(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 399 250 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
01.06.2022 Bulletin 2022/22

(21) Application number: **17852265.2**

(22) Date of filing: **28.08.2017**

(51) International Patent Classification (IPC):
F24F 11/00 *(2018.01)* ***F25B 29/00*** *(2006.01)*
F24F 1/0003 *(2019.01)* ***F24F 3/06*** *(2006.01)*
F24F 11/64 *(2018.01)* ***F24F 11/67*** *(2018.01)*
F24F 110/10 *(2018.01)* ***F24F 110/12*** *(2018.01)*
F25B 5/02 *(2006.01)* ***F25B 6/02*** *(2006.01)*
F25B 13/00 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
F24F 11/67; F24F 1/0003; F24F 11/64; F24F 3/065; F24F 11/84; F24F 2110/10; F24F 2110/12; F24F 2221/54; F25B 13/00; F25B 2313/0253; F25B 2700/2106

(86) International application number:
PCT/CN2017/099277

(87) International publication number:
WO 2018/054196 (29.03.2018 Gazette 2018/13)

(54) **MULTI-CONNECTED SYSTEM AND CONTROL METHOD THEREFOR**

MEHRFACH VERBUNDENES SYSTEM UND STEUERUNGSVERFAHREN DAFÜR

SYSTÈME INTER-RELIÉ ET SON PROCÉDÉ DE COMMANDE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **21.09.2016 CN 201610840220**

(43) Date of publication of application:
07.11.2018 Bulletin 2018/45

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Processed by Luminess, 75001 PARIS (FR)

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JP-A- H07 305 879

Description

FIELD

[0001] The present disclosure relates to air conditioner field, and more particularly, to a multi-split air conditioning system and a method for controlling a multi-split air conditioning system.

BACKGROUND

[0002] A multi-split air conditioning system is a system that uses a single or multiple outdoor units in parallel, and configures a plurality of air conditioning indoor units. The indoor units are independently controlled, and general operating modes include refrigerating, heating, air supply, etc. However, in the same system, the outdoor units can only operate in one mode, and cannot operate in refrigerating and heating mode at the same time. Since the body sense of each person may vary, in the transitional season, there may be cases that some people may want to start refrigerating and others may want to start heating. In this case, it is necessary to set a mode priority for the air conditioning system, and the system operates this mode first. At present, priority modes of each air conditioning manufacturer generally include a refrigerating priority or a heating priority. However, the priority modes have certain limitations, and cannot meet needs of most users, user experience is poor.

[0003] EP3021060A1 relates to an air conditioner and a method of controlling the same are provided. The air conditioner includes an outdoor unit provided with a compressor, an outdoor temperature sensor, an outdoor humidity recognition part, and a controller. The outdoor temperature sensor is installed on the outdoor unit to sense outdoor temperature. The outdoor humidity recognition part is installed on the outdoor unit to recognize outdoor humidity information. The controller controls an operation of the compressor, based information sensed from the outdoor temperature sensor and the outdoor humidity recognition part. When the outdoor temperature has a preset value, the controller determines target evaporation temperature such that the target evaporation temperature is decreased as outdoor humidity increases, and the controller drives the compressor at an operation frequency corresponding to the determined target evaporation temperature.

SUMMARY

[0004] An objective of the present disclosure is to provide a multi-split air conditioning system and a method for controlling thereof, which aims to avoid conflicts in operating modes of multi-split air conditioning systems.

[0005] In accordance with the present invention, there is provided a method for controlling a multi-split air conditioning system as set out in claim 1 and a multi-split air conditioning system as set out in claim 6. Other aspects of the invention can be found in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] In order to clearly illustrate technical solutions in embodiments of the present invention or in the related art, the drawings used in embodiments or the related art will be briefly described below. Obviously, the drawings in the following descriptions are only part embodiments of the present disclosure, and for those skilled in the art, other drawings can be obtained according to these drawings without creative labor.

Fig. 1 is a schematic diagram of a multi-split air conditioning system;
Fig. 2 is a flow chart of a first embodiment of a method for controlling a multi-split air conditioning system;
Fig. 3 is a flow chart of determining an operating mode of a multi-split air conditioning system in a method for controlling a multi-split air conditioning system according to the present invention;
Fig. 4 is a flow chart of a second embodiment of a method for controlling a multi-split air conditioning system according to the present invention;
Fig. 5 is a flow chart of a third embodiment of a method for controlling a multi-split air conditioning system according to the present invention; and
Fig. 6 is a block diagram of function modules of a controller of a multi-split air conditioning system according to the present invention.

Description of reference numerals of drawings

Number	Name	Number	Name
1	compressor	2	four-way valve
3	outdoor heat exchanger	4	first throttling element
5a	first electronic expansion valve	5b	second electronic expansion valve
6a	first indoor heat exchange unit	6b	second indoor heat exchange unit
7	high-pressure valve	8	low-pressure valve
9	gas-liquid separator		

[0007] The implementation, function characteristics and advantages of the present disclosure will further be described with reference to the accompanying drawings in conjunction with embodiments.

DETAILED DESCRIPTION

[0008] To better understand the invention, the scope of which is solely defined by the appended claims, reference will be made clearly and completely technical solutions in the embodiments of the present invention with accompanying drawings. Obviously, the embodiments described herein are only part of the embodiments of the present disclosure but not all embodiments of the present disclosure.

[0009] It should be noted that, if directional indications (such as up, down, left, right, front, rear, etc.) are involved in embodiments of the present disclosure, the directional indications are only used to explain relative positional relationships and movement between various components in a specific posture (as illustrated in the drawing). If the specific posture changes, the directional indications may also change accordingly.

[0010] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In addition, technical solutions between various embodiments can be combined with each other, but must be based on the implementation of those skilled in the art.

[0011] The present invention provides a method for controlling a multi-split air conditioning system according to claim 1, which solves conflicts in operating modes of multi-split air conditioning systems that, when the multi-split air conditioning system is used in a transitional season, some people want the indoor unit to operate in a refrigerating mode, and others want the indoor unit to operate in a heating mode, the ambient temperature is divided, operations in the transitional season are separately controlled and conflicts of operating modes are avoided.

[0012] In detail, as illustrated in Fig. 1. Fig. 1 illustrates a structure of a multi-split air conditioning system according to an embodiment of the present disclosure. The multi-split air conditioning system includes a compressor 1, a four-way valve 2, an outdoor heat exchanger 3, a first throttling element 4, a second throttling element and an indoor heat exchanger. The indoor heat exchanger includes a plurality of indoor heat change units, such as a first indoor heat exchange unit 6a and a second indoor heat exchange unit 6b illustrated in Fig. 1. Correspondingly, the second throttling element includes a first electronic expansion valve 5a and a second electronic expansion valve 5b.

[0013] The four-way valve 2 includes four ports, i.e., a first port a, a second port b, a third port c and a fourth port d.

[0014] An exhaust port of the compressor 1 is connected with the first port a of the four-way valve 2 with a refrigerant line, and a one-way valve is provided at the exhaust port of the compressor to prevent refrigerant reflux. A gas returning port of the compressor 1 is connected with the third port c of the four-way valve 2 with a refrigerant line. It can be understood that, the multi-split air conditioning system may further include a gas-liquid separator 9, i.e., gas-liquid separation is performed on the refrigerant returned to the compressor 1, to prevent liquid refrigerant from flowing into the compressor 1. The third port c of the four-way valve 2 is connected with an inlet of the gas-liquid separator 9, and an outlet of the gas-liquid separator 9 is connected with the gas returning port of the compressor 1 with the refrigerant line.

[0015] An end of the outdoor heat exchanger 3 is connected with the second port b of the four-way valve 2 with a refrigerant line, and the other end of the outdoor heat exchanger 3 is connected with an end of the first throttling element 4 with a refrigerant line. The other end of the first throttling element 4 is connected with an end of the indoor heat exchanger, i.e., is connected with an end of the first indoor exchange unit 6a and an end of the second indoor heat exchange unit 6b.

[0016] The other end of the indoor heat exchanger is connected with the four port d of the four-way valve 2 with a refrigerant line, i.e., the other end of the first indoor heat exchange unit 6a and the other end of the second indoor heat exchange unit 6b are connected with the four port d of the four-way valve 2 after joining with the refrigerant line.

[0017] A high-pressure valve 7 is provided on the refrigerant line that connects the first throttling element 4 and an

end of the indoor heat exchanger. A low-pressure 8 is provided on the refrigerant line that connects with the other end of the indoor heat exchanger and the four-way valve 2.

[0018] Based on the above multi-split air conditioning system, the present disclosure provides a method for controlling a multi-split air conditioning system. As illustrated in Fig. 2, the method may include followings.

