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- **NAGAHASHI, Katsuaki**
Tokyo 105-0022 (JP)
- **KISHITANI, Tetsushi**
Tokyo 105-0022 (JP)
- **TOYODA, Hiroyuki**
Tokyo 105-0022 (JP)
- **MORI, Hayato**
Tokyo 105-0022 (JP)

(71) Applicant: **Johnson Controls-Hitachi Air
Conditioning
Technology (Hong Kong) Limited**
Hong Kong (CN)

(74) Representative: **MERH-IP Matias Erny Reichl
Hoffmann
Patentanwälte PartG mbB
Paul-Heyse-Strasse 29
80336 München (DE)**

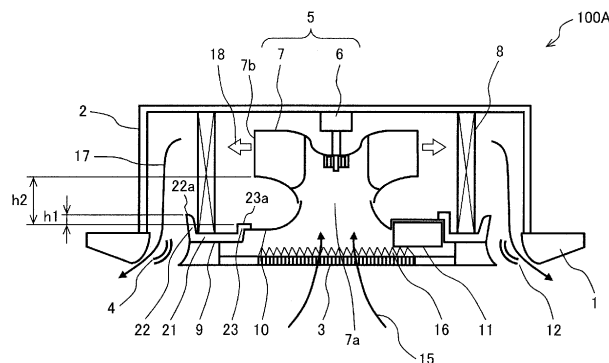
(72) Inventors:
• **OBARA, Hideshi**
Tokyo 105-0022 (JP)

(54) **INDOOR UNIT FOR AIR CONDITIONER**

(57) An object of the present invention is to provide an indoor unit of an air conditioner that can prevent an increase in noise due to interference of a flow of the air discharged from a centrifugal fan with a drain pan. The indoor unit of the air conditioner includes an indoor-unit suction port 3 for sucking the indoor air into the indoor unit, a centrifugal blower 5 configured to discharge the air sucked from the indoor-unit suction port 3 to the periphery, a heat exchanger 8 provided on a discharge side of the centrifugal blower 5, a blowout port 12 for the air provided on a downstream side of the heat exchanger 8, and a drain pan 9 provided under the heat exchanger 8

and configured to receive moisture condensation water. The lower end of a discharge port 7b of the centrifugal blower 5 is provided in a position higher than an upper end 23a of a wall surface section 23 of the drain pan 9 located on the upstream side with respect to the heat exchanger 8. In the drain pan 9, the upper end 23a of the wall surface section 23 located on the upstream side with respect to the heat exchanger 8 is formed lower than an upper end 22a of a wall surface section 22 located on the downstream side with respect to the heat exchanger 8.

[FIG. 1]



Description

Technical Field

[0001] The present invention relates to an indoor unit of an air conditioner that sucks the air out of a room using a centrifugal blower provided in a housing, cools or heats the air via a heat exchanger provided on a blowout side of the centrifugal blower, and thereafter blows out the air into the room.

Background Art

[0002] An air conditioner includes a refrigeration cycle configured by sequentially disposing, in a refrigerant circulation channel in which a refrigerant is encapsulated, a compressor that compresses the refrigerant, an indoor heat exchanger that causes the refrigerant and the indoor air to exchange heat, an expansion valve that decompresses the refrigerant, and an outdoor heat exchanger that causes the refrigerant and the outdoor air to exchange heat. The outdoor heat exchanger is housed in a housing of an outdoor unit together with a blower that feeds the air to the outdoor heat exchanger. The indoor heat exchanger is housed in a housing of an indoor unit together with a blower that feeds the indoor air to the indoor heat exchanger.

[0003] Indoor units of various forms are present as the indoor unit according to installation places. In recent years, in particular, in the field of indoor units for business use, a so-called ceiling-embedded cassette type for embedding a housing in a ceiling, sucking the air via a decorative panel set on a ceiling surface, and blowing out the air is the mainstream.

[0004] As an indoor unit of the ceiling-embedded cassette type, an indoor unit of an air conditioner described in JP-A-2002-139230 (Patent Literature 1) is known. Patent Literature 1 discloses, for the purpose of providing an indoor unit that can equalize a wind speed distribution of wind passing a heat exchanger, sufficiently bring out the performance of the heat exchanger, and achieve a reduction in energy, a reduction in noise, and compacting, an indoor unit of an air conditioner that includes a suction port and a blowout port and in which a heat exchanger is disposed around a blower, a vane for static pressure collection being provided on the unit suction port side in the windward of the heat exchanger (see the abstract).

[0005] In the indoor unit of Patent Literature 1, the heat exchanger is disposed to surround the periphery of a centrifugal blower. The air blown out from a centrifugal fan of the centrifugal blower is subjected to heat exchange in the heat exchanger and thereafter blown out into a room from the blowout port. In such structure, a drain pan for receiving droplets adhering to the heat exchanger is set under the heat exchanger (see paragraph 0021 and Fig. 1).

Citation List

Patent Literature

5 **[0006]** Patent Literature 1: JP-A-2002-139230

Summary of Invention

Technical Problem

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[0007] In an indoor unit of an air conditioner, it is important to reduce noise from the viewpoint of comfortableness. For example, in Patent Literature 1, the noise reduction is achieved by providing a vane for static pressure collection on the unit suction port in the windward of the heat exchanger.

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[0008] Incidentally, in the indoor unit of the air conditioner having such structure, it is effective to increase the diameter of a centrifugal fan in order to reduce noise. However, when the centrifugal fan is formed in a similar shape and increased in size, the distance between a discharge port section of the centrifugal fan and a drain pan decreases. When the distance between the discharge port section of the centrifugal fan and the drain pan is too short, a flow of the air interferes with the drain pan and the noise increases. Therefore, there is a problem in that, although the diameter of the centrifugal fan is increased, the noise cannot be sufficiently reduced.

