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(54) **FAN CONTROL METHOD, FAN, AND COMPUTER-READABLE STORAGE MEDIUM**

(57) A fan control method, a fan, and a computer-readable storage medium. The fan (100) comprises an oscillation mechanism (20), a plurality of sensor components (40) being provided at different positions of the oscillation mechanism (20). The control method comprises: acquiring remote control signals received by the plurality of sensor components (40); comparing amplitudes of the multiple remote control signals, and acquiring as a target position the position of the sensor component (40) corresponding to the remote control signal amongst the multiple remote control signals having the maximum amplitude; and controlling the oscillation mechanism (20) to rotate towards the target position. The control method can receive the remote control signal of a remote controller by means of the plurality of sensor components and, by means of the amplitudes of the remote control signal, determine the position where the remote control signal is transmitted, intelligently supplying air and improving air supply effects.

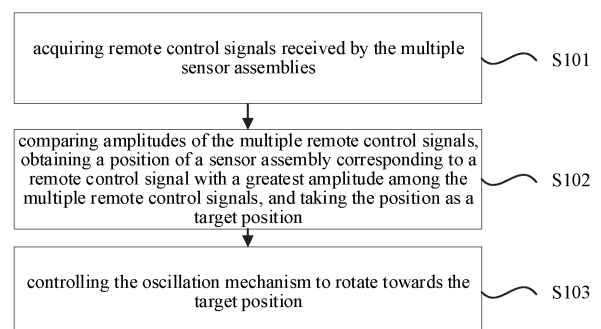


FIG. 1

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Description

[0001] The present application claims the priority of the Chinese patent application No. 2023113568568 filed on October 18, 2023, with the title of "Fan Control Method, Fan, and Computer-Readable Storage Medium"; and claims the priority of the Chinese patent application No. 2023113568479 filed on October 18, 2023, with the title of "Infrared Detection Circuit, Infrared Control Circuit, and Fan", the entire contents of which are incorporated into the present application by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of fan control, and particularly relates to a fan control method, a fan, and a computer-readable storage medium.

BACKGROUND

[0003] During the use of a fan, when a user wants the fan to blow towards a person, there are several methods. The most direct method is to manually operate an oscillation button. The second method is to use a remote control, selecting a fixed angle during the fan's natural oscillation process and pressing a stop oscillation button. The first method uses physical limbs for mechanical operation, which is inconvenient in special environments or for specific groups of people. Additionally, it has a high time cost and poor user experience. The second method uses the remote control's stop oscillation button for positioning. Its drawbacks are: firstly, there is a waiting time during the oscillation process, as the user may need to wait up to one oscillation cycle to reach the correct position, consuming more time; secondly, the oscillation mechanism has inertia, and human reaction also has a delay, leading to positioning errors in space.

SUMMARY OF THE DISCLOSURE

[0004] The present disclosure provides a fan control method, a fan, and a computer-readable storage medium, aiming to solve the aforementioned technical problems existing in the related art.

[0005] To solve the above technical problems, one technical solution adopted by the present disclosure is to provide a control method for a fan; wherein the fan includes an oscillation mechanism, and different positions of the oscillation mechanism are arranged with a plurality of sensor assemblies; the control method includes:

acquiring a plurality of remote control signals received by the plurality of sensor assemblies;
comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a

greatest amplitude among the plurality of remote control signals, and taking the position as a target position; and
controlling the oscillation mechanism to rotate towards the target position.

[0006] In some embodiments, the acquiring remote control information of the plurality of sensor assemblies includes:

acquiring the plurality of remote control signals received by the plurality of sensor assemblies at intervals of a preset duration;
wherein the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position include:

determining whether the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at a current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at a previous moment; and

in response to the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the current moment is inconsistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the previous moment, taking the position of the sensor assembly corresponding to the greatest amplitude at the current moment as the target position.

[0007] In some embodiments, the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position further include:

in response to the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the previous moment, determining whether the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment; and
in response to the greatest amplitude at the current moment being greater than the greatest amplitude at the previous moment, taking the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the plurality of remote control signals at the current moment

as the target position.

[0008] In some embodiments, the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position further include:

in response to the greatest amplitude at the current moment being less than or equal to the greatest amplitude at the previous moment, taking the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the plurality of remote control signals at the previous moment as the target position.

[0009] In some embodiments, the controlling the oscillation mechanism to rotate towards the target position includes:

acquiring a current central air outlet position of the oscillation mechanism;
based on the central air outlet position and the target position, acquiring rotation information; and
based on the rotation information, controlling the oscillation mechanism to rotate.

[0010] In some embodiments, one of the plurality of sensor assemblies is disposed at the central air outlet position, and the control method further includes:

determining whether an amplitude of remote control information corresponding to the sensor assembly located at the central air outlet position is greater than a threshold; and
in response to the amplitude of the remote control information corresponding to the sensor assembly located at the central air outlet position being greater than the threshold, controlling the fan to deliver air to the target position.

[0011] In some embodiments, the control method further includes:

calculating an angle difference between the central air outlet position and the target position; and
in a case where the angle difference is less than or equal to a preset angle threshold, controlling the fan to deliver air to the target position.

[0012] In some embodiments, the controlling the fan to deliver air to the target position includes:

controlling the fan to perform fixed-point air delivery to the target position; or
controlling the fan to perform left-right oscillating air delivery with the target position as a center point and within a preset angle.

[0013] To solve the above technical problems, another technical solution adopted by the present disclosure is to provide a fan. The fan includes:

an air delivery mechanism;
an oscillation mechanism, connected to the air delivery mechanism, configured to control the fan to rotate; wherein different positions of the oscillation mechanism are arranged with a plurality of sensor assemblies; the plurality of sensor assemblies are arranged based on an air delivery range of the oscillation mechanism, and the plurality of sensor assemblies are configured to receive a plurality of remote control signals; and
a controller, connected to the oscillation mechanism and the plurality of sensor assemblies, configured to execute any one of the aforementioned fan control methods.

[0014] To solve the above technical problems, another technical solution adopted by the present disclosure is to provide a computer-readable storage medium, which internally stores program instructions, and the program instructions are executed by a processor to implement any one of the aforementioned fan control methods.

[0015] The beneficial effect of the present disclosure is: Different from the related art, the fan control method of the present disclosure acquires remote control signals received by multiple sensor assemblies arranged on the fan's oscillation mechanism; then compares the amplitudes of the multiple remote control signals, thereby obtaining the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the multiple remote control signals, and takes this position the target position; finally controls the oscillation mechanism to rotate towards the target position. Through the above method, the fan control method of the present disclosure can quickly locate the position from which the remote control signal is emitted through the amplitude of the remote control signal, achieving intelligent air delivery, thereby improving the air delivery effect of the fan's oscillating air delivery and the user's experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] In order to more clearly illustrate the technical solutions in the embodiments of the present disclosure, the following will briefly introduce the drawings needed in the description of the embodiments. Obviously, the drawings in the following description are only some embodiments of the present disclosure. For those skilled in the art, other drawings can be obtained based on these drawings without creative effort.

FIG. 1 is a flowchart of a fan control method according to a first implementation of the present disclosure.

FIG. 2 is a schematic structural diagram of the installation of sensor assemblies according to some embodiments of the present disclosure.

FIG. 3 is a flowchart of a fan control method according to a second implementation of the present disclosure.

FIG. 4 is a flowchart of a fan control method according to a third implementation of the present disclosure.

FIG. 5 is a schematic diagram of a control process of a specific implementation of the fan control method of the present disclosure.

FIG. 6 is a flowchart of operation S103 in FIG. 1 according to some embodiments of the present disclosure.

FIG. 7 is a flowchart of a fan control method according to a fourth implementation of the present disclosure.

FIG. 8 is a flowchart of a fan control method according to a fifth implementation of the present disclosure.

FIG. 9 is a schematic structural diagram of a fan according to a first implementation of the present disclosure.

FIG. 10 is a schematic structural diagram of a computer-readable storage medium according to some embodiments of the present disclosure.

FIG. 11 is a schematic structural diagram of an infrared detection circuit according to a first implementation of the present disclosure.

FIG. 12 is a circuit schematic of an infrared detection circuit according to a second implementation of the present disclosure.

FIG. 13 is a circuit schematic of an infrared detection circuit according to a third implementation of the present disclosure.

FIG. 14 is a circuit schematic of an infrared detection circuit according to a fourth implementation of the present disclosure.

FIG. 15 is a schematic structural diagram of an infrared control circuit according to some embodiments of the present disclosure.

FIG. 16 is a schematic structural diagram of a fan according to a second implementation of the present disclosure.

FIG. 17 is a schematic structural diagram of a fan according to a third implementation of the present disclosure.

FIG. 18 is a schematic diagram of sensor installation positions according to some embodiments of the present disclosure.

DETAILED DESCRIPTION

[0017] The technical solutions of the embodiments of the present disclosure will be described in detail below in conjunction with the drawings. The following embodiments are only intended to illustrate the technical solu-

tions of the present disclosure more clearly, and therefore are only examples, and should not be intended to limit the protection scope of the present disclosure.

[0018] Unless otherwise defined, all technical and scientific terms used herein have the same meanings as commonly understood by those skilled in the art; the terms used herein are only for the purpose of describing specific embodiments, and are not intended to limit the present disclosure; the terms "comprising" and "having" and any variations thereof in the description and claims of the present disclosure and the above description of the drawings are intended to cover non-exclusive inclusion.

[0019] In the description of the embodiments of the present disclosure, the technical terms "first", "second", etc. are only intended to distinguish different objects, and should not be understood as indicating or implying relative importance or implicitly indicating the quantity, specific order, or primary-secondary relationship of the indicated technical features. In the description of the embodiments of the present disclosure, "a plurality of" means two or more, unless otherwise clearly and specifically defined.

[0020] Mentioning "embodiment" herein means that a specific feature, structure, or characteristic described in connection with the embodiment may be included in at least one embodiment of the present disclosure. The appearance of this phrase in various places in the specification does not necessarily refer to the same embodiment, nor is it an independent or alternative embodiment mutually exclusive with other embodiments. Those skilled in the art explicitly and implicitly understand that the embodiments described herein may be combined with other embodiments.

[0021] In the description of the embodiments of the present disclosure, the term "a plurality of" refers to two or more (including two), similarly, "a plurality of groups" refers to two or more groups (including two groups), and "a plurality of pieces" refers to two or more pieces (including two pieces).

[0022] In the description of the embodiments of the present disclosure, unless otherwise clearly specified and defined, the technical terms "install", "connect", "link", "fix", and other terms should be understood broadly. For example, it may be a fixed connection, a detachable connection, or an integral connection; it may be a mechanical connection or an electrical connection; it may be a direct connection, an indirect connection through an intermediate medium, or the internal communication between two components or the interaction relationship between two components. For those skilled in the art, the specific meanings of the above terms in the embodiments of the present disclosure may be understood according to the specific circumstances.

[0023] During the use of a fan, when a user wants the fan to blow towards a person, there are several methods. The most direct method is to manually operate an oscillation button. The second method is to use a remote control, selecting a fixed angle during the fan's natural os-

cillation process and pressing a stop oscillation button. The first method uses physical limbs for mechanical operation, which is inconvenient in special environments or for specific groups of people. Additionally, it has a high time cost and poor user experience. The second method uses the remote control's stop oscillation button for positioning. Its drawbacks are: firstly, there is a waiting time during the oscillation process, as the user may need to wait up to one oscillation cycle to reach the correct position, consuming more time; secondly, the oscillation mechanism has inertia, and human reaction also has a delay, leading to positioning errors in space.

