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(54) **AIR CONDITIONER**

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Description**FIELD OF THE INVENTION**

[0001] The present invention relates to the technical field of an air conditioner device, and specifically an air conditioner.

BACKGROUND OF THE INVENTION

[0002] In the prior art, the blasting comfort of the air conditioner affects the user experience. However, the blasting manner of the air conditioner directly affects the indoor comfort. In order to resolve that the blasting manner of the air conditioner cannot satisfy the needs for reasonable airflow organization during the cooling/heating at the same time such that the indoor airflow organization conforms more to the requirements for the comfort of human body, it is a general practice in the prior art that the front air outlet is closed and the upper air outlet is opened for blasting during the cooling, and the upper air outlet is closed and the front air outlet is opened for blasting during the heating. Although the blasting manner may satisfy the cooling and heating requirements at the same time, there is still a problem that it is impossible to satisfy the personalized blasting requirements of the air conditioner, which causes a poor blasting comfort of the air conditioner and reduces the user experience.

[0003] There has been a patent issued that cover variations of the air conditioner. For example, Patent No. CN202660645U discloses an upward and downward blowing air conditioner room unit, which includes an air conditioner shell, wherein an upper volute fan and a lower volute fan are arranged side by side in the shell; the upper volute fan is provided with an upper air inlet and an upper air outlet, the lower volute fan is provided with a lower air inlet and a lower air outlet, and the upper and the lower air inlets are respectively reversely arranged on the side parts of the upper and lower volute fans; the upper and the lower air inlets are connected with a shell air-inlet grille, and a heat exchanger is arranged between the air-inlet grille and the upper and lower air inlets; and the upper and lower air outlets respectively extend to upper and lower air out grids and are connected to form an induced air flue. The upper-down blowing-in air conditioner indoor machine provided by the utility model realizes high efficiency refrigeration and low-air heating, hot air is easy to send to the bottom space of a room, the comfortability of an air conditioner is improved, the utilization ratio of heating of the air conditioner is improved, and the energy is saved and the environment is protected.

SUMMARY OF THE INVENTION

[0004] The main object of the present invention is to provide an air conditioner to solve the problem of a poor blasting comfort of an air conditioner in the prior art.

[0005] In order to achieve the above-described object, according to the present invention, an air conditioner according to claim 1 is provided. The air conditioner configured to heat and cool and to be placed on the ground, includes: a housing having an upper air outlet and a lower air outlet, wherein the upper air outlet has an air outlet capacity greater than an air outlet capacity of the lower air outlet, the lower air outlet is configured to be disposed proximate to the ground; under a heating condition, the air conditioner is configured such that the upper air outlet and the lower air outlet perform blasting at the same time, and the upper air outlet produces an air stream performing downward suppression to an air stream proximate to ground produced by the lower air outlet to increase a movement distance of the air stream on the ground; wherein the lower air outlet has a lower edge, and a distance L3 from the ground to the lower edge of the lower air outlet satisfies that $0 < L3 < 0.2\text{m}$.

[0006] In some embodiments, the housing has an air inlet having an air inlet capacity φ , and the upper air outlet has an air outlet capacity φ_1 , wherein $53\% \leq \varphi_1/\varphi \leq 70\%$.

[0007] In some embodiments, the lower air outlet has an air outlet capacity φ_2 , wherein $30\% \leq \varphi_2/\varphi \leq 47\%$.

[0008] In some embodiments, the air inlet has a lower edge, and a distance L1 from ground to the lower edge satisfies that $0.3\text{m} \leq L1 \leq 0.5\text{m}$.

[0009] In some embodiments, the air inlet has a width W1, wherein $0.1\text{m} \leq W1 \leq 0.4\text{m}$.

[0010] In some embodiments, the air conditioner further includes: a temperature sensing means connected to the housing, and configured to monitor an indoor temperature; and an opening-and-closing member disposed at the lower air outlet, and configured to close the lower air outlet when the indoor temperature monitored by the temperature sensing means reaches a preset value.

[0011] In some embodiments, the upper air outlet has a lower edge, and a distance L2 from ground to the lower edge of the upper air outlet satisfies that $1.6\text{m} \leq L2 \leq 1.9\text{m}$.

[0012] In some embodiments, the upper air outlet and the lower air outlet are sequentially arranged along a vertical axis direction of the housing, and the upper air outlet and the lower air outlet are located on a same side of the housing, wherein the lower air outlet is symmetrically arranged with respect to an extension line of a geometric centerline of the upper air outlet extending along a vertical direction.

[0013] In some embodiments, the air conditioner has a cooling mode and a heating mode, wherein Air Diffusion Performance Index ADPI > 83% when the air conditioner is in the cooling mode or the heating mode.

[0014] In some embodiments, the housing has a circular, elliptical or quadrate cross-section.

[0015] In some embodiments, the upper air outlet is configured to produce an air stream blasting obliquely upwards under a cooling condition, and the lower air outlet is configured to produce an air stream proximate to ground under the cooling condition.

