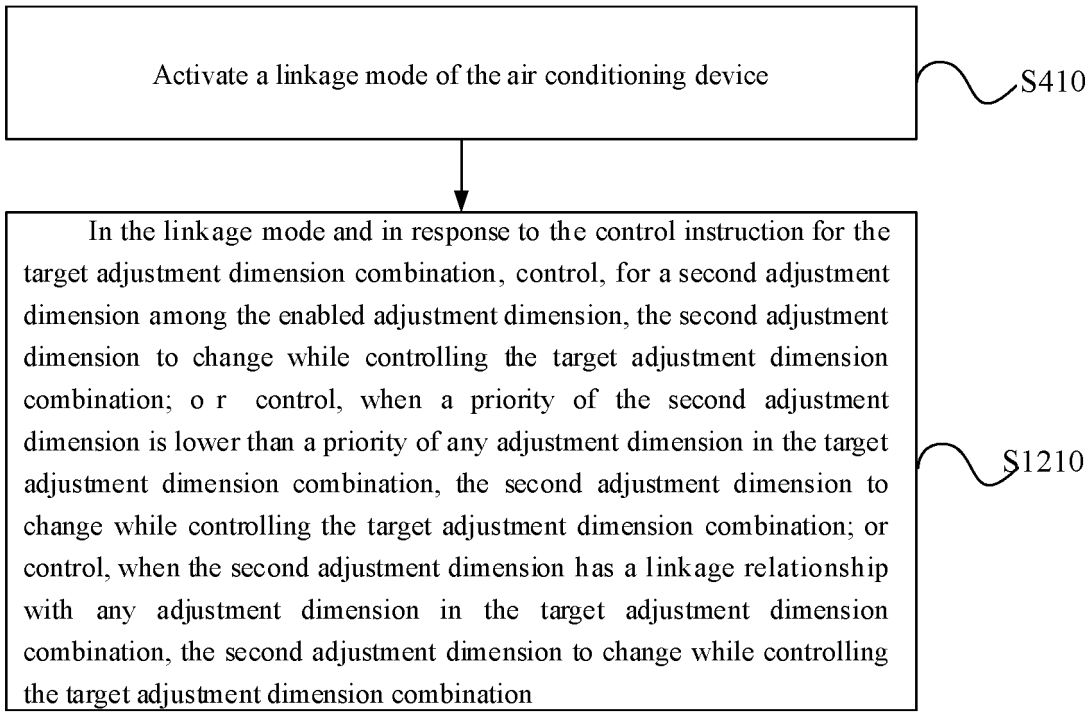
Activate a linkage mode of the air conditioning device
S410
In the linkage mode and in response to the control instruction for the target adjustment dimension combination, control, for a second adjustment dimension among the enabled adjustment dimension, the second adjustment dimension to change while controlling the target adjustment dimension combination; o r control, when a priority of the second adjustment dimension is lower than a priority of any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination; or control, when the second adjustment dimension has a linkage relationship with any adjustment dimension in the target adjustment dimension combination, the second adjustment dimension to change while controlling the target adjustment dimension combination
S1210