[0019] At block S110, an outdoor ambient temperature is acquired when a starting instruction of an indoor unit is received.

[0020] When the user wants to start the indoor unit to adjust the temperature (such as increase temperature or decrease temperature) in the area where the indoor unit is located, the user may send a starting instruction, and set a target indoor temperature and an operating mode (such as a refrigerating mode, a heating mode, etc.). The indoor unit receives the starting instruction sent by the user, and sends the starting instruction to the outdoor unit. The outdoor unit acquires the outdoor ambient temperature based on the starting instruction of the indoor unit.

[0021] At block S120, it is determined whether the outdoor ambient temperature is within a preset temperature range.

[0022] In the embodiment of the present invention, a temperature range (i.e., a temperature range of the transitional season (such as 22°C to 28°C)) is preset, when the outdoor ambient temperature is within the temperature range, it is indicated that it is in the transitional season. When the outdoor ambient temperature is less than 22°C, the air conditioning system is controlled to operate in the heating mode. When the outdoor ambient temperature is greater than 28°C, the air conditioning system is controlled to operate in the refrigerating mode.

[0023] At block S130, when the outdoor ambient temperature is within the preset temperature range, an operating mode of the multi-split air conditioning system is determined according to operating conditions of respective started indoor units.

[0024] When the outdoor ambient temperature is within the preset temperature range, operating conditions of respective indoor units are obtained, and the operating mode of the multi-split air conditioning system is determined through a preset rule according to the operating conditions of respective indoor units. In other words, the multi-split air conditioning system may operate in a refrigerating mode, or may operate in a heating mode. The operating condition may include an operating state (such as on or off) of the indoor unit, and an operating mode (such as a refrigerating mode, a heating mode, etc.) of the indoor unit.

[0025] In the embodiment of the present invention, , when the multi-split air conditioning system is operating, it is determined whether the outdoor ambient temperature is in the transitional season, when the outdoor ambient temperature is in the transitional season, operating conditions of respective indoor units are obtained, and the operating mode of the multi-split air conditioning system is determined based on the operating conditions of respective indoor units, thereby avoiding conflicts in operating modes of multi-split air conditioning systems.

[0026] Furthermore, as illustrated in Fig. 3, block S130 may include followings.

[0027] At block S131, when the outdoor ambient temperature is within the preset temperature range, it is determined whether there is a started indoor unit.

[0028] In the operating process of the multi-split air conditioning system, the outdoor unit may communicate with the indoor unit to inform its respective operating state. In other words, when the outdoor ambient temperature is within the preset temperature range, the operating condition of the indoor unit can be obtained by querying the outdoor unit, such that it can be determined whether there is the started indoor unit.

[0029] At block S132, when there is the started indoor unit, it is determined whether the indoor unit sending the starting instruction has a highest priority level.

[0030] In embodiments of the present disclosure, the indoor units may be numbered in advance, such as indoor unit 1, indoor unit 2, indoor unit 3, etc. A priority level may be set for each indoor unit, and a priority level table can be defined. Therefore, based on the preset priority level table, when it is determined that there is the started indoor unit, the priority level of the started indoor unit may be compared with that of the indoor unit sending the starting instruction, to determine whether the indoor unit sending the starting instruction has the highest priority level.

[0031] At block S133, when the indoor unit sending the starting instruction has the highest priority level, the operating mode of the multi-split air conditioning system is determined according to an operating mode set by the indoor unit sending the starting instruction, and otherwise the operating mode of the multi-split air conditioning system is determined according to the operating mode of the started indoor unit.

[0032] When the indoor unit sending the starting instruction has the highest priority level, the operating mode of the multi-split air conditioning system is determined according to the operating mode set by the starting instruction. For example, when the indoor unit sending the starting instruction is in the refrigerating mode, the multi-split air conditioning system is currently operating in the heating mode, and then the current heating mode is switched to the refrigerating mode.

[0033] When the indoor unit sending the starting instruction does not have the highest priority level, i.e., one of the started indoor units has the highest priority level, no operation is performed, and the multi-split air conditioning system operates in the current operating mode.

[0034] At block S134, when there is no started indoor unit, it is determined whether there are at least two indoor units sending the starting instruction.

[0035] When there is no started indoor unit, it is indicated that the multi-split air conditioning system is not in the operating state. It is determined whether there is one or more indoor units sending the starting instruction. When there is only one indoor unit sending the starting instruction, the operation of the multi-split air conditioning system is controlled based on the operating mode set by the starting instruction. When there are more than two indoor units sending the starting instruction, the operating mode of the multi-split air conditioning system is determined through a priority level rule or a majority rule based on set operating modes of respective indoor units.

[0036] At block S135, when there are at least two indoor units sending the starting instruction, the operating mode of the multi-split air conditioning system is determined through a priority level rule or a majority rule according to the number of indoor units and set operating modes thereof.

[0037] For the operating mode of the multi-split air conditioning system is determined according to the priority level rule, reference may be made to the above. The majority rule refers to that, according to the number of indoor units sending the same starting instruction and the same operating modes set by respective indoor units, the operating mode of the multi-split air conditioning system is determined by the operating mode set by most of the indoor units. For example, the indoor units sending the starting instruction include an indoor unit 1, an indoor unit 2 and an indoor unit 4, the operating mode set by the indoor unit 1 is the refrigerating mode, the operating mode set by the indoor unit 2 is the heating mode, and the operating mode set by the indoor unit 4 is the refrigerating mode, and then the final operating mode of the multi-split air conditioning system is the refrigerating mode according to the majority rule.

[0038] Furthermore, as illustrated in Fig. 4, the method further includes followings.

[0039] At block S140, after the operating mode of multi-split air conditioning system is determined, when a mode switching instruction sent by the indoor unit is received, it is determined whether the indoor unit sending the mode switching instruction has the highest priority level.

[0040] At block S150, when the indoor unit sending the mode switching instruction does not have the highest priority level, the mode switching instruction is forwarded to the indoor unit having the highest priority level, and the operating mode of the multi-split air conditioning system is switched when confirmation from the indoor unit having the highest priority level is received.

[0041] At block S160, when the indoor unit sending the mode switching instruction has the highest priority level, the current operating mode of the multi-split air conditioning system is switched according to the mode switching instruction.

[0042] After the operating mode of the multi-split air conditioning system is determined, the user may want to switch the current operating mode (for example, switch the refrigerating mode to the heating mode), after the indoor unit receives the mode switching instruction, the indoor unit can send it to the outdoor unit. The outdoor unit may first determine whether the indoor unit sending the mode switching instruction has the highest priority level. When the indoor unit sending the mode switching instruction has the highest priority level, the current operating mode of the multi-split air conditioning system is switched according to the mode switching instruction. When the indoor unit sending the mode switching instruction does not have the highest priority level, the mode switching instruction is forwarded to the indoor unit having the highest priority level to confirm. It should be noted that, the above comparison of the priority level is to compare the priority level of the indoor unit sending the mode switching instruction to that of the started indoor unit.

[0043] Furthermore, as illustrated in Fig. 5, the method further includes followings.

[0044] At block S170, after the operating mode of multi-split air conditioning system is determined, a current indoor temperature corresponding to the indoor unit is obtained.

[0045] At block S180, when a current indoor temperature corresponding to the indoor unit reaches a target temperature, the indoor unit is stopped for a preset time period and then the indoor unit is started again.

[0046] After the operating mode of multi-split air conditioning system is determined, the indoor unit may further detect the current indoor temperature corresponding to the indoor unit. In the embodiment, the indoor temperature may be detected by a temperature sensor provided at a return air inlet of the indoor unit. When the indoor temperature corresponding to the indoor unit reaches the target temperature, the indoor unit is controlled to stop operating for a time period, and then the indoor unit is started again. After the indoor unit stops operating, the multi-split air conditioning system may obtain operating conditions of remaining indoor units to re-determine the operating mode of the multi-split air conditioning system.

[0047] Accordingly, embodiments of the present invention further provide a multi-split air conditioning system according to claim 6 for performing the above method. The multi-split air conditioning system includes the structure illustrated in Fig. 1, and further includes a controller. The controller is configured to receive a control signal from the indoor unit and control the outdoor unit according to the control signal. In detail, as illustrated in Fig. 6, the controller includes a temperature acquiring module 110, a temperature determining module 120 and a control module 130.

[0048] The temperature acquiring module 110 is configured to acquire an outdoor ambient temperature when receiving a starting instruction of the indoor unit.

[0049] The temperature determining module 120 is configured to determine whether the outdoor ambient temperature is within a preset temperature range.

[0050] The control module 130 is configured to determine an operating mode of the multi-split air conditioning system

according to operating conditions of respective started indoor units when the outdoor ambient temperature is within the preset temperature range.