[0016] By applying the technical solution of the present invention, the air conditioner includes a housing. The housing has an upper air outlet and a lower air outlet, wherein the upper air outlet has an air outlet capacity greater than that of the lower air outlet. The air outlet capacity of the upper air outlet is set to be greater than that of the lower air outlet, such that during the heating, the air conditioner realizes an effect in which an air stream blown from the upper air outlet suppresses an air stream blown from the lower air outlet, a floor covering area of hot air can be an effectively enlarged and a blasting comfort of the air conditioner can be enhanced.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0017] The accompanying drawings of the description that constitute a part of the present application, are used to provide a further understanding of the present invention. The illustrative embodiments of the present invention as well as the descriptions thereof, which are used for explaining the present invention, help to understand the invention which is defined in the claims.

[0018] In the accompanying drawings:

Fig. 1 shows a schematic structural diagram in a first perspective view of a first embodiment of an air conditioner according to the present invention;

Fig. 2 shows a schematic structural diagram in a second perspective view of an embodiment of the air conditioner of Fig. 1;

Fig. 3 shows a schematic structural diagram in a third perspective view of an embodiment of the air conditioner of Fig. 1;

Fig. 4 shows a schematic diagram of a first blasting mode of the air conditioner when the air conditioner is operating indoor in Fig. 1;

Fig. 5 shows a schematic diagram of a second blasting mode of the air conditioner when the air conditioner is operating indoor in Fig. 1;

Fig. 6 shows a schematic diagram of a third blasting mode of the air conditioner when the air conditioner is operating indoor in Fig. 1;

Fig. 7 shows a schematic diagram of a fourth blasting mode of the air conditioner when the air conditioner is operating indoor in Fig. 1;

Fig. 8 shows a schematic structural diagram of a second embodiment of an air conditioner according to the present invention;

Fig. 9 shows a schematic structural diagram of a third embodiment of an air conditioner according to the present invention.

[0019] The above-described accompanying drawings include the following reference signs:

10. housing; 11. upper air outlet; 12. lower air outlet; 13. air inlet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] It should be noted that, in the case without a conflict, the embodiments in the present application and the features in the embodiments may be combined with each other. The present invention will be described in detail below with reference to the drawings and in conjunction with the embodiments.

[0021] It is to be noted that the terms used here are only for the purpose of describing particular embodiments, and not intended to limit the exemplary embodiments according to the present application. As used here, the singular forms are also intended to include plural forms unless specified additionally in the context. In addition, it should also be understood that when the term "contains" and/or "includes" is used in the present specification, it is intended to indicate the presence of features, steps, operations, devices, assemblies, and/or combinations thereof.

[0022] It should be noted that the terms "first", "second" and the like in the specification and claims of the present application and the drawings are used to distinguish similar objects, and not necessarily used to describe a specific order or sequence. It is to be understood that the terms thus used are interchangeable as appropriate, such that the embodiments of the present application described here can be implemented, for example, in a sequence other than those illustrated or described here. In addition, the terms "include/comprise" and "have/has" as well as any of their

deformations are intended to cover a non-exclusive inclusion. For example, the process, method, system, product, or device that contains a series of steps or units is not necessarily limited to those steps or units that are explicitly listed, but may include other steps or units that are not explicitly listed or that are inherent to such processes, methods, products or devices.

[0023] For ease of description, spatially relative terms such as "over", "above", "on an upper surface of", "upper", and the like, may be used here to describe the spatial positional relationship of one device or feature shown in the drawings with other devices or features. It should be understood that, the spatially relative terms are intended to contain different orientations in use or operation in addition to the orientation of the device described in the drawings. For example, if the device in the drawings is inverted, the device described to be "above other devices or constructions" or "over other devices or constructions" will be positioned "below other devices or constructions" or "under other devices or constructions". Thus, the exemplary term "above" may include both orientations including "above" and "below". The device may also be positioned in other different manners (rotated 90 degrees or at other orientations), and the relative descriptions of the space used here are interpreted accordingly.

[0024] Exemplary embodiments according to the present application will now be described in more detail with reference to the accompanying drawings. However, these exemplary embodiments may be embodied in multiple different forms and should not be construed as being limited to only the embodiments set forth here, but only by the claims.

[0025] It is to be understood that these embodiments are provided so that the disclosure of the present invention will be thorough and complete. In the accompanying drawings, for the sake of clarity, it is possible to enlarge the thickness of layers and areas and use the same reference sign to present the same component, so that the description thereof will be omitted.

[0026] In conjunction with Figs. 1 to 9, according to an embodiment of the present invention, an air conditioner is provided.

[0027] Specifically, as shown in Fig. 1, the air conditioner includes a housing 10. The housing 101 has an upper air outlet 11 and a lower air outlet 12, wherein the upper air outlet 11 has an air outlet capacity greater than an air outlet capacity of the lower air outlet 12.

[0028] In the invention, the air outlet capacity of the upper air outlet is set to be greater than that of the lower air outlet, such that during the heating, the air conditioner realizes an effect in which an air stream blown from the upper air outlet suppresses an air stream blown from the lower air outlet, a floor covering area of hot air can be an effectively enlarged and a blasting comfort of the air conditioner can be enhanced.

[0029] Further, the housing 10 further has an air inlet 13 having an air inlet capacity φ , and the upper air outlet 11 has an air outlet capacity φ_1 , wherein $53\% \leq \varphi_1 / \varphi \leq 70\%$. This arrangement can effectively improve the blasting comfort of the upper air outlet 11 of the air conditioner and enhance the user's operational experience.