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[0009] An object of the present invention is to provide an indoor unit of an air conditioner that can prevent an increase in noise due to interference of a flow of the air discharged from a centrifugal fan with a drain pan.

Solution to Problem

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[0010] In order to achieve the object, an indoor unit of an air conditioner of the present invention includes: an indoor-unit suction port for sucking indoor air into the indoor unit; a centrifugal blower configured to discharge the air sucked from the indoor-unit suction port to a periphery; a heat exchanger provided on a discharge side of the centrifugal blower and configured to cool or heat the air; a blowout port provided on a downstream side of the heat exchanger to blow out the air; and a drain pan provided under the heat exchanger and configured to receive moisture condensation water generated in the heat exchanger, the drain pan including wall surface sections standing upward respectively from an end portion located on an upstream side with respect to the heat exchanger and an end portion located on the downstream side with respect to the heat exchanger, and a lower end of a discharge port of the centrifugal blower being provided in a position higher than an upper end of the wall surface section of the drain pan located on the upstream side with respect to the heat exchanger, wherein in the drain pan, the upper end of the wall surface section located on the upstream side with respect to the heat exchanger is formed lower than an upper end of the wall

surface section located on the downstream side with respect to the heat exchanger.

Advantageous Effect of Invention

[0011] According to the present invention, in an indoor unit of an air conditioner that sucks the air out of a room via a centrifugal blower provided in a housing, cools or heats the air via a heat exchanger provided on a blowout side of the centrifugal blower, and thereafter blows out the air into the room, it is possible to suppress an increase in noise caused by interference of a flow of the air discharged from the centrifugal blower with a drain pan disposed under the heat exchanger.

[0012] Problems, configurations, and effects other than those explained above are clarified by the following explanation of embodiments.

Brief Description of the Drawings

[0013]

[Fig. 1] Fig. 1 is a sectional view showing an indoor unit of an air conditioner in a first embodiment according to the present invention.

[Fig. 2] Fig. 2 is a sectional view showing an indoor unit of an air conditioner in a second embodiment according to the present invention.

[Fig. 3] Fig. 3 is a sectional view showing an indoor unit of an air conditioner in a third embodiment according to the present invention.

[Fig. 4] Fig. 4 is a sectional view showing an indoor unit of an air conditioner in a fourth embodiment according to the present invention.

[Fig. 5] Fig. 5 is a sectional view showing an indoor unit of an air conditioner in a comparative example compared with the present invention.

Description of Embodiments

[0014] Embodiments of the present invention are explained below with reference to the drawings.

First Embodiment

[0015] A first embodiment according to the present invention is explained below with reference to Fig. 1. Fig. 1 is a sectional view showing an indoor unit of an air conditioner in the first embodiment according to the present invention. In the following explanation, as well as in other embodiments, an "upstream side" and a "downstream side" represent an "upstream side" and a "downstream side" in a flowing direction of the air (an air current direction).

[0016] An indoor unit 100A includes a decorative panel 1 and a housing 2 connected to the decorative panel 1. The decorative panel 1 includes a suction grill (an indoor-unit suction port) 3 in the center. A blowout port (an in-

door-unit blowout port) 12 including a wind direction plate 4 is disposed around the grill 3. A centrifugal blower 5 configured from a motor 6 and a centrifugal fan 7 connected to a shaft of the motor 6 is set in the housing 2.

5 The centrifugal fan 7 rotates according to operation of the motor 6. As indicated by an arrow 15 in Fig. 1, the indoor air is sucked into a suction port 7a of the centrifugal fan 7 through the suction grill 3, a filter 16 set in the suction grill 3, and a bell mouth 10 set in the housing 2 and discharged from a discharge port 7b of the centrifugal fan 7 as indicated by an arrow 18.

10 **[0017]** An indoor heat exchanger 8 is disposed to surround the periphery of the centrifugal blower 5. The air discharged from the centrifugal fan 7 is subjected to heat exchange in the indoor heat exchanger 8 and thereafter blown out into a room from the blowout port 12 as indicated by an arrow 17. A drain pan 9 for receiving moisture condensation water generated in the indoor heat exchanger 8 during cooling is set under the indoor heat exchanger 8.

20 **[0018]** The suction grill 3 is detachably attachable to the decorative panel 1 together with the filter 16. It is easy to clean the filter 16. An electrical component box 11, in which a not-shown control board for controlling the operation of the indoor unit 100A is housed, is set on the lower surface of the bell mouth 10. In such structure, it is possible to carry out maintenance of the electrical component box 11 by opening the suction grill 13. Consequently, it is easy to perform maintenance of the electrical component box 11. The bell mouth 10 is attached to the inner circumferential section of the drain pan 9 from below. Consequently, it is also possible to easily perform maintenance such as replacement of the centrifugal fan 7 and the motor 6 by opening the suction grill 3 and detaching the bell mouth 10.

30 **[0019]** In this embodiment, the centrifugal blower 5, the indoor heat exchanger 8, the drain pan 9, the bell mouth 10, the electrical component box 11, and the filter 16 are disposed in a space surrounded by the housing 2 and the decorative panel 1 (on the inner side of the housing 2).

40 **[0020]** The drain pan 9 is formed in a shape in which a wall surface (a wall surface section) 22 and a wall surface (a wall surface section) 23 stand upward from a bottom surface (a bottom surface section) 21 on which the heat exchanger 8 is placed. The wall surface 22 is a wall surface located on the downstream side with respect to the heat exchanger 8 in the flowing direction of the air. The wall surface 22 configures a wall surface on the outer circumference side of the drain pan 9. The wall surface 23 is a wall surface located on the upstream side with respect to the heat exchanger 8 in the flowing direction of the air. The wall surface 23 configures a wall surface on the inner circumference side of the drain pan 9.