[0051] When the user wants to start the indoor unit to adjust the temperature (such as increase temperature or decrease temperature) in the area where the indoor unit is located, the user can may a starting instruction, and set a target indoor temperature and an operating mode (such as a refrigerating mode, a heating mode, etc.). The indoor unit receives the starting instruction sent by the user, and sends the starting instruction to the outdoor unit. The temperature acquiring module 110 acquires the outdoor ambient temperature based on the starting instruction of the indoor unit.

[0052] In the embodiments of the invention, a temperature range (i.e., a temperature range of the transitional season (such as 22°C to 28°C)) is preset, when the outdoor ambient temperature is within the temperature range, it is indicated that it is in the transitional season. When the outdoor ambient temperature is less than 22°C, the air conditioning system is controlled to operate in the heating mode. When the outdoor ambient temperature is greater than 28°C, the air conditioning system is controlled to operate in the refrigerating mode.

[0053] When the outdoor ambient temperature is within the preset temperature range, operating conditions of respective indoor units are obtained, and the operating mode of the multi-split air conditioning system is determined through a preset rule according to the operating conditions of respective indoor units. In other words, the multi-split air conditioning system may operate in a refrigerating mode, or may operate in a heating mode. The operating condition may include an operating state (such as on or off) of the indoor unit, and an operating mode (such as a refrigerating mode, a heating mode, etc.) of the indoor unit.

[0054] In embodiments of the present disclosure, it is determined whether the outdoor ambient temperature is in the transitional season, when the outdoor ambient temperature is in the transitional season, operating conditions of respective indoor units are obtained, and the operating mode of the multi-split air conditioning system is determined based on the operating conditions of respective indoor units, thereby avoiding conflicts in operating modes of multi-split air conditioning systems.

[0055] Furthermore, the control module 130 in the controller is further configured to determine whether there is a started indoor unit when the outdoor ambient temperature is within the preset temperature range; determine whether the indoor unit sending the starting instruction has a highest priority level when there is the started indoor unit; and determine the operating mode of the multi-split air conditioning system according to an operating mode set by the indoor unit sending the starting instruction when the indoor unit sending the starting instruction has the highest priority level, and determine the operating mode of the multi-split air conditioning system according to the operating mode of the started indoor unit when the indoor unit sending the starting instruction does not have the highest priority level.

[0056] In the operating process of the multi-split air conditioning system, the outdoor unit may communicate with the indoor unit to inform its respective operating state. In other words, when the outdoor ambient temperature is within the preset temperature range, the operating condition of the indoor unit can be obtained by querying the outdoor unit, such that it can be determined whether there is the started indoor unit.

[0057] In embodiments of the present disclosure, the indoor units may be numbered in advance, such as indoor unit 1, indoor unit 2, indoor unit 3, etc. A priority level may be set for each indoor unit, and a priority level table can be defined. Therefore, based on the preset priority level table, when it is determined that there is the started indoor unit, the priority level of the started indoor unit may be compared with that of the indoor unit sending the starting instruction, to determine whether the indoor unit sending the starting instruction has the highest priority level.

[0058] When the indoor unit sending the starting instruction has the highest priority level, the operating mode of the multi-split air conditioning system is determined according to the operating mode set by the starting instruction. For example, when the indoor unit sending the starting instruction is in the refrigerating mode, the multi-split air conditioning system is currently operating in the heating mode, and then the current heating mode is switched to the refrigerating mode.

[0059] When the indoor unit sending the starting instruction does not have the highest priority level, i.e., one of the started indoor units has the highest priority level, no operation is performed, and the multi-split air conditioning system operates in the current operating mode.

[0060] Furthermore, the control module 130 is further configured to determine whether there are at least two indoor units sending the starting instruction when there is no started indoor unit; and when there are at least two indoor units sending the starting instruction, determine the operating mode of the multi-split air conditioning system through a priority level rule or a majority rule according to the number of indoor units and set operating modes thereof.

[0061] When there is no started indoor unit, it is indicated that the multi-split air conditioning system is not in the operating state. It is determined whether there is one or more indoor units sending the starting instruction. When there is only one indoor unit sending the starting instruction, the operation of the multi-split air conditioning system is controlled based on the operating mode set by the starting instruction. When there are more than two indoor units sending the starting instruction, the operating mode of the multi-split air conditioning system is determined through a priority level rule or a majority rule based on set operating modes of respective indoor units.

[0062] For the operating mode of the multi-split air conditioning system is determined according to the priority level rule, reference may be made to the above. The majority rule refers to that, according to the number of indoor units

sending the same starting instruction and the same operating modes set by respective indoor units, the operating mode of the multi-split air conditioning system is determined by the operating mode set by most of the indoor units. For example, the indoor units sending the starting instruction include an indoor unit 1, an indoor unit 2 and an indoor unit 4, the operating mode set by the indoor unit 1 is the refrigerating mode, the operating mode set by the indoor unit 2 is the heating mode, and the operating mode set by the indoor unit 4 is the refrigerating mode, and then the final operating mode of the multi-split air conditioning system is the refrigerating mode according to the majority rule.

[0063] Furthermore, the control module 130 is further configured to, when receiving a mode switching instruction sent by the indoor unit, determine whether the indoor unit sending the mode switching instruction has the highest priority level; when the indoor unit sending the mode switching instruction does not have the highest priority level, forward the mode switching instruction to the indoor unit having the highest priority level, and switch the operating mode of the multi-split air conditioning system when receiving confirmation from the indoor unit having the highest priority level; and when the indoor unit sending the mode switching instruction has the highest priority level, switch the current operating mode of the multi-split air conditioning system according to the mode switching instruction.

[0064] After the operating mode of the multi-split air conditioning system is determined, the user may want to switch the current operating mode (for example, switch the refrigerating mode to the heating mode), after the indoor unit receives the mode switching instruction, the indoor unit can send it to the outdoor unit. The outdoor unit may first determine whether the indoor unit sending the mode switching instruction has the highest priority level. When the indoor unit sending the mode switching instruction has the highest priority level, the current operating mode of the multi-split air conditioning system is switched according to the mode switching instruction. When the indoor unit sending the mode switching instruction does not have the highest priority level, the mode switching instruction is forwarded to the indoor unit having the highest priority level to confirm. It should be noted that, the above comparison of the priority level is to compare the priority level of the indoor unit sending the mode switching instruction to that of the started indoor unit.

[0065] Furthermore, the control module 130 is further configured to stop operating of the indoor unit for a preset time period and then start the indoor unit again, when a current indoor temperature corresponding to the indoor unit reaches a target temperature.

[0066] After the operating mode of multi-split air conditioning system is determined, the indoor unit may further detect the current indoor temperature corresponding to the indoor unit. In the embodiment, the indoor temperature may be detected by a temperature sensor provided at a return air inlet of the indoor unit. When the indoor temperature corresponding to the indoor unit reaches the target temperature, the indoor unit is controlled to stop operating for a time period, and then the indoor unit is started again. After the indoor unit stops operating, the multi-split air conditioning system may obtain operating conditions of remaining indoor units to re-determine the operating mode of the multi-split air conditioning system.

[0067] Although explanatory embodiments have been shown and described, it would be appreciated that the above embodiments are exemplary and cannot be construed to limit the present invention, and changes, amendments, alternatives and modifications can be made in the embodiments by those skilled in the art without departing from the scope of the present invention which is solely defined by the appendend claims.

Claims

1. A method for controlling a multi-split air conditioning system, comprising:

acquiring (S110) an outdoor ambient temperature when receiving a starting instruction of an indoor unit;
determining (S120) whether the outdoor ambient temperature is within a preset temperature range; and
determining (S130) an operating mode of the multi-split air conditioning system according to operating conditions of respective started indoor units, when the outdoor ambient temperature is within the preset temperature range, the method being **characterised by** further comprising:
determining (S130) the operating mode of the multi-split air conditioning system according to the operating conditions of respective started indoor units when the outdoor ambient temperature is within the preset temperature range comprises:

determining (S131) whether there is a started indoor unit, when the outdoor ambient temperature is within the preset temperature range;
determining (S132) whether the indoor unit sending the starting instruction has a highest priority level, when there is the started indoor unit; and
determining (S133) the operating mode of the multi-split air conditioning system according to an operating mode set by the indoor unit sending the starting instruction when the indoor unit sending the starting instruction has the highest priority level, and determining the operating mode of the multi-split air conditioning

system according to the operating mode of the started indoor unit when the indoor unit sending the starting instruction does not have the highest priority level.

