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(54) AIR CONDITIONER ADJUSTING METHOD AND DEVICE, AND STORAGE MEDIUM

(57) Disclosed is an adjusting method of an air conditioner, including the following operations: acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve; and updating the first air conditioning parameter variation curve according to the time point and the first target value, to control the operation of the air conditioner according to the updated first air conditioning parameter variation curve. The present application further discloses an air conditioning device for an air conditioner and a computer readable storage medium.

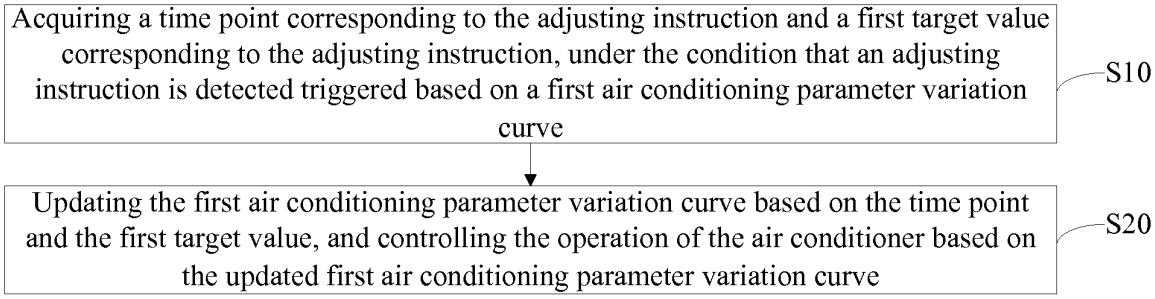

Fig. 2

EP 3 553 400 A1

Description

[0001] The present application claims the priority of a Chinese patent application filed in the Chinese patent office on December 13, 2017 with the application number 201711347759.7 and the invention name "Adjusting method and device for air conditioner, and storage medium", the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

[0002] The present application relates to the technical field of air conditioners, in particular to an adjusting method and an adjusting device for an air conditioner, and a computer readable storage medium.

BACKGROUND

[0003] Currently, user commonly uses a remote controller to set parameters of air conditioning devices, such as target temperature, target humidity, and the like. However, it is difficult for the user to compare a setting trend of the parameters visually in such an adjusting manner. And the user needs to constantly press the adjusting button when the parameters need to be up-regulated or down-regulated, making the adjustment quite troublesome.

SUMMARY

[0004] The present application aims to provide an adjusting method, an adjusting device, and a computer readable storage medium for an air conditioner, in order to adjust the parameters of the air conditioner more quickly and accurately.

[0005] To achieve the aforementioned objective, the present application provides an adjusting method for an air conditioner including the following operations:

acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve;

updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve.

[0006] Optionally, after the operation of updating the first air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, in which the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related;

updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the related second air conditioning parameter variation curve exists.

[0007] Optionally, after the related second air conditioning parameter variation curve being existed and prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted;

executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the air conditioning parameter corresponding to the second air conditioning parameter variation curve is the parameter to be adjusted.

[0008] Optionally, prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

acquiring a second target value corresponding to the time point in the second air conditioning parameter variation curve;

calculating a comfort parameter according to the first target value and the second target value;

outputting prompt message of whether to adjust the second air conditioning parameter variation curve, if the comfort parameter is not within a preset comfort range;

executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the target value, under the condition that a confirming instruction is received.

[0009] Optionally, after the operation of controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve, the method further includes:

storing the updated first air conditioning parameter variation curve, under the condition that a shutdown command is detected, to control the operation of the air conditioner according to the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted.

[0010] Optionally, prior to the operation of detecting an adjusting instruction triggered based on a first air conditioning parameter variation curve, the method further in-

cludes:

acquiring track information corresponding to the touching operation, under the condition that a touching operation is detected based on the first air conditioning parameter variation curve;
generating the adjusting instruction according to the track information.

[0011] Optionally, after the operations of detecting a touching operation aiming at the first air conditioning parameter variation curve and prior to the operation of acquiring track information corresponding to the touching operation, the method further includes:

judging whether the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve;
executing the operation of acquiring track information corresponding to the touching operation, under the condition that the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve.

[0012] Optionally, the operation of detecting a touching operation based on the first air conditioning parameter variation curve, includes:
outputting the time point and the target value corresponding to the touching operation, under the condition that the touching operation is detected.

[0013] Optionally, the operation of generating the adjusting instruction, according to the track information, includes:

acquiring a starting point and an ending point of the track information;
determining the time point according to the starting point of the track information;
determining the target value according to an ending point of the track information;
generating the adjusting instruction, according to the time point and the target value.

[0014] In order to achieve the aforementioned objective, the present application further provides an adjusting device for the air conditioner, which includes:

a memory, a processor and an adjusting program for the air conditioner stored on the memory and executable on the processor, the adjusting program for the air conditioner implements the operations of the adjusting method described above, when executed by the processor.

[0015] In order to achieve the aforementioned objective, the present application further provides a computer-readable storage medium in which an adjusting program for an air conditioner is stored, and the adjusting program when being executed by a processor implements, the operations described above for the adjusting method of the air conditioner.

[0016] According to the adjusting method, adjusting device and the computer readable storage medium for the air conditioner provided by the application, under the condition that an adjusting instruction triggered is detected for a first air conditioning parameter variation curve, a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction are acquired. And the first air conditioning parameter variation curve is updated according to the time point and the first target value, to control the operation of the air conditioner according to the updated first air conditioning parameter variation curve. The present application adjusts parameters of the air conditioner more quickly and accurately.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Fig. 1 is a schematic diagram of a hardware operational environment of a terminal according to an embodiment of the present application;
Fig. 2 is a flow chart according to a first embodiment of the adjusting method for an air conditioner of the present application;
Fig. 3 is a flow chart according to a second embodiment of the adjusting method for an air conditioner of the present application;
Fig. 4 is a flow chart according to a third embodiment of the adjusting method for an air conditioner of the present application;
Fig. 5 is a flow chart according to a fourth embodiment of the adjusting method for an air conditioner of the present application;
Fig. 6 is a flow chart according to a fifth embodiment of the adjusting method for an air conditioner of the present application;
Fig. 7 is a flow chart according to a sixth embodiment of the adjusting method for an air conditioner of the present application;
Fig. 8 is a flow chart according to a seventh embodiment of the adjusting method for an air conditioner of the present application;
Fig. 9 is a detailed flow chart of the touching operation of detecting the variation curve for the first air conditioning parameter in the present application;
Fig. 10 is a detailed flow chart of generating the adjusting instruction according to track information in the present application.

[0018] The implementation, functional characteristics and advantages of the present application will be further described with reference to the attached drawings in combination with embodiments.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0019] It should be understood that the specific embodiments described herein are only for the purpose of explaining the present application and are not intended to limit the present application.

[0020] The present application provides an adjusting method of an air conditioner, which adjusts parameters of the air conditioner more quickly and accurately.

[0021] As shown in Fig. 1, which is a schematic diagram of an operational environment of a terminal hardware according to an embodiment of the present application.

[0022] The terminal can be an air conditioning device such as air conditioners, air purifiers and the like, in the embodiment of the present application.

[0023] As shown in Fig. 1, the terminal may include a processor 1001, such as a CPU, a network interface 1004, a user interface 1003, a memory 1005, and a communication bus 1002. In which, the communication bus 1002 is configured to implement connection and communication between these components. The user interface 1003 may include a display, an input unit such as a keyboard, and the optional user interface 1003 may further include a standard wired interface and a wireless interface. The network interface 1004 may optionally include a standard wired interface, a wireless interface (such as a non-volatile memory), such as a disk memory. The memory 1005 may optionally be a storage device independent of the aforementioned processor 1001.