50 **[0021]** In this embodiment, an upper end (an upper edge portion) 23a of the wall surface 23 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) an upper end (an upper edge

portion) 22a of the wall surface 22 located on the downstream side of the heat exchanger 8. The upper end 23a of the wall surface 23 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) the lower end of a discharge port 7b of the centrifugal fan 7. Note that, in this embodiment, the upper end 23a of the wall surface 23 and the upper end 22a of the wall surface 22 are apart by a distance h1 in the height direction. The lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 23a of the wall surface 23 are apart by a distance h2 in the height direction.

[0022] A comparative example compared with this embodiment is explained with reference to Fig. 5. Fig. 5 is a sectional view showing an indoor unit of an air conditioner in the comparative example compared with the present invention. Note that portions having configurations same as the configurations shown in Fig. 1 are denoted by the same reference numerals and signs and explanation of the portions is omitted.

[0023] In an indoor unit 100E in the comparative example shown in Fig. 5, compared with the indoor unit 100A shown in Fig. 1, the shape of a drain pan 109 is different. Since the shape of the drain pan 109 is different, the shape (the dimension in the height direction) of a bell mouth 110 is different from the shape of the bell mouth 110 of the indoor unit 100A shown in Fig. 1.

[0024] In the drain pan 109, an upper end (an upper edge portion) 123a of a wall surface 123 located on the upstream side of the heat exchanger 8 is located above (in a higher position than) an upper end (an upper edge portion) 122a of a wall surface 122 located on the downstream side of the heat exchanger 8. The upper end 123a of the wall surface 123 is located below the lower end of the discharge port 7b of the centrifugal fan 7. In this comparative example, the upper end 123a of the wall surface 123 is located above the upper end 122a of the wall surface 122 in the height direction by h3. In this case, if the height position of the upper end 122a of the wall surface 122 is the same as the height position of the upper end 22a of the wall surface 22 in the indoor unit 100A shown in Fig. 1, the height position of the upper end 123a of the wall surface 123 is high by (h1+h3) compared with the height position of the upper end 23a of the wall surface 23 in the first embodiment. A distance h4 in the height direction between the lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 123a of the wall surface 123 is length of (h2-(h1+h3)). That is, in the indoor unit 100E in the comparative example, the distance in the height direction between the lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 123a of the wall surface 123 is short by (h1+h3) with respect to the indoor unit 100A shown in Fig. 1. In the indoor unit 100E, the height direction dimension of the bell mouth 110 is smaller by shortness of the distance in the height direction between the lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 123a of the wall surface 123.

[0025] In this embodiment, the upper end 23a of the

wall surface 23 located on the upstream side of the heat exchanger 8 is located below the upper end 22a of the wall surface 22 located on the downstream side of the heat exchanger 8. Therefore, it is possible to increase the distance between the discharge port 7b and the drain pan 9 (in particular, the distance in the height direction between the discharge port 7b and the upper end 23a of the wall surface 23) even when the diameter of the centrifugal fan 7 is increased. Consequently, it is possible to reduce interference between a flow of the air (an air current) discharged from the discharge port 7b and the drain pan 9. It is possible to suppress an increase in noise caused by closeness of the drain pan 9 and the discharge port 7b of the centrifugal fan 7.

Second Embodiment

[0026] A second embodiment according to the present invention is explained with reference to Fig. 2. Note that portions having configurations same as the configurations shown in Fig. 1 are denoted by the same reference numerals and signs and explanation of the portions is omitted. Fig. 2 is a sectional view showing an indoor unit 100B of an air conditioner in the second embodiment according to the present invention.

[0027] This embodiment is different from the first embodiment in that, on a bottom surface 31 of a drain pan 30, a dug portion 34 dug further downward from the bottom surface 31 is provided on the upstream side with respect to the heat exchanger 8.

[0028] An electrical component box 35 is provided on the outside of the housing 2. Since the electrical component box 35 is provided on the outside of the housing 2, the shape of a bell mouth 36 is different from the shape in the first embodiment. In this embodiment, the centrifugal blower 5, the indoor heat exchanger 8, the drain pan 9, the bell mouth 10, and the filter 16 are disposed in a space surrounded by the housing 2 and the decorative panel 1 (on the inner side of the housing 2). The electrical component box 35 is disposed on the outer side of the housing 2.

[0029] In this embodiment, as in the first embodiment, an upper end (an upper edge portion) 33a of a wall surface 33 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) an upper end (an upper edge portion) 32a of a wall surface 32 located on the downstream side of the heat exchanger 8. The upper end 33a of the wall surface 33 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) the lower end of the discharge port 7b of the centrifugal fan 7. The upper end 33a of the wall surface 33 and the upper end 32a of the wall surface 32 are apart by the distance h1 in the height direction. The lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 33a of the wall surface 33 are apart by the distance h2 in the height direction.

[0030] When the height of the wall surface 33 located on the upstream side of the heat exchanger 8 is reduced,

a water retention amount of moisture concentration water that can be stored in the drain pan 30 decreases. Therefore, in this embodiment, a dug section 34 is provided on the upstream side of the heat exchanger 8 in the drain pan 30 to secure the water retention amount of the drain pan 30. It is difficult to provide a dug section on the downstream side of the heat exchanger 8 in the drain pan 30 because the downstream side of the heat exchanger 8 configures a blowout channel of the air. However, since the upstream side of the heat exchanger 8 is a dead water region of a fan suction port, even if the dug section 34 is provided, a flow of the air is not adversely affected. Since the electrical component box 35 is disposed on the outside of the housing 2, the dug section 34 can also be provided in the portion where the electrical component box 11 is provided in the first embodiment. It is possible to further secure the water retention amount.