FIG. 12

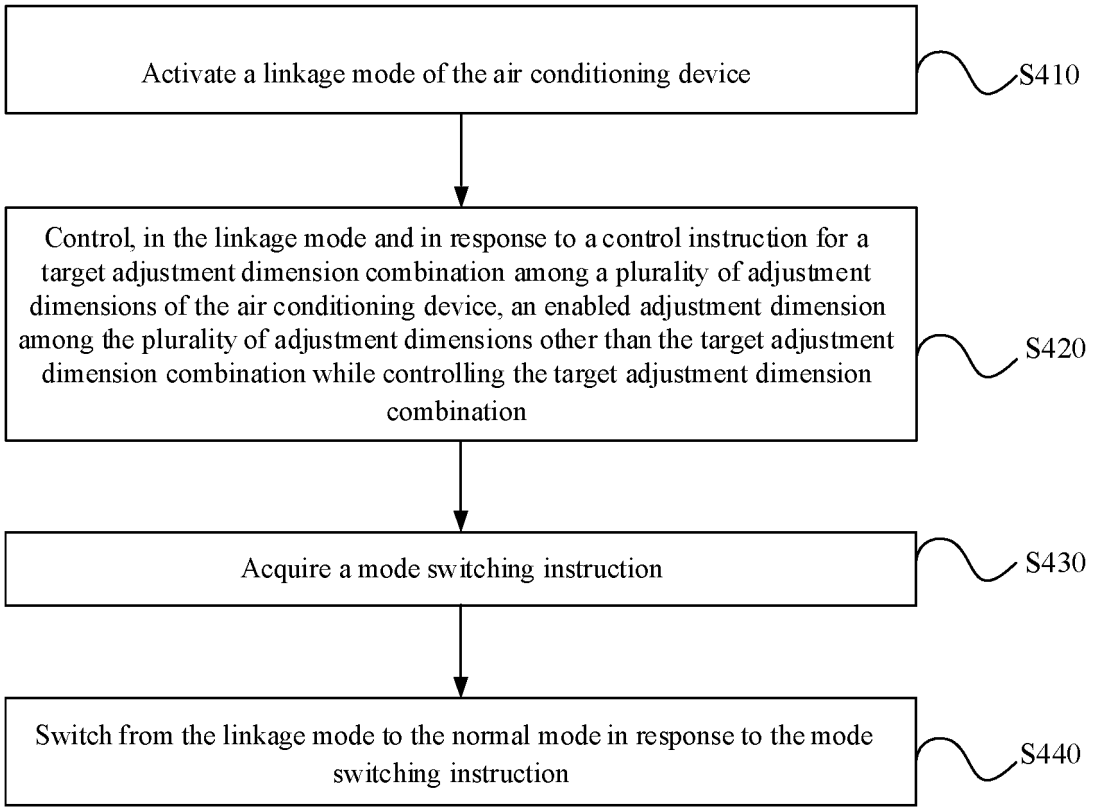
Activate a linkage mode of the air conditioning device
S410
Control, in the linkage mode and in response to a control instruction for a target adjustment dimension combination among a plurality of adjustment dimensions of the air conditioning device, an enabled adjustment dimension among the plurality of adjustment dimensions other than the target adjustment dimension combination while controlling the target adjustment dimension combination
S420
Acquire a mode switching instruction
S430
Switch from the linkage mode to the normal mode in response to the mode switching instruction
S440

FIG. 13

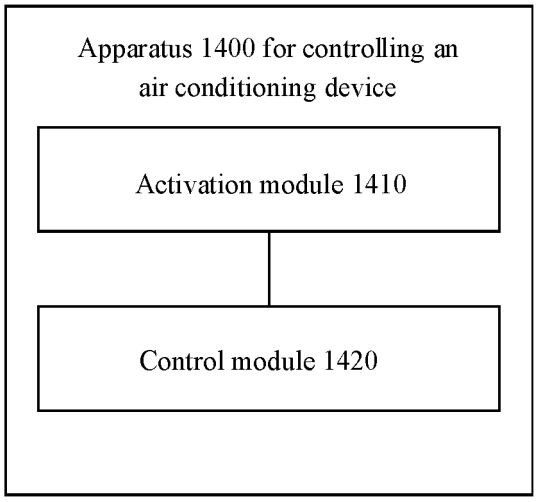
Apparatus 1400 for controlling an air conditioning device
Activation module 1410
Control module 1420

