

SPECIFICATION

INDOOR UNIT OF AIR CONDITIONER

5 TECHNICAL FIELD

The present invention relates to an indoor unit of an air conditioner for sucking air from a front part and discharging the air in multiple directions.

10 BACKGROUND ART

Conventionally, there has been an indoor unit of an air conditioner wherein a cross-fin heat exchanger and a cross-flow fan are disposed within a generally rectangular-shaped casing fitted to a wall, and wherein air is sucked from the front side and then conditioned air is blown out through a discharge port provided on the lower side of the casing. A suction grille is fitted to a suction port provided on the front side of the indoor unit.

However, this indoor unit of an air conditioner has a problem that changing the shape and color of the indoor unit according to the interior design of a room, people's tastes, seasons or the like would cause its molding dies and material to cost high so that various demands could not be met. Also, disadvantageously, the

suction grille is so uneven that it is difficult to wipe off dirt.

DISCLOSURE OF THE INVENTION

5 Therefore, an object of the present invention is to provide an indoor unit of an air conditioner, which is capable of meeting various demands about patterns and colors according to the interior design of a room, people's tastes, seasons or the like, at low costs, and which can
10 have dirt on the unit wiped off easily.

 An indoor unit of an air conditioner according to the present invention comprises:

 a casing:

 a turbofan which is disposed in the casing with an
15 axis of the turbofan extending in an anteroposterior direction of the casing and which sucks air from an axially front and blows out the air radially outwardly with respect to the axis;

 a heat exchanger disposed axially forward of the
20 turbofan within the casing;

 a front panel fitted to the casing and having a suction port in front of the heat exchanger; and

 a meshed flat plate fitted to the suction port of the front panel.

With the adoption of the structure in which air sucked from a front part is blown out by the turbofan radially outwardly in multiple directions, and by thinning the turbofan and the heat exchanger, the indoor unit of an air conditioner can be made thin as a whole and flattened on its suction port side, thus making it possible for a meshed flat plate, instead of a suction grille, to be fitted to the suction port. The meshed flat plate can be easily printed or painted with patterns or colors according to the interior design of a room, people's tastes, seasons or the like, so that the indoor unit can be improved in designability without changing its configuration, capable of meeting various demands with low cost. Further, the meshed flat plate permits dirt thereon to be wiped off easily, as compared with suction grilles having recesses and projections.

If the meshed flat plate is removable, the range of choices for design of the meshed flat plate can be widened by additionally preparing other meshed flat plates of different patterns and colors, with the result of an increased degree of freedom for design choice.

The meshed flat plate may be made fittable with either one of its front and rear surfaces facing forward. In such a case, with different two types of patterns or colors provided on the front and rear surfaces of the meshed

flat plate, respectively, one meshed flat plate can provide two types of patterns or colors to be chosen, without use of any additional meshed flat plate of different pattern or color.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view of an indoor unit of an air conditioner according to an embodiment of the present invention;

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Figs. 2(A), 2(B) are a front view and a side view, respectively, of the indoor unit;

Fig. 3 is an enlarged view of an essential part of the meshed flat plate of the indoor unit;

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Fig. 4 is a sectional view taken along the line IV - IV of Fig. 2(A);

Fig. 5 is a perspective view showing an example of the indoor unit; and

Fig. 6 is a perspective view showing another example of the indoor unit.

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BEST MODE FOR CARRYING OUT THE INVENTION

Hereinbelow, the indoor unit of an air conditioner of the present invention is described in detail referring to an embodiment thereof illustrated in the accompanying drawings.

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Fig. 1 is an exploded perspective view of an indoor unit of an air conditioner according to an embodiment of the present invention. Reference numeral 1 denotes a casing which is fitted to an indoor wall surface on the rear face side and which has four discharge ports 1a (only two are shown in Fig. 1), reference numeral 2 denotes a front panel fitted to the casing 1 and having a suction port 2a opened forward, reference numeral 3 denotes a filter fitted to the suction port 2a of the front panel 2, reference numeral 4 denotes a meshed flat plate fitted to the suction port 2a of the front panel 2 and on the front side of the filter 3, and reference numeral 5 denotes a fitting frame for fixing the filter 3 and the meshed flat plate 4 to the suction port 2a of the front panel 2. The fitting frame 5 is provided with engaging claws 5a near its corners and on a side facing the front panel 2, while the front panel 2 is provided with engaging holes 2b to receive the engaging claws 5a of the fitting frame 5. The filter 3, the meshed flat plate 4 and the fitting frame 5 constitute a suction part 10.

Fig. 2(A) is a front view of the indoor unit, and Fig. 2(B) is a side view of the indoor unit. As shown in Fig. 2(A), the meshed flat plate 4 covers the suction port 2a (shown in Fig. 1) of the front panel 2. Fig. 3 is an enlarged view of an essential part of the meshed flat plate

4, where a multiplicity of circular holes 4a are shown formed in the meshed flat plate 4 so as to reduce resistance to air stream. Patterns shown in Figs. 5 and 6 have been printed on the front and rear surfaces of the meshed flat plate 4, respectively. For example, when installed in a nursery, this indoor unit is set so as to show its one face on which the pattern of bears of Fig. 5 has been printed. When installed in a bedroom, the indoor unit is set so as to show the other face on which the calm-toned pattern of Fig. 6 has been printed.