[0031] Note that, although the water retention amount decreases, it is also possible to form, as a dug section, a part of the drain pan in the structure explained in the first embodiment and provide the electrical component box 11 in this part as in the first embodiment such that the maintenance of the electrical component box 11 can be performed if a grill is detached. Further, it is also possible to provide a part or the entire dug section 34 on the downstream side of the heat exchanger 8 by, for example, increasing the size of a product. In the indoor unit of the air conditioner having such structure, a drain pump 37 for discharging moisture condensation water to the outside of the indoor unit is provided. However, it is desirable for efficient discharge of drain water to provide a suction port 37a of the drain pump 37 in the same height position as the dug section 34 and open the suction port 37a of the drain pump 37 on the inner side of the dug section 34. The drain pump 37 may be provided in the first embodiment explained above or a third embodiment and a fourth embodiment explained below. When the drain pump 37 is provided in the third embodiment and the fourth embodiment, as in this embodiment, it is desirable to open the suction port 37a of the drain pump 37 on the inner sides of dug sections 44 and 54. Moisture condensation water pumped up by the drain pump 37 is discharged to the outside of the indoor unit through a drainage pipe 37b.

Third Embodiment

[0032] A third embodiment according to the present invention is explained with reference to Fig. 3. Note that portions having configurations same as the configurations shown in Fig. 1 and Fig. 2 are denoted by the same reference numerals and signs and explanation of the portions is omitted. Fig. 3 is a sectional view showing an indoor unit 100C of an air conditioner in the third embodiment according to the present invention.

[0033] In this embodiment, the centrifugal blower 5, the indoor heat exchanger 8, a drain pan 40, a bell mouth 45, and the filter 16 are disposed in a space surrounded

by the housing 2 and the decorative panel 1 (on the inner side of the housing 2). The electrical component box 35 is disposed on the outer side of the housing 2. As in the first embodiment, the electrical component box 35 may be disposed on the inner side of the housing 2.

[0034] This embodiment is different from the first embodiment and the second embodiment in that an upper end 43a of a wall surface 43 of the drain pan 40 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) the lower end of the heat exchanger 8.

[0035] In this embodiment, the upper end (an upper edge portion) 43a of the wall surface 43 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) an upper end (an upper edge portion) 42a of a wall surface 42 located on the downstream side of the heat exchanger 8. The upper end 43a of the wall surface 43 located on the upstream side of the heat exchanger 8 is located below (in a position lower than) the lower end of the discharge port 7b of the centrifugal fan 7. The upper end 43a of the wall surface 43 and the upper end 42a of the wall surface 42 are apart by a distance h5 in the height direction. The lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 43a of the wall surface 43 are apart by a distance h6 in the height direction. In this embodiment, H5 and H6 are in relations of $h5 > h1$ and $h6 > h2$ with respect to h1 and h2 in the first embodiment. The upper end 43a of the wall surface 43 and the lower end of the heat exchanger 8 are apart by a distance h7 in the height direction.

[0036] Usually, the wall surface 43 on the upstream side of the drain pan 40 with respect to the heat exchanger 8 is disposed to close the heat exchanger 8. Therefore, the wall surface 43 prevents a flow of the air flowing into the heat exchanger 8 and acts as ventilation resistance. Therefore, in this embodiment, the wall surface 43 on the upstream side of the heat exchanger 8 is prevented from acting as the ventilation resistance by configuring the wall surface 43 not to close the heat exchanger 8.

[0037] Further, as in the second embodiment, on the upstream side of the heat exchanger 8 on a bottom surface 41 of the drain pan 40, a dug section 44 dug further downward from the bottom surface 41 is provided. Therefore, it is possible to retain moisture condensation water even if the wall surface 43 on the heat exchanger upstream side is lowered.

[0038] In this embodiment, the upstream side end portion of the bell mouth 45 is fixed to the upper end 43a of the lowered wall surface 43. Therefore, the height direction dimension of the bell mouth 45 is larger than the height direction dimension in the first embodiment and the second embodiment.

Fourth Embodiment

[0039] A fourth embodiment according to the present invention is explained with reference to Fig. 4. Note that

portions having configurations same as the configurations shown in Fig. 1 to Fig. 3 explained above are denoted by the same reference numerals and signs and explanation of the portions is omitted. Fig. 4 is a sectional view showing an indoor unit 100D of an air conditioner in the fourth embodiment according to the present invention.

[0040] In this embodiment, the centrifugal blower 5, an indoor heat exchanger 58, a drain pan 50, the bell mouth 45, and the filter 16 are disposed in a space surrounded by the housing 2 and the decorative panel 1 (on the inner side of the housing 2). The electrical component box 35 is disposed on the outer side of the housing 2. As in the first embodiment, the electrical component box 35 may be disposed on the inner side of the housing 2.

[0041] This embodiment is different from the third embodiment in that a distance d1 in the horizontal direction between a wall surface 52 of the drain pan 50 on the downstream side with respect to the heat exchanger 8 and the heat exchanger 58 is set to be larger than a distance d2 in the horizontal direction between a wall surface 53 on the upstream side with respect to the heat exchanger 8 and the heat exchanger 58.

[0042] The wall surface 52 of the drain pan 50 on the downstream side of the heat exchanger 8 has a role of retaining moisture condensation water generated in the heat exchanger 8 and preventing moisture condensation generated in the heat exchanger 8 from being splashed out to the outside by blowing. In this embodiment, the moisture condensation water is retained in a dug section 54 provided on the upstream side with respect to the heat exchanger 8. The distance d1 between the heat exchanger 58 and the wall surface 52 on the downstream side of the heat exchanger 8 is increased. Therefore, even if the height of the wall surface 52 on the downstream side of the heat exchanger 8 is reduced, it is possible to prevent the moisture concentration generated in the heat exchanger 58 from being blown out to the outside by blowing. Since the wall surface 52 on the downstream side of the heat exchanger 8 is lowered, the air blowing out from the heat exchanger 58 is not prevented by the wall surface 52 on the downstream side of the heat exchanger 8. It is possible to reduce ventilation resistance.