2. The method according to claim 1, wherein, after determining whether there is a started indoor unit when the outdoor ambient temperature is within the preset temperature range, the method further comprises:

determining (S134) whether there are at least two indoor units sending the starting instruction, when there is no started indoor unit; and
when there are at least two indoor units sending the starting instruction, determining (S135) the operating mode of the multi-split air conditioning system through a priority level rule or a majority rule according to the number of indoor units and set operating modes thereof.

3. The method according to claim 1, further comprising:

when receiving a mode switching instruction sent by the indoor unit, determining (S140) whether the indoor unit sending the mode switching instruction has the highest priority level;
when the indoor unit sending the mode switching instruction does not have the highest priority level, forwarding (S150) the mode switching instruction to the indoor unit having the highest priority level, and switching the operating mode of the multi-split air conditioning system when receiving confirmation from the indoor unit having the highest priority level; and
when the indoor unit sending the mode switching instruction has the highest priority level, switching (S160) the current operating mode of the multi-split air conditioning system according to the mode switching instruction.

4. The method according to any one of claims 1 to 3, further comprising:
stopping (S180) operating of the indoor unit for a preset time period and then starting the indoor unit again, when a current indoor temperature corresponding to the indoor unit reaches a target temperature.

5. The method according to claim 1, further comprising:

controlling the multi-split air conditioning system to operate in a heating mode when the outdoor ambient temperature is less than a lower limit of the preset temperature range; and
controlling the multi-split air conditioning system to operate in a cooling mode when the outdoor ambient temperature is greater than an upper limit of the preset temperature range.

6. A multi-split air conditioning system, comprising at least one outdoor unit (3) and at least two indoor units (6a, 6b), wherein the at least two indoor units and the at least one outdoor unit form a refrigerant cycle loop and communicate with each other, the outdoor unit comprises a controller configured to receive a control signal from the indoor unit and control the outdoor unit according to the control signal; the controller comprises:

a temperature acquiring module (110), configured to acquire (S110) an outdoor ambient temperature when receiving a starting instruction of the indoor unit;
a temperature determining module (120), configured to determine (S120) whether the outdoor ambient temperature is within a preset temperature range; and
a control module (130), configured to determine (S130) an operating mode of the multi-split air conditioning system according to operating conditions of respective started indoor units when the outdoor ambient temperature is within the preset temperature range, the multi-split air conditioning system being **characterised in that** the control module is further configured to:

determine (S131) whether there is a started indoor unit when the outdoor ambient temperature is within the preset temperature range;
determine (S132) whether the indoor unit sending the starting instruction has a highest priority level when there is the started indoor unit; and
determine (S133) the operating mode of the multi-split air conditioning system according to an operating mode set by the indoor unit sending the starting instruction when the indoor unit sending the starting instruction has the highest priority level, and determine the operating mode of the multi-split air conditioning system according to the operating mode of the started indoor unit when the indoor unit sending the starting instruction does not have the highest priority level.

7. The multi-split air conditioning system according to claim 6, wherein the control module is further configured to:

determine (S134) whether there are at least two indoor units sending the starting instruction when there is no started indoor unit; and
when there are at least two indoor units sending the starting instruction, determine (S135) the operating mode of the multi-split air conditioning system through a priority level rule or a majority rule according to the number of indoor units and set operating modes thereof.

8. The multi-split air conditioning system according to claim 6, wherein the control module is further configured to:

when receiving a mode switching instruction sent by the indoor unit, determine (S140) whether the indoor unit sending the mode switching instruction has the highest priority level;
when the indoor unit sending the mode switching instruction does not have the highest priority level, forward (S150) the mode switching instruction to the indoor unit having the highest priority level, and switch the operating mode of the multi-split air conditioning system when receiving confirmation from the indoor unit having the highest priority level; and
when the indoor unit sending the mode switching instruction has the highest priority level, switch (160) the current operating mode of the multi-split air conditioning system according to the mode switching instruction.

9. The multi-split air conditioning system according to any one of claims 6 to 8, wherein the control module is further configured to:
stop (S180) operating of the indoor unit for a preset time period and then start the indoor unit again, when a current indoor temperature corresponding to the indoor unit reaches a target temperature.

10. The multi-split air conditioning system according to claim 6, wherein the control module is further configured to:

control the multi-split air conditioning system to operate in a heating mode when the outdoor ambient temperature is less than a lower limit of the preset temperature range; and
control the multi-split air conditioning system to operate in a cooling mode when the outdoor ambient temperature is greater than a upper limit of the preset temperature range.

Patentansprüche

1. Verfahren zum Steuern einer Multisplit-Klimaanlage, umfassend:

Erfassen (S110) einer Außenumgebungstemperatur, wenn eine Einschaltanweisung einer Inneneinheit empfangen wird;
Bestimmen (S120), ob die Außenumgebungstemperatur innerhalb eines voreingestellten Temperaturbereichs liegt; und
Bestimmen (S130) eines Betriebsmodus der Multisplit-Klimaanlage gemäß Betriebsbedingungen jeweiliger eingeschalteter Inneneinheiten, wenn die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt, wobei das Verfahren **dadurch gekennzeichnet ist, dass** es ferner Folgendes umfasst:
dass das Bestimmen (S130) des Betriebsmodus der Multisplit-Klimaanlage gemäß den Betriebsbedingungen jeweiliger eingeschalteter Inneneinheiten, wenn die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt, Folgendes umfasst:

Bestimmen (S131), ob eine eingeschaltete Inneneinheit vorhanden ist, wenn die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt;
Bestimmen (S132), ob die die Einschaltanweisung sendende Inneneinheit eine höchste Prioritätsstufe aufweist, wenn die eingeschaltete Inneneinheit vorhanden ist; und
Bestimmen (S133) des Betriebsmodus der Multisplit-Klimaanlage gemäß einem von der die Einschaltanweisung sendenden Inneneinheit eingestellten Betriebsmodus, wenn die die Einschaltanweisung sendende Inneneinheit die höchste Prioritätsstufe aufweist, und Bestimmen des Betriebsmodus der Multisplit-Klimaanlage gemäß dem Betriebsmodus der eingeschalteten Inneneinheit, wen die die Einschaltanweisung sendende Inneneinheit nicht die höchste Prioritätsstufe aufweist.

2. Verfahren nach Anspruch 1, wobei nach dem Bestimmen, ob eine eingeschaltete Inneneinheit vorhanden ist, wenn

die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt, das Verfahren ferner Folgendes umfasst:

Bestimmen (S134), ob mindestens zwei die Einschaltanweisung sendende Inneneinheiten vorhanden sind, wenn keine eingeschaltete Inneneinheit vorhanden ist; und
wenn mindestens zwei die Einschaltanweisung sendende Inneneinheiten vorhanden sind, Bestimmen (S135) des Betriebsmodus der Multisplit-Klimaanlage durch eine Prioritätsstufenregel oder eine Mehrheitsregel gemäß der Anzahl von Inneneinheiten und deren eingestellter Betriebsmodi.

3. Verfahren nach Anspruch 1, ferner umfassend:

wenn eine von der Inneneinheit gesendete Moduswechselanweisung empfangen wird, Bestimmen (S140), ob die die Moduswechselanweisung sendende Inneneinheit die höchste Prioritätsstufe aufweist;
wenn die die Moduswechselanweisung sendende Inneneinheit nicht die höchste Prioritätsstufe aufweist, Weiterleiten (S150) der Moduswechselanweisung an die die höchste Prioritätsstufe aufweisende Inneneinheit und Wechseln des Betriebsmodus der Multisplit-Klimaanlage, wenn eine Bestätigung von der die höchste Prioritätsstufe aufweisenden Inneneinheit empfangen wird; und
wenn die die Moduswechselanweisung sendende Inneinheit die höchste Prioritätsstufe aufweist, Wechseln (S160) des aktuellen Betriebsmodus der Multisplit-Klimaanlage gemäß der Moduswechselanweisung.

4. Verfahren nach einem der Ansprüche 1 bis 3, ferner umfassend:
Abbrechen (S180) des Betriebs der Inneneinheit für einen voreingestellten Zeitraum und dann Wiedereinschalten der Inneneinheit, wenn eine der Inneneinheit entsprechende aktuelle Innentemperatur eine Solltemperatur erreicht.

5. Verfahren nach Anspruch 1, ferner umfassend:

Steuern der Multisplit-Klimaanlage, um in einem Heizmodus zu arbeiten, wenn die Außenumgebungstemperatur niedriger als eine untere Grenze des voreingestellten Temperaturbereichs ist; und
Steuern der Multisplit-Klimaanlage, um in einem Kühlmodus zu arbeiten, wenn die Außenumgebungstemperatur höher als eine obere Grenze des voreingestellten Temperaturbereichs ist.