[0024] It would be understood by those skilled in the art that the terminal shown in Fig. 1 does not constitute a limitation to the terminal, which may include more or fewer components than shown, or some components may be combined, or different components arranged.

[0025] As shown in Fig. 1, the memory 1005 as a computer storage medium may include an operating system, a network communication module, a user interface module, and an adjusting program for an air conditioner.

[0026] In the terminals shown in Fig. 1, the network interface 1004 is mainly configured to connect with a back-end server and perform data communication with the back-end server. The user interface 1003 is mainly configured to connect the client (user end) and perform data communication with the client end; while the processor 1001 can be configured to call the adjusting program of the air conditioner stored in the memory 1005 and execute the following operations:

[0027] acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve;

[0028] updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve.

[0029] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:

judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, wherein the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related;
updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the related second air conditioning parameter variation curve exists.

[0030] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:

judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted;
executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the air conditioning parameter corresponding to the second air conditioning parameter variation curve is the parameter to be adjusted.

[0031] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:

acquiring a second target value corresponding to the time point in the second air conditioning parameter variation curve;
calculating a comfort parameter according to the first target value and the second target value;
outputting prompt message of whether to adjust the second air conditioning parameter variation curve, if the comfort parameter is not within a preset comfort range;
executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the target value, under the condition that a confirming instruction is received.

[0032] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:
storing the updated first air conditioning parameter variation curve, under the condition that a shutdown command is detected, to control the operation of the air conditioner based on the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted.

[0033] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the mem-

ory 1005, and also execute the following operations:

acquiring track information corresponding to the touching operation, under the condition that a touching operation is detected based on the first air conditioning parameter variation curve; and
generating the adjusting instruction, according to the track information.

[0034] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:

judging whether the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve;
executing the operation of acquiring track information corresponding to the touching operation, under the condition that the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve.

[0035] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:
outputting the time point and the target value corresponding to the touching operation, under the condition that the touching operation is detected.

[0036] Further, the processor 1001 may call the adjusting program of the air conditioner stored in the memory 1005, and also execute the following operations:

acquiring a starting point and an ending point of the track information;
determining the time point according to the starting point of the track information;
determining the target value according to an ending point of the track information;
generating the adjusting instruction, according to the time point and the target value.

[0037] Referring to Fig. 2, in the first embodiment, the adjusting method for the air conditioner includes:
Step S10, acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve.

[0038] In the present embodiment, the adjusting instruction includes an adjusting function selected by the user and specific adjusting parameters within the adjusting function. The air conditioner has five regulating functions including temperature, humidity, wind speed, cleanliness and freshness. Each regulating function associates with an air conditioning parameter variation curve. The user triggers the operation on the air conditioning parameter variation curve, and the regulating instruction is thus generated. Specifically, the air conditioning parameter variation curve associating with each adjusting function is displayed on the display or the display interface of the mobile terminal APP connected with the air conditioner. User can send the adjusting instruction through the display of the air conditioner or through the mobile terminal connected with the air conditioner.

[0039] It should be noted that cleanliness is mainly judged by the content of volatile organic compounds as well as PM 2.5, while freshness by the content of indoor oxygen and carbon dioxide. Users can turn on all or some of the adjusting functions. When a user turns on a certain adjusting function, the air conditioner will automatically output an air conditioning parameter variation curve which matches the environmental parameters, according to the current environmental parameters, such as temperature, humidity, cleanliness, freshness, etc. For example, when the user opens the cleanliness mode, the air conditioner automatically outputs the cleanliness variation curve according to the current cleanliness of the environment, to control the operation of the air conditioner. In addition, prompt message is output with the air conditioning parameter variation curve, in which, the prompt message can be the effect brought by running the air conditioning parameter variation curve.

[0040] Specifically, the x-coordinate is time of the air conditioning parameter variation curve, and the y-coordinate is the specific parameter of the corresponding adjusting function of the curve. The user can up-regulate or down-regulate the specific parameters of the adjusting function through lifting or dragging the curve. For example, in the temperature variation curve interface, the user lifts the curve by 2°C at 2h, which means, in the second hour of the air conditioner operation, the target temperature is 2°C higher on the basis of the target temperature output by the air conditioner.

[0041] Step S20, updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve.

[0042] In the present embodiment, temperature, humidity and wind speed are interrelated. Generally speaking, temperature perceived by user is different under different humidity. For example, the winter is drier in the north than the south, and the winter is wetter in the south than the north. Under a same temperature, the perception of chilling is stronger in the south than the north. Similarly, different wind speeds would bring to different temperature perception. For example, warm air with a higher wind speed is more intense than warm air with a lower wind speed. Therefore, if the first air conditioning parameter variation curve is a temperature, humidity or wind speed conditioning variation curve, the not only for the temperature, humidity or wind speed adjustment variation curve would be singly adjusted according to the adjusting instruction, but it has to be judged that whether the temperature, humidity and wind speed adjustment parameter variation curve be integrally adjusted.

[0043] It should be noted that cleanliness and freshness are not linked parameters which can be adjusted independently.

[0044] In the first embodiment, a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction are acquired, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve. And the first air conditioning parameter variation curve is updated according to the time point and the first target value, to control the operation of the air conditioner according to the updated first air conditioning parameter variation curve. In such manner, the conditioning parameters of the air conditioner can be adjusted more quickly and accurately.

[0045] In the second embodiment, as shown in Fig. 3, on the basis of the embodiment shown in Fig. 2 aforementioned, after the operation of updating the first air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

Step S30, judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related;

Step S40, updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the related second air conditioning parameter variation curve exists.

[0046] In the present embodiment, temperature, humidity and wind speed are interrelated. In General, user perception of temperature associates with the humidity. The winter is drier in the north than the south, and the winter is wetter in the south than the north. Under a same temperature, the perception of chilling is stronger in the south than the north. Similarly, different wind speeds would bring to different temperature perception. For example, warm air with a higher wind speed is more intense than warm air with a lower wind speed. Therefore, when the first air conditioning parameter variation curve is an adjusting curve of temperature, humidity or wind speed, not only the first air conditioning parameter is adjusted according to the first air conditioning parameter variation curve, but also the second air conditioning parameter related with the first air conditioning parameter is adjusted according to the change of the first air conditioning parameter variation curve. That is, if the first air conditioning parameter variation curve is a temperature, humidity or wind speed conditioning variation curve, the not only for the temperature, humidity or wind speed adjustment variation curve would be singly adjusted according to the adjusting instruction, but it has to be judged that whether the temperature, humidity and wind speed adjustment parameter variation curve be integrally adjusted.

[0047] In the present embodiment, the second air conditioning parameter should be changeable, that is, if the second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, but the second air conditioning parameter is not in a changeable state, updating would not be performed of the second air conditioning parameter variation curve.

[0048] In the second embodiment, it is determined whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve. If it exists, the related second air conditioning parameter variation curve is updated according to the time point and the first target value. In such manner, the variation curves of the adjustment parameters of temperature, humidity and wind speed are integrally adjusted to bring more comprehensive and comfortable experience to users.

[0049] In the third embodiment, as shown in Fig. 4, on the basis of the embodiment shown in any one of Figs. 2 to 3 aforementioned, after the related second air conditioning parameter variation curve being existed and prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

Step S41, judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted;

Step S42, executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the air conditioning parameter corresponding to the second air conditioning parameter variation curve is the parameter to be adjusted.