[0043] A positional relation in the height direction between the wall surfaces 52 and 53 and discharge port 7b of the centrifugal fan 7 in this embodiment is set as explained below. An upper end (an upper edge portion) 53a of the wall surface 43 located on the upstream side of the heat exchanger 58 is located below (in a position lower than) an upper end (an upper edge portion) 52a of the wall surface 52 located on the downstream side of the heat exchanger 58. The upper end 53a of the wall surface 53 located on the upstream side of the heat exchanger 58 is located below (in a position lower than) the lower end of the discharge port 7b of the centrifugal fan 7. The upper end 53a of the wall surface 53 and the upper end 52a of the wall surface 52 are apart by a distance h8 in the height direction. The lower end of the discharge

port 7b of the centrifugal fan 7 and the upper end 53a of the wall surface 53 are apart by the distance h6 in the height direction. The upper end 53a of the wall surface 53 and the lower end of the heat exchanger 58 are part by a distance h7 in the height direction. That is, the distance in the height direction between the lower end of the discharge port 7b of the centrifugal fan 7 and the upper end 53a of the wall surface 53 is the same as the distance in the configuration in the third embodiment. The distance in the height direction between the upper end 53a of the wall surface 53 and the lower end of the heat exchanger 58 is the same as the distance in the configuration in the third embodiment.

[0044] A distance relation in the horizontal direction among the wall surface 52, the heat exchanger 58, and the wall surface 53 explained in this embodiment is also applicable to the first embodiment and the second embodiment.

[0045] Note that, in the embodiments explained above, the distance between the drain pans 9, 30, 40, and 50 and the centrifugal blower 5 can be further increased by setting the thickness of the wall surfaces 23, 33, 43, and 53 of the drain pans 9, 30, 40, and 50 on the upstream side with respect to the heat exchanger 8 and 58 smaller than the thickness of the wall surfaces 22, 32, 42, and 52 on the downstream side with respect to the heat exchangers 8 and 58. Therefore, this is advantageous for a noise reduction.

[0046] In this embodiment, the indoor unit of the ceiling-embedded cassette type in which the blowout port is provided around the housing is explained. However, the present invention is also applicable to an indoor unit of a form in which a blowout port is provided only in two directions or one direction around a housing and an indoor unit of a form suspended from a ceiling. The present invention can be applied in common to an indoor unit of a form that includes a centrifugal blower and in which a heat exchanger is provided in a part or the entire circumference of the centrifugal blower.

[0047] In the embodiments explained above, it is possible to prevent an increase in noise due to closeness of the centrifugal fan and the drain pan in the indoor unit of the air conditioner that sucks the air out of the room via the centrifugal blower provided in the housing, cools or heats the air via the heat exchanger provided on the blow-out side of the centrifugal blower, and thereafter blows out the air into the room.

[0048] Note that the present invention is not limited to the embodiments explained above. Various modifications are included in the present invention. The embodiments are explained in detail in order to clearly explain the present invention and are not always limited to embodiments including all the components. Further, a part of the components of a certain embodiment can be replaced with the components of another embodiment. The components of another embodiment can be added to the components of a certain embodiment. Other components can be added to, deleted from, and replaced with a part

of the components of the embodiments.

Reference Signs List

[0049]

3 suction grill (indoor-unit suction port)
 5 centrifugal blower
 7 centrifugal fan
 7a suction port of the centrifugal fan
 7b discharge port of the centrifugal fan
 8, 58 heat exchanger
 12 blowout port (indoor unit blowout port)
 9, 30, 40, 50, 109 drain pan
 10, 36, 45, 110 bell mouth
 21, 31, 41, 51 bottom surface of the drain pan
 22, 32, 42, 52 wall surface (wall surface section) of the drain pan located on the upstream side with respect to the heat exchanger
 23, 33, 43, 53 wall surface (wall surface section) of the drain pan located on the downstream side with respect to the heat exchanger
 24, 34, 44, 54 dug section of the drain pan provided on the upstream side with respect to the heat exchanger
 37 drain pump
 37a suction port of the drain pump 37
 37b drainage pipe of the drain pump 37

Claims

1. An indoor unit of an air conditioner comprising:

an indoor-unit suction port that sucks indoor air into the indoor unit;
 a centrifugal blower configured to discharge the air sucked from the indoor-unit suction port to a periphery;
 a heat exchanger provided on a discharge side of the centrifugal blower and configured to cool or heat the air;
 a blowout port provided on a downstream side of the heat exchanger to blow out the air; and
 a drain pan provided under the heat exchanger and configured to receive moisture condensation water generated in the heat exchanger, the drain pan including wall surface sections standing upward respectively from an end portion located on an upstream side with respect to the heat exchanger and an endportion located on the downstream side with respect to the heat exchanger, and
 a lower end of a discharge port of the centrifugal blower being provided in a position higher than an upper end of the wall surface section of the drain pan located on the upstream side with respect to the heat exchanger, wherein

in the drain pan, the upper end of the wall surface section located on the upstream side with respect to the heat exchanger is formed lower than an upper end of the wall surface section located on the downstream side with respect to the heat exchanger.

