



EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
28.07.2021 Bulletin 2021/30

(21) Application number: **19862878.6**

(22) Date of filing: **18.09.2019**

(51) Int Cl.:
F24F 1/0014 ^(2019.01) **F24F 11/61** ^(2018.01)
F24F 11/63 ^(2018.01) **F24F 11/64** ^(2018.01)
F24F 11/65 ^(2018.01) **F24F 11/74** ^(2018.01)
F24F 13/14 ^(2006.01)

(86) International application number:
PCT/CN2019/106362

(87) International publication number:
WO 2020/057532 (26.03.2020 Gazette 2020/13)

(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
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **18.09.2018 CN 201811084955**

(71) Applicant: **Qingdao Hisense Hitachi Air-Conditioning Systems Co. Ltd.**
Qingdao, Shandong 266555 (CN)

(72) Inventors:
• **ZHANG, Jixue**
Qingdao, Shandong 266510 (CN)
• **WANG, Xinglong**
Qingdao, Shandong 266510 (CN)
• **CHU, Jingjing**
Qingdao, Shandong 266510 (CN)

(74) Representative: **Casalonga**
Casalonga & Partners
Bayerstraße 71/73
80335 München (DE)

(54) **AIR CONDITIONER AND CONTROL METHOD THEREFOR**

(57) The present application provides an air conditioner and a control method thereof. The air conditioner includes an indoor unit having a first air outlet. First swing louvers capable of controlling an opening-closing range of the first air outlet are disposed at the first air outlet. A controller including a memory and a processor is disposed in the indoor unit. The memory stores a computer program, and when the program is executed by the processor, a following step is able to be implemented: when the indoor unit is powered on, the first swing louvers operate to be in a fully open state to reset, and then operate to be in a fully closed state. The control method of the air conditioner is capable of executing the above program. A deviation between an actual swing and a required swing of swing louvers due to changes in initial positions of the swing louvers when the air conditioner is turned on is avoided.

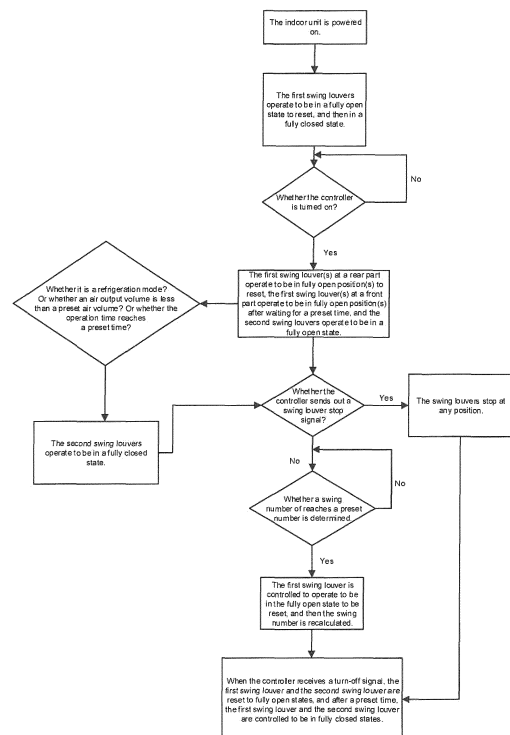


FIG. 1

Description

[0001] This application claims priority to Chinese Patent Application No. 201811084955.4, filed with the Chinese Patent Office on September 18, 2018, titled "AIR CONDITIONER AND CONTROL METHOD OF AIR CONDITIONER", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present application relates to the field of air conditioners, and in particular, to a control method of an air conditioner.

BACKGROUND

[0003] With the improvement of people's living standard, air conditioners become increasingly desirable household appliances for people. An indoor unit of an air conditioner is generally provided with swing louvers. However, since the swing louvers of the indoor unit are generally within the reach of a user, the swing louvers are likely to be moved manually by the user. If the user turns on the indoor unit after the swing louvers are moved, it is easy to cause a problem of inconsistent swings of the swing louvers.