[0024] To solve the above problems existing in the fan, the present disclosure first proposes a fan control method. In the embodiments, the fan includes an oscillation mechanism, and different positions of the oscillation mechanism are arranged with multiple sensor assemblies. That is, the oscillation mechanism has multiple different positions for installing sensor assemblies, and each position is arranged with a sensor assembly. In the embodiments, the fan's oscillation mechanism may be an upper air outlet part of a bladeless fan, or a fan head of a floor fan, or a moving part of the oscillation drive mechanism, which is not limited herein. Referring to FIG. 1, FIG. 1 is a flowchart of a fan control method according to a first implementation of the present disclosure. As shown in FIG. 1, the fan control method specifically includes operations S101 to S103 at blocks illustrated herein.

[0025] At block S101: acquiring remote control signals received by the multiple sensor assemblies.

[0026] A controller of the fan is connected to each sensor assembly and can directly acquire the remote control signals received by the multiple sensor assemblies. In the embodiments, the sensor assembly may be set as a photosensitive sensor and a filtering amplification circuit. After the photosensitive sensor receives the remote control signal emitted by the remote control, the filtering amplification circuit in the sensor assembly is configured to filter and amplify the remote control signal, such that the discrete remote control signal becomes an analog signal. Finally, the controller acquires the processed remote control signal from each sensor assembly.

[0027] At block S102: comparing amplitudes of the multiple remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the multiple remote control signals, and taking the position as a target position.

[0028] In the embodiments, after the fan's controller acquires the remote control signals received by all sensor assemblies at the current moment, the controller may acquire the amplitude of each remote control signal, compare the amplitudes of the multiple remote control signals, obtain the sensor assembly corresponding to the remote control signal with the greatest amplitude, then acquire the position of the sensor assembly, and take the current position of the sensor assembly as the target

position for the rotation of the fan's oscillation mechanism.

[0029] Referring to FIG. 2, FIG. 2 is a schematic structural diagram of the installation of sensor assemblies according to some embodiments of the present disclosure. As shown in FIG. 2, the fan further includes a sensor mounting part. The multiple sensor assemblies are uniformly arranged on the sensor mounting part. The sensor mounting part is arranged on the fan's oscillation mechanism. During the fan's swing process, the sensor mounting part keeps synchronized operation with the oscillation mechanism, and the relative position between each sensor assembly and the fan's blowing forward direction remains unchanged during oscillation.

[0030] The sensor mounting part may be, as shown in FIG. 2, a semi-arc structural part. In other embodiments, the sensor mounting part may be of other shapes. The shape of the sensor mounting part may change based on the actual situation of the oscillation mechanism, which is not limited herein.

[0031] The amplitude of the remote control signal detected by each sensor assembly is related to an angle between the remote control and the sensor assembly. The sensor assembly directly facing the remote control typically acquires the remote control signal with the greatest amplitude. The amplitude of the remote control signal acquired by other sensor assemblies gradually decreases as the angle increases.

[0032] As shown in FIG. 2, taking the installation of four sensor assemblies on the sensor mounting part as an example, when the emission forward direction of the remote control signal is I, the remote control signal amplitude of the four sensor assemblies is greatest for sensor assembly A. In this case, the position of sensor assembly A at the current moment can be selected as the target position. When the emission forward direction of the remote control signal is III, the remote control signal amplitude is greatest for sensor assembly B. In this case, the position of sensor assembly B at the current moment can be selected as the target position. When the emission forward direction of the remote control signal is II, the controller needs to determine the amplitudes of the remote control signals received by sensor assembly A and sensor assembly B. In this case, the position of the sensor assembly corresponding to the greatest amplitude is selected as the target position. In the embodiments, the more sensor assemblies arranged on the sensor mounting part shown in FIG. 2, the more accurate the obtained target position will be. That is, the more sensor assemblies distributed, the higher the positioning accuracy.

[0033] At block S103: controlling the oscillation mechanism to rotate towards the target position.

[0034] After the controller obtains the target position of the oscillation mechanism, in order for the fan to achieve precise and intelligent air delivery, the fan's blowing forward direction is required to face the remote control position for air delivery. In this case, the controller may

obtain a current central air outlet position of the oscillation mechanism, i.e., the fan's blowing forward direction. Based on the central air outlet position and the target position, the rotation direction and rotation angle can be calculated. Since the relative angle between the fan's blowing forward direction and the sensor assembly position is fixed, it is only necessary to calculate the motor step count corresponding to the rotation angle of the oscillation mechanism. Then the controller can control the oscillation mechanism to rotate towards the target position.

[0035] Different from the related art, the fan control method of the present disclosure acquires remote control signals received by multiple sensor assemblies arranged on the fan's oscillation mechanism; then compares the amplitudes of the multiple remote control signals, thereby obtaining the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the multiple remote control signals, and takes this position as the target position; finally controls the oscillation mechanism to rotate towards the target position. Through the above method, the fan control method of the present disclosure may quickly locate the position from which the remote control signal is emitted through the amplitude of the remote control signal, achieving intelligent air delivery, thereby improving the air delivery effect of the fan's oscillating air delivery and the user's experience.

[0036] In some embodiments, the present disclosure further proposes a fan control method. Referring to FIG. 3, FIG. 3 is a flowchart of a fan control method according to a second implementation of the present disclosure. As shown in FIG. 3, the fan control method specifically includes operations S201 to S204 at blocks illustrated herein.

[0037] At block S201: acquiring remote control signals received by the multiple sensor assemblies at intervals of a preset duration.

[0038] Based on the above embodiments, when the fan's controller controls the oscillation mechanism to rotate towards the target position, the target position obtained from the above embodiments may have errors. Therefore, it is necessary to update the target position when the controller controls the oscillation mechanism to rotate towards the target position, to improve the accuracy of the fan's positioning for air delivery.

[0039] The fan's controller may acquire remote control signals received by the multiple sensor assemblies at intervals of a preset duration. That is, during the process of controlling the oscillation mechanism to rotate towards the target position, the controller may acquire remote control signals received by the multiple sensor assemblies at intervals of a preset duration. By acquiring the remote control signals sent by the remote control, the target position can be updated, thereby gradually reducing the positioning error and achieving accurate positioning for air delivery. The preset duration may be set based on actual conditions. It may be 1s or other num-

bers, which is not limited herein.

[0040] At block S202: determining whether the sensor assembly corresponding to the greatest amplitude among the remote control signals received at a current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at a previous moment.

[0041] That is, when the controller controls the oscillation mechanism to rotate towards the target position, it may determine whether the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment.

[0042] At block S203: in response to the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment being inconsistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment, taking the position of the sensor assembly corresponding to the greatest amplitude at the current moment as the target position.

[0043] When the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment is inconsistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment, the position of the sensor assembly corresponding to the greatest amplitude at the current moment is taken as the target position.

[0044] At block S204: controlling the oscillation mechanism to rotate towards the target position.

[0045] The S204 may be consistent with S103 and will not be repeated herein.

[0046] In some embodiments, based on the embodiments in FIG. 3, referring to FIG. 4, FIG. 4 is a flowchart of a fan control method according to a third implementation of the present disclosure. As shown in FIG. 4, the fan control method specifically includes operations S301 to S307 at blocks illustrated herein.

[0047] At block S301: acquiring remote control signals received by the multiple sensor assemblies at intervals of a preset duration.

[0048] The S301 may be consistent with S201 and will not be repeated herein.

[0049] At block S302: determining whether the sensor assembly corresponding to the greatest amplitude among the remote control signals received at a current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at a previous moment.

[0050] The S302 may be consistent with S202 and will not be repeated herein.

[0051] In response to the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment being

inconsistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment, the method proceeds to S303. In response to the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment being consistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment, the method proceeds to S304.

[0052] At block S303: taking the position of the sensor assembly corresponding to the greatest amplitude at the current moment as the target position.

[0053] The S303 may be consistent with S203 and will not be repeated herein.

[0054] At block S304: determining whether the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment.

[0055] When the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the remote control signals received at the previous moment, it may be necessary to determine whether the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment.

[0056] In response to the greatest amplitude at the current moment being greater than the greatest amplitude at the previous moment, the method proceeds to S305. In response to the greatest amplitude at the current moment being less than or equal to the greatest amplitude at the previous moment, the method proceeds to S306.

[0057] At block S305: taking the position of the sensor assembly corresponding to the signal with the greatest amplitude among the remote control signals at the current moment as the target position.

[0058] When the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment, the target position is updated to the position of the sensor assembly corresponding to the signal with the greatest amplitude among the remote control signals at the current moment.

[0059] At block S306: taking the position of the sensor assembly corresponding to the signal with the greatest amplitude among the remote control signals at the previous moment as the target position.

[0060] When the greatest amplitude at the current moment is less than or equal to the greatest amplitude at the previous moment, there is no need to update the target position. The position of the sensor assembly corresponding to the signal with the greatest amplitude among the remote control signals at the previous moment is kept as the target position.

[0061] At block S307: controlling the oscillation mechanism to rotate towards the target position.

[0062] The S307 may be consistent with S103 and will not be repeated herein.

[0063] In an application scenario, referring to FIG. 5, FIG. 5 is a schematic diagram of a control process of a specific implementation of the fan control method of the present disclosure. As shown in FIG. 5(a), at this moment, multiple sensor assemblies receive a first set of remote control signals. After filtering and amplifying the first set of multiple remote control signals, the amplitudes of the multiple remote control signals in the first set at this moment can be obtained. Taking four sensor assemblies as an example, the sensor assembly that receives the remote control signal with the greatest amplitude at this moment should be sensor assembly A. Let the maximum amplitude at this moment be MaxA. Then, the position of the sensor assembly A is taken as the target position. Based on the fan's central air outlet position and the target position, the rotation information of the oscillation mechanism can be calculated, thereby controlling the fan's central air outlet position to rotate towards the position of sensor assembly A.

[0064] As shown in FIG. 5(b), during the process of the fan's central air outlet position rotating towards the target position corresponding to sensor assembly A, the multiple sensor assemblies receive a second set of remote control signals. After filtering and amplifying the second set of multiple remote control signals, the amplitudes of the multiple remote control signals in the second set at this moment can be obtained. At this moment, the sensor assembly that receives the remote control signal with the greatest amplitude should be sensor assembly B. When it is confirmed that the sensor assembly corresponding to the greatest amplitude at the current moment has changed, the target position is updated to the current position of the sensor assembly B. The rotation information between the current fan's central air outlet position and the target position is recalculated, thereby controlling the fan's central air outlet position to rotate towards the target position where the sensor assembly B is located.

[0065] As shown in FIG. 5(c), during the process of the fan's central air outlet position rotating towards the target position corresponding to sensor assembly B, multiple sensor assemblies receive a third set of remote control signals. After filtering and amplifying the third set of multiple remote control signals, the amplitudes of the multiple remote control signals in the third set at this moment can be obtained. At this moment, the sensor assembly that receives the remote control signal with the greatest amplitude is still the sensor assembly B. It is confirmed that the sensor assembly corresponding to the greatest amplitude at the current moment has not changed compared to the previous moment. In this case, it is necessary to determine whether the amplitude MAXB1 of the sensor assembly B at the current moment is greater than the amplitude MAXB of the sensor assembly B at the previous moment. When $MaxB1 > MaxB$, then the target position is updated to the position of sensor assembly B at the current moment. When $MaxB1 \leq MaxB$, it is unnecessary to update the target position, and the position of the sensor assembly B at the previous moment is

kept as the target position.

[0066] In some embodiments, based on the above embodiments, referring to FIG. 6, FIG. 6 is a flowchart of operation S103 in FIG. 1 according to some embodiments of the present disclosure. As shown in FIG. 6, the embodiments implement the S103 through the method shown in FIG. 6. The specific implementation steps include operations S401 to S403 at blocks illustrated herein.

[0067] At block S401: acquiring a current central air outlet position of the oscillation mechanism.

[0068] After the fan's controller determines the target position, it may obtain the central air outlet position of the fan's oscillation mechanism at the current moment, i.e., obtains the fan's blowing forward direction at the current moment.