2. The indoor unit of the air conditioner according to claim 1, wherein, in the drain pan, on a bottom surface between the wall surface section located on the upstream side with respect to the heat exchanger and the wall surface section located on the downstream side with respect to the heat exchanger, a dug section dug further downward from the bottom surface is provided.
3. The indoor unit of the air conditioner according to claim 2, wherein the dug section is provided on the upstream side with respect to the heat exchanger.
4. The indoor unit of the air conditioner according to claim 2, further comprising a drain pump for discharging drain water to an outside of the indoor unit, wherein a suction port of the drain pump is provided in the dug section.
5. The indoor unit of the air conditioner according to claim 1, further comprising:

a decorative panel including the indoor-unit suction port in a center and including the blowout port around the indoor-unit suction port; and
 a housing connected to the decorative panel, wherein the centrifugal blower, the heat exchanger, and the drain pan are disposed on an inner side of the housing, and
 an electrical component box incorporating a control board for controlling the indoor unit is provided on an outer side of the housing.

6. The indoor unit of the air conditioner according to claim 2, wherein the upper end of the wall surface section of the drain pan located on the upstream side with respect to the heat exchanger is located below a lower end of the heat exchanger.
7. The indoor unit of the air conditioner according to claim 1, thickness of the wall surface section of the drain pan located on the upstream side with respect to the heat exchanger is smaller than thickness of the wall surface section of the drain pan located on the downstream side with respect to the heat exchanger.
8. The indoor unit of the air conditioner according to claim 1, wherein a distance between the wall surface

section of the drain pan located on the downstream side with respect to the heat exchanger and the heat exchanger is set larger than a distance between the wall surface section of the drain pan located on the upstream side with respect to the heat exchanger and the heat exchanger.

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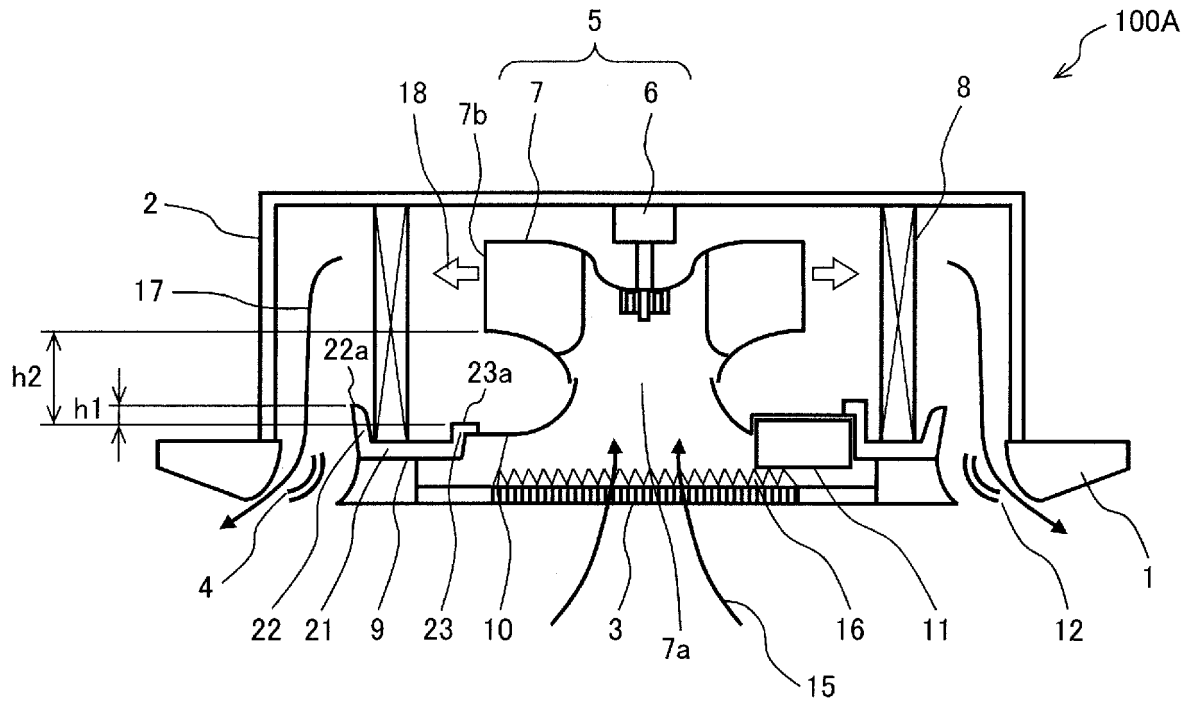
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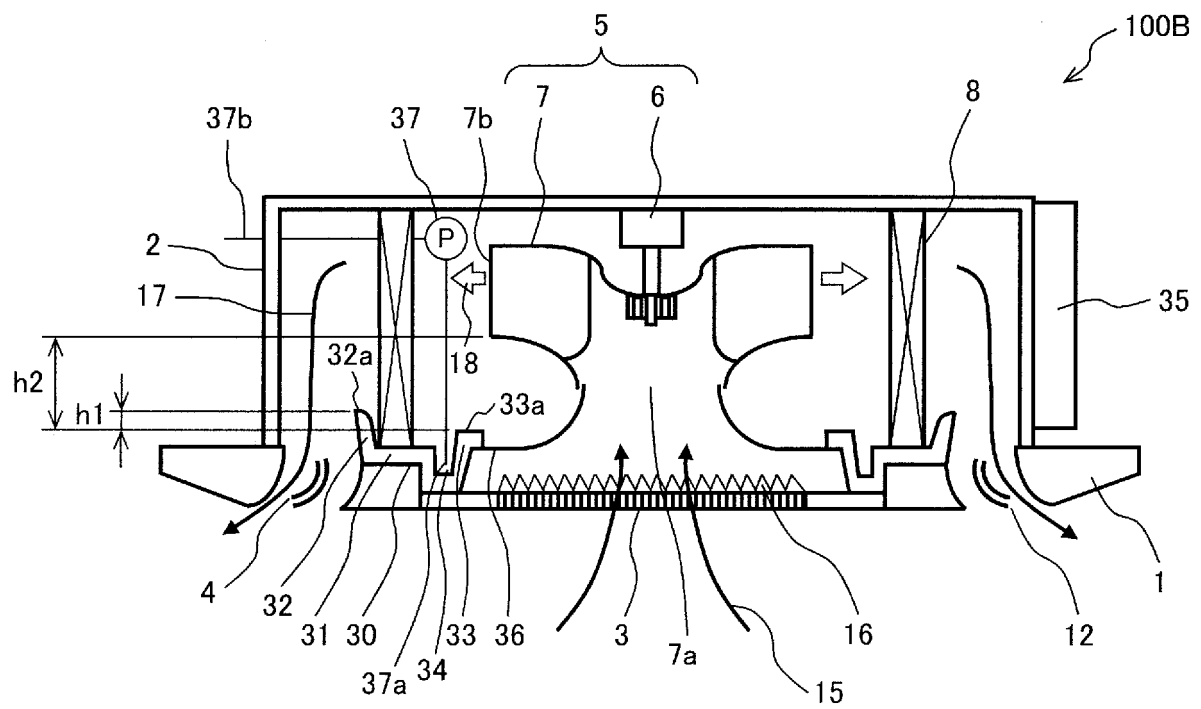
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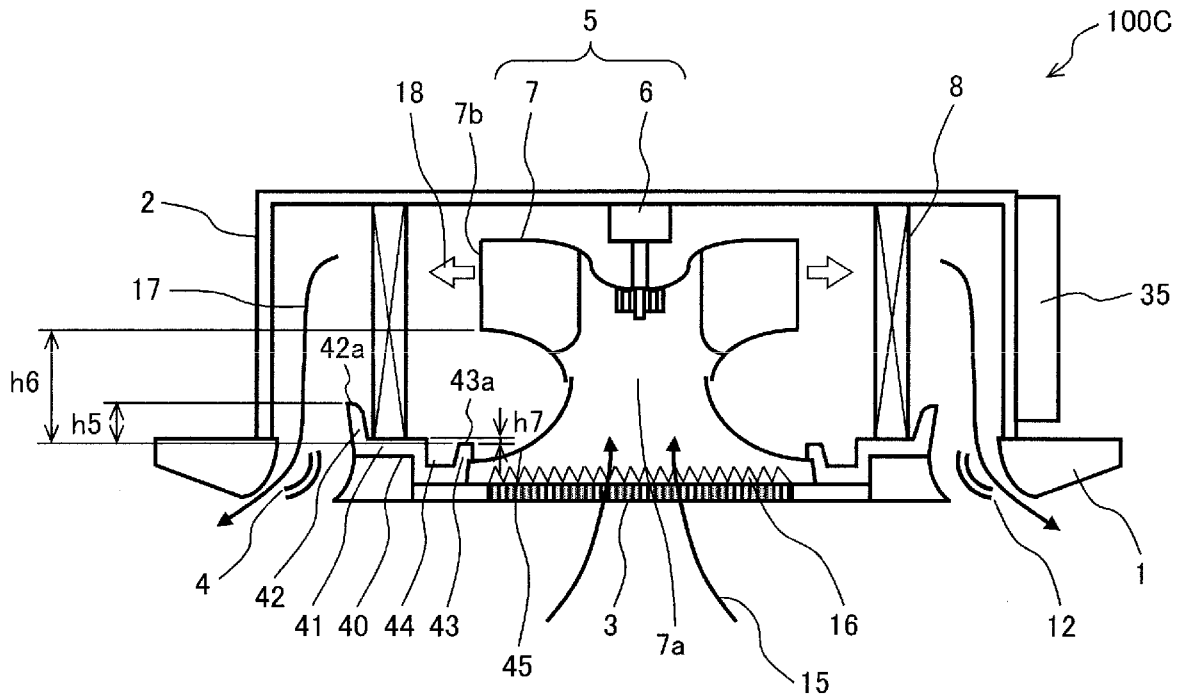
[FIG. 1]