[0050] In the present embodiment, it is determined whether the second air conditioning parameter is in a changeable state, and if the second air conditioning parameter is in a changeable state, the second air conditioning parameter is determined as a parameter to be adjusted.

[0051] For example, when the user adjusts the temperature variation curve, if the user does not turn on the humidity function, only the wind speed variation curve which is related with the temperature will be adjusted accordingly.

[0052] In the third embodiment, it is judged whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as the parameter to be adjusted. If the air conditioning parameter corresponding to the second air conditioning parameter variation curve is the parameter to be adjusted, the related second air conditioning parameter variation curve is updated according to the time point and the first

target value. In such manner, the variation curves of the adjustment parameters of temperature, humidity and wind speed are integrally adjusted to bring more comprehensive and comfortable experience to users.

[0053] In the fourth embodiment, as shown in Fig. 5, on the basis of the embodiment shown in any one of Figs. 2 to 4 aforementioned, prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further includes:

Step S43, acquiring a second target value corresponding to the time point in the second air conditioning parameter variation curve;

Step S44, calculating a comfort parameter according to the first target value and the second target value;

Step S45, outputting prompt message of whether to adjust the second air conditioning parameter variation curve, if the comfort parameter is not within a preset comfort range; and

Step S46: judging whether a confirming instruction has been received;

Step S47, executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the target value, under the condition that a confirming instruction is received.

[0054] In the present embodiment, temperature, humidity and wind speed are interrelated. If the first air conditioning parameter variation curve is a temperature, humidity or wind speed conditioning variation curve, the not only for the temperature, humidity or wind speed adjustment variation curve would be singly adjusted according to the adjusting instruction, but it has to be judged that whether the temperature, humidity and wind speed adjustment parameter variation curve be integrally adjusted.

[0055] When a user adjusts a first target value at a certain time point in the first air conditioning parameter variation curve, if a second air conditioning parameter variation curve exists which is related with the first air conditioning parameter variation curve, and the second air conditioning parameter variation curve is in a changeable state, a second target value at the same time point is acquired in the second air conditioning parameter variation curve. And a comfort parameter is calculated according to the first target value and the second target value.

[0056] It is determined whether to adjust the second air conditioning parameter variation curve, by judging whether the comfort parameter is within the preset comfort range. In which, the preset comfort range is a comfort range which is previously set and is a range obtained by a large quantity of experimental statistics. If the comfort parameter is not within a preset comfort range, a prompt message would be output, asking the user whether to adjust the variation curve of the second air conditioning parameter. If the confirmation command is received, the air conditioner automatically adjusts the second air conditioning parameter variation curve according to the comfort parameter. If no confirming instruction is received within the preset time period, the second air conditioning parameter variation curve is not adjusted. The preset time period can be one minute. It should be noted that the second air conditioning parameter variation curve can also be manually adjusted by the user.

[0057] An example is given for illustration as follows, with the first air conditioning parameter variation curve taken as the temperature and the second air conditioning parameter variation curve taken as the humidity. It should be noted that the present embodiment is not limited to the embodiment, but for descriptive convenience. Thus, temperature and humidity are selected.

[0058] For example, when the user adjusts the target temperature at the third hour through the temperature variation curve, the air conditioner automatically acquires the target humidity at the third hour, and calculates the comfort parameter for the third hour according to the target temperature and the target humidity. under the condition that the comfort parameter is not within a preset comfort range, a prompt message is output, asking the user whether to adjust the humidity variation curve. If the confirmation command is received, the air conditioner automatically adjusts the target humidity at the third hour according to the comfort parameter. If no confirming instruction is received within the preset time period, the target humidity is not adjusted at the third hour.

[0059] In the fourth embodiment, the second target value is acquired corresponding to the time point in the second air conditioning parameter variation curve. And the comfort parameter is calculated according to the first target value and the second target value. If the comfort parameter is not within a preset comfort range, a prompt message is output, asking the user whether to adjust the second air conditioning parameter variation curve. If a confirming instruction is received, the related second air conditioning parameter variation curve is updated according to the time point and the target value. In such manner, when the user adjusts the temperature, humidity or wind speed, the comfort parameter is calculated, thereby bringing a more comprehensive and comfortable experience to the user.

[0060] In the fifth embodiment, as shown in Fig. 6, on the basis of the embodiment shown in any one of Figs. 2 to 5 aforementioned, after the operation of controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve, the method further includes:

Step S50, detecting a shutdown instruction, storing the updated first air conditioning parameter variation curve, to control the operation of the air conditioner based on the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted.

[0061] In the present embodiment, the air conditioning parameter variation curve is stored regarding to each air

conditioning parameter, which is going to be operated according to the adjustment parameter variation curve preferred by the user for the next booting operation, so as to prevent the user from a secondary adjustment.

[0062] In the fifth embodiment, if a shutdown instruction is detected, the updated first air conditioning parameter variation curve is stored, to control the operation of the air conditioner based on the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted. In such manner, the adjustment parameter variation curve preferred by the user is memorized, and the conditioning parameter variation curve preferred by the user is rebooted.

[0063] In the sixth embodiment, as shown in Fig. 7, on the basis of the embodiment shown in any one of Figs. 2 to 6 aforementioned, prior to the operation of detecting an adjusting instruction triggered based on the first air conditioning parameter variation curve, the method further includes:

Step S60, detecting a touching operation based on the first air conditioning parameter variation curve, and acquiring track information corresponding to the touching operation; and

Step S70, generating the adjusting instruction, according to the track information.

[0064] In the present embodiment, the air conditioning parameter variation curve associating with each adjusting function is displayed on the display or the display interface of the mobile terminal APP connected with the air conditioner. User can send the adjusting instruction through the display of the air conditioner or through the mobile terminal connected with the air conditioner.

[0065] Specifically, the x-coordinate is time of the air conditioning parameter variation curve, and the y-coordinate is the specific parameter of the corresponding adjusting function of the curve. The user forms the track information by lifting or dragging down the curve, and an adjusting instruction is thus generated according to the ending point of the track information. In which, if it is detected that the touching operation is stopped and the stopped time interval is greater than the preset time interval, then the ending point is determined of the track information. The preset time interval can be 5 seconds.

[0066] The adjusting instruction is generated according to the time point and the target value of the ending point. For example, the adjusting instruction may be: increasing the target temperature for the third hour by 3°C.

[0067] In the sixth embodiment, if a touching operation is detected based on the first air conditioning parameter variation curve, track information is acquired corresponding to the touching operation, and the adjusting instruction is generated according to the track information. In such manner, an adjusting instruction can be generated according to the user's touching operation on the air conditioning parameter variation curve. The user can adjust the adjustment parameters of the air conditioning device more quickly and accurately.

[0068] In the seventh embodiment, as shown in Fig. 8, on the basis of the embodiment shown in any one of Figs. 2 to 7 aforementioned, after the operations of detecting a touching operation based on the first air conditioning parameter variation curve and prior to the operation of acquiring track information corresponding to the touching operation, the method further includes:

Step S80, judging whether the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve;

Step S90, executing the operation of acquiring track information corresponding to the touching operation, under the condition that the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve.

[0069] In the present embodiment, an adjustable point is existed on the air conditioning parameter variation curve. And if the user's touching operation is detected based on the adjustable point, it is determined that the touching operation is to generate an adjusting instruction. Track information corresponding to the touching operation is acquired to generate an adjusting instruction according to the track information.

[0070] In the seventh embodiment, executing the operation of acquiring track information corresponding to the touching operation, under the condition that the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve. In such manner, the mistriggering is avoided of the user.