FIG. 14

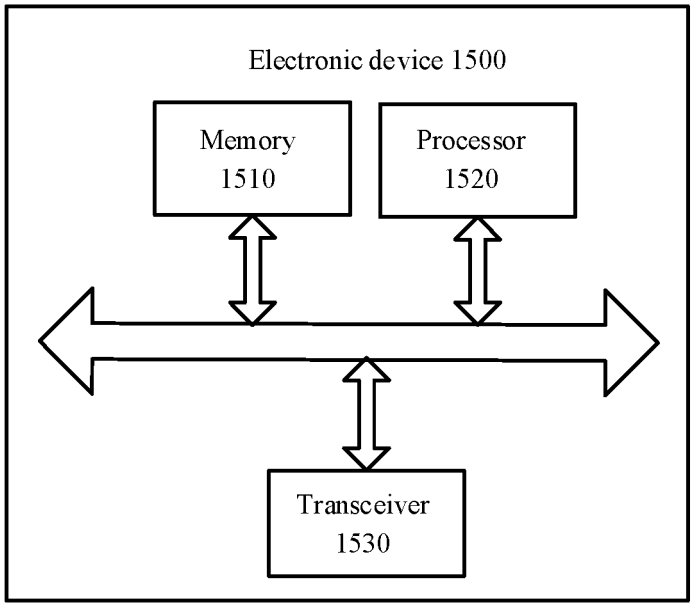
Electronic device 1500
Memory 1510
Processor 1520
Transceiver 1530

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/106855

A. CLASSIFICATION OF SUBJECT MATTER

F24F 11/64(2018.01)i; F24F 11/65(2018.01)i; F24F 11/74(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)

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)

DWPI, CJFD, CNABS, VEN, CNTXT, USTXT: 美的, 格力, 海尔, 海信, 樊其锋, 尚喆, 空调, 模式, 联动, 关联, 映射, 维度, 多维, 多项, 多个, 参数, 命令, 指令, 目标, 任务, 湿度, 温度, 风速, 转速, 优先级, 调节, 调整; MIDEA, MEDE, GREE, HAIER, HIER, HISENSE, HISG, air condition+, mode, associat+, relat+, correspond+, match+, dimension, item+, parameter+, multi+, plural+, several, order+, command?, target+, humid+, temperature, speed+, velocity+, rpm, prior+, adjust+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 217690443 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 28 October 2022 (2022-10-28) description, paragraphs 0124-0254, and figures 6-18	1-5, 10-19
E	CN 217690442 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 28 October 2022 (2022-10-28) description, paragraphs 0188-0237, and figures 6-18	1-5, 10-19
E	CN 217467952 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 20 September 2022 (2022-09-20) description, paragraphs 0124-0257, and figures 9-21	1-5, 10-19
Y	CN 108489020 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 04 September 2018 (2018-09-04) description, paragraphs 0051-0118, and figures 1-6	1-19
Y	CN 111457565 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 28 July 2020 (2020-07-28) description, paragraphs 0043-0169, and figures 1-10	1-19

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

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"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
03 December 2022	**16 December 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/106855

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 108489042 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 04 September 2018 (2018-09-04) description, paragraphs 0063-0160, and figures 1-12	2-15, 17-19
A	CN 212227350 U (ZHANG DINGYI) 25 December 2020 (2020-12-25) entire document	1-19
A	CN 112344530 A (QINGDAO HISENSE ELECTRONIC INDUSTRY HOLDING CO., LTD.) 09 February 2021 (2021-02-09) entire document	1-19
A	JP 2009-150590 A (DAIKIN INDUSTRIES, LTD.) 09 July 2009 (2009-07-09) entire document	1-19

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/106855

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 217690443 U	28 October 2022	None	
CN 217690442 U	28 October 2022	None	
CN 217467952 U	20 September 2022	None	
CN 108489020 A	04 September 2018	CN 108489020 B	11 December 2020
CN 111457565 A	28 July 2020	WO 2021196483 A1	07 October 2021
CN 108489042 A	04 September 2018	CN 108489042 B	03 December 2021
CN 212227350 U	25 December 2020	CN 111457571 A	28 July 2020
CN 112344530 A	09 February 2021	CN 112344530 B	27 May 2022
JP 特开2009-150590 A	09 July 2009	None	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202210657564 **[0001]**