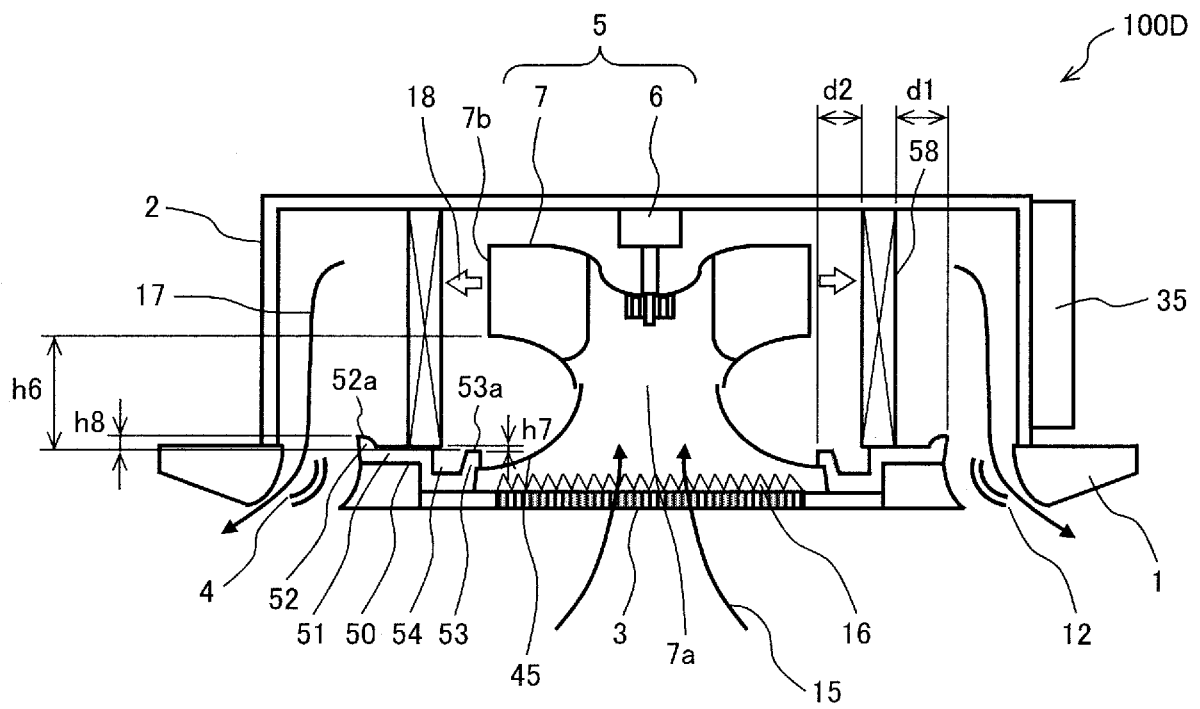
[FIG. 2]