[0071] In an eighth embodiment, as shown in Fig. 9, on the basis of the embodiment shown in any one of Figs. 2 to 8 aforementioned, the operation of detecting a touching operation for the first air conditioning parameter variation curve includes:

Step S61, detecting the touching operation, and outputting the time point and the target value corresponding to the touching operation.

[0072] In the present embodiment, if a touching operation is detected at the air conditioning parameter variation curve interface, coordinate values corresponding to the touching operation, i.e., time points corresponding to the touching operation and target values, are displayed in real time along with the movement of the touching operation. This facilitates the user to set the adjusting parameters and avoids misoperation.

[0073] In the eighth embodiment, under the condition that a touching operation is detected, a time point and a target value are output corresponding to the touching operation. In such manner, the accuracy is improved of the adjusting parameters by the user.

[0074] In the ninth embodiment, as shown in Fig. 10, on the basis of the embodiment shown in any one of Figs. 2 to 9 aforementioned, the operation of generating the adjusting instruction according to the track information

includes:

Step S71, acquiring a starting point and an ending point of the track information;
Step S72, determining the time point according to the starting point of the track information;
Step S73, determining the target value according to an ending point of the track information; and
Step S74, generating the adjusting instruction, according to the time point and the target value.

[0075] In the present embodiment, the time point is determined according to the starting point of the track information, and the target value is determined according to the ending point of the track information. Of course, the time point and the target value can also be determined according to the ending point of the track information.

[0076] In the ninth embodiment, the starting point and the ending point are acquired of the track information. The time point is determined according to the starting point of the track information, and the target value is determined according to the ending point of the track information. The adjusting instruction is generated according to the time point and the target value. In such manner, the user can adjust the adjusting parameters of the air conditioner more quickly and accurately.

[0077] The application further provides an adjusting device for an air conditioner, including an adjusting program which is configured to implement the operations of the adjusting method described above, with the adjusting device as the main body.

[0078] The embodiment of the application further provides a computer readable storage medium on which an air conditioner adjusting program is stored, and the adjusting program, when executed by a processor, implements the adjusting method described above, with the adjusting device as the main body.

[0079] The aforementioned serial numbers regarding the embodiments of the present application are for description only and do not represent the superiority and inferiority of the embodiments.

[0080] From the above description of the embodiments, those skilled in the art can clearly understand that the method of the above embodiments can be implemented by means of software plus necessary general-purpose hardware platforms. Of course, it can also be implemented by means of hardware, but in many cases the former is a better embodiment. Based on this understanding, the technical solution of the present application can be embodied in the form of a software product, which is stored in a storage medium (such as ROM/RAM, magnetic disk, optical disk) as described above, and includes several instructions to cause a terminal device (which can be a mobile phone, a computer, a server, an air conditioner, or a network device, etc.) to perform the methods described in various embodiments of the present application.

[0081] The description aforementioned is only the preferred embodiment of the present application and is not intended to limit the scope of the present application. Any equivalent structural modification made by using the description and drawings of the present application or direct/indirect application in other related technical fields under the concept of the present application shall be included in the protection scope of the present application.

Claims

1. An adjusting method for an air conditioner, **characterized in that**, the method comprises the following operations:

   detecting an adjusting instruction triggered based on a first air conditioning parameter variation curve, and acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction; and
   updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve.

2. The adjusting method as claimed in claim 1, **characterized in that**, after the operation of updating the first air conditioning parameter variation curve based on the time point and the first target value, the method further comprises:

   judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, wherein the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related; and
   updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the related second air conditioning parameter variation curve exists.

3. The adjusting method as claimed in claim 2, **characterized in that**, after the related second air conditioning parameter variation curve being existed and prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further comprises:

   judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted; and

executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, if the air conditioning parameter corresponding to the second air conditioning parameter variation curve is the parameter to be adjusted.

4. The adjusting method as claimed in claim 3, **characterized in that**, prior to the operation of updating the related second air conditioning parameter variation curve based on the time point and the first target value, the method further comprises:

acquiring a second target value corresponding to the time point in the second air conditioning parameter variation curve;
calculating a comfort parameter according to the first target value and the second target value;
outputting a prompt message of whether to adjust the second air conditioning parameter variation curve, if the comfort parameter is not within a preset comfort range; and
executing the operation of updating the related second air conditioning parameter variation curve based on the time point and the target value, when a confirming instruction is received.

5. The adjusting method as claimed in claim 1, **characterized in that**, after the operation of controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve, the method further comprises:
detecting a shutdown instruction, and storing the updated first air conditioning parameter variation curve, to control the operation of the air conditioner according to the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted.

6. The adjusting method as claimed in claim 1, **characterized in that**, prior to the operation of detecting an adjusting instruction triggered based on a first air conditioning parameter variation curve, the method further comprises:

detecting a touching operation based on the first air conditioning parameter variation curve, and acquiring track information corresponding to the touching operation; and
generating the adjusting instruction according to the track information.

7. The adjusting method as claimed in claim 6, **characterized in that**, after the operation of detecting a touching operation based on the first air conditioning parameter variation curve and prior to the operation of acquiring track information corresponding to the touching operation, the method further comprises:

judging whether the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve; and
executing the operation of acquiring track information corresponding to the touching operation, under the condition that the touching operation is the operation based on an adjustable point in the first air conditioning parameter variation curve.

8. The adjusting method as claimed in claim 6, **characterized in that**, the operation of detecting a touching operation based on the first air conditioning parameter variation curve, comprises:
detecting the touching operation, and outputting the time point and the target value corresponding to the touching operation.

9. The adjusting method as claimed in claim 6, **characterized in that**, the operation of generating the adjusting instruction according to the track information, comprises:

acquiring a starting point and an ending point of the track information;
determining the time point according to the starting point of the track information;
determining the target value according to the ending point of the track information; and
generating the adjusting instruction according to the time point and the target value.

10. An air conditioning device, **characterized in that**, the air conditioning device comprises a heat exchange system, a memory, a processor and a display connected with the processor, wherein:

the memory, is configured to store a first target value corresponding to an adjusting instruction;
the processor, is configured to acquire a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction;
the display, is configured to display a first air conditioning parameter variation curve;
the processor, is further configured to control the operation of the air conditioner based on an updated first air conditioning parameter variation curve.

11. A computer-readable storage medium, **characterized in that**, an adjusting program for an air conditioner is stored in the computer-readable storage medium, and the adjusting program when being executed by a processor implements the following op-

erations:

acquiring a time point corresponding to an adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that the adjusting instruction triggered based on a first air conditioning parameter variation curve is detected; and

updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve.