[0030] Preferably, the lower air outlet 12 has an air outlet capacity φ_2 , wherein $30\% \leq \varphi_2 / \varphi \leq 47\%$. This arrangement can effectively improve the blasting comfort of the lower air outlet 12. In the present embodiment, $\varphi_1 + \varphi_2 = \varphi$. This arrangement can effectively improve the heating performance of the air conditioner.

[0031] As shown in Fig. 2, the air inlet 13 has a lower edge at a distance L_1 from ground, wherein $0.3\text{m} \leq L_1 \leq 0.5\text{m}$. The air inlet 13 has a width W_1 , wherein $0.1\text{m} \leq W_1 \leq 0.4\text{m}$. This arrangement can effectively improve the air intake efficiency of an entirety of the air conditioner.

[0032] In order to further improve the blasting comfort of the air conditioner, the air conditioner further includes a temperature sensing means and an opening-and-closing member. The temperature sensing means is connected to the housing 10, wherein the temperature sensing means is configured to monitor an indoor temperature. The opening-and-closing member is disposed at the lower air outlet 12, and configured to close the lower air outlet 12 when the indoor temperature monitored by the temperature sensing means reaches a preset value.

[0033] As shown in Fig. 1, the upper air outlet 11 has a lower edge at a distance L_2 from ground, wherein $1.6\text{m} \leq L_2 \leq 1.9\text{m}$. The lower air outlet 12 has a lower edge at a distance L_3 from the ground, wherein $0 < L_3 \leq 0.2\text{m}$. This arrangement can effectively control an air outlet capacity of the upper air outlet 11 and the lower air outlet 12. The air blown by the air conditioner is more comfortable by changing the distance between the air inlet of the air conditioner and the ground, and/or between the air outlet of the air conditioner and the ground.

[0034] In order to further improve the blasting comfort of the air conditioner, the upper air outlet 11 and the lower air outlet 12 are sequentially arranged along a vertical axis direction of the housing 10, and the upper air outlet 11 and the lower air outlet 12 are located on the same side of the housing 10. The lower air outlet 12 is symmetrically arranged with respect to an extension line of a geometric centerline of the upper air outlet 11 extending along a vertical direction. The arrangement enables that the air stream blown from the upper air outlet 11 and the air stream blown from the lower air outlet 12 mix with each other to effectively avoid laminarity of the indoor streams, and effectively improve the comfort of the air conditioner during cooling and heating.

[0035] Further, in the present embodiment, the air conditioner has a cooling mode and a heating mode, wherein ADPI $> 83\%$ when the air conditioner is in the cooling mode or the heating mode. Specifically, as shown in Figs. 3, 8 and 9, the housing 10 may have a circular, elliptical or quadrate cross-section. The quadrate may be square or rectangular.

[0036] Specifically, the air conditioner is used to effectively solve the problem of poor heating comfort and indoor thermal stratification of the current household air conditioners and solves the problem that the current household air conditioners are difficult to take into consideration the refrigeration and the heating comfort at the same time. The air conditioner of this structure is used to significantly shorten the processing time for the indoor air to meet the comfort requirements and save the operational cost. The power consumption may be saved by 48% as compared to the conventional household air conditioners, the air conditioner can quickly achieve thermal balance.

[0037] The heights of the upper and lower air outlets relative to the ground and the distance between the air outlets are both optimally designed, so that the airflow organization within the room is reasonable and efficient. At the same time, the optimal design of air capacity ratio of the upper air outlet and lower air outlet is used, to achieve an airflow control effect by configuring different air capacity proportions of the upper air outlet and the lower air outlet. During the heating, it is possible to implement that the upper air outlet suppresses the air stream of the lower air outlet, thereby increasing the floor covering area of hot air and significantly enhancing the heating comfort. During the cooling, the upper and lower air outlets perform blasting at the same time, and after the indoor temperature reaches a preset temperature rapidly, it is allowable to change to separately blast from the upper air outlet, thereby avoiding a blasting feeling to be produced.

[0038] By optimizing the design of the size of the air inlet, the airflow organization and circulation efficiency is ensured while the windward area of the heat exchanger is satisfied.