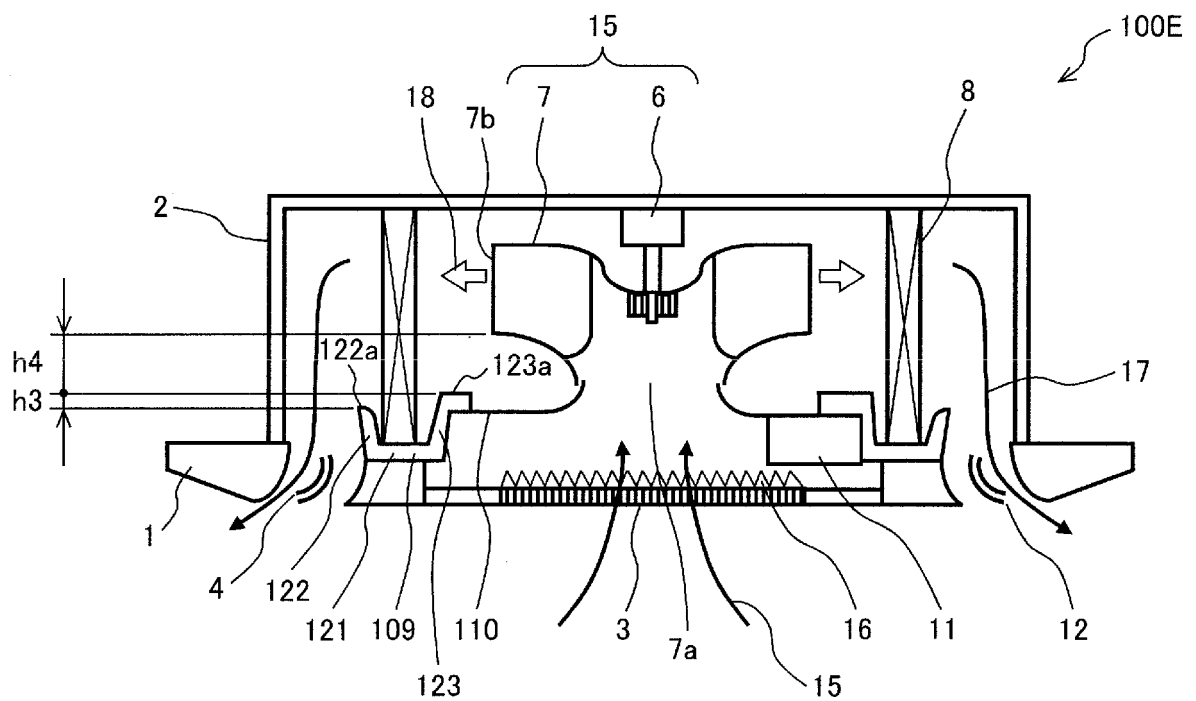
[FIG. 3]



[FIG. 4]



[FIG. 5]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2014/081500

A. CLASSIFICATION OF SUBJECT MATTER

F24F13/22(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)

F24F13/22

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2015
Kokai Jitsuyo Shinan Koho	1971-2015	Toroku Jitsuyo Shinan Koho	1994-2015

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000-111137 A (Fujitsu General Ltd.), 18 April 2000 (18.04.2000), paragraphs [0005] to [0006]; fig. 1 (Family: none)	1-8
Y	JP 8-86462 A (Hitachi, Ltd.), 02 April 1996 (02.04.1996), paragraphs [0008] to [0009]; fig. 1 (Family: none)	1-8
Y	JP 2013-164219 A (Daikin Industries, Ltd.), 22 August 2013 (22.08.2013), paragraphs [0026] to [0043]; fig. 1 to 4 & CN 203083029 U	2-4, 6

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

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"&" document member of the same patent family

Date of the actual completion of the international search
23 February 2015 (23.02.15)Date of mailing of the international search report
03 March 2015 (03.03.15)Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2014/081500

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000-283548 A (Sanyo Electric Co., Ltd.), 13 October 2000 (13.10.2000), paragraph [0040]; fig. 3 (Family: none)	5
Y	JP 10-9665 A (Toshiba Corp.), 16 January 1998 (16.01.1998), paragraphs [0020] to [0025]; fig. 2 (Family: none)	7
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 48907/1991 (Laid-open No. 136434/1992) (Mitsubishi Heavy Industries, Ltd.), 18 December 1992 (18.12.1992), paragraphs [0007] to [0008]; fig. 1 (Family: none)	8

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2002139230 A [0004] [0006]