6. Multisplit-Klimaanlage, umfassend mindestens eine Außeneinheit (3) und mindestens zwei Inneneinheiten (6a, 6b), wobei die mindestens zwei Inneneinheiten und die mindestens eine Außeneinheit eine Kältemittelkreislaufschleife bilden und miteinander in Verbindung stehen, wobei die Außeneinheit eine Steuereinheit umfasst, die dazu konfiguriert ist, ein Steuersignal von der Inneneinheit zu empfangen und die Außeneinheit gemäß dem Steuersignal zu steuern; wobei die Steuereinheit Folgendes umfasst:

ein Temperaturerfassungsmodul (110), das dazu konfiguriert ist, eine Außenumgebungstemperatur zu erfassen (S110), wenn es eine Einschaltanweisung der Inneneinheit empfängt;
ein Temperaturbestimmungsmodul (120), das dazu konfiguriert ist, zu bestimmen (S120), ob die Außenumgebungstemperatur innerhalb eines voreingestellten Temperaturbereichs liegt; und
ein Steuermodul (130), das dazu konfiguriert ist, einen Betriebsmodus der Multisplit-Klimaanlage gemäß Betriebsbedingungen jeweiliger eingeschalteter Inneneinheiten zu bestimmen (S130), wenn die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt, wobei die Multisplit-Klimaanlage **dadurch gekennzeichnet ist, dass** das Steuermodul ferner dazu konfiguriert ist:

zu bestimmen (S131), ob eine eingeschaltete Inneneinheit vorhanden ist, wenn die Außenumgebungstemperatur innerhalb des voreingestellten Temperaturbereichs liegt;
zu bestimmen (S132), ob die die Einschaltanweisung sendende Inneneinheit eine höchste Prioritätsstufe aufweist, wenn die eingeschaltete Inneneinheit vorhanden ist; und
den Betriebsmodus der Multisplit-Klimaanlage gemäß einem von der die Einschaltanweisung sendenden Inneneinheit eingestellten Betriebsmodus zu bestimmen (S133), wenn die die Einschaltanweisung sendende Inneneinheit die höchste Prioritätsstufe aufweist, und den Betriebsmodus der Multisplit-Klimaanlage gemäß dem Betriebsmodus der eingeschalteten Inneneinheit zu bestimmen, wenn die die Einschaltanweisung sendende Inneneinheit nicht die höchste Prioritätsstufe aufweist.

7. Multisplit-Klimaanlage nach Anspruch 6, wobei das Steuermodul ferner dazu konfiguriert ist:

zu bestimmen (S 134), ob mindestens zwei die Einschaltanweisung sendende Inneneinheiten vorhanden sind, wenn keine eingeschaltete Inneneinheit vorhanden ist; und
wenn mindestens zwei die Einschaltanweisung sendende Inneneinheiten vorhanden sind, den Betriebsmodus der Multisplit-Klimaanlage durch eine Prioritätsstufenregel oder eine Mehrheitsregel gemäß der Anzahl von Inneneinheiten und deren eingestellter Betriebsmodi zu bestimmen (S135).

8. Multisplit-Klimaanlage nach Anspruch 6, wobei das Steuermodul ferner dazu konfiguriert ist:

wenn es eine von der Inneneinheit gesendete Moduswechselanweisung empfängt, zu bestimmen (S 140), ob die die Moduswechselanweisung sendende Inneneinheit die höchste Prioritätsstufe aufweist;
wenn die die Moduswechselanweisung sendende Inneneinheit nicht die höchste Prioritätsstufe aufweist, die Moduswechselanweisung an die die höchste Prioritätsstufe aufweisende Inneneinheit weiterzuleiten (S150) und den Betriebsmodus der Multisplit-Klimaanlage zu wechseln, wenn es eine Bestätigung von der die höchste Prioritätsstufe aufweisenden Inneneinheit empfängt; und
wenn die die Moduswechselanweisung sendende Inneinheit die höchste Prioritätsstufe aufweist, den aktuellen Betriebsmodus der Multisplit-Klimaanlage gemäß der Moduswechselanweisung zu wechseln (160).

9. Multisplit-Klimaanlage nach einem der Ansprüche 6 bis 8, wobei das Steuermodul ferner dazu konfiguriert ist:
den Betrieb der Inneneinheit für einen voreingestellten Zeitraum abzubrechen (S180) und dann die Inneneinheit wiedereinzuschalten, wenn eine der Inneneinheit entsprechende aktuelle Innentemperatur eine Solltemperatur erreicht.

10. Multisplit-Klimaanlage nach Anspruch 6, wobei das Steuermodul ferner dazu konfiguriert ist:

die Multisplit-Klimaanlage zu steuern, um in einem Heizmodus zu arbeiten, wenn die Außenumgebungstemperatur geringer als eine untere Grenze des voreingestellten Temperaturbereichs ist; und
die Multisplit-Klimaanlage zu steuern, um in einem Kühlmodus zu arbeiten, wenn die Außenumgebungstemperatur höher als eine obere Grenze des voreingestellten Temperaturbereichs ist.

Revendications

1. Procédé servant à commander un système de conditionnement d'air à multiples blocs, comportant les étapes consistant à :

acquérir (S110) une température ambiante extérieure lors de la réception d'une instruction de démarrage d'une unité intérieure ;
déterminer (S 120) si la température ambiante extérieure se trouve dans les limites d'une plage de température prédéfinie ; et
déterminer (S130) un mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction de conditions de fonctionnement d'unités intérieures démarrées respectives, quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie, le procédé étant **caractérisé en ce que** :
l'étape consistant à déterminer (S130) le mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction des conditions de fonctionnement d'unités intérieures démarrées respectives quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie comporte les étapes consistant à :

déterminer (S131) s'il y a une unité intérieure démarrée, quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie ;
déterminer (S132) si l'unité intérieure qui envoie l'instruction de démarrage a un niveau de priorité le plus élevé, quand il y a l'unité intérieure démarrée ; et
déterminer (S133) le mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction d'un mode de fonctionnement défini par l'unité intérieure qui envoie l'instruction de démarrage quand l'unité intérieure qui envoie l'instruction de démarrage a le niveau de priorité le plus élevé, et déterminer le mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction du mode de fonctionnement de l'unité intérieure démarrée quand l'unité intérieure qui envoie l'instruction de démarrage n'a pas le niveau de priorité le plus élevé.

2. Procédé selon la revendication 1, dans lequel, après avoir déterminé s'il y a une unité intérieure démarrée quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie, le procédé comporte par ailleurs les étapes consistant à :

déterminer (S134) s'il y a au moins deux unités intérieures qui envoient l'instruction de démarrage, quand il n'y a pas d'unité intérieure démarrée ; et
quand il y a au moins deux unités intérieures qui envoient l'instruction de démarrage, déterminer (S135) le mode de fonctionnement du système de conditionnement d'air à multiples blocs par le biais d'une règle de niveau de priorité ou d'une règle de majorité en fonction du nombre d'unités intérieures et des modes de fonctionnement définis de celles-ci.

3. Procédé selon la revendication 1, comportant par ailleurs les étapes consistant à :

lors de la réception d'une instruction de commutation de mode envoyée par l'unité intérieure, déterminer (S140) si l'unité intérieure qui envoie l'instruction de commutation de mode a le niveau de priorité le plus élevé ;
quand l'unité intérieure qui envoie l'instruction de commutation de mode n'a pas le niveau de priorité le plus élevé, acheminer (S150) l'instruction de commutation de mode à l'unité intérieure qui a le niveau de priorité le plus élevé, et commuter le mode de fonctionnement du système de conditionnement d'air à multiples blocs lors de la réception de la confirmation en provenance de l'unité intérieure qui a le niveau de priorité le plus élevé ; et
quand l'unité intérieure qui envoie l'instruction de commutation de mode a le niveau de priorité le plus élevé, commuter (S160) le mode de fonctionnement en cours du système de conditionnement d'air à multiples blocs en fonction de l'instruction de commutation de mode.

4. Procédé selon l'une quelconque des revendications 1 à 3, comportant par ailleurs les étapes consistant à :
arrêter (S180) le fonctionnement de l'unité intérieure pendant une période de temps prédéfinie, et puis redémarrer l'unité intérieure, quand une température intérieure en cours correspondant à l'unité intérieure atteint une température cible.

5. Procédé selon la revendication 1, comportant par ailleurs les étapes consistant à :

commander le système de conditionnement d'air à multiples blocs pour qu'il fonctionne dans un mode de chauffage quand la température ambiante extérieure est inférieure à une limite inférieure de la plage de température prédéfinie ; et
commander le système de conditionnement d'air à multiples blocs pour qu'il fonctionne dans un mode de refroidissement quand la température ambiante extérieure est supérieure à une limite supérieure de la plage de température prédéfinie.