[0039] As shown in Figs. 1 to 3, in a top view, the housing of the air conditioner has a circular cross-section with a diameter D1. The housing has two air outlets and one air inlet, which are an upper air outlet, a lower air outlet, and an air inlet respectively, and all symmetrical with respect to a centerline of the housing. Under the heating condition, the blasting manner of the air conditioner is as shown in Fig. 4. The upper air outlet and the lower air outlet perform blasting at the same time, and the air capacity of the upper air outlet has a proportion ϕ_1/ϕ (that is, the percentage of the air outlet capacity of the upper air outlet relative to the air inlet capacity of the air inlet), and the air capacity of the lower air outlet has a proportion ϕ_2/ϕ , wherein $\phi_1 > \phi_2$. The lower air outlet is disposed proximate to the ground. Due to the viscosity of the air, the produced air stream is conveyed close to the ground to realize a carpet-type blasting. The air stream produced by the upper air outlet performs downward suppression to increase a movement distance of the air stream on the ground, such that there is a greater blasting area during the heating, thereby avoiding a thermal stratification phenomenon in a room, and significantly improving the heating comfort. Under the cooling condition, the blasting mode at an extremity is as shown in Figs. 5 and 6. The air capacity of the upper air outlet has a proportion ϕ_1/ϕ , and the air capacity of the lower air outlet has a proportion ϕ_2/ϕ , wherein $\phi_1 > \phi_2$. In order to rapidly reach a set temperature and avoid a blasting feeling to be produced, the upper air outlet blasts obliquely upwards, such that cold air which has a large density falls slowly from up to down, to effectuate a shower-type blasting. The lower air outlet performs blasting close to the ground, to effectuate rapid temperature reduction in a near-ground area. When the temperature in a room is close to a set temperature, the lower air outlet is closed, such that only a shower-type blasting manner is used, to ensure the indoor comfort. In addition to the above-described blasting manner, personalized blasting may also be performed at the extremity according the needs of human body. As shown in Fig. 7, the upper air outlet may swing longitudinally within a certain angle β , and the upper air outlet and the lower air outlet may swing right and left within a certain angle, to satisfy different blasting requirements.

[0040] By using the air conditioner of the present application, it is possible to ensure reasonable and comfortable airflow organization, and the indoor Air Diffusion Performance Indices (ADPIs) can reach more than 83% under both the cooling and heating conditions. The definition of ADPI is as follows:

[0041] ADPI is an airflow organization assessment standard recommended by AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE), in which by considering a temperature and speed of each measurement point, it is considered that when an effective draft temperature (EDT) of a certain point satisfies the range between -1.7 and 1.1 °C, a majority of people feel comfortable. The percentage occupied by such points in all the measurement points is an ADPI value. When $ADPI \geq 80\%$, the airflow organization within the air-conditioned area may be considered satisfactory. The calculation formula is as follows:

$$\Delta ET = (t_i - t_n) - 7.66(u_i - 0.15);$$

$$ADPI = (-1.7 < \Delta ET < 1.1) / \text{total number of measurement points} \times 100\%.$$

[0042] In the formula, ΔET is an effective blasting temperature, t_i is a temperature of a certain point in a working area with a unit of °C, t_n is a given indoor average temperature with a unit of °C, and u_i is an air flow rate at a certain point in a working area with a unit of m/s. The ADPI value comprehensively reflects an impact by an airflow organization in the air-conditioned area. The higher the ADPI value is, the more people feel satisfactory with the environment among the

people who stay within the air-conditioned area. When $ADPI \geq 80\%$, it may be considered that the airflow organization blown by the air conditioner is satisfactory.

[0043] In addition to the above-described, it should also be noted that "one embodiment", "another embodiment", "an embodiment" and the like referred to in the present specification mean that specific features, structures or characteristics described in conjunction with the embodiment are included in at least one embodiment generally described in the present application. The same definition appearing in multiple places in the specification does not necessarily refer to the same embodiment.

[0044] In the above-described embodiments, the focus of the descriptions of the various embodiments are different, and for the parts that are not described in detail in a certain embodiment, it is possible to refer to the related descriptions of other embodiments.

[0045] The foregoing descriptions are only preferred embodiments of the present invention, but do not serve to limit the present invention which is defined in the claims.

[0046] For those skilled in the art, various modifications and changes may be made in the present invention as long as within the scope of the claims.

Claims

1. An air conditioner configured to heat and cool and to be placed on the ground, comprising: a housing (10) having an upper air outlet (11) and a lower air outlet (12), **characterized in that** the upper air outlet (11) has an air outlet capacity greater than an air outlet capacity of the lower air outlet (12), the lower air outlet is configured to be disposed proximate to the ground; under a heating condition, the air conditioner is configured such that the upper air outlet and the lower air outlet perform blasting at the same time, and the upper air outlet (11) produces an air stream performing downward suppression to an air stream proximate to ground produced by the lower air outlet (12) to increase a movement distance of the air stream on the ground; wherein the lower air outlet (12) has a lower edge, and a distance $L3$ from the ground to the lower edge of the lower air outlet (12) satisfies that $0 < L3 \leq 0.2m$.
2. The air conditioner according to claim 1, wherein the housing (10) has an air inlet (13) having an air inlet capacity ϕ , and the upper air outlet (11) has an air outlet capacity $\phi1$, wherein $53\% \leq \phi1/\phi \leq 70\%$.
3. The air conditioner according to claim 2, wherein the lower air outlet (12) has an air outlet capacity $\phi2$, wherein $30\% \phi \leq \phi2/\phi \leq 47\%$.
4. The air conditioner according to claim 2, wherein the air inlet (13) has a lower edge, and a distance $L1$ from ground to the lower edge satisfies that $0.3m \leq L1 \leq 0.5m$.
5. The air conditioner according to claim 2, wherein the air inlet (13) has a width $W1$, wherein $0.1m \leq W1 \leq 0.4m$.
6. The air conditioner according to claim 2, further comprising:
 - a temperature sensing means connected to the housing (10), and configured to monitor an indoor temperature; and
 - an opening-and-closing member disposed at the lower air outlet (12), and configured to close the lower air outlet (12) when the indoor temperature monitored by the temperature sensing means reaches a preset value.
7. The air conditioner according to claim 1, wherein the upper air outlet (11) has a lower edge, and a distance $L2$ from ground to the lower edge of the upper air outlet (11) satisfies that $1.6m \leq L2 \leq 1.9m$.
8. The air conditioner according to claim 1, wherein the upper air outlet (11) and the lower air outlet (12) are sequentially arranged along a vertical axis direction of the housing (10), and the upper air outlet (11) and the lower air outlet (12) are located on a same side of the housing (10), wherein the lower air outlet (12) is symmetrically arranged with respect to an extension line of a geometric centerline of the upper air outlet (11) extending along a vertical direction.
9. The air conditioner according to claim 1, wherein the air conditioner having a cooling mode and a heating mode, wherein Air Diffusion Performance Index $ADPI > 83\%$ when the air conditioner is in the cooling mode or the heating mode.
10. The air conditioner according to claim 1, wherein the housing (10) has a circular, elliptical or quadrate cross-section.