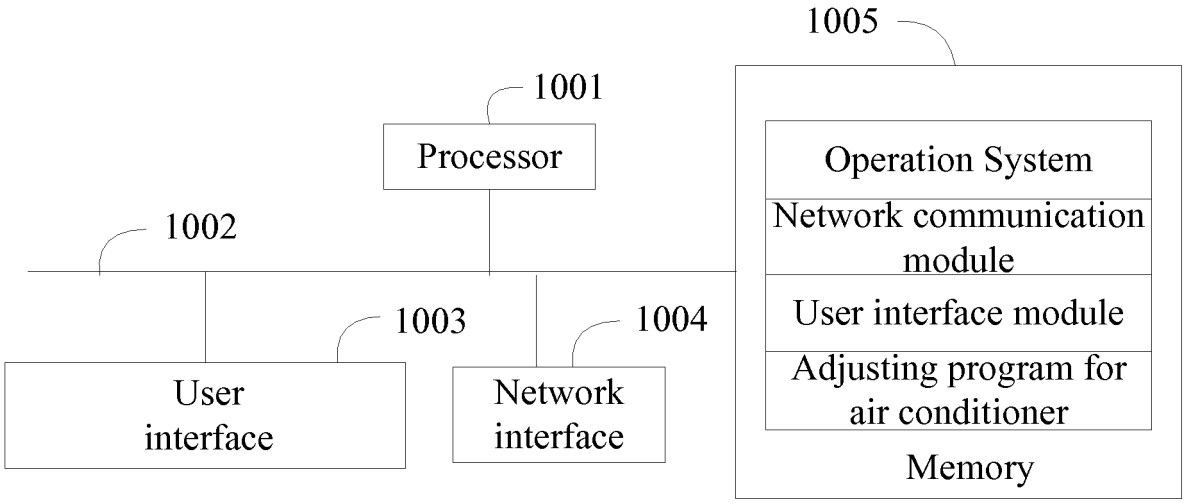
1005
1001
Processor
Operation System
Network communication module
1002
User interface module
1003
1004
Adjusting program for air conditioner
User interface
Network interface
Memory

Fig. 1

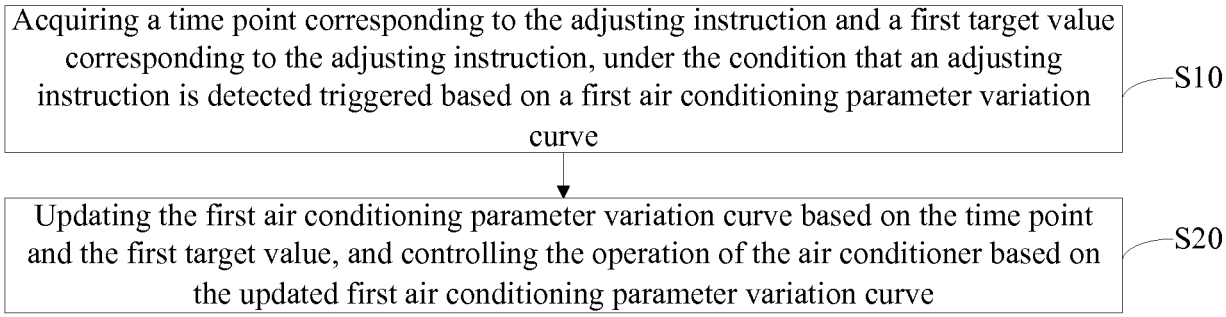
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of the air conditioner based on the updated first air conditioning parameter variation curve
S20

Fig. 2

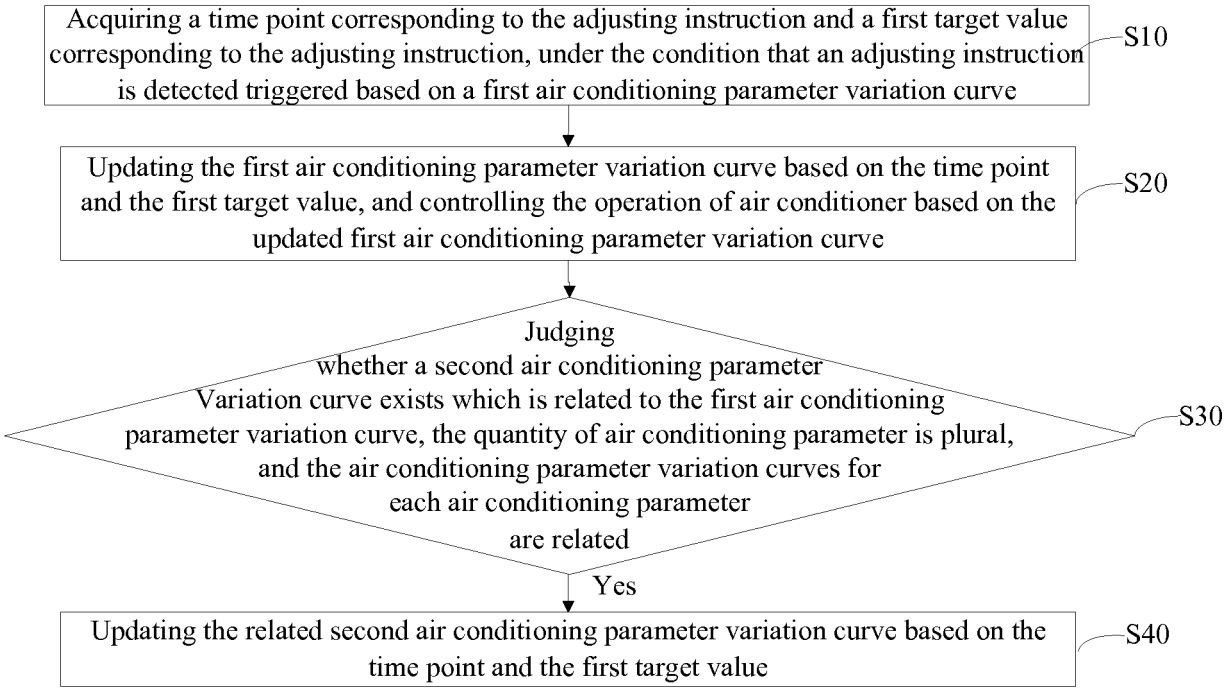
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20
Judging whether a second air conditioning parameter Variation curve exists which is related to the first air conditioning parameter variation curve, the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related
S30
Yes
Updating the related second air conditioning parameter variation curve based on the time point and the first target value
S40

Fig. 3

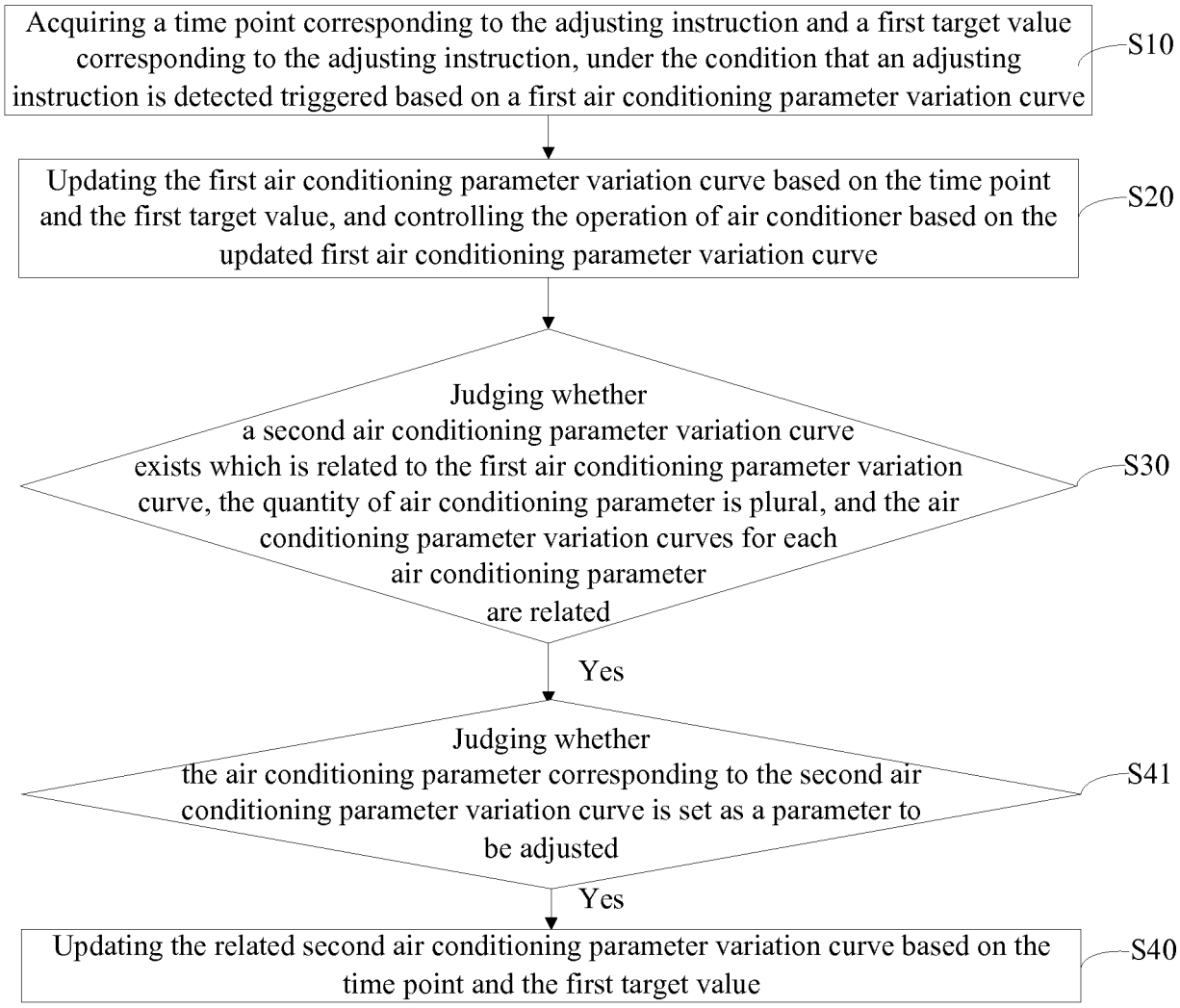
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20
Judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related
S30
Yes
Judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted
S41
Yes
Updating the related second air conditioning parameter variation curve based on the time point and the first target value
S40