6. Système de conditionnement d'air à multiples blocs, comportant au moins une unité extérieure (3) et au moins deux unités intérieures (6a, 6b), dans lequel lesdites au moins deux unités intérieures et ladite au moins une unité extérieure forment une boucle de cycle de fluide frigorigène et communiquent les unes avec les autres, l'unité extérieure comporte un dispositif de commande configuré pour recevoir un signal de commande en provenance de l'unité intérieure et pour commander l'unité extérieure en fonction du signal de commande ; le dispositif de commande comporte :

un module d'acquisition de température (110), configuré pour acquérir (S110) une température ambiante extérieure lors de la réception d'une instruction de démarrage de l'unité intérieure ;
un module de détermination de température (120), configuré pour déterminer (S 120) si la température ambiante extérieure se trouve dans les limites d'une plage de température prédéfinie ; et
un module de commande (130), configuré pour déterminer (S130) un mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction de conditions de fonctionnement d'unités intérieures démarrées respectives quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie, le système de conditionnement d'air à multiples blocs étant **caractérisé en ce que** le module de commande est par ailleurs configuré pour :

déterminer (S131) s'il y a une unité intérieure démarrée quand la température ambiante extérieure se trouve dans les limites de la plage de température prédéfinie ;
déterminer (S132) si l'unité intérieure qui envoie l'instruction de démarrage a un niveau de priorité le plus élevé quand il y a l'unité intérieure démarrée ; et

déterminer (S133) le mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction d'un mode de fonctionnement défini par l'unité intérieure qui envoie l'instruction de démarrage quand l'unité intérieure qui envoie l'instruction de démarrage a le niveau de priorité le plus élevé, et déterminer le mode de fonctionnement du système de conditionnement d'air à multiples blocs en fonction du mode de fonctionnement de l'unité intérieure démarrée quand l'unité intérieure qui envoie l'instruction de démarrage n'a pas le niveau de priorité le plus élevé.

7. Système de conditionnement d'air à multiples blocs selon la revendication 6, dans lequel le module de commande est par ailleurs configuré pour :

déterminer (S134) s'il y a au moins deux unités intérieures qui envoient l'instruction de démarrage quand il n'y a pas d'unité intérieure démarrée ; et
quand il y a au moins deux unités intérieures qui envoient l'instruction de démarrage, déterminer (S135) le mode de fonctionnement du système de conditionnement d'air à multiples blocs par le biais d'une règle de niveau de priorité ou d'une règle de majorité en fonction du nombre d'unités intérieures et des modes de fonctionnement définis de celles-ci.

8. Système de conditionnement d'air à multiples blocs selon la revendication 6, dans lequel le module de commande est par ailleurs configuré pour :

lors de la réception d'une instruction de commutation de mode envoyée par l'unité intérieure, déterminer (S140) si l'unité intérieure qui envoie l'instruction de commutation de mode a le niveau de priorité le plus élevé ;
quand l'unité intérieure qui envoie l'instruction de commutation de mode n'a pas le niveau de priorité le plus élevé, acheminer (S150) l'instruction de commutation de mode à l'unité intérieure qui a le niveau de priorité le plus élevé, et commuter le mode de fonctionnement du système de conditionnement d'air à multiples blocs lors de la réception de la confirmation en provenance de l'unité intérieure qui a le niveau de priorité le plus élevé ; et
quand l'unité intérieure qui envoie l'instruction de commutation de mode a le niveau de priorité le plus élevé, commuter (160) le mode de fonctionnement en cours du système de conditionnement d'air à multiples blocs en fonction de l'instruction de commutation de mode.

9. Système de conditionnement d'air à multiples blocs selon l'une quelconque des revendications 6 à 8, dans lequel le module de commande est par ailleurs configuré pour :
arrêter (S180) le fonctionnement de l'unité intérieure pendant une période de temps prédéfinie, et puis redémarrer l'unité intérieure, quand une température intérieure en cours correspondant à l'unité intérieure atteint une température cible.

10. Système de conditionnement d'air à multiples blocs selon la revendication 6, dans lequel le module de commande est par ailleurs configuré pour :

commander le système de conditionnement d'air à multiples blocs pour qu'il fonctionne dans un mode de chauffage quand la température ambiante extérieure est inférieure à une limite inférieure de la plage de température prédéfinie ; et
commander le système de conditionnement d'air à multiples blocs pour qu'il fonctionne dans un mode de refroidissement quand la température ambiante extérieure est supérieure à une limite supérieure de la plage de température prédéfinie.

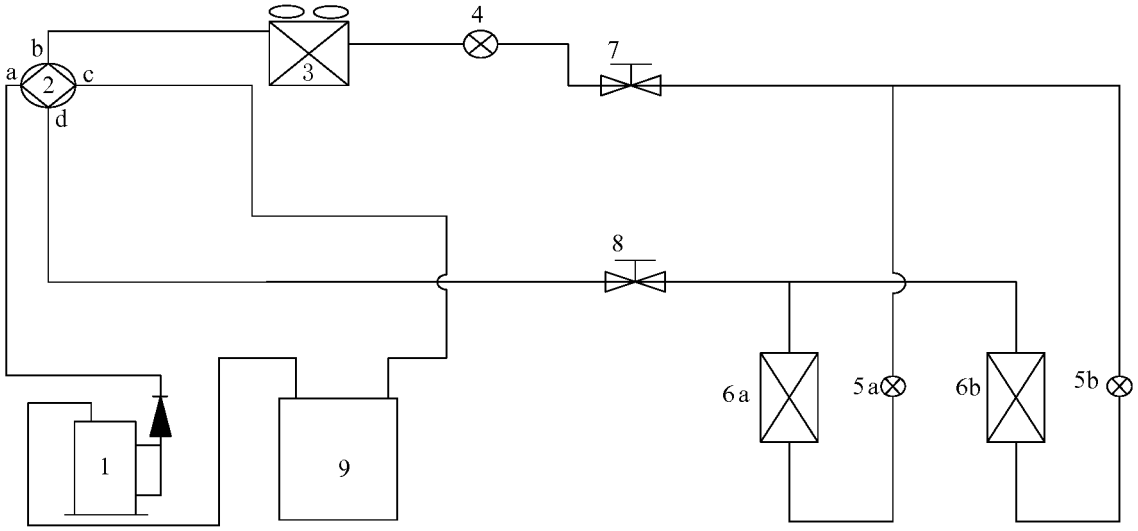
4
b
a
2
c
3
7
d
8
6a
5a
6b
5b
1
9

Fig. 1

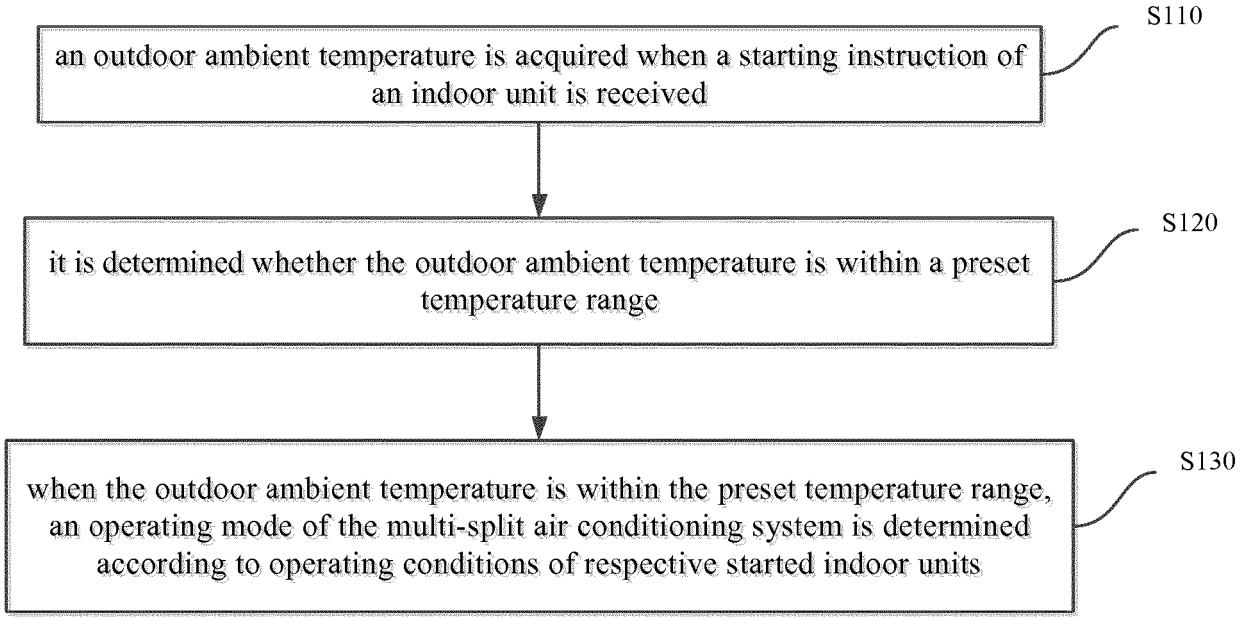
S110
an outdoor ambient temperature is acquired when a starting instruction of an indoor unit is received
S120
it is determined whether the outdoor ambient temperature is within a preset temperature range
S130
when the outdoor ambient temperature is within the preset temperature range, an operating mode of the multi-split air conditioning system is determined according to operating conditions of respective started indoor units