[0004] Chinese invention patent CN104964391 B discloses a control method of a swing louver of an air conditioner and the air conditioner. The air conditioner has a first air outlet and a second air outlet, and the control method of the swing louver of the air conditioner includes a refrigeration control mode. The refrigeration control mode includes steps that before or when the air conditioner is turned on, swing louvers at the first air outlet of the air conditioner are controlled to be incline downward to form a first angle with the horizontal plane in a refrigeration mode, and swing louvers at the second air outlet of the air conditioner are controlled to be incline upward to form a second angle with the horizontal plane in the refrigeration mode, so that cold air from the first air outlet and the second air outlet can be blown downward and upward respectively when the air conditioner is in a turn-on state. The control method of the swing louver of the air conditioner may make the temperature of the room drop relatively uniformly during the refrigeration mode.

[0005] In the above air conditioner, by adjusting initial positions of the swing louvers at the first air outlet and the second air outlet, a blowing air temperature in the refrigeration mode is controlled to be more uniform. However, in this way, when initial positions of the swing louvers are changed, control angles of the swing louvers cannot be guaranteed to form a preset included angle with the horizontal plane, which makes the technical effect unachievable.

SUMMARY

[0006] In order to solve the above problem, the present application provides an air conditioner and a control method of the air conditioner, which avoids a deviation between an actual swing and a required swing of swing louvers due to changes in initial positions of the swing louvers when the air conditioner is turned on.

[0007] In order to achieve the above purpose, a technical solution adopted in the present application is as follows.

[0008] An air conditioner includes an indoor unit having a first air outlet. First swing louvers capable of controlling an opening-closing range of the first air outlet are disposed at the first air outlet, when the first swing louvers close the first air outlet, the first swing louvers are in a fully closed state, and when the first swing louvers are opened to enable the first air outlet to reach a maximum air output volume, the first swing louvers are in a fully open state. A controller is disposed in the indoor unit, and the controller includes a memory and a processor. The memory stores a computer program, and when the program is executed by the processor, a following step is able to be implemented in such way that: when the indoor unit is powered on, the first swing louvers operate to be in the fully open state to be reset, and then operate to be in the fully closed state.

[0009] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-off signal, the first swing louvers are reset to be in the fully open state, and operate to be in the fully closed state after a preset time.

[0010] In some embodiments of the present application, the first swing louver includes a plurality of first swing louvers arranged in a front-rear order. First swing louver(s) at a rear part are stacked on first swing louver(s) at a front part when the first swing louvers are in the fully closed state; and when the program in the memory is executed by the processor, a following step is able to be implemented in such way that when the controller receives a turn-on signal, the first swing louver(s) at the rear part operate to be in fully open position(s) to be reset, and the first swing louver(s) at the front part operate to be in the fully open position(s) to be reset after waiting for a preset time.

[0011] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a swing signal, the first swing louvers swing according to an instruction from the controller; and it is determined that whether a swing number of the first swing louvers reaches a preset number, if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset.

[0012] In some embodiments of the present application, a second air outlet is disposed on the indoor unit, and second swing louvers capable of controlling an opening-closing range of the first air outlet are disposed in the second air outlet. When the second swing louvers close the second air outlet, the second swing louvers are in a fully closed state, and when the second swing louvers are opened to enable the second air outlet to reach a maximum air output volume, the second swing louvers are in a fully open state. When the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-on signal, the second swing louvers operate to be in the fully open state.

[0013] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the air conditioner operates in a refrigeration mode, the second swing louvers operate to be in the fully closed state.

[0014] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when an air output of the air conditioner is less than a preset air output volume, the second swing louvers operate to be in the fully closed state.

[0015] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the air conditioner operates for a preset time, the second swing louvers operate to be in the fully closed state.

[0016] In some embodiments of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented: when the controller receives a turn-off signal, the second swing louvers operate to be in the fully closed state.

[0017] A control method of an air conditioner, includes following steps in such ways that:

when an indoor unit is powered on, first swing louvers operate to be in a fully open state to be reset, and then operate to be in a fully closed state;

when a controller of the indoor unit is turned on, swing louver(s) at a rear part in the first swing louvers operate to be in fully open position(s) to be reset, swing louver(s) at a front part in the first swing louvers operate to be in fully open position(s) after waiting for a preset time, and second swing louvers operate to be in a fully open state;

when the indoor unit controls the swing louvers to swing, it is determined that whether a swing number of the first swing louvers reaches a preset number, if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset;

when the indoor unit controls the swing louvers to

stop swinging, the swing louvers stop at current positions to which they are operating;

when the indoor unit operates in a refrigeration mode, or when an air output volume of the indoor unit is less than a preset air output volume, or when the indoor unit operates for a preset time, the second swing louvers operate to be in a fully closed state; and

when the controller of the indoor unit is turned off, the swing louvers are reset to fully open state(s), and operate to be in fully closed state(s) after a preset time.