Fig. 4

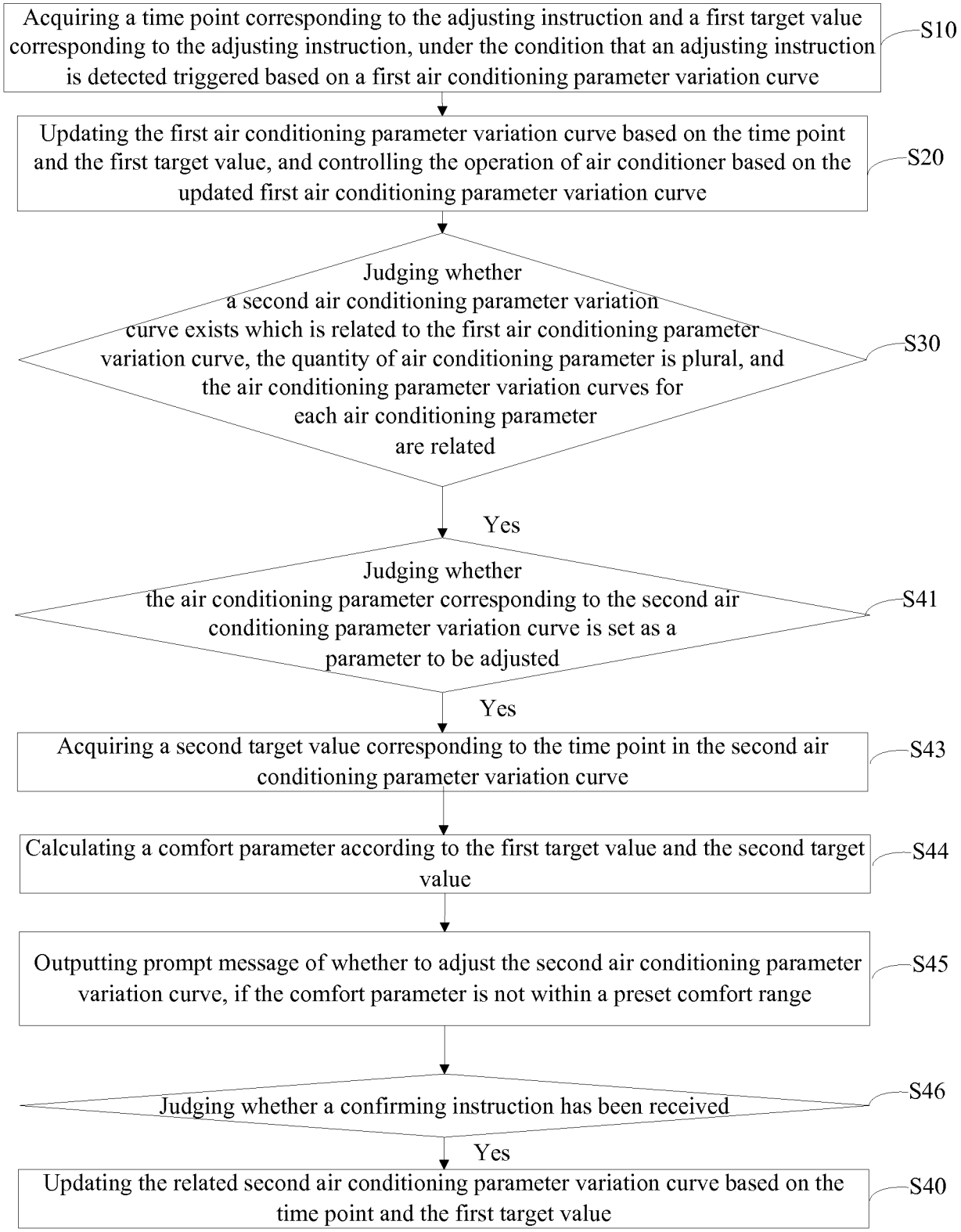
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20
Judging whether a second air conditioning parameter variation curve exists which is related to the first air conditioning parameter variation curve, the quantity of air conditioning parameter is plural, and the air conditioning parameter variation curves for each air conditioning parameter are related
S30
Yes
Judging whether the air conditioning parameter corresponding to the second air conditioning parameter variation curve is set as a parameter to be adjusted
S41
Yes
Acquiring a second target value corresponding to the time point in the second air conditioning parameter variation curve
S43
Calculating a comfort parameter according to the first target value and the second target value
S44
Outputting prompt message of whether to adjust the second air conditioning parameter variation curve, if the comfort parameter is not within a preset comfort range
S45
Judging whether a confirming instruction has been received
S46
Yes
Updating the related second air conditioning parameter variation curve based on the time point and the first target value
S40

Fig. 5

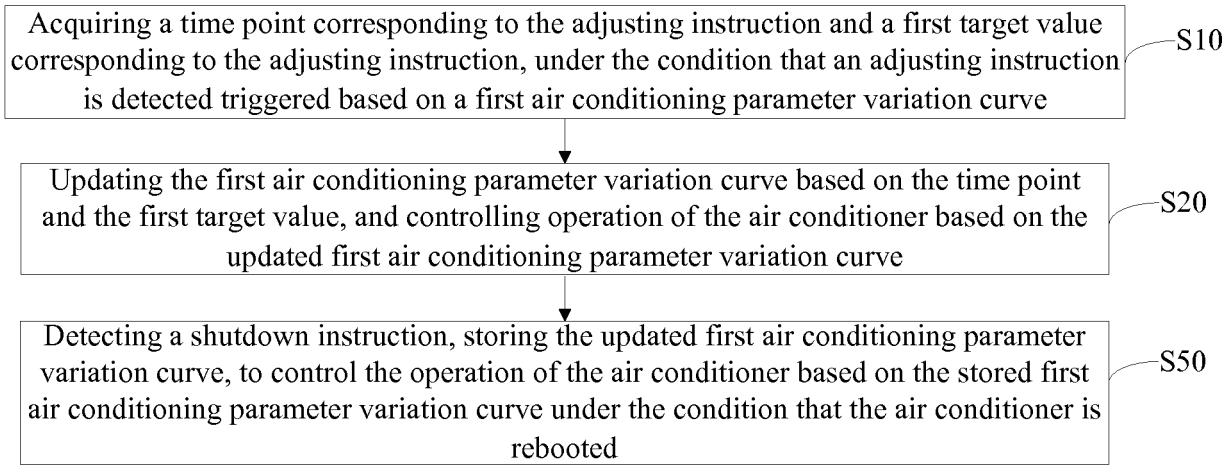
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling operation of the air conditioner based on the updated first air conditioning parameter variation curve
S20
Detecting a shutdown instruction, storing the updated first air conditioning parameter variation curve, to control the operation of the air conditioner based on the stored first air conditioning parameter variation curve under the condition that the air conditioner is rebooted
S50