Fig. 2

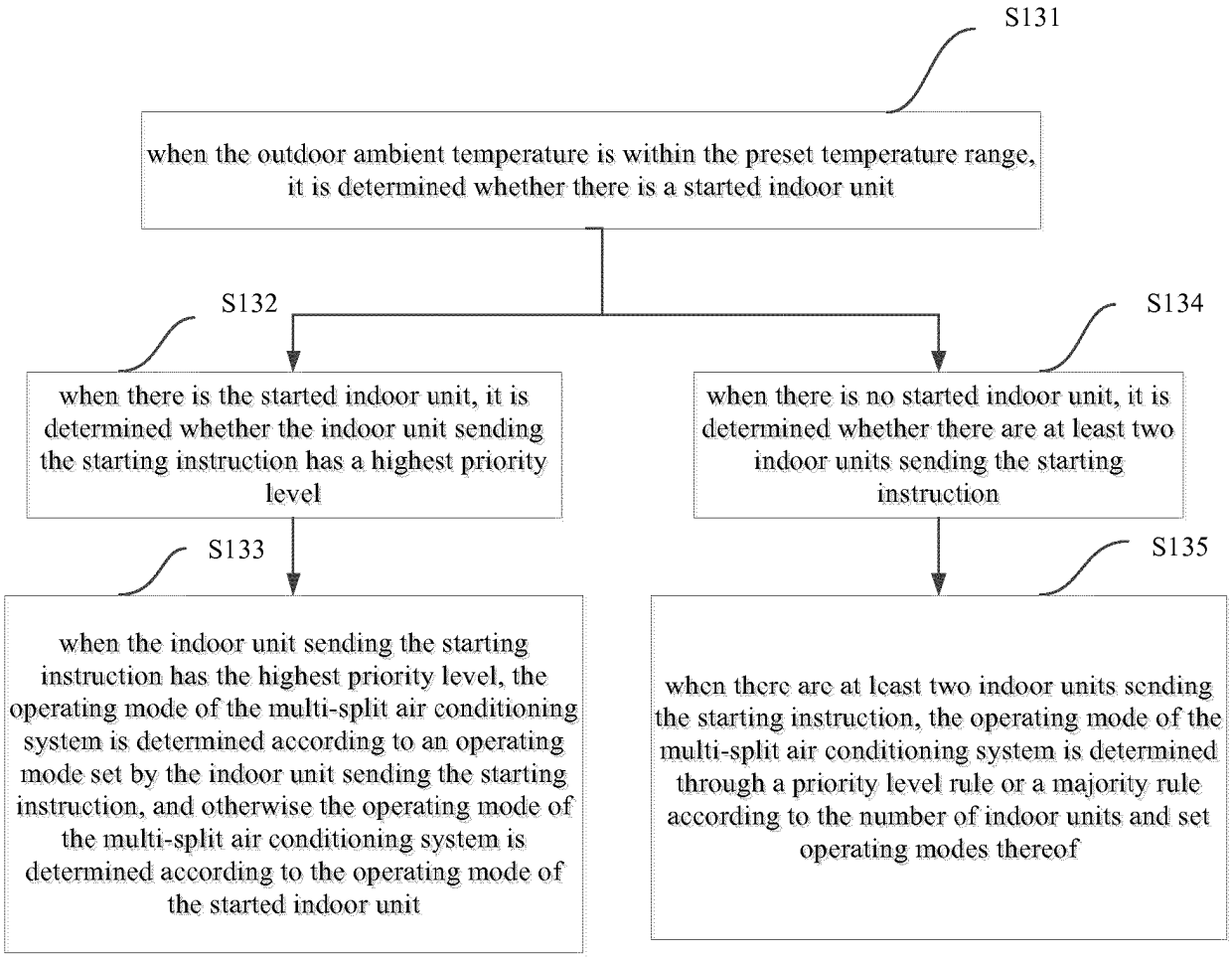
S131
when the outdoor ambient temperature is within the preset temperature range, it is determined whether there is a started indoor unit
S132
when there is the started indoor unit, it is determined whether the indoor unit sending the starting instruction has a highest priority level
S133
when the indoor unit sending the starting instruction has the highest priority level, the operating mode of the multi-split air conditioning system is determined according to an operating mode set by the indoor unit sending the starting instruction, and otherwise the operating mode of the multi-split air conditioning system is determined according to the operating mode of the started indoor unit
S134
when there is no started indoor unit, it is determined whether there are at least two indoor units sending the starting instruction
S135
when there are at least two indoor units sending the starting instruction, the operating mode of the multi-split air conditioning system is determined through a priority level rule or a majority rule according to the number of indoor units and set operating modes thereof

Fig. 3

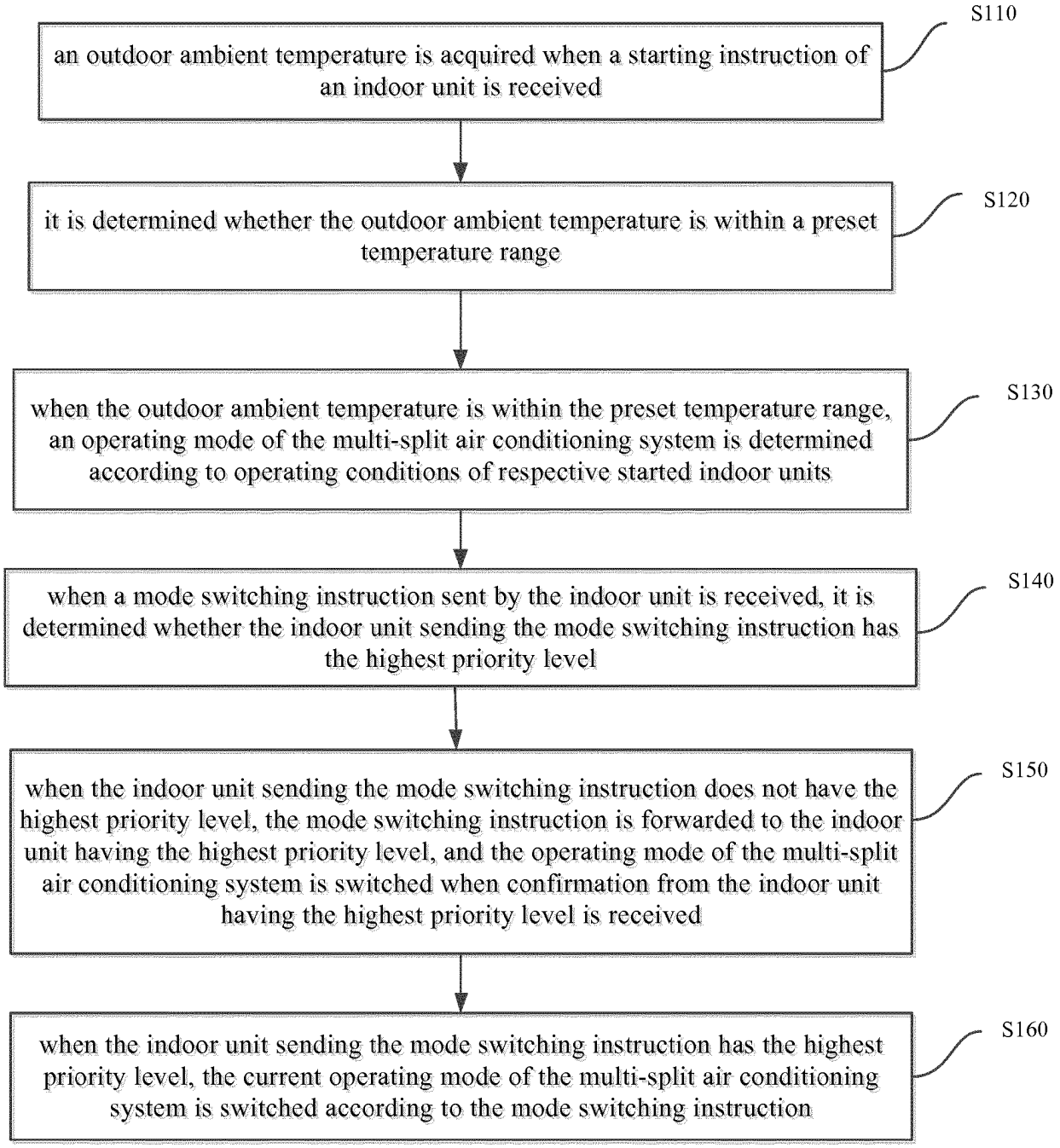
S110
an outdoor ambient temperature is acquired when a starting instruction of an indoor unit is received
S120
it is determined whether the outdoor ambient temperature is within a preset temperature range
S130
when the outdoor ambient temperature is within the preset temperature range, an operating mode of the multi-split air conditioning system is determined according to operating conditions of respective started indoor units
S140
when a mode switching instruction sent by the indoor unit is received, it is determined whether the indoor unit sending the mode switching instruction has the highest priority level
S150
when the indoor unit sending the mode switching instruction does not have the highest priority level, the mode switching instruction is forwarded to the indoor unit having the highest priority level, and the operating mode of the multi-split air conditioning system is switched when confirmation from the indoor unit having the highest priority level is received
S160
when the indoor unit sending the mode switching instruction has the highest priority level, the current operating mode of the multi-split air conditioning system is switched according to the mode switching instruction