11. The air conditioner according to claim 1, wherein the upper air outlet (11) is configured to produce an air stream blasting obliquely upwards under a cooling condition, and the lower air outlet (12) is configured to produce an air stream proximate to ground under the cooling condition.

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Patentansprüche

1. Klimaanlage, die zum Heizen und Kühlen konfiguriert ist und auf dem Boden platziert werden kann, umfassend: ein Gehäuse (10) mit einem oberen Luftauslass (11) und einem unteren Luftauslass (12), **dadurch gekennzeichnet, dass** der obere Luftauslass (11) eine Luftauslasskapazität hat, die größer ist als eine Luftauslasskapazität des unteren Luftauslasses (12), wobei der untere Luftauslass so konfiguriert ist, dass er in der Nähe des Bodens angeordnet ist. Im Heizbetrieb ist die Klimaanlage so konfiguriert, dass der obere Luftauslass und der untere Luftauslass gleichzeitig ein Ausblasen durchführen, und der obere Luftauslass (11) einen Luftstrom erzeugt, der eine Abwärtsunterdrückung eines Luftstroms in der Nähe des Bodens durchführt, der durch den unteren Luftauslass (12) erzeugt wird, um eine Bewegungsdistanz des Luftstroms auf dem Boden zu vergrößern; wobei der untere Luftauslass (12) eine untere Kante aufweist, und der Abstand L_3 vom Boden zur unteren Kante des unteren Luftauslasses (12) beträgt $0 < L_3 \leq 0,2 \text{ m}$.
2. Klimaanlage nach Anspruch 1, wobei das Gehäuse (10) einen Lufteinlass (13) mit einer Lufteinlasskapazität φ und der obere Luftauslass (11) eine Luftauslasskapazität $q > 1$ aufweist, wobei $53 \% \leq \varphi_1/\varphi \leq 70 \%$.
3. Klimaanlage nach Anspruch 2, wobei der untere Luftauslass (12) eine Luftauslasskapazität φ_2 aufweist, wobei $30 \% \leq \varphi_2/\varphi \leq 47 \%$.
4. Klimaanlage nach Anspruch 2, wobei der Lufteinlass (13) eine Unterkante hat und der Abstand L_1 vom Boden zur Unterkante beträgt $0,3 \text{ m} \leq L_1 \leq 0,5 \text{ m}$.
5. Klimaanlage nach Anspruch 2, wobei der Lufteinlass (13) eine Breite W_1 hat, wobei $0,1 \text{ m} \leq W_1 \leq 0,4 \text{ m}$.
6. Klimaanlage nach Anspruch 2, ferner umfassend:
 - eine mit dem Gehäuse (10) verbundene Temperaturerfassungseinrichtung, die so konfiguriert ist, dass sie eine Innentemperatur überwacht; und
 - ein Öffnungs- und Schließelement, das an dem unteren Luftauslass (12) angeordnet ist und so konfiguriert ist, dass es den unteren Luftauslass (12) schließt, wenn die durch die Temperaturerfassungseinrichtung überwachte Innentemperatur einen voreingestellten Wert erreicht.
7. Klimaanlage nach Anspruch 1, wobei der obere Luftauslass (11) eine untere Kante hat und ein Abstand L_2 vom Boden zur unteren Kante des oberen Luftauslasses (11) beträgt $1,6 \text{ m} \leq L_2 \leq 1,9 \text{ m}$.
8. Klimaanlage nach Anspruch 1, wobei der obere Luftauslass (11) und der untere Luftauslass (12) aufeinanderfolgend entlang einer vertikalen Achsenrichtung des Gehäuses (10) angeordnet sind, und der obere Luftauslass (11) und der untere Luftauslass (12) sich auf derselben Seite des Gehäuses (10) befinden, wobei der untere Luftauslass (12) symmetrisch in Bezug auf eine Verlängerungslinie einer geometrischen Mittellinie des oberen Luftauslasses (11) angeordnet ist, die sich entlang einer vertikalen Richtung erstreckt.
9. Klimaanlage nach Anspruch 1, wobei die Klimaanlage einen Kühlmodus und einen Heizmodus hat, wobei der Luftdiffusionsleistungsindex $ADPI > 83 \%$ ist, wenn sich die Klimaanlage im Kühlmodus oder im Heizmodus befindet.
10. Klimaanlage nach Anspruch 1, wobei das Gehäuse (10) einen kreisförmigen, elliptischen oder quadratischen Querschnitt aufweist.
11. Klimaanlage nach Anspruch 1, wobei der obere Luftauslass (11) so konfiguriert ist, dass er einen Luftstrom erzeugt, der im Kühlmodus schräg nach oben bläst, und der untere Luftauslass (12) so konfiguriert ist, dass er im Kühlmodus einen Luftstrom in Bodennähe erzeugt.