Fig. 6

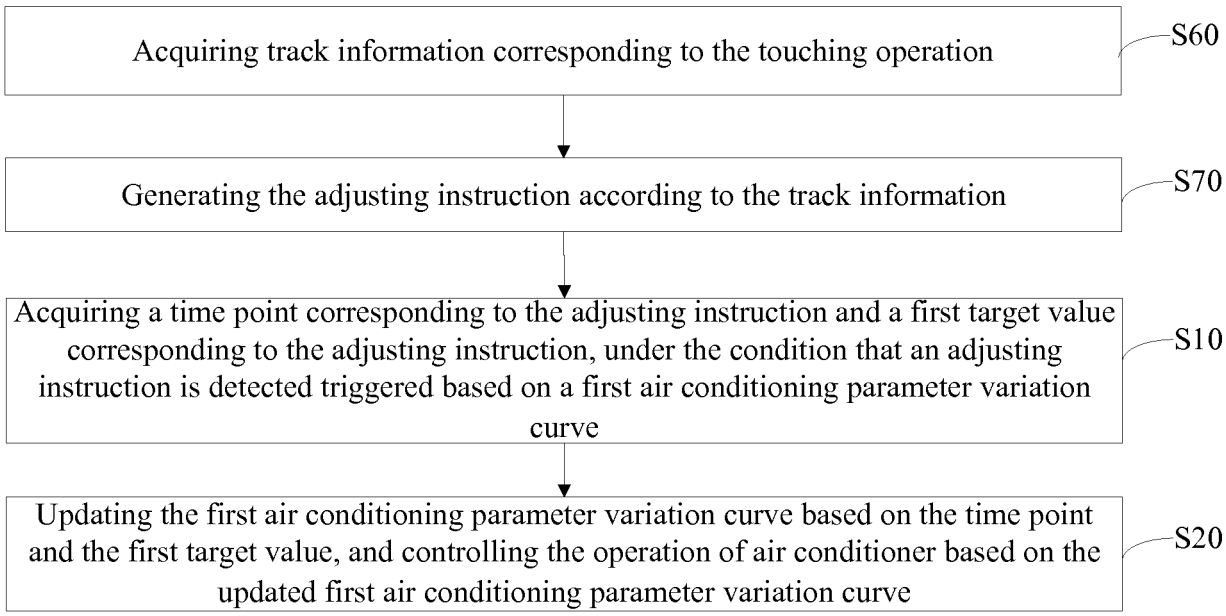
Acquiring track information corresponding to the touching operation
S60
Generating the adjusting instruction according to the track information
S70
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20

Fig. 7

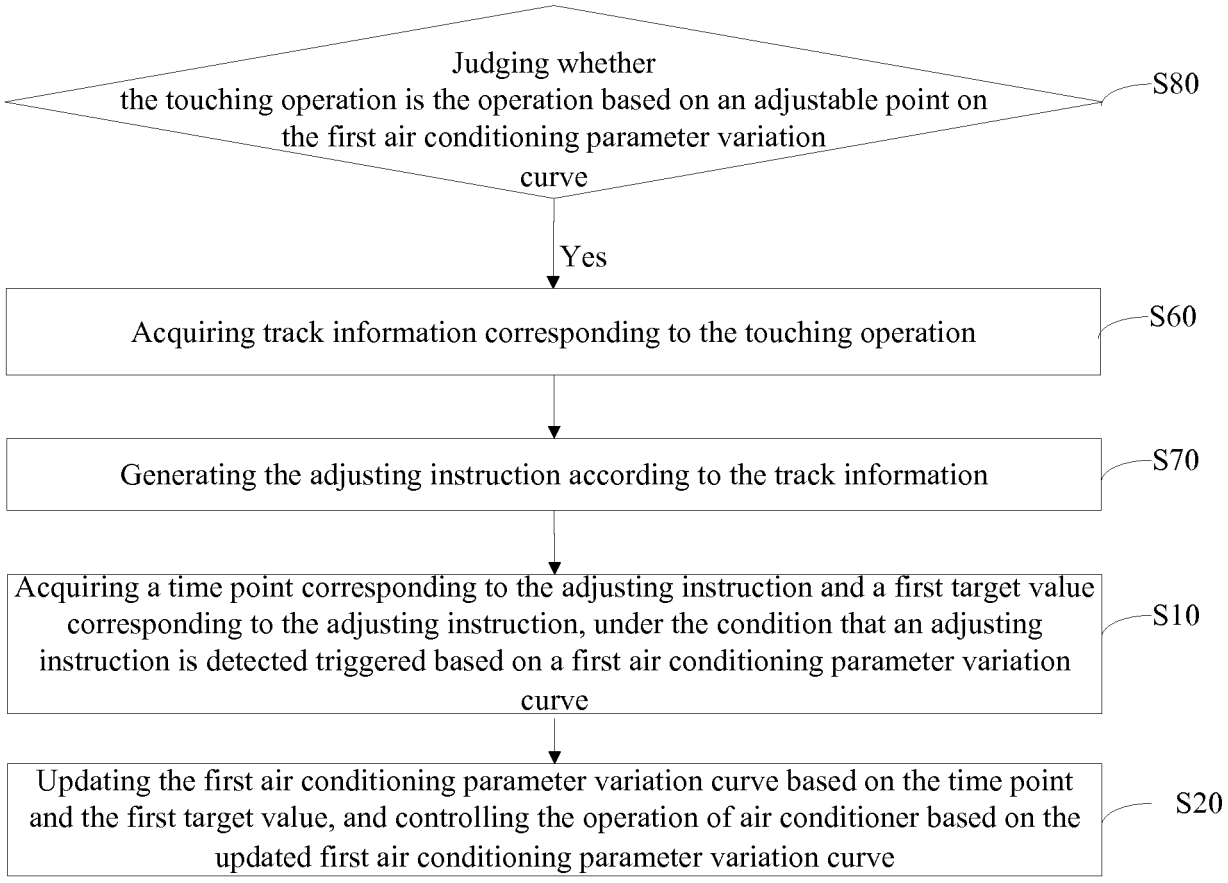
Judging whether the touching operation is the operation based on an adjustable point on the first air conditioning parameter variation curve
S80
Yes
Acquiring track information corresponding to the touching operation
S60
Generating the adjusting instruction according to the track information
S70
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20