[0069] At block S402: based on the central air outlet position and the target position, acquiring rotation information.

[0070] In the embodiments, as shown in FIG. 2, since the relative angle between the fan's central air outlet position and the target position corresponding to the sensor assembly is fixed, the rotation information such as the rotation angle and rotation direction of the oscillation mechanism from the central air outlet position to the target position can be quickly calculated. Since the rotation mechanism is controlled by a corresponding stepper motor, in this implementation, the motor's step count may also be calculated based on the rotation angle.

[0071] At block S403: based on the rotation information, controlling the oscillation mechanism to rotate.

[0072] Based on the step count and rotation direction mentioned above, the oscillation mechanism can be controlled to rotate, such that the fan's central blowing position faces the sending position of the remote control signal for air delivery.

[0073] In some embodiments, the present disclosure further proposes a fan control method. Referring to FIG. 7, FIG. 7 is a flowchart of a fan control method according to a fourth implementation of the present disclosure. Based on the above embodiments, as shown in FIG. 7, in the embodiments, a sensor assembly may be arranged at the central air outlet position, that is, one sensor assembly is arranged at the center position of the sensor mounting part as shown in FIG. 2. In this case, the fan control method further includes operations S501 to S502 at blocks illustrated herein.

[0074] At block S501: determining whether an amplitude of remote control information corresponding to the sensor assembly located at the central air outlet position is greater than a threshold.

[0075] When the central air outlet position of the fan's oscillation mechanism reaches the target position, in a case where a sensor assembly is arranged at the center position of the sensor mounting part as shown in FIG. 2, the remote control signal amplitude received by this sensor assembly should be the maximum. However, to make the fan's oscillation mechanism stop rotating, stop

at the target position, and blow air towards the position corresponding to the remote control signal, an amplitude threshold may be set for the remote control signal received by the sensor assembly located at the central air outlet position, to determine whether the amplitude of the remote control information corresponding to the sensor assembly located at the central air outlet position is greater than the threshold.

[0076] At block S502: in response to the amplitude of the remote control information corresponding to the sensor assembly located at the central air outlet position being greater than the threshold, controlling the fan to deliver air to the target position.

[0077] When the controller determines that the amplitude of the remote control information corresponding to the sensor assembly located at the central air outlet position is greater than the threshold, it may control the oscillation mechanism to stop rotating and controls the fan to deliver air to the target position.

[0078] In some embodiments, the present disclosure further proposes a fan control method. Referring to FIG. 8, FIG. 8 is a flowchart of a fan control method according to a fifth implementation of the present disclosure. Based on the above embodiments, as shown in FIG. 8, the fan control method further includes operations S601 to S602 at blocks illustrated herein.

[0079] At block S601: calculating an angle difference between the central air outlet position and the target position.

[0080] When the central air outlet position of the fan's oscillation mechanism is moving towards the target position, the angle difference between the central air outlet position of the fan's oscillation mechanism and the target position may be calculated.

[0081] At block S602: in a case where the angle difference is less than or equal to a preset angle threshold, controlling the fan to deliver air to the target position.

[0082] The controller may set a threshold to determine whether the angle difference is less than or equal to the preset angle threshold. When the angle difference is less than or equal to the preset angle threshold, the oscillation mechanism may be controlled to stop rotating, thereby controlling the fan to deliver air to the target position.

[0083] In some embodiments, based on the embodiments of FIG. 7 and FIG. 8, the embodiments may implement the operation of controlling the fan to deliver air to the target position in the embodiments of FIG. 7 and FIG. 8 through the following method. The specific implementation operations may include:

controlling the fan to perform fixed-point air delivery to the target position; or controlling the fan to perform left-right oscillating air delivery with the target position as a center point and within a preset angle.

[0084] Different from the related art, the fan control method of the present disclosure acquires remote control signals received by multiple sensor assemblies arranged on the fan's oscillation mechanism; then compares the amplitudes of the multiple remote control signals, thereby

obtaining the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the multiple remote control signals, and takes this position the target position; finally controls the oscillation mechanism to rotate towards the target position. Through the above method, the fan control method of the present disclosure may quickly locate the position from which the remote control signal is emitted through the amplitude of the remote control signal, achieving intelligent air delivery, thereby improving the air delivery effect of the fan's oscillating air delivery and the user's experience.

[0085] In some embodiments, the present disclosure further proposes a fan. Referring to FIG. 9, FIG. 9 is a schematic structural diagram of a fan according to a first implementation of the present disclosure. As shown in FIG. 9, the fan 100 includes an air delivery mechanism 10, an oscillation mechanism 20, and a controller 30. The oscillation mechanism 20 is connected to the air delivery mechanism 10 for controlling the fan to rotate; different positions of the oscillation mechanism 20 are arranged with multiple sensor assemblies 40; that is, the oscillation mechanism 20 has multiple different positions for installing the sensor assemblies 40, and each position is arranged with a corresponding sensor assembly 40; the multiple sensor assemblies 40 are arranged based on an air delivery range of the oscillation mechanism 20, and the sensor assemblies 40 are configured to receive remote control signals; the controller 30 is connected to the oscillation mechanism 20 and the sensor assemblies 40, and is configured to execute any one of the aforementioned fan control methods.

[0086] As shown in FIG. 9, the fan 100 has a bladeless fan structure. In the embodiments, the air delivery mechanism 10 and the oscillation mechanism 20 are integrally arranged. A hollowed-out part of the oscillation mechanism 20 in FIG. 9 is the air delivery mechanism 10 of the fan 100. In the embodiments, the controller 30 may be arranged in a base fixing structure 60.

[0087] As shown in FIG. 9, the fan 100 further includes a sensor mounting part 50. The multiple sensor assemblies 40 are uniformly arranged on the sensor mounting part 50. The sensor mounting part 50 is arranged on the oscillation mechanism 20 of the fan 100. During the swing process of the fan 100, the sensor mounting part 50 keeps synchronized operation with the oscillation mechanism 20, and the relative position between each sensor assembly 40 and the fan 100's blowing forward direction remains unchanged during the oscillation process. The sensor mounting part 50 may be, as shown in FIG. 2, a semi-arc structural part. In other embodiments, the sensor mounting part 50 may be of other shapes. The shape of the sensor mounting part 50 may change based on the actual situation of the oscillation mechanism 20, which is not limited herein.

[0088] In other embodiments, the sensor assemblies 40 may be arranged on the sensor mounting part 50 with equal angular distribution combined with an air delivery

range of the oscillation mechanism 20, which is not limited herein.

[0089] In other embodiments, the fan 100 may be an ordinary floor fan, which is not limited herein. Furthermore, in the present disclosure, the oscillation mechanism 20 of the fan 100 may be an upper air outlet part of a bladeless fan, a fan head of a floor fan, or a moving part of the oscillation drive mechanism, which is not limited herein.

[0090] In some embodiments, the present disclosure further proposes a computer-readable storage medium. Referring to FIG. 10, FIG. 10 is a schematic structural diagram of a computer-readable storage medium according to some embodiments of the present disclosure.

[0091] The computer-readable storage medium 200 internally stores program instructions 210. The program instructions 210 can be executed by a processor to implement the fan control method of any of the above embodiments.

[0092] The program instructions 210 can form program files stored in the aforementioned storage medium in the form of software products, such that an electronic device (which may be a personal computer, server, or network device, etc.) or a processor executes all or part of the operations in the methods of the various implementations of the present disclosure. The aforementioned storage medium includes: U disk, mobile hard disk, read-only memory (ROM), random access memory (RAM), magnetic disk, or optical disk, and other various media that can store program codes, or terminal devices such as computers, servers, mobile phones, and tablets.

[0093] The computer-readable storage medium 200 may be, but is not limited to, U disk, SD card, PD optical drive, mobile hard disk, large-capacity floppy drive, flash memory, multimedia memory card, server, etc.

[0094] Furthermore, during the use of the above fan, when the user wants the fan to blow towards a person, there are several methods. The most direct method is to manually operate an oscillation button. The second method is to use a remote control, selecting a fixed angle during the fan's natural oscillation process and pressing a stop oscillation button. These two methods are complex to operate, inefficient, and provide poor user experience.

[0095] In the related art, most fans use remote control signals for control. However, the remote control signals emitted by existing remote controls are weak, easily interfered with by the environment, and because the signals emitted by the remote control are square wave digital signals with fast signal frequencies, there may be situations where the control center cannot detect the infrared signal of the remote control, resulting in poor remote control effectiveness and affecting the user experience.

[0096] To solve the problem of poor remote control effectiveness, the present disclosure further proposes an infrared detection circuit. Referring to FIG. 11, FIG. 11 is a schematic structural diagram of an infrared detection circuit according to a first implementation of the present

disclosure. As shown in FIG. 11, the infrared detection circuit 300 of the embodiments includes a signal receiving circuit 310, a differential amplification circuit 320, and a peak voltage maintaining circuit 330.

[0097] The signal receiving circuit 310 is configured to receive the fan's remote control signal and filter the remote control signal; the differential amplification circuit 320 is connected to the signal receiving circuit 310, configured to receive the filtered remote control signal and amplifies it; the peak voltage maintaining circuit 330 is connected to the differential amplification circuit 320, configured to receive the amplified remote control signal and performs peak maintenance processing to obtain a remote control analog signal.

[0098] In the embodiments, the signal receiving circuit 310 may be arranged with a sensor assembly 311 and a filtering circuit. The sensor assembly 311 is configured to receive the fan's remote control signal, and the filtering circuit is configured to filter interference in the remote control signal. In the embodiments, the sensor assembly 311 may be a photosensitive sensor. In other embodiments, the sensor assembly 311 may be other types of sensors, which is not limited herein.

[0099] In the embodiments, the differential amplification circuit 320 is mainly configured to amplify the signal. Its specific structure is described below and is not limited herein.

[0100] Furthermore, because the remote control signal may be a square wave digital signal with a 38KHz carrier wave emitted by the remote control, in the related art, even after an existing infrared detection circuit 300 receives and processes this signal, it still obtains a high-frequency square wave signal. When the controller detects this remote control signal and when the high-level remote control signal arrives, the fan's controller has not had time to detect it before the low-level remote control signal arrives. Therefore, the controller cannot detect the remote control signal from the remote control or the detected amplitude is too less, resulting in poor remote control effectiveness.

[0101] Therefore, in the present disclosure, the peak voltage maintaining circuit 330 is set. The peak voltage maintaining circuit can maintain and smooth the remote control signal amplified by the differential amplification circuit 320, maintaining the high level of the remote control signal for a period of time, thereby making it easier for the controller to detect the amplitude of the remote control signal, thereby improving the accuracy and precision of the infrared detection circuit 300 in detecting remote control signals.

[0102] Different from the related art, the infrared detection circuit 300 of the present disclosure is applied to a fan, and the infrared detection circuit 300 includes a signal receiving circuit 310, a differential amplification circuit 320, and a peak voltage maintaining circuit 330. The signal receiving circuit 310 is configured to receive the fan's remote control signal and filter the remote control signal; the differential amplification circuit 320 is

connected to the signal receiving circuit 310, configured to receive the filtered remote control signal and amplifies it; the peak voltage maintaining circuit 330 is connected to the differential amplification circuit 320, configured to receive the amplified remote control signal and performs peak maintenance processing to obtain a remote control analog signal. Through the above method, the infrared detection circuit 300 of the present disclosure can filter out infrared interference from the environment received by the signal receiving circuit 310, use the differential amplification circuit 320 to amplify the remote control signal, and finally use the peak voltage maintaining circuit 330 to perform peak maintenance processing on the amplified remote control signal to convert the remote control signal into a stable and smooth remote control analog signal. Therefore, the infrared detection circuit 300 of the present disclosure may reduce environmental interference on the infrared detection circuit 300. The use of the peak voltage maintaining circuit 330 may further turn the remote control signal into a stable and smooth remote control analog signal, which is easy to be detected by the controller, thereby improving the precision and accuracy of the infrared detection circuit 300 in detecting remote control signals.