Fig. 4

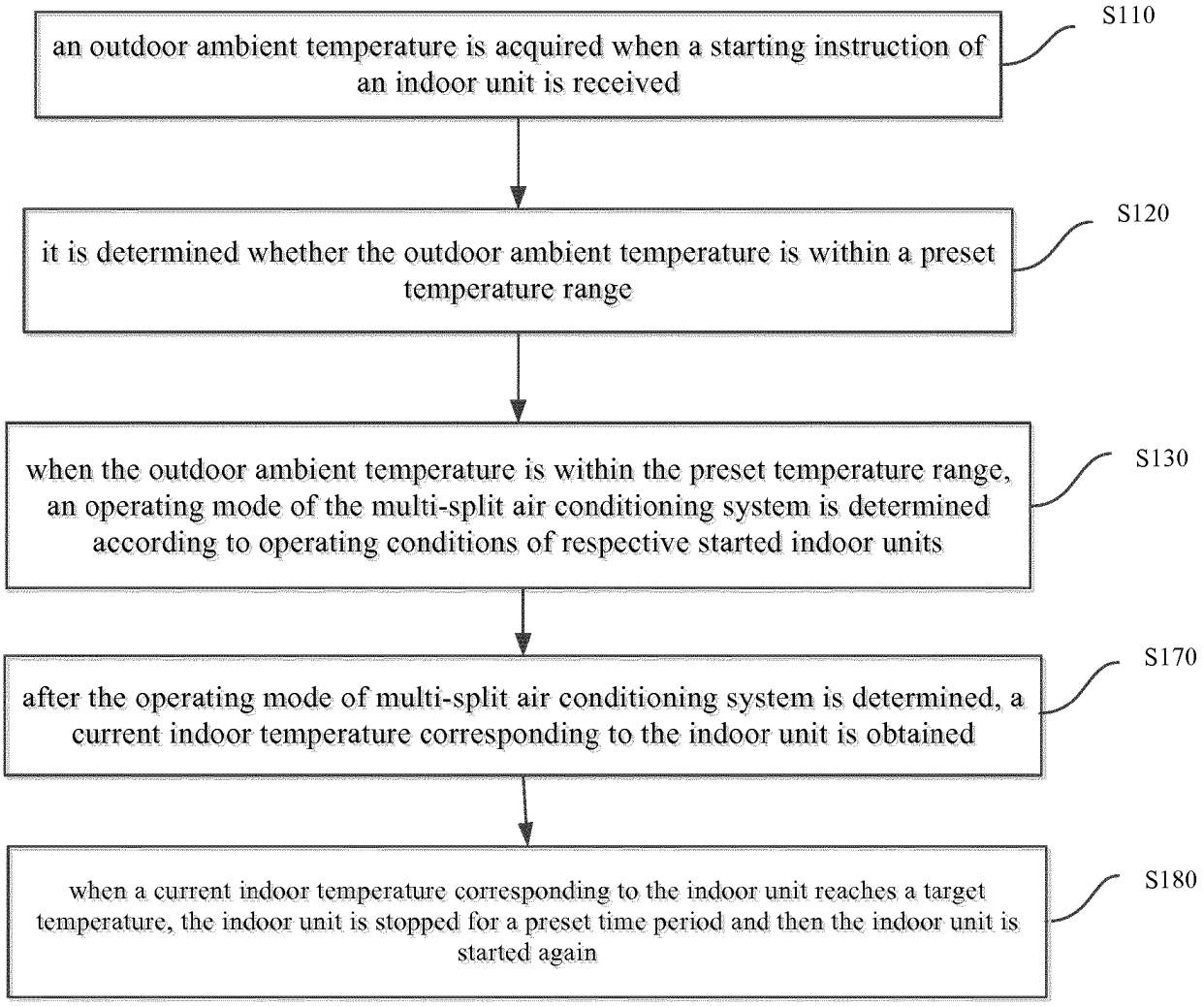
an outdoor ambient temperature is acquired when a starting instruction of an indoor unit is received
S110
it is determined whether the outdoor ambient temperature is within a preset temperature range
S120
when the outdoor ambient temperature is within the preset temperature range, an operating mode of the multi-split air conditioning system is determined according to operating conditions of respective started indoor units
S130
after the operating mode of multi-split air conditioning system is determined, a current indoor temperature corresponding to the indoor unit is obtained
S170
when a current indoor temperature corresponding to the indoor unit reaches a target temperature, the indoor unit is stopped for a preset time period and then the indoor unit is started again
S180

Fig. 5

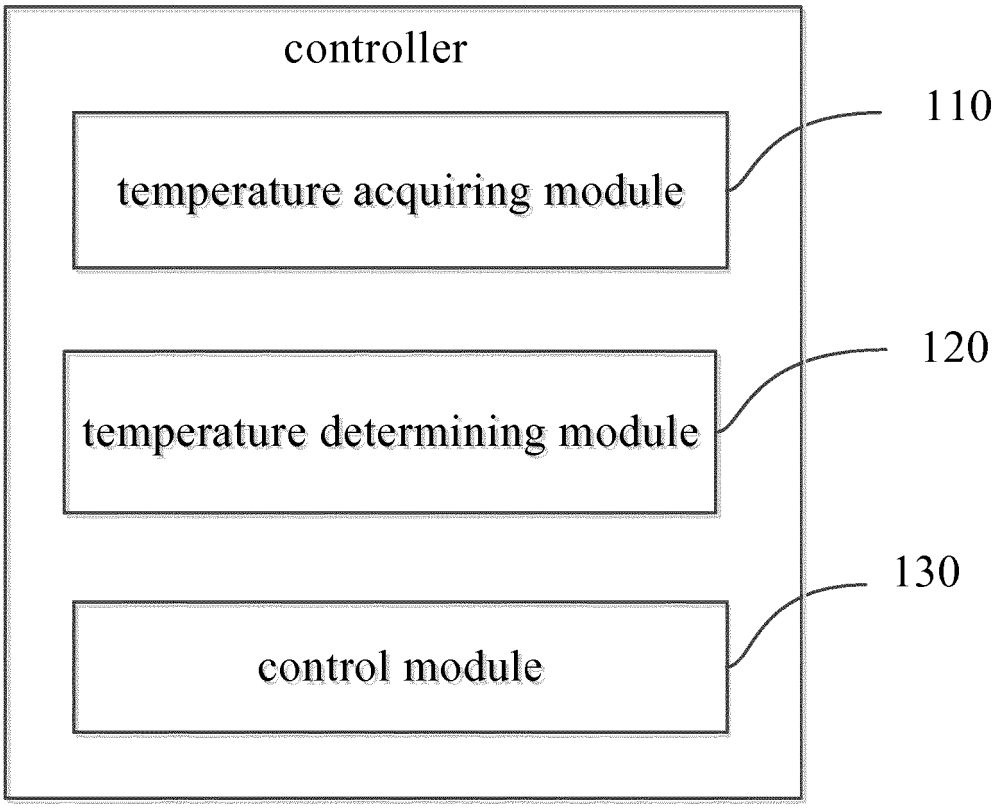
controller
temperature acquiring module
110
temperature determining module
120
control module
130

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 3021060 A1 **[0003]**