Revendications

1. Climatiseur configuré pour chauffer et refroidir et pouvant être placé sur le sol, comprenant : un boîtier (10) présentant une sortie d'air supérieure (11) et une sortie d'air inférieure (12), **caractérisé en ce que** la sortie d'air supérieure (11) présente une capacité de sortie d'air supérieure à la capacité de sortie d'air de la sortie d'air inférieure (12), la sortie d'air inférieure est configurée pour être disposée à proximité du sol ; dans une condition de chauffage, le climatiseur est configuré de telle sorte que la sortie d'air supérieure et la sortie d'air inférieure effectuent un soufflage en même temps, et la sortie d'air supérieure (11) produit un flux d'air effectuant une suppression vers le bas à un flux d'air proche du sol produit par la sortie d'air inférieure (12) pour augmenter une distance de mouvement du flux d'air sur le sol ; dans lequel la sortie d'air inférieure (12) présente un bord inférieur, et une distance L3 du sol au bord inférieur de la sortie d'air inférieure (12) satisfait à ce que $0 < L3 \leq 0,2$ m.
2. Climatiseur selon la revendication 1, dans lequel le boîtier (10) présente une entrée d'air (13) présentant une capacité d'entrée d'air φ , et la sortie d'air supérieure (11) présente une capacité de sortie d'air φ_1 , dans lequel $53 \% \leq \varphi_1 / \varphi \leq 70 \%$.
3. Climatiseur selon la revendication 2, dans lequel la sortie d'air inférieure (12) présente une capacité de sortie d'air φ_2 , dans lequel $30 \% \leq \varphi_2 / \varphi \leq 47 \%$.
4. Climatiseur selon la revendication 2, dans lequel l'entrée d'air (13) présente un bord inférieur, et une distance L1 du sol au bord inférieur satisfait que $0,3 \text{ m} \leq L1 \leq 0,5 \text{ m}$.
5. Climatiseur selon la revendication 2, dans lequel l'entrée d'air (13) présente une largeur W1, dans lequel $0,1 \text{ m} \leq W1 \leq 0,4 \text{ m}$.
6. Climatiseur selon la revendication 2, comprenant en outre :
 - un moyen de détection de la température relié au boîtier (10) et configuré pour surveiller une température intérieure ; et
 - un élément d'ouverture et de fermeture disposé sur la sortie d'air inférieure (12) et configuré pour fermer la sortie d'air inférieure (12) lorsque la température intérieure surveillée par le moyen de détection de la température atteint une valeur prédéfinie.
7. Climatiseur selon la revendication 1, dans lequel la sortie d'air supérieure (11) présente un bord inférieur, et une distance L2 du sol au bord inférieur de la sortie d'air supérieure (11) satisfait que $1,6 \text{ m} \leq L2 \leq 1,9 \text{ m}$.
8. Climatiseur selon la revendication 1, dans lequel la sortie d'air supérieure (11) et la sortie d'air inférieure (12) sont disposées séquentiellement le long d'une direction d'axe vertical du boîtier (10), et la sortie d'air supérieure (11) et la sortie d'air inférieure (12) sont situées sur un même côté du boîtier (10), dans lequel la sortie d'air inférieure (12) est disposée symétriquement par rapport à une ligne d'extension d'une ligne géométrique centrale de la sortie d'air supérieure (11) qui s'étend le long d'une direction verticale.
9. Climatiseur selon la revendication 1, dans lequel le climatiseur présente un mode de refroidissement et un mode de chauffage, dans lequel l'indice de performance de diffusion de l'air ADPI $> 83 \%$ lorsque le climatiseur est en mode de refroidissement ou en mode de chauffage.
10. Climatiseur selon la revendication 1, dans lequel le boîtier (10) présente une section transversale circulaire, elliptique ou quadrangulaire.
11. Climatiseur selon la revendication 1, dans lequel la sortie d'air supérieure (11) est configurée pour produire un flux d'air soufflant obliquement vers le haut dans une condition de refroidissement, et la sortie d'air inférieure (12) est configurée pour produire un flux d'air proche du sol dans une condition de refroidissement.