Fig. 4 shows a sectional view taken along the line IV - IV of Fig. 2(A). A turbofan 11 for sucking air from a front part in the axial direction and blowing out the air radially outwardly with respect to the axis is disposed within the casing 1 with the axis of the turbofan aligned along the anteroposterior direction of the casing, and a heat exchanger 12 is disposed axially forward of the turbofan 11.

In the indoor unit of an air conditioner constructed as described above, as shown in Fig. 4, when the turbofan 11 is rotated, air is sucked from the front via the meshed flat plate 4, the filter 3 and the heat exchanger 12, and the sucked air is blown out through the discharge ports 1a radially outwardly with respect to the axis of the turbofan 11 in four directions (up, down, left

and right). In this indoor unit, either one of the front and rear faces of the meshed flat plate 4 is selected, and with the selected face directed forward, the meshed flat plate 4 is fitted to the suction port 2a of the front panel

5 2. For the fitting of the meshed flat plate 4 in a reversed manner, the fitting frame 5 is removed and then, with the rear-side pattern of the meshed flat plate 4 set as the front face, the meshed flat plate 4 is again fitted to the suction port 2a of the front panel 2 by means of the fitting
10 frame 5. It is also possible that, with additional meshed flat plates of different patterns and colors prepared, pattern or color of the meshed flat plate may be selected according to the interior design of the room or according to the inhabitant's taste or season.

15 As shown above, by printing or painting the meshed flat plate 4 with patterns or colors according to the interior design of the room or people's tastes or seasons or the like, it becomes possible to realize an indoor unit of an air conditioner capable of meeting various demands at low
20 costs. The meshed flat plate 4 also allows dirt to be wiped off more easily, as compared with conventional suction grilles having larger unevenness.

Also in this indoor unit of an air conditioner, since the printing of patterns can be easily done in a flat

part of the meshed flat plate 4, an indoor unit of various patterns and colors can be manufactured with low cost.

Further, since the meshed flat plate 4 is removable, the range of choices for the design of the meshed flat plate is extended by preparing additional meshed flat plates of different patterns and colors, so that the degree of freedom of design choice can be increased.

Further, since the meshed flat plate 4 is fittable with either one of the front and rear faces directed forward, two alternative types of patterns or colors for choice are available from one meshed flat plate, without preparing a further meshed flat plate of a different pattern or colors.

In the above embodiment, the meshed flat plate 4 is configured so as to be fitted with either of its two faces directed forward, i.e., a reversible structure. However, the meshed flat plate can be configured so as to be fitted with only one face directed forward.

Also in the above embodiment, the meshed flat plate 4 is fitted to the suction port 2a of the front panel 2 together with the filter 3 by means of the fitting frame 5. However, the fitting structure of the meshed flat plate is not limited to this.

INDUSTRIAL APPLICABILITY

The indoor unit of an air conditioner of the present invention is capable of readily accommodating to various needs in appearance, or looks, such as a design suited to a room, a pattern suited to a person's taste, or a color suited to a season. Furthermore, because the indoor unit is also easy to clean, the indoor unit can be used widely not only for home and offices but also in public buildings.



CLAIMS:

1. An indoor unit of an air conditioner, comprising:
a casing (1);
5 a turbofan (11) which is disposed within the casing (1) with an axis of the turbofan (11) extending in an anteroposterior direction of the casing (1) and which sucks air from an axially front and blows out the air radially outwardly with respect to the axis;
10 a heat exchanger (12) disposed axially forward of the turbofan (11) within the casing (1);
a front panel (2) fitted to the casing (1) and having a suction port (2a) in front of the heat exchanger (12); and
15 a meshed flat plate (4) fitted to the suction port (2a) of the front panel (2).
2. The indoor unit of an air conditioner according to Claim 1, wherein
20 the meshed flat plate (4) has a pattern printed thereon.
3. The indoor unit of an air conditioner according to Claim 1 or 2, wherein
25 the meshed flat plate (4) is removable.



4. The indoor unit of an air conditioner according to
any one of Claims 1 to 3, wherein

the meshed flat plate (4) is fittable with either
5 one of its front and rear faces directed forward.

ABSTRACT

In an indoor unit of an air conditioner, a turbofan for sucking air from an axially front and discharging the air radially outwardly with respect to an axis of the turbofan is disposed within a casing (1) such that the axis extends in an anteroposterior direction of the casing. Within the casing (1), a heat exchanger is disposed axially forward of the turbofan. A front panel (2) is fitted to the casing (1), which panel has a suction port (2a) in front of the heat exchanger. A meshed flat plate (4) which allows air to be sucked from the front and which has a pattern printed on both faces thereof is fitted to the suction port (2a) of the front panel (2). This indoor unit can accommodate itself to various patterns and colors according to the interior design of a room, people's tastes, seasons or the like with low cost, and allows dirt on the unit wiped off easily.