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

(57) An object of the present invention is to provide an indoor unit for an air conditioner for preventing occurrence of condensation in a motor and mechanical components due to leakage of conditioned air from an airflow path to a driving unit of airflow direction change means. A driving unit (6) for horizontal airflow direction louvers (5) functioning as airflow direction change means is disposed outside an airflow path (7). The driving unit (6) includes a motor (11), a link mechanism (12), a case (13) and a rotation output shaft (14). The link mechanism (12) transmits power of the motor (11). The case (13) covers the motor (11) and the link mechanism (12). The rotation output shaft (14) is configured to transmit power of the motor (11) to the outside of the case (13) after receiving transmission of the power of the motor (11) through the link mechanism (12). A first through hole (15) is formed in an airflow path formation part (2a) of a bottom case (2). The first through hole (15) allows the rotation output shaft (14) to reach the inside of the airflow path (7) there-through. A blocking structure is formed in a periphery of the first through hole (15). The blocking structure includes a first engagement part (21). The blocking structure blocks