[0103] In some embodiments, referring to FIG. 12, FIG. 12 is a circuit schematic of an infrared detection circuit according to a second implementation of the present disclosure. As shown in FIG. 12, in the embodiments, the peak voltage maintaining circuit 330 includes a diode D1, a first capacitor C1, and a first resistor R1.

[0104] In the embodiments of FIG. 12, an input end of the diode D1 is connected to the differential amplification circuit 320 to receive the amplified remote control signal; a first end of the first capacitor C1 is connected to an output end of the diode D1, and a second end of the first capacitor C1 is grounded; a first end of the first resistor R1 is connected to the output end of the diode D1, and a second end of the first resistor R1 is grounded; a connection end between the first resistor R1 and the diode D1 serves as an output end of the peak voltage maintaining circuit 330 to output the remote control analog signal.

[0105] The working principle of the peak voltage maintaining circuit 330 is as follows.

[0106] When the amplified remote control signal passes through the diode D1, due to the presence of the first capacitor C1 and the first resistor R1, the high-level remote control signal is not discharged back. In this case, the high-level remote control signal will be maintained for a period of time without change. The signal input to the controller in this case is a stable and smooth remote control analog signal. The controller can then accurately detect the amplitude of the remote control analog signal.

[0107] In other embodiments, the peak voltage maintaining circuit 330 may adopt other circuit architectures, as long as it satisfies the function of maintaining the peak voltage, which is not limited herein.

[0108] Compared with the related art, the peak maintaining circuit of the present disclosure converts the square wave digital signal with a high-frequency carrier wave into a stable and smooth remote control analog signal, making it easy for the controller to detect accurately, thereby improving the precision and accuracy of the infrared detection circuit 300 in detecting remote control signals.

[0109] In some embodiments, referring to FIG. 13, FIG. 13 is a circuit schematic of an infrared detection circuit according to a third implementation of the present disclosure. As shown in FIG. 13, in the embodiments, the signal receiving circuit 310 includes a second resistor R2 and a sensor assembly 311.

[0110] A first end of the second resistor R2 receives a preset voltage signal; a first path end of the sensor assembly 311 is connected to a second end of the second resistor R2, a second path end of the sensor assembly 311 is grounded, and a signal receiving end of the sensor assembly 311 is configured to receive the remote control signal of the fan 500; a connection end between the second resistor R2 and the sensor assembly 311 serves as an output end of the signal receiving circuit 310 to output the remote control signal.

[0111] In the embodiments, as mentioned above, the sensor assembly 311 may be set as a photosensitive sensor. When the remote control signal is sent to the photosensitive sensor, the photosensitive sensor can perform a first filtering and conversion on the remote control signal, converting it into a remote control signal with an AC component.

[0112] In other embodiments, the sensor assembly 311 may be other types of sensors, which is not limited herein.

[0113] In some embodiments, as shown in FIG. 13, the signal receiving circuit 310 further includes a filtering component 312. A first end of the filtering component 312 is connected to the connection end between the second resistor R2 and the sensor assembly 311, and a second end of the filtering component 312 is connected to the differential amplification circuit 320. The filtering component 312 is configured to filter the remote control signal.

[0114] In the embodiments, the filtering component 312 is configured to perform the second filtering on the remote control signal with the AC component mentioned above. In the actual application of fans, the working environment of the fan inevitably contains infrared signal interference from fluorescent lamps or sunlight. The filtering component 312 set in the embodiments is precisely to effectively filter out infrared signal interference from fluorescent lamps or sunlight, thereby improving the accuracy of the acquired remote control signal.

[0115] In some embodiments, as shown in FIG. 13, in the embodiments, the filtering component 312 includes a second capacitor C2. A first end of the second capacitor C2 is connected to the connection end between the second resistor R2 and the sensor assembly 311, and a second end of the second capacitor C2 is connected to

the differential amplification circuit 320.

[0116] In the embodiments, the second capacitor C2 plays the role of blocking DC and passing AC. Because after the first filtering and conversion by the photosensitive sensor, the remote control signal is a remote control signal with an AC component. Setting the second capacitor C2 may effectively filter out other interference signals and only receive effective remote control signals.

[0117] In some embodiments, referring to FIG. 14, FIG. 14 is a circuit schematic of an infrared detection circuit according to a fourth implementation of the present disclosure. As shown in FIG. 14, the differential amplification circuit 320 includes a comparison circuit 321. A first input end of the comparison circuit 321 is connected to the signal receiving circuit 310, and a second input end of the comparison circuit 321 receives a reference signal. It is configured to receive the filtered remote control signal; an output end of the comparison circuit 321 is configured to output the amplified remote control signal.

[0118] Specifically, as shown in FIG. 14, the differential amplification circuit 320 includes a comparator IC2A, a sixth resistor R6, a seventh resistor R7, an eighth resistor R8, a ninth resistor R9, a tenth resistor R10, and a fourth capacitor C4.

[0119] As shown in FIG. 14, one end of the seventh resistor R7 is connected to the signal receiving circuit 310, and the other end of the seventh resistor R7 is connected to a first input end of the comparator IC2A. One end of the sixth resistor R6 is grounded, and the other end of the sixth resistor R6 is connected to the other end of the seventh resistor R7 and the first input end of the comparator IC2A.

[0120] One end of the eighth resistor R8 is grounded, and the other end of the eighth resistor R8 is connected to the second input end of the comparator IC2A. One end of the ninth resistor R9 is connected to the other end of the eighth resistor R8 and the second input end of the comparator IC2A. The other end of the ninth resistor R9 is connected to the output end of the comparator IC2A. The fourth capacitor C4 is connected in parallel with the ninth resistor R9. The fourth capacitor C4 is configured to compensate the feedback loop of the comparator IC2A. One end of the tenth resistor R10 is connected to the output end of the comparator IC2A, and the other end of the tenth resistor R10 is connected to the peak voltage maintaining circuit 330.

[0121] A power input end of the comparator IC2A receives a preset voltage. In the embodiments, the preset voltage is 5V. In order to make the differential amplification circuit 320 work stably and normally, in the embodiments, the resistance value of the seventh resistor R7 and the resistance value of the eighth resistor R8 can be set equal, and the resistance value of the sixth resistor R6 and the resistance value of the ninth resistor R9 can be set equal. In this case, the amplification factor β of the differential amplification circuit 320 is $R9/R8$.

[0122] In other embodiments, the differential amplification circuit 320 may be set to other circuit structures, as

long as it satisfies the above amplification function, which is not limited herein.

[0123] In some embodiments, the present disclosure further proposes an infrared control circuit. Referring to FIG. 15, which is a schematic structural diagram of an embodiment of the infrared control circuit of the present disclosure. As shown in FIG. 15, the infrared control circuit 400 of the embodiments includes multiple infrared detection circuits 300 of any of the above embodiments and a receiving circuit 410.

[0124] Based on the previous embodiments, because the sensor assembly 311 in the signal receiving circuit 310 of the infrared detection circuit 300 can only identify the remote control signal but cannot decode the remote control signal, in the embodiments, a receiving circuit 410 is added. The receiving circuit 410 may be configured to identify the remote control signal and decode it to obtain a decoded signal. The decoded signal may be sent to the fan's controller to make it determine whether it is its own fixed remote control code value. In response to being its own fixed remote control code value, the fan works to deliver air. In response to not being its own fixed remote control code value, the fan does not work.

[0125] As shown in FIG. 15, the receiving circuit 410 includes a receiver component 411, a third resistor R3, a fourth resistor R4, a fifth resistor R5, and a third capacitor C3.

[0126] As shown in FIG. 15, the receiver component 411 is configured to receive the remote control signal; a first end of the third resistor R3 receives a preset voltage signal, and a second end of the third resistor R3 is connected to a power input end of the receiver component 411; a first end of the fourth resistor R4 is configured to receive the preset voltage signal, and a second end of the fourth resistor R4 is connected to an output end of the receiver component 411; a first end of the fifth resistor R5 is connected to the output end of the receiver component 411 and the second end of the fourth resistor R4, and a second end of the fifth resistor R5 serves as the output end of the receiving circuit 410 to output the decoded signal; one end of the third capacitor C3 is grounded, and a second end of the third capacitor C3 is connected to the second end of the fifth resistor R5.

[0127] In the embodiments, the receiver component 411 may be set as an infrared receiver head. In other embodiments, the receiver component 411 may be set as other components, as long as it satisfies the above function, which is not limited herein.

[0128] When the receiver component 411 receives the fan's remote control signal, the receiving circuit 410 may decode the remote control signal to obtain the decoded signal corresponding to the remote control signal. In the embodiments, the decoded signal is the fan's fixed remote control code value mentioned above.

[0129] Different from the related art, the addition of the receiving circuit 410 in the embodiments may prevent interference from remote control signals of other fans in multi-remote control signal scenarios, thereby improving

the control precision and accuracy of the fan.

[0130] In some embodiments, the present disclosure further proposes a fan. Referring to FIG. 16, FIG. 16 is a schematic structural diagram of a fan according to a second implementation of the present disclosure. As shown in FIG. 16, the fan 500 includes an air delivery mechanism 510, an oscillation mechanism 520, and a controller 530.

[0131] The oscillation mechanism 520 is connected to the air delivery mechanism 510. The oscillation mechanism 520 is arranged with the infrared control circuit 400 of the above embodiments; multiple infrared detection circuits 300 are arranged on the oscillation mechanism 520; the receiving circuit 410 is arranged on the oscillation mechanism 520; the controller 530 is connected to the oscillation mechanism 520, the air delivery mechanism 510, and the infrared control circuit 400, and is configured to control the oscillation mechanism 520 and the air delivery mechanism 510 to deliver air based on the remote control analog signals of the multiple infrared detection circuits 300 and the remote control signal of the receiving circuit 410.

[0132] Referring to FIG. 17, FIG. 17 is a schematic structural diagram of a fan according to a third implementation of the present disclosure. As shown in FIG. 17, the fan 500 has a bladeless fan structure. In the embodiments, the air delivery mechanism 510 and the oscillation mechanism 520 are integrally arranged. A hollowed-out part of the oscillation mechanism 520 is the air delivery mechanism 510 of the fan 500. Below the oscillation mechanism 520 is a base fixing structure 540 of the fan 500.

[0133] Referring to FIG. 17 and FIG. 18, FIG. 18 is a schematic diagram of sensor installation positions according to some embodiments of the present disclosure. As shown in FIG. 17 and FIG. 18, the fan 500 may further include a sensor mounting part 550. The sensor assemblies 311 of the multiple infrared detection circuits 300 may be uniformly arranged on the sensor mounting part 550. The sensor mounting part 550 is arranged on the oscillation mechanism 520 of the fan 500. During the swing process of the fan 500, the sensor mounting part 550 keeps synchronized operation with the oscillation mechanism 520, and the relative position between each sensor assembly 311 and the fan 500's blowing forward direction remains unchanged during the oscillation process. The sensor mounting part 550 may be, as shown in FIG. 17, a semi-arc structural part. In other embodiments, the sensor mounting part 550 may be of other shapes. The shape of the sensor mounting part 550 may change based on the actual situation of the oscillation mechanism 520, which is not limited herein.

[0134] In other embodiments, the sensor assemblies 311 may be arranged on the sensor assembly 311 with equal angular distribution combined with an air delivery range of the oscillation mechanism 520, which is not limited herein.

[0135] The receiver component 411 of the receiving

circuit 410 may be disposed on the sensor mounting part 550. In some embodiments, as shown in FIG. 17, the receiver component 411 may be disposed at the center of the sensor mounting part 550. In other embodiments, the receiver component 411 may be disposed at other positions on the sensor mounting part 550, which is not limited herein.