[0018] The positive effect of the present application is that:

in the air conditioner and the control method of the air conditioner of the present application, the swing louvers are first fully opened to reset when the air conditioner is powered on, and then the swing louvers are controlled to be fully closed, so that the swing louvers are in a fully-closed initial state after the air conditioner is powered on, which avoids a deviation between an actual swing and a required swing of the swing louvers due to changes in initial positions of the swing louvers when the air conditioner is turned on.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In order to explain the technical solutions in embodiments of the present application or the prior art more clearly, the accompanying drawings used in the description of the embodiments or the prior art will be introduced briefly. Obviously, the accompanying drawings to be described below are merely some embodiments of the application, and a person of ordinary skill in the art may obtain other drawings according to those drawings without paying any creative effort.

[0020] FIG. 1 is a flow chart of a control method of an air conditioner, in accordance with the present application.

DETAILED DESCRIPTION

[0021] In the following, the present application will be described in detail through exemplary embodiments. However, it will be understood that without further description, elements, structures and features in one embodiment may also be beneficially combined with other embodiments.

[0022] In the description of the present application, it will be understood that orientations or positional relationships indicated by terms "center", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer" and the like are based on orientations or positional relationships shown in the drawings, which are used merely for convenience of description and simplifying the description of the present application, but not to indicate or imply that the referred de-

vices or elements must have a specific orientation, or be constructed and operated in a particular orientation. Therefore, these terms should not be construed as limitations to the present application.

[0023] Terms "first" and "second" are merely used for a purpose of description and should not be construed as indicating or implying the relative importance, or implicitly indicating the number of referred technical features. Thus, features defined by "first" and "second" may explicitly or implicitly include one or more of the features.

[0024] In the description of the present application, it will be noted that term "installation", "communication", or "connection" is to be understood broadly. For example, it may be a fixed connection, a detachable connection, or an integral connection; and it may be a direct connection, or may be an indirect connection through an intervening medium, and may be internal communication between two elements. Specific meanings of the above terms in the present application may be understood by those skilled in the art according to specific situations.

[0025] The present application provides an air conditioner, and the air conditioner includes an indoor unit having a first air outlet. First swing louvers capable of controlling an opening-closing range of the first air outlet are disposed at the first air outlet. The first swing louvers are in a fully closed state when the first swing louvers close the first air outlet, the first swing louvers are in a fully open state when the first swing louvers are opened to enable the first air outlet to reach a maximum air output volume, and when the first swing louvers are between the fully closed state and the fully open state, a state of the first swing louvers is defined as a free state. A controller is disposed in the indoor unit, which includes a memory and a processor. A computer program is stored in the memory, and when the program is executed by the processor, a following step is able to be implemented in such way that: when the indoor unit is powered on, the first swing louvers operate to be in the fully open state to be reset, and then operate to be in the fully closed state.

[0026] Although swing louvers at an air outlet of an air conditioner are generally in the close state before the air conditioner is powered on, the swing louvers of the indoor unit are easily moved by mistake due to the position and the environment of the indoor unit, which may cause changes in initial positions of the swing louvers. By adding processes of resetting the swing louvers to fully open positions and then closing the swing louvers simultaneously when the air conditioner is powered on, it is ensured that the swing louvers may be in the fully closed state after the air conditioner is powered on. In these processes, it takes approximately 10 seconds for the swing louvers to switch from the fully open state to the fully closed state generally, and thus the addition of the processes may not cause an excessive increase of the startup time. In addition, through the reset process from the fully open state to the fully closed state, it is ensured to meet accuracy requirements of required angles or required positions when the air conditioner executes a command of

swinging the swing louvers, which may reduce deviations between the required positions caused by differences between the initial positions.