Fig. 8

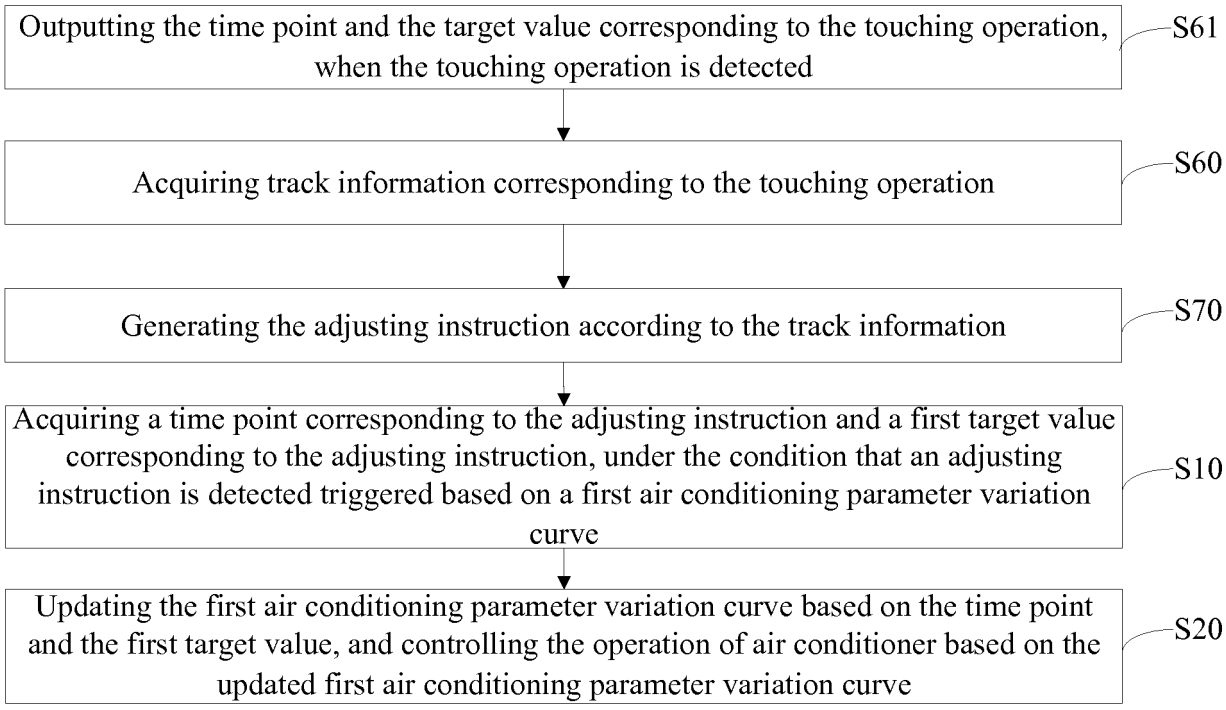
Outputting the time point and the target value corresponding to the touching operation, when the touching operation is detected
S61
Acquiring track information corresponding to the touching operation
S60
Generating the adjusting instruction according to the track information
S70
Acquiring a time point corresponding to the adjusting instruction and a first target value corresponding to the adjusting instruction, under the condition that an adjusting instruction is detected triggered based on a first air conditioning parameter variation curve
S10
Updating the first air conditioning parameter variation curve based on the time point and the first target value, and controlling the operation of air conditioner based on the updated first air conditioning parameter variation curve
S20

Fig. 9

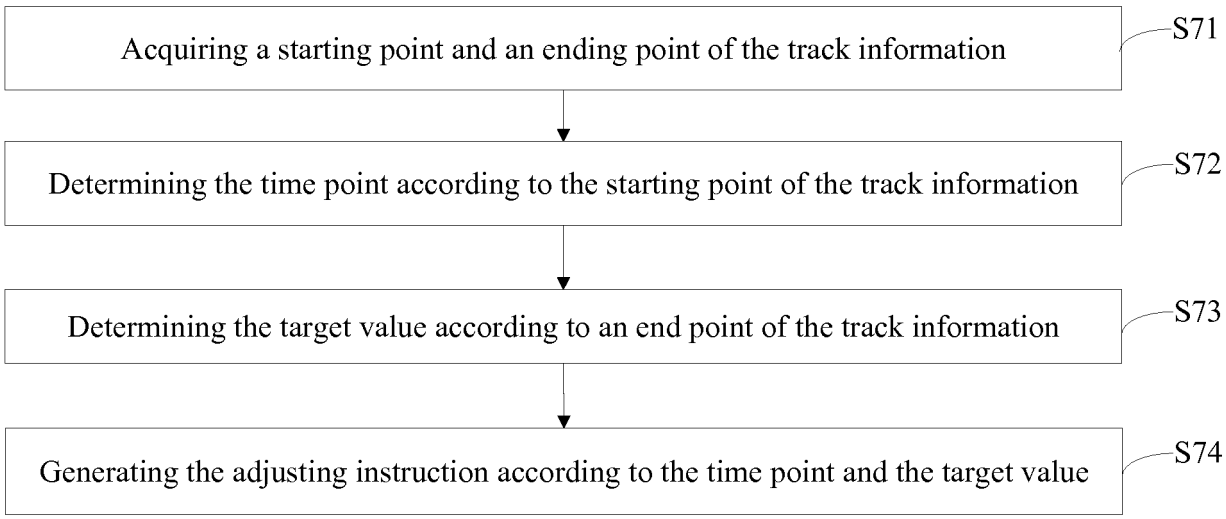
Acquiring a starting point and an ending point of the track information
S71
Determining the time point according to the starting point of the track information
S72
Determining the target value according to an end point of the track information
S73
Generating the adjusting instruction according to the time point and the target value
S74

Fig. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/118391

A. CLASSIFICATION OF SUBJECT MATTER

F24F 11/00(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)

CNPAT, CNKI, IEEE, EPODOC, WPI: 空调, 空气调节, 温度, 湿度, 风速, 参数, 曲线, 触摸, 上提, 下拉, 轨迹, 控制, 调整, 改变, 关联, 舒适, air conditioner, temperature, humidity, wind speed, parameter, curve, touch, pull, up, down, track, control, adjust, change, associate, relate, comfort

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 105299832 A (SHENZHEN GIONEE COMMUNICATION EQUIPMENT CO., LTD.) 03 February 2016 (2016-02-03) description, paragraphs [0022]-[0053] and [0085]-[0144], and figures 1, 2a, 5, and 6	1, 5-11
X	CN 101561170 A (GUANGDONG MIDEA ELECTRIC APPLIANCES CO., LTD.) 21 October 2009 (2009-10-21) description, pp. 4-10, and figures 1-8	1, 5-11
X	CN 104864543 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD.) 26 August 2015 (2015-08-26) description, paragraphs [0059]-[0122], and figures 1-12	1, 5-11
X	CN 104154631 A (WU, SHENG ET AL.) 19 November 2014 (2014-11-19) description, paragraphs [0029]-[0044], and figures 1-5	1, 5-11
A	CN 103673194 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2014 (2014-03-26) entire document	1-11

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

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

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

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 February 2019	**06 March 2019**

Name and mailing address of the ISA/CN	Authorized officer
State Intellectual Property Office of the P. R. China (ISA/CN) **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China**	
Facsimile No. **(86-10)62019451**	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/118391

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2015105917 A1 (PANASONIC INTELLECTUAL PROPERTY CORPORATION OF AMERICA) 16 April 2015 (2015-04-16) entire document	1-11

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2018/118391

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 105299832 A	03 February 2016	None	
CN 101561170 A	21 October 2009	CN 101561170 B	27 July 2011
CN 104864543 A	26 August 2015	CN 104864543 B	27 October 2017
CN 104154631 A	19 November 2014	None	
CN 103673194 A	26 March 2014	CN 103673194 B	03 August 2016
US 2015105917 A1	16 April 2015	US 9791208 B2	17 October 2017
		CN 104566849 A	29 April 2015
		JP 2015099007 A	28 May 2015

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201711347759 **[0001]**