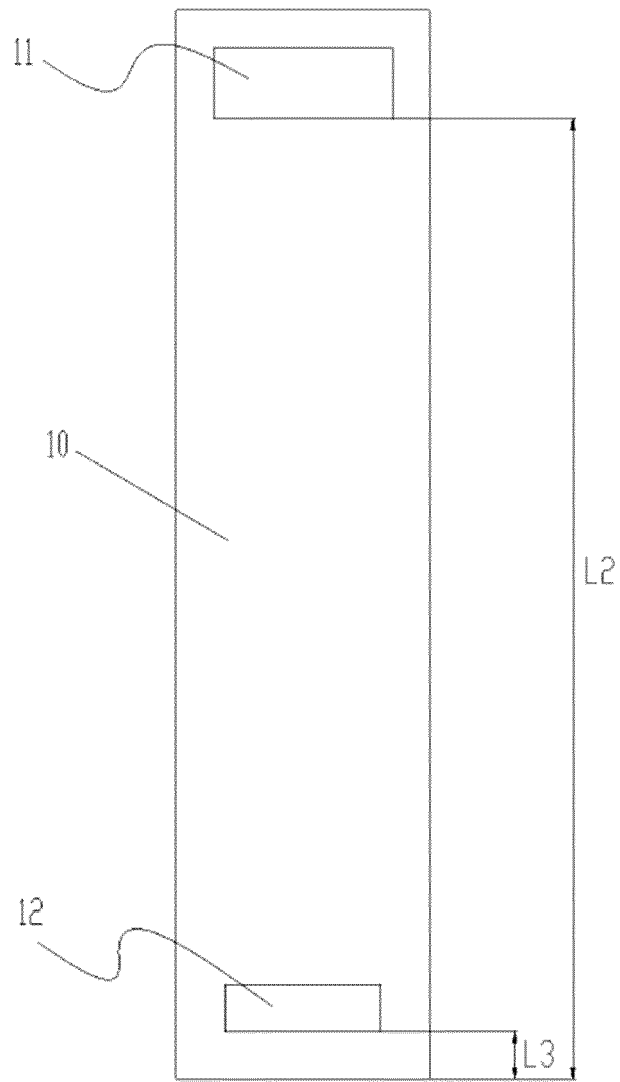


Fig. 1

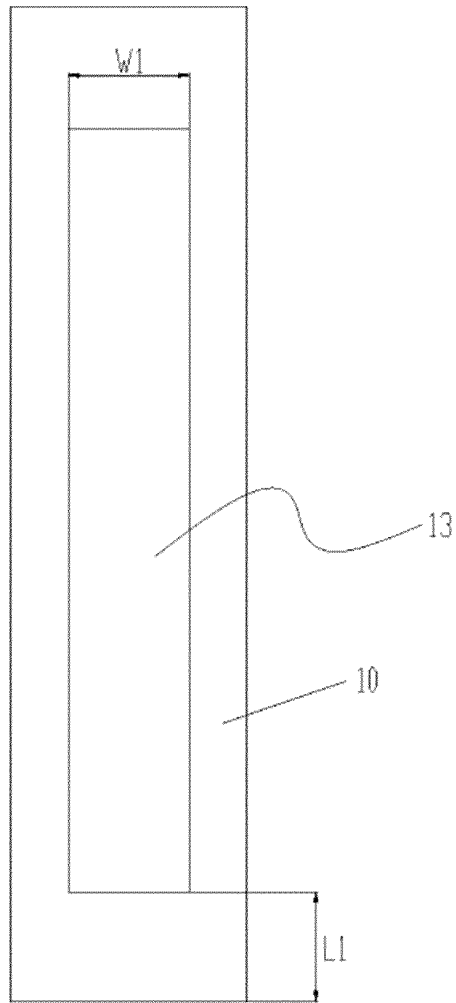


Fig. 2

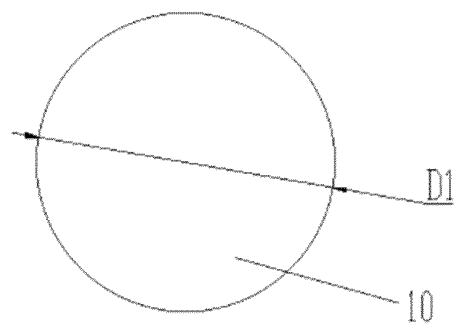


Fig. 3

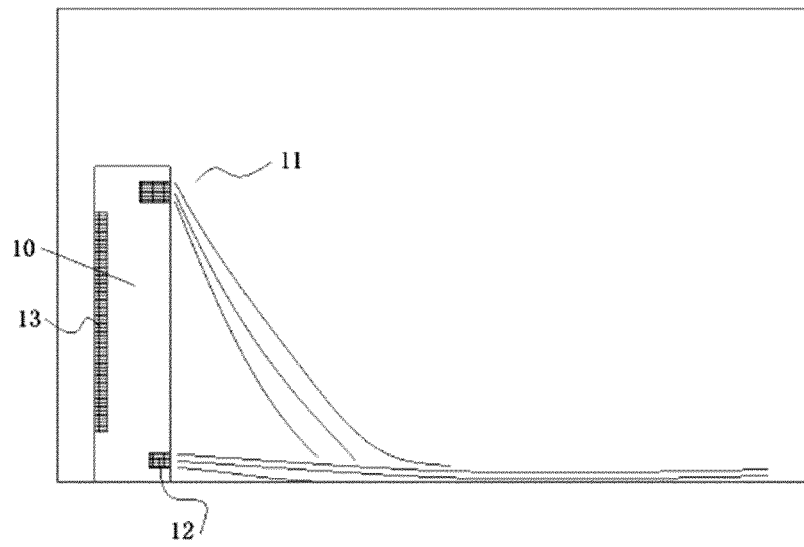


Fig. 4

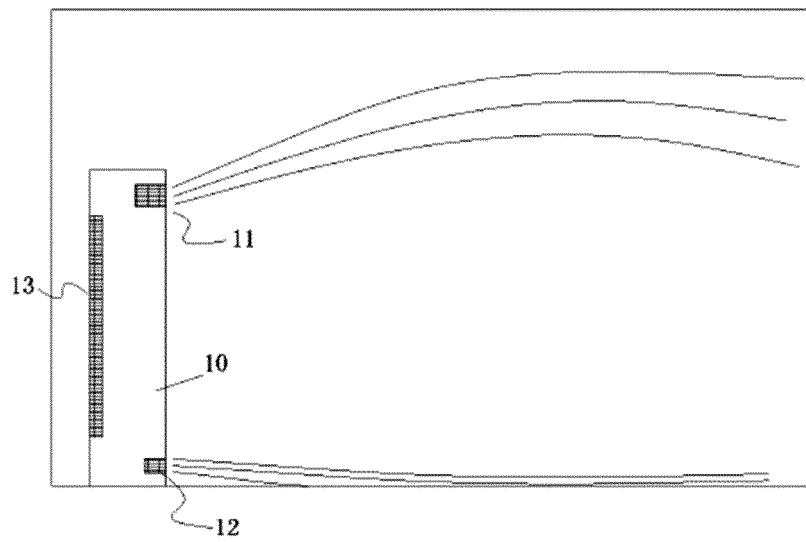


Fig. 5

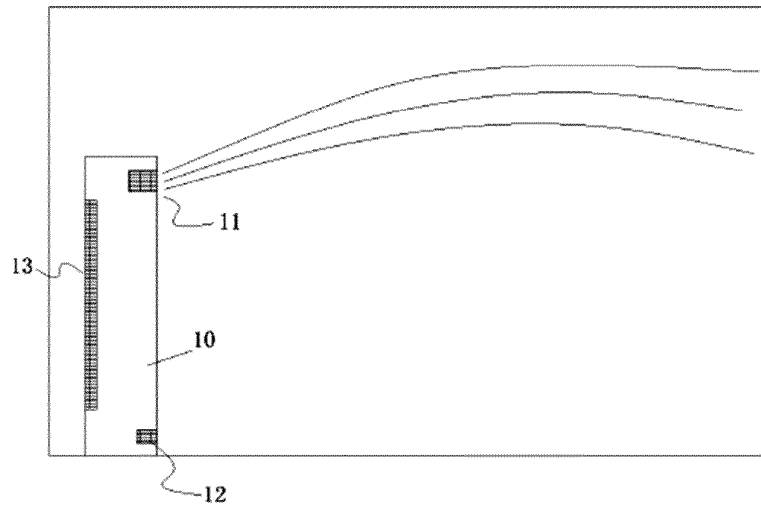