[0027] In addition, when the air conditioner is turned off, the first swing louvers at the first air outlet can prevent dust from entering and people from accidentally touching electrical components and moving components in the air conditioner only if the first swing louvers are in the fully closed state. When the air conditioner is turned off, the swing louvers move to fully closed positions, and a fan motor also stops operating at the same time. However, since the draught fan may prolong its operation for a period of time, the air may be blocked and loud noise may be generated if the swing louvers are immediately closed at the time. When the above program is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-off signal, the first swing louvers are reset to be in the fully open state, and operate to be in the fully closed state after a preset time. The preset time may be 5 seconds, that is, when the controller receives the turn-off signal, the first swing louvers at the first air outlet reset to the fully open positions and wait for 5 seconds, and then the first swing louvers are closed simultaneously. In this way, a phenomenon of air blocking during the operation prolongation of the draught fan is improved, and the noise is greatly reduced.

[0028] Further, the first swing louvers in the present application include a plurality of first swing louvers arranged in a front-to-rear order. First swing louver(s) at a rear part are stacked on first swing louver(s) at a front part when the first swing louvers are in the fully closed state. When the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-on signal, the first swing louver(s) at the rear part operate to be in the fully open position(s) to be reset, and the first swing louver(s) at the front part operate to be in the fully open position(s) to be reset after waiting for a preset time.

[0029] Adding the above process may bring benefits as follows. When the controller is turned on, the plurality of swing louvers start to move synchronously. If the swing louvers are moved mistakenly by a user and are not in the fully closed positions before the air conditioner is turned on, inaccurate stop positions of the swing louvers are easily to be caused. However, by adding the process, i.e., the swing louvers are reset to the fully open positions first, and then the swing louvers are made to stop at positions required by the user through the controller, it is avoided that stop positions of air deflectors are inaccurate due to the mistaken movement by the user. In addition, when the swing louver(s) at the front part and the swing louver(s) at the rear part are in the fully closed state, the swing louver(s) at the rear part are stacked on the swing louver(s) at the front part. In this case, if the plurality of swing louvers move simultaneously, the swing louvers may interfere with each other in the swing process due to a same moving speed, which may cause the

swing louver(s) at the front part and the swing louver(s) at the rear part to collide with each other. However, if the swing louver(s) at the front part are set to wait for the preset time and then start to be fully opened, the mutual interferences between the swing louvers may be effectively avoided. In the above, the preset time may be 1 second.

[0030] Further, when swinging, the swing louvers are generally controlled by a stepping motor to rotate, and the stepping motor may lose some pulses when the swing louvers changed their rotation direction. The pulse losses may be accumulated after multiple swings, which may cause the swing louvers to fail to swing in parallel. Therefore, in the air conditioner of the present application, when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a swing signal, the first swing louvers swing according to an instruction from the controller, and it is determined that whether a swing number of the first swing louvers reaches a preset number; if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset. The above preset number may be 256. By limiting the preset number, a phenomenon that the swing louvers are not parallel after their swings due to differences in pulse losses of the swing louvers is effectively improved.

[0031] The air conditioner of the present application may further have a second air outlet, and details are as follows: a second air outlet is disposed on the indoor unit, and there is a second swing louver capable of controlling an opening-closing range of the second air outlet disposed in the second air outlet. The second swing louvers are in a fully closed state when the second swing louvers close the second air outlet, the second swing louvers are in a fully open state when the second swing louvers are opened to enable the second air outlet to reach a maximum air output volume, and when the second swing louvers are between the fully closed state and the fully open state, a state of the second swing louvers are defined as a free state. When the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-on signal, the second swing louvers operate to be in the fully open state; and when the air conditioner operates in a refrigeration mode, the second swing louvers operate to be in the fully closed state. Or when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when an air output volume of the air conditioner is less than a preset air output volume, the second swing louvers operate to be in the fully closed state. Or when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the air conditioner operates for a preset time, the second swing louvers operate to be in the fully closed state. Or when the program in the memory is executed

by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-off signal, the second swing louvers operate to be in the fully closed state. In all the above three embodiments, it is able to make the second swing louvers operate to be in the fully closed state.