[0136] In the embodiments, the controller 530 may be disposed in the base fixing structure 540 and respectively connected to the oscillation mechanism 520, the air delivery mechanism 510, and the infrared control circuit 400. When the user uses a remote control to transmit a remote control signal, the controller 530 receives remote control analog signals from the multiple infrared detection circuits 300 to control the oscillation mechanism 520 and the air delivery mechanism 510 to deliver air.

[0137] For example, by comparing the amplitude of each remote control analog signal, the controller 530 may determine the target position of the remote control, thereby obtaining the step count of the stepper motor of the oscillation mechanism 520 during the oscillation process, and thus controlling the air delivery mechanism 510 to rotate towards the target position.

[0138] In some embodiments, in the embodiments, the controller 530 is further configured to determine whether the decoded signal is a preset fixed code value. When the decoded signal is the preset fixed code value, the controller 530 controls the oscillation mechanism 520 and the air delivery mechanism 510 to deliver air based on the remote control analog signals. When the decoded signal is not the preset fixed code value, the controller 530 controls the oscillation mechanism 520 and the air delivery mechanism 510 to stop working.

[0139] In some embodiments, based on the above embodiments, in other embodiments, the fan 500 may be an ordinary floor fan, which is not limited herein. Furthermore, in the present disclosure, the oscillation mechanism 520 of the fan 500 may be an upper air outlet part of a bladeless fan 500, a fan head of a floor fan, or a moving part of an oscillation drive mechanism, which is not limited herein.

[0140] Despite the appended claims, the embodiments of FIGS. 11 to 18 of the present disclosure are also defined by the following clauses.

[0141] An infrared detection circuit, applied to a fan and including:

a signal receiving circuit, configured to receive a remote control signal of the fan and filter the remote control signal;
a differential amplification circuit, connected to the signal receiving circuit, configured to receive the filtered remote control signal and amplify it; and
a peak voltage maintaining circuit, connected to the differential amplification circuit, configured to receive the amplified remote control signal and perform peak maintaining processing to obtain a remote control analog signal.

[0142] In some embodiments, the peak voltage maintaining circuit includes:

a diode, an input end of the diode being connected to the differential amplification circuit to receive the amplified remote control signal;
a first capacitor, a first end of the first capacitor being connected to an output end of the diode, and a second end of the first capacitor being grounded; and
a first resistor, a first end of the first resistor being connected to the output end of the diode, and a second end of the first resistor being grounded; where a connection end between the first resistor and the diode serves as an output end of the peak voltage maintaining circuit to output the remote control analog signal.

[0143] In some embodiments, the signal receiving circuit includes:

a second resistor, a first end of the second resistor being configured to receive a preset voltage signal; and
a sensor assembly, a first path end of the sensor assembly being connected to a second end of the second resistor, a second path end of the sensor assembly being grounded, and a signal receiving end of the sensor assembly being configured to receive the remote control signal of the fan; where a connection end between the second resistor and the sensor assembly serves as an output end of the signal receiving circuit to output the remote control signal.

[0144] In some embodiments, the signal receiving circuit further includes:

a filtering component, a first end of the filtering component being connected to the connection end between the second resistor and the sensor assembly, and a second end of the filtering component being connected to the differential amplification circuit; where the filtering component is configured to filter the remote control signal.

[0145] In some embodiments, the filtering component includes a second capacitor, a first end of the second capacitor being connected to the connection end between the second resistor and the sensor assembly, and a second end of the second capacitor being connected to the differential amplification circuit.

[0146] In some embodiments, the differential amplification circuit includes:

a comparison circuit, a first input end of the comparison circuit being connected to the signal receiving circuit, and a second input end of the comparison circuit receiving a reference signal; where the comparison circuit is configured to receive the filtered remote control signal; an output end of the comparison circuit is configured to output the amplified remote control signal.

[0147] An infrared control circuit, comprising multiple infrared detection circuits according to any one of the above terms and a receiving circuit; where the receiving circuit is configured to identify the remote control signal and decode the remote control signal to obtain a decoded signal.

[0148] In some embodiments, the receiving circuit includes:

a receiver component, configured to receive the remote control signal;

a third resistor, a first end of the third resistor being configured to receive a preset voltage signal, and a second end of the third resistor being connected to a power input end of the receiver component;

a fourth resistor, a first end of the fourth resistor being configured to receive the preset voltage signal, and a second end of the fourth resistor being connected to an output end of the receiver component;

a fifth resistor, a first end of the fifth resistor being connected to the output end of the receiver component and the second end of the fourth resistor, and a second end of the fifth resistor serving as an output end of the receiving circuit to output the decoded signal; and

a third capacitor, one end of the third capacitor being grounded, and a second end of the third capacitor being connected to the second end of the fifth resistor.

[0149] A fan, including:

an air delivery mechanism;

an oscillation mechanism, connected to the air delivery mechanism, the oscillation mechanism being arranged with the infrared control circuit according to any one of the above terms; where the multiple infrared detection circuits are arranged on the oscillation mechanism, and the receiving circuit is disposed on the oscillation mechanism; and

a controller, connected to the oscillation mechanism, the air delivery mechanism, and the infrared control circuit, configured to control the oscillation mechanism and the air delivery mechanism to deliver air based on the remote control analog signals from the multiple infrared detection circuits and the decoded signal from the receiving circuit.

[0150] In some embodiments, the controller is further configured to determine whether the decoded signal is a preset fixed code value; in a case where the decoded signal is the preset fixed code value, the controller controls the oscillation mechanism and the air delivery mechanism to deliver air based on the remote control analog signals; in a case where the decoded signal is not the preset fixed code value, the controller controls the oscillation mechanism and the air delivery mechanism to stop working.

[0151] The above descriptions are merely embodiments of the present disclosure and are not intended to limit the scope of the present disclosure. Any equivalent structural or process transformations made using the contents of the description and drawings of the present disclosure, or directly or indirectly applied in other related technical fields, shall be similarly included within the scope of the present disclosure.

Claims

1. A control method for a fan, **characterized in that** the fan comprises an oscillation mechanism that is provided at different positions thereof with a plurality of sensor assemblies, and the control method comprises:

acquiring a plurality of remote control signals received by the plurality of sensor assemblies; comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position; and controlling the oscillation mechanism to rotate towards the target position.

2. The control method according to claim 1, wherein:

the acquiring remote control information of the plurality of sensor assemblies comprises:

acquiring the plurality of remote control signals received by the plurality of sensor assemblies at intervals of a preset duration; and

the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position comprises:

determining whether the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at a current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at a previous moment; and in the case that the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the current moment is inconsistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the

- previous moment, taking the position of the sensor assembly corresponding to the greatest amplitude at the current moment as the target position.
3. The control method according to claim 2, wherein the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position further comprises:
- in the case that the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the current moment is consistent with the sensor assembly corresponding to the greatest amplitude among the plurality of remote control signals received at the previous moment, determining whether the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment; and
- in the case that the greatest amplitude at the current moment is greater than the greatest amplitude at the previous moment, taking the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the plurality of remote control signals at the current moment as the target position.
4. The control method according to claim 3, wherein the comparing amplitudes of the plurality of remote control signals, obtaining a position of a sensor assembly corresponding to a remote control signal with a greatest amplitude among the plurality of remote control signals, and taking the position as a target position further comprises:
- in the case that the greatest amplitude at the current moment is less than or equal to the greatest amplitude at the previous moment, taking the position of the sensor assembly corresponding to the remote control signal with the greatest amplitude among the plurality of remote control signals at the previous moment as the target position.
5. The control method according to claim 1, wherein the controlling the oscillation mechanism to rotate towards the target position comprises:
- acquiring a current central air outlet position of the oscillation mechanism;
- based on the central air outlet position and the target position, acquiring rotation information; and
- based on the rotation information, controlling the oscillation mechanism to rotate.
6. The control method according to claim 5, wherein one of the plurality of sensor assemblies is disposed at the central air outlet position, and the control method further comprises:
- determining whether an amplitude of remote control information corresponding to the sensor assembly located at the central air outlet position is greater than a threshold; and
- in the case that the amplitude of the remote control information corresponding to the sensor assembly located at the central air outlet position is greater than the threshold, controlling the fan to deliver air to the target position.
7. The control method according to claim 5, further comprising:
- calculating an angle difference between the central air outlet position and the target position; and
- in a case where the angle difference is less than or equal to a preset angle threshold, controlling the fan to deliver air to the target position.
8. The control method according to claim 6 or 7, wherein the controlling the fan to deliver air to the target position comprises:
- controlling the fan to perform fixed-point air delivery to the target position; or
- controlling the fan to perform left-right oscillating air delivery with the target position as a center point and within a preset angle.
9. A fan, comprising:
- an air delivery mechanism;
- an oscillation mechanism, connected to the air delivery mechanism, and configured to control the fan to rotate, wherein the oscillation mechanism is provided at different positions thereof with a plurality of sensor assemblies, wherein the plurality of sensor assemblies are arranged based on an air delivery range of the oscillation mechanism and are configured to receive a plurality of remote control signals; and
- a controller, connected to the oscillation mechanism and the plurality of sensor assemblies, and configured to execute the control method according to any one of claims 1-8.
10. A computer-readable storage medium, having program instructions stored thereon, wherein the program instructions are capable of being executed by a processor to implement the control method according to any one of claims 1-8.