Fig. 6

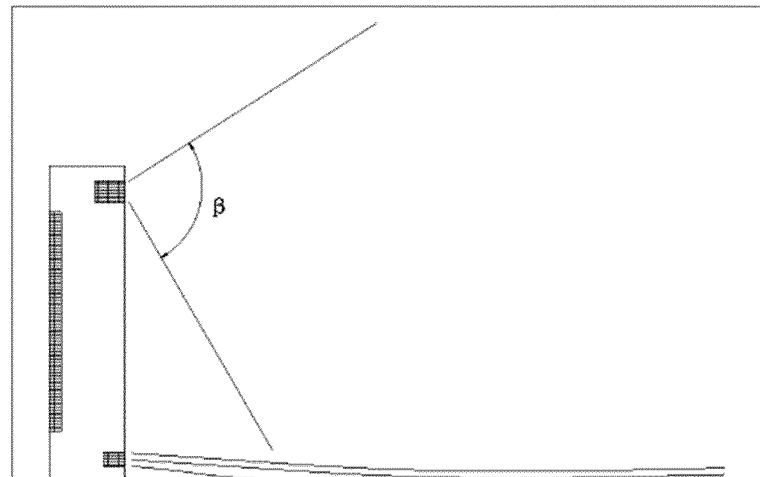


Fig. 7

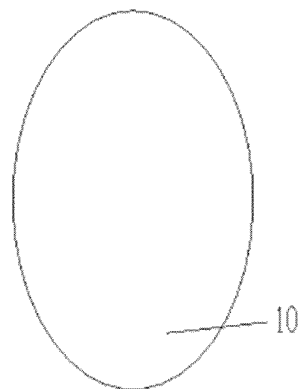


Fig. 8

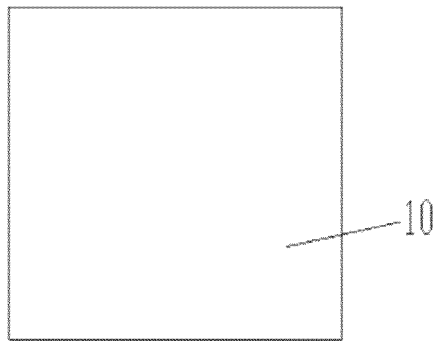


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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