[0032] In addition, in the air conditioner of the present application, except the improved structures described above, other structures and connections therebetween are all well known to those skilled in the art. For example, the indoor unit may be a wall-mounted type or a cabinet type; the first air outlet may be arranged above the second air outlet, and there may be two first swing louvers at the first air outlet, which will not be repeated herein.

[0033] As shown in FIG. 1, the present application further provides a control method of the air conditioner, which includes the following steps in such ways that:

when the indoor unit is powered on, the first swing louvers operate to be in the fully open state to be reset, and then operate to be in the fully closed state; when the controller of the indoor unit is turned on, the swing louver(s) at the rear part in the first swing louvers operate to be in fully open position(s) to be reset, the swing louver(s) at the front part in the first swing louvers operate to be in fully open position(s) after waiting for the preset time, and second swing louvers operate to be in the fully open state; when the indoor unit controls the swing louvers to swing, it is determined that whether the swing number of the first swing louvers reaches a preset number; if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset; when the indoor unit controls the swing louvers to stop swinging, the swing louvers stop at current positions to which they are operating; when the indoor unit operates in the refrigeration mode, or when the air output volume of the indoor unit is less than the preset air output volume, or when the indoor unit operates for a preset time, the second swing louvers operate to be in the fully closed state; and

when the controller of the indoor unit is turned off, the swing louvers are reset to the fully open state, and then operate to be in the fully closed state after the preset time.

[0034] It will be noted that, when the swing louvers of the air conditioner in the present application swing freely, it is not limited that during the free swing state, the swing louvers can only operate from the fully open state to the fully closed state, and the swing louvers may also be controlled to swing within a certain range according to a preset angle.

[0035] The foregoing descriptions are merely some specific implementation manners of the present applica-

tion, but the protection scope of the present application is not limited thereto, and changes or replacements that any person skilled in the art can easily think of in the technical scope disclosed by the present application should be included in the protection scope of the present application. Therefore, the protection scope of the present application shall be subject to the protection scope of the claims.

Claims

1. An air conditioner, comprising an indoor unit having a first air outlet, **characterized in that** first swing louvers capable of controlling an opening-closing range of the first air outlet are disposed at the first air outlet, when the first swing louvers close the first air outlet, the first swing louvers are in a fully closed state, and when the first swing louvers are opened to enable the first air outlet to reach a maximum air output volume, the first swing louvers are in a fully open state; a controller is disposed in the indoor unit, the controller comprises a memory and a processor, wherein the memory stores a computer program, and when the program is executed by the processor, a following step is able to be implemented in such way that: when the indoor unit is powered on, the first swing louvers operate to be in the fully open state to be reset, and then operate to be in the fully closed state.
2. The air conditioner according to claim 1, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-off signal, the first swing louvers are reset to be in the fully open state, and operate to be in the fully closed state after a preset time.
3. The air conditioner according to claim 1 or 2, **characterized in that** the first swing louver comprises a plurality of first swing louvers arranged in a front-to-rear order, first swing louver(s) at a rear part are stacked on first swing louver(s) at a front part when the first swing louvers are in the fully closed state; and when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-on signal, the first swing louver(s) at the rear part operate to be in fully open position(s) to be reset, and the first swing louver(s) at the front part operate to be in fully open position(s) to be reset after waiting for a preset time.
4. The air conditioner according to claim 1 or 2, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the con-

troller receives a swing signal, the first swing louvers swing according to an instruction from the controller; and it is determined that whether a swing number of the first swing louvers reaches a preset number, if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset.

5. The air conditioner according to claim 1, **characterized in that** a second air outlet is disposed on the indoor unit, and second swing louvers capable of controlling an opening-closing range of the first air outlet are disposed in the second air outlet; when the second swing louvers close the second air outlet, the second swing louvers are in a fully closed state, and when the second swing louvers are opened to enable the second air outlet to reach a maximum air output volume, the second swing louvers are in a fully open state; when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the controller receives a turn-on signal, the second swing louvers operate to be in the fully open state.
6. The air conditioner according to claim 5, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the air conditioner operates in a refrigeration mode, the second swing louvers operate to be in the fully closed state.
7. The air conditioner according to claim 5, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when an air output of the air conditioner is less than a preset air output volume, the second swing louvers operate to be in the fully closed state.
8. The air conditioner according to claim 5, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented in such way that: when the air conditioner operates for a preset time, the second swing louvers operate to be in the fully closed state.
9. The air conditioner according to claim 5, **characterized in that** when the program in the memory is executed by the processor, a following step is able to be implemented: when the controller receives a turn-off signal, the second swing louvers operate to be in the fully closed state.
10. A control method of an air conditioner, **characterized in that** the control method comprises following steps in such ways that:

when an indoor unit is powered on, first swing louvers operate to be in a fully open state to be reset, and then operate to be in a fully closed state;

when a controller of the indoor unit is turned on, swing louver(s) at a rear part in the first swing louvers operate to be in fully open position(s) to be reset, swing louver(s) at a front part in the first swing louvers operate to be in fully open position(s) after waiting for a preset time, and second swing louvers operate to be in a fully open state;

when the indoor unit controls the swing louvers to swing, it is determined that whether a swing number of the first swing louvers reaches a preset number, if yes, the first swing louvers are controlled to operate to be in the fully open state to be reset, and the swing number is recalculated after the first swing louvers are reset;

when the indoor unit controls the swing louvers to stop swinging, the swing louvers stop at current positions to which they are operating;

when the indoor unit operates in a refrigeration mode, or when an air output volume of the indoor unit is less than a preset air output volume, or when the indoor unit operates for a preset time, the second swing louvers operate to be in a fully closed state; and

when the controller of the indoor unit is turned off, the swing louvers are reset to fully open state(s), and operate to be in fully closed state(s) after a preset time.

35

40

45

50

55

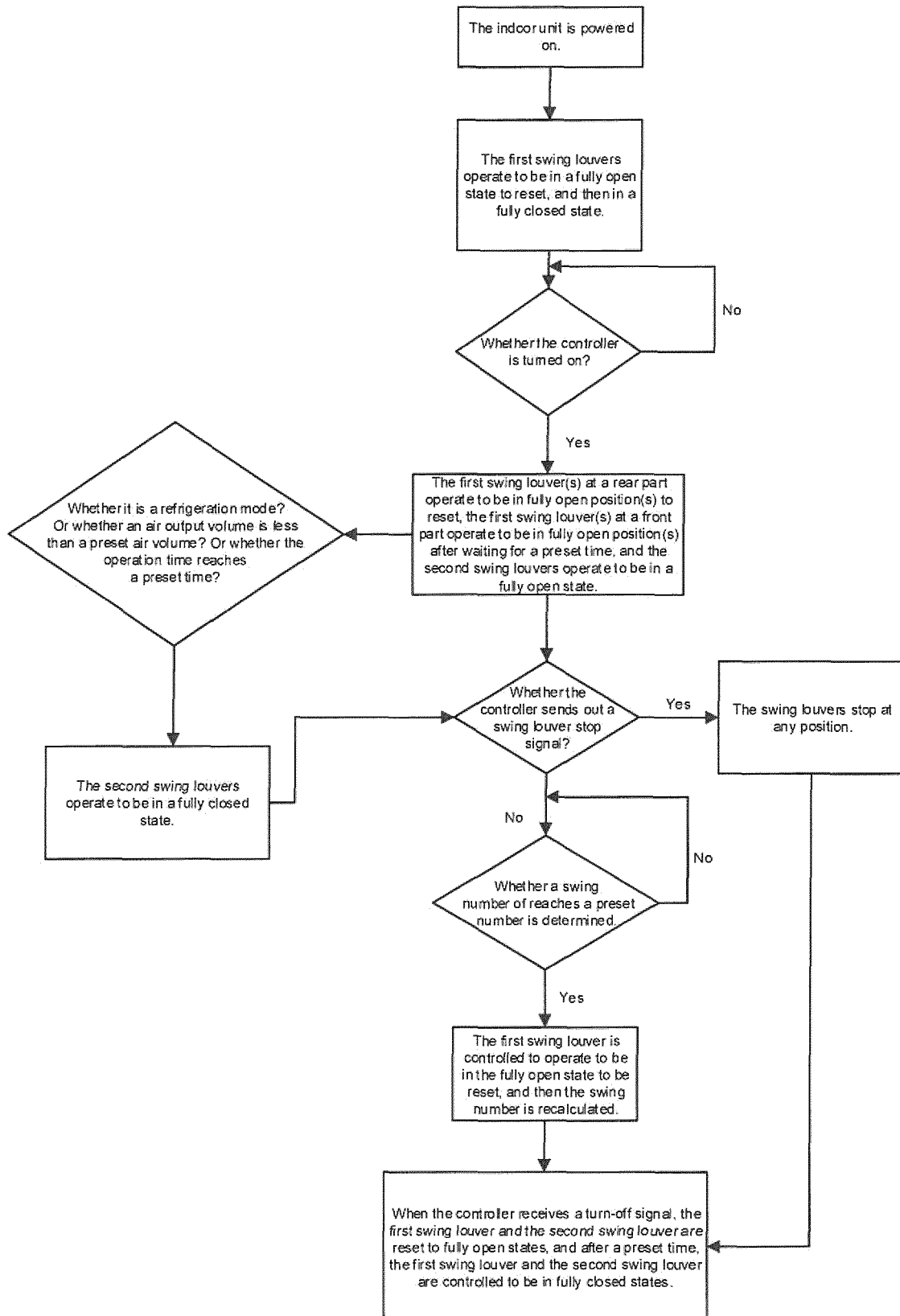


FIG. 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/106362

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/0014(2019.01)i; F24F 11/61(2018.01)i; F24F 11/63(2018.01)i; F24F 11/64(2018.01)i; F24F 11/65(2018.01)i;
F24F 11/74(2018.01)i; F24F 13/14(2006.01)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 1/-;F24F 11/-;F24F13/-

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)

CNABS, CNTXT, CNKI, DWPI, PATENTICS; 海信, 日立, 张吉雪, 王兴龙, 楚晶晶, 空调, 柜机, 风板, 扇叶, 风条, 百叶, 摆叶, 格栅, 摆动, 导风, 出风, 方向, 导流, 排风, 角度, 堵风, 通电, 上电, 供电, 启动, 开机, 开启, 复位, 偏差, 干扰, 干涉, 初始, 开合, 堵转, 重置, 全闭, 关闭, 预设, 设定, 分钟, 等待, 时间, 时长, conditioner+, leaf, zero, get+, strip, air, guid+, swing+, blade?, vane?, flap?, louver?, outlet?, clos+, conduct+, reset?, electrici+, initializ+, wind?, return, power+, replace, restorat+, obstruct+, interfere+, positon, fully