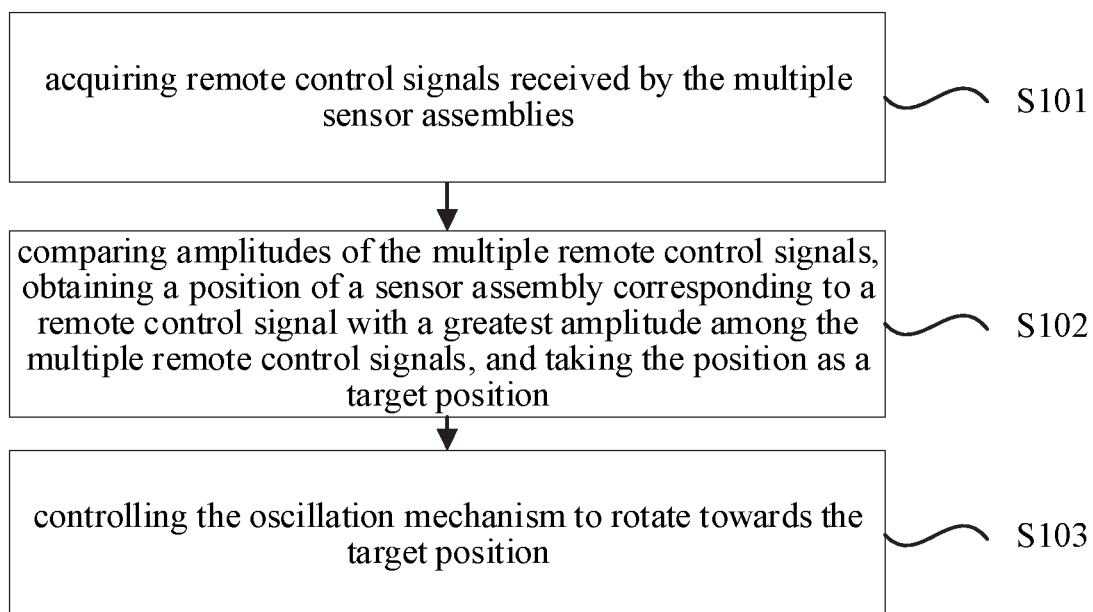


FIG. 1

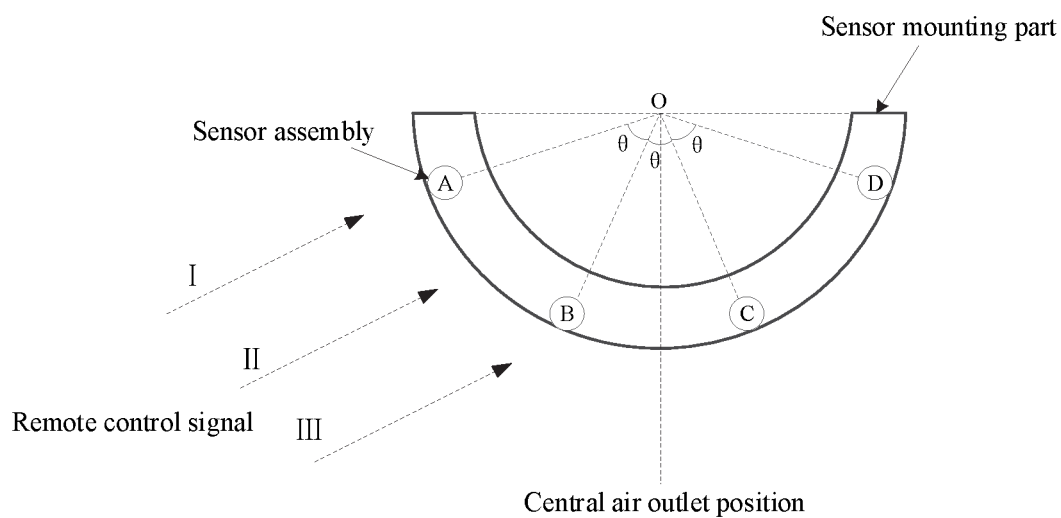


FIG. 2

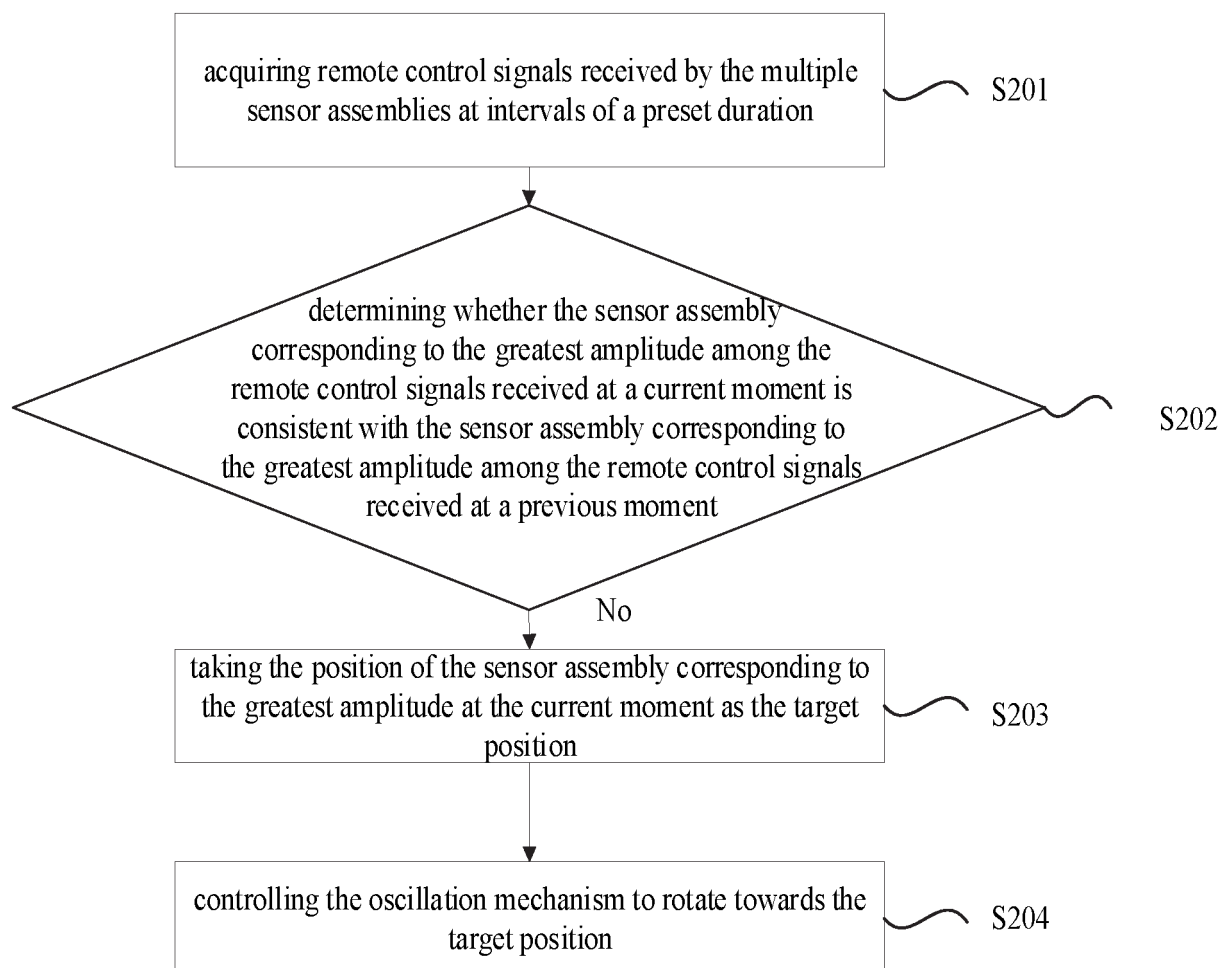


FIG. 3

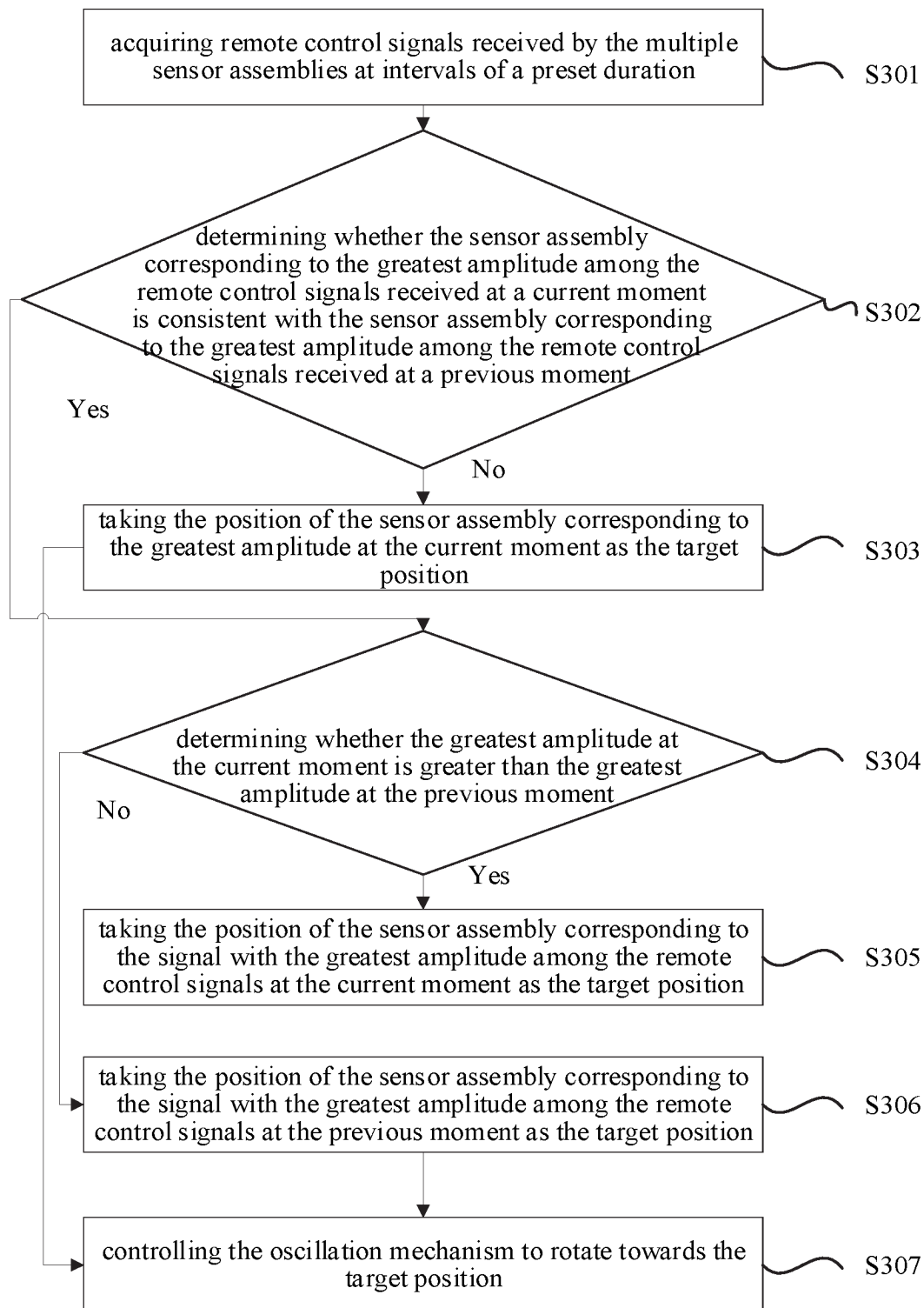


FIG. 4

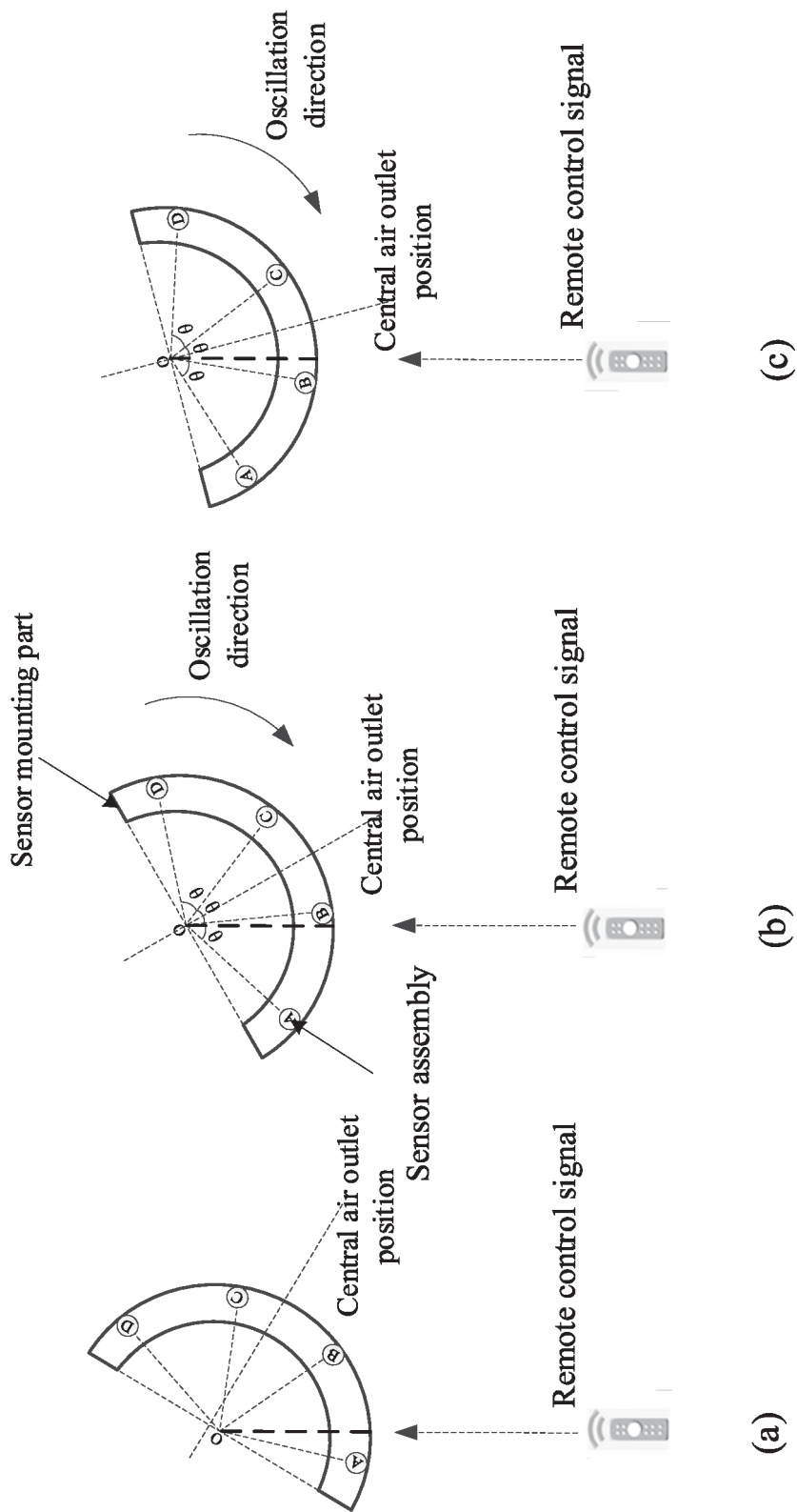


FIG. 5

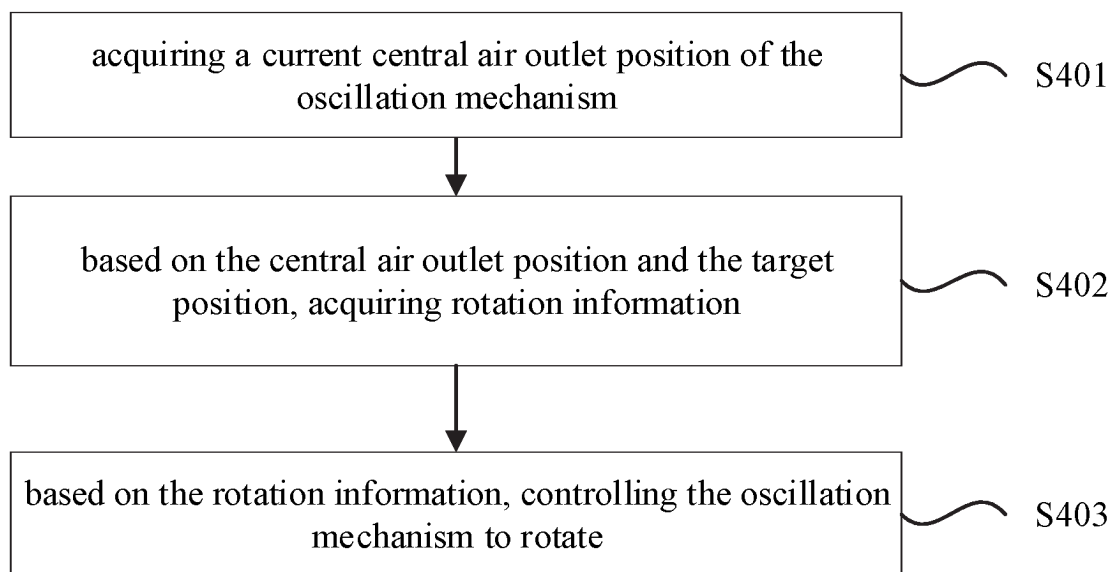


FIG. 6

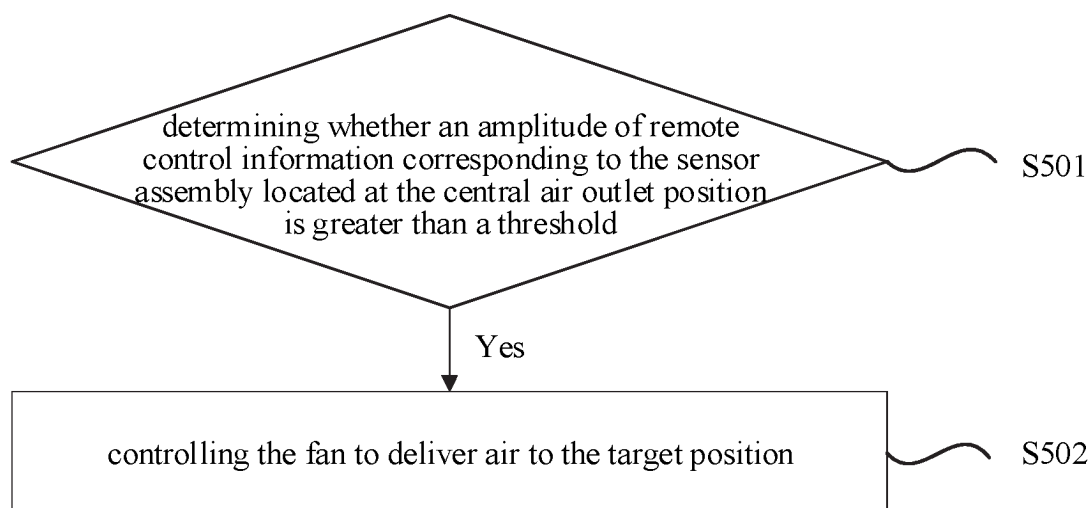


FIG. 7

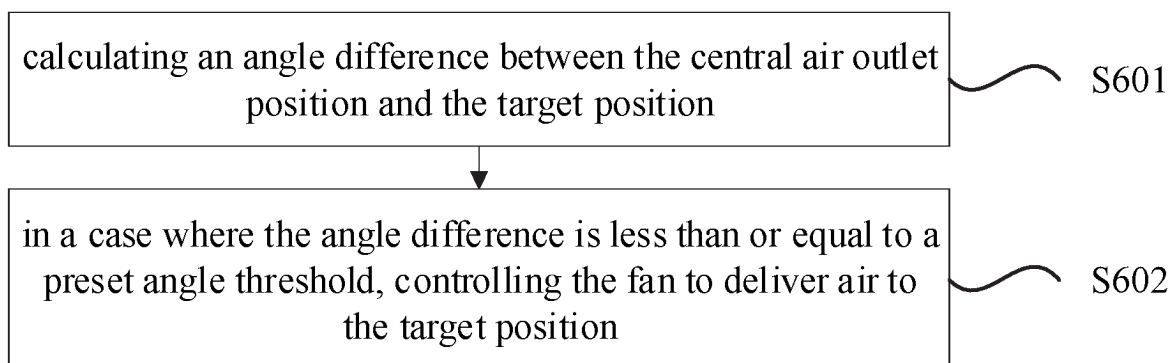


FIG. 8

100

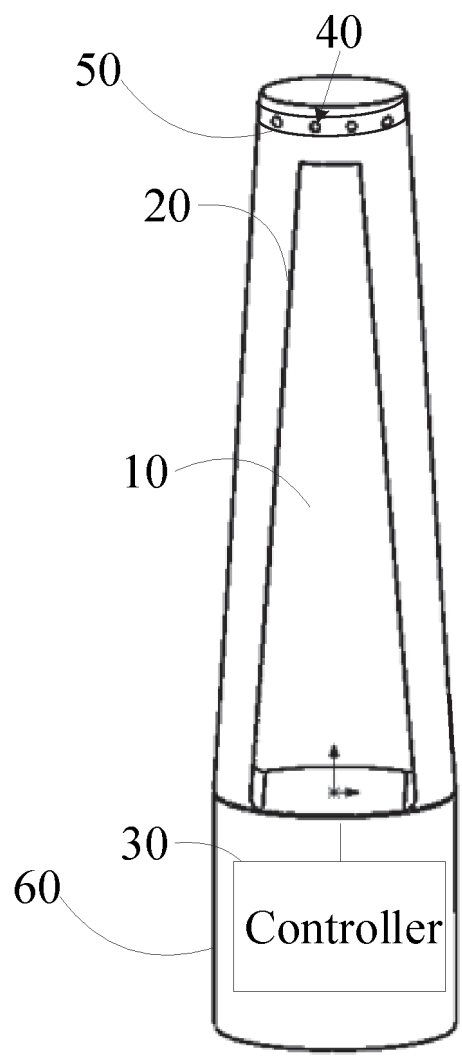


FIG. 9

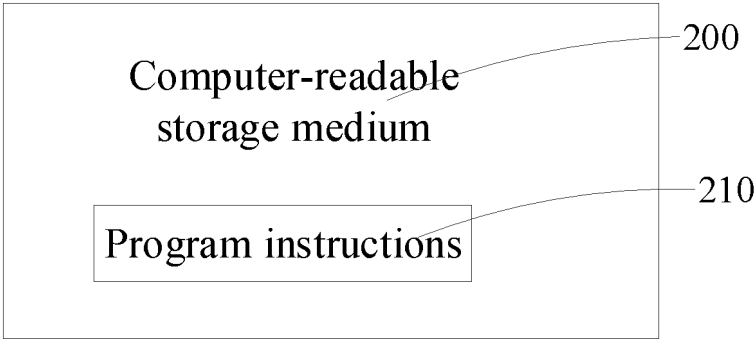


FIG. 10

300

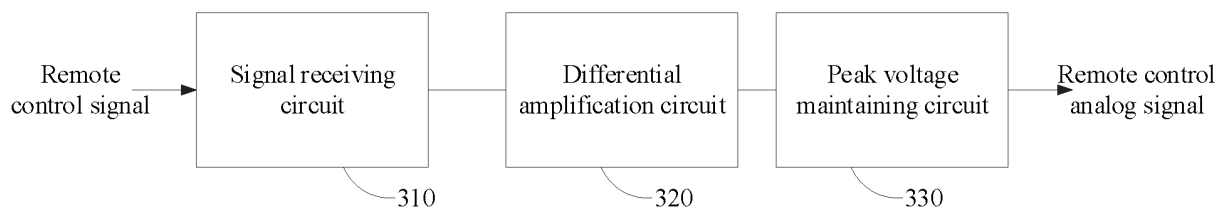


FIG. 11

300

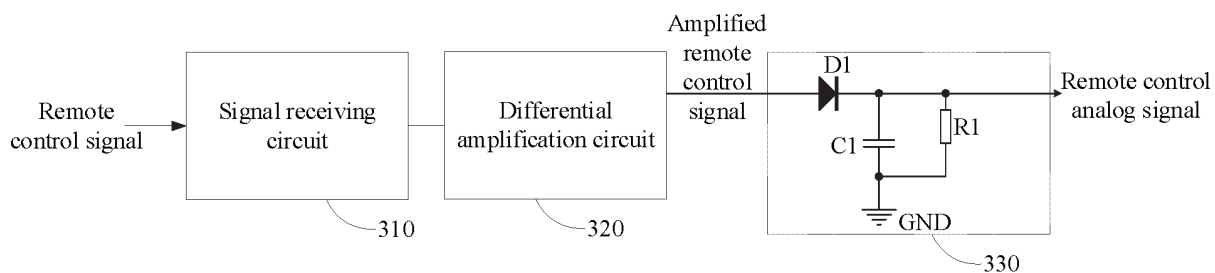


FIG. 12

300

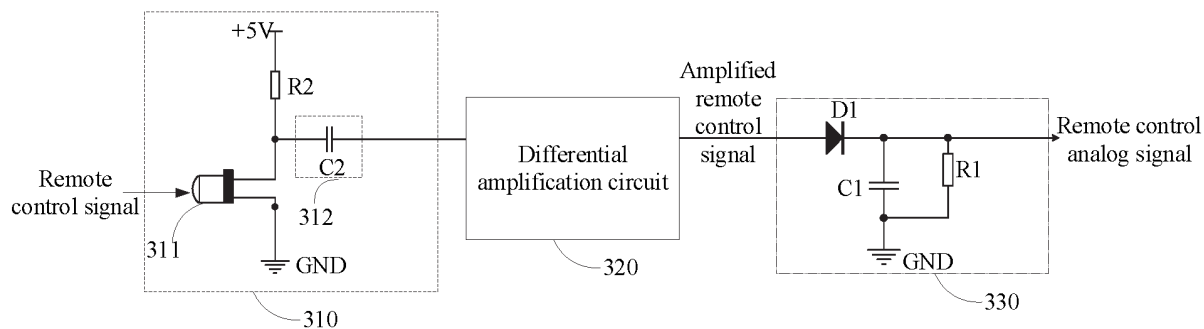


FIG. 13

300

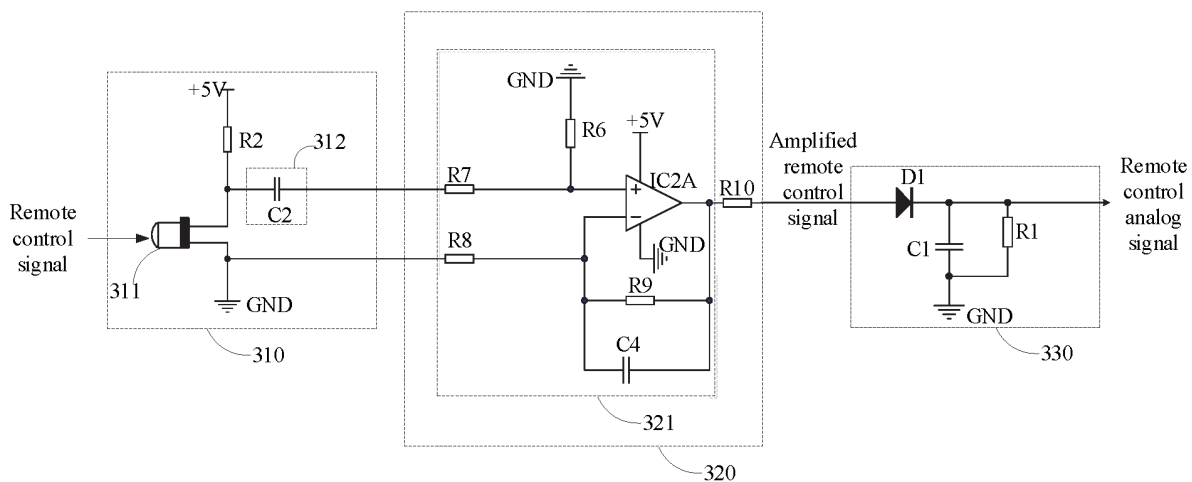
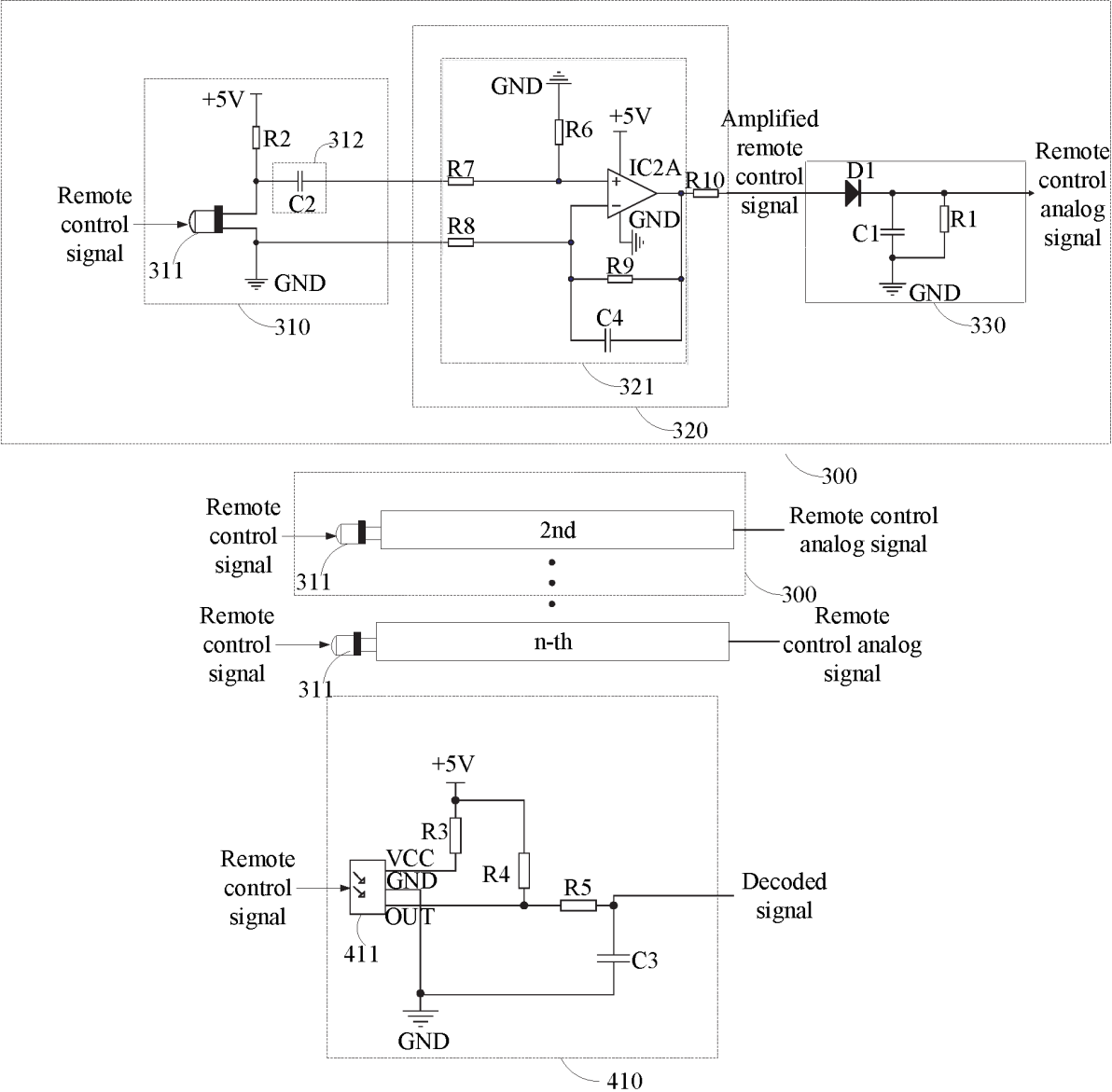
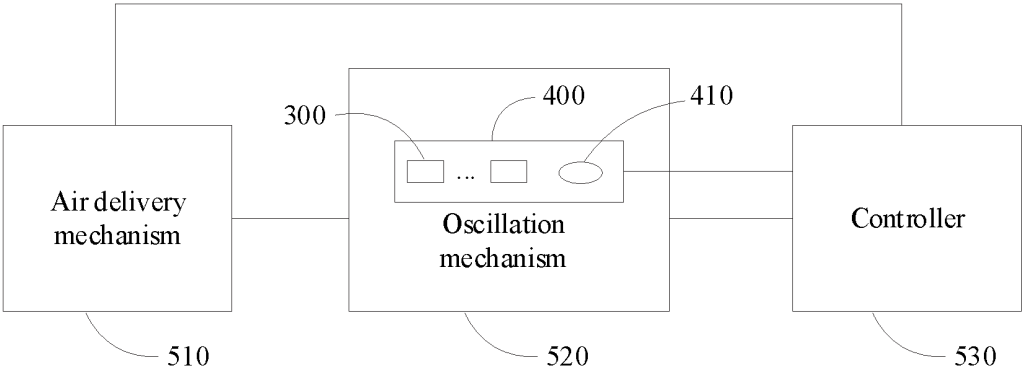


FIG. 14

400



500



500

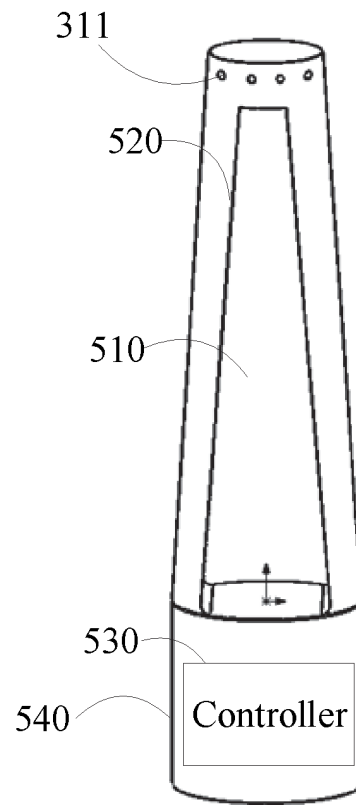
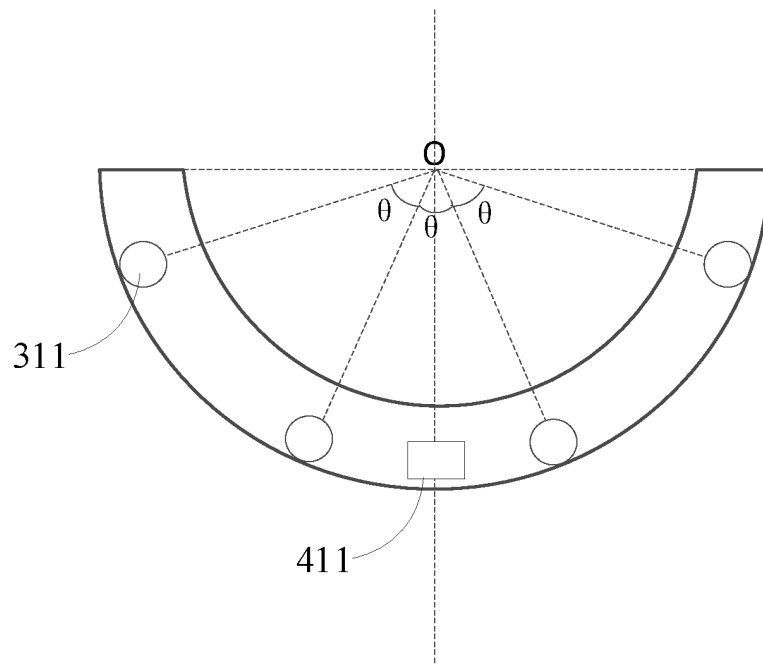


FIG. 17

550



Blowing forward direction

FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2024/089882

A. CLASSIFICATION OF SUBJECT MATTER

F04D25/10(2006.01)i; F04D27/00(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)

IPC:F04D25/10,F04D27/00; CPC:F04D25/105

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

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

CNTXT, ENTXTC, VEN, DWPI, CNKI: 美的, 风扇, 摇头, 转动, 多个, 多组, 传感器, 接收器, 遥控, 比较, 目标, 位置, 幅值, 信号值, 强度, fan, rotate, angle, sensor, receiver, compare, signal, target

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2019085883 A (TOSHIBA HOME TECHNOLOGY CORP.) 06 June 2019 (2019-06-06) description, paragraphs 0016-0067, and figures 1-13	1, 5-10
A	CN 106704238 A (GUANGDONG MIDEA ENVIRONMENT APPLIANCES MANUFACTURING CO., LTD. et al.) 24 May 2017 (2017-05-24) entire document	1-10
A	CN 104180796 A (SHANGHAI NINE EAGLES ELECTRONIC TECHNOLOGY CO., LTD.) 03 December 2014 (2014-12-03) entire document	1-10
A	CN 208870823 U (SHENZHEN FLYING MICROELECTRONIC CO., LTD.) 17 May 2019 (2019-05-17) entire document	1-10
A	CN 105370601 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 02 March 2016 (2016-03-02) entire document	1-10

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 24 July 2024	Date of mailing of the international search report 04 August 2024
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2024/089882

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				EP	3001144	A4	04 January 2017
				US	2016189537	A1	30 June 2016
				WO	2014187027	A1	27 November 2014
CN	208870823	U	17 May 2019	None			
CN	105370601	A	02 March 2016	None			

REFERENCES CITED IN THE DESCRIPTION

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- CN 2023113568479 [0001]