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 109297096 A (QINGDAO HISENSE HITACHI AIR CONDITIONING SYSTEM CO., LTD.) 01 February 2019 (2019-02-01) claims 1-10, description, paragraphs 5-45, and figure 1	1-10
Y	CN 106091298 A (GUANDONG MIDEA HVAC EQUIPMENT CO., LTD. et al.) 09 November 2016 (2016-11-09) description, paragraphs 2-40, and figure 1	1-10
Y	CN 107655168 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 02 February 2018 (2018-02-02) description, paragraphs 2-49, and figures 1-6	1-10
A	CN 104964391 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 07 October 2015 (2015-10-07) entire document	1-10
A	CN 106895548 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD.) 27 June 2017 (2017-06-27) entire document	1-10

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

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

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

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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

03 December 2019

Date of mailing of the international search report

19 December 2019

Name and mailing address of the ISA/CN

China National Intellectual Property Administration
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/106362

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 107345706 A (NINGBO AUX ELECTRIC CO., LTD.) 14 November 2017 (2017-11-14) entire document	1-10
A	JP 2000199640 A (SANYO ELECTRIC CO., LTD.) 18 July 2000 (2000-07-18) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/106362

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 109297096 A	01 February 2019	None	
CN 106091298 A	09 November 2016	None	
CN 107655168 A	02 February 2018	None	
CN 104964391 A	07 October 2015	CN 104964391 B	05 December 2017
CN 106895548 A	27 June 2017	None	
CN 107345706 A	14 November 2017	None	
JP 2000199640 A	18 July 2000	JP 4334042 B2	16 September 2009

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201811084955 [0001]
- CN 104964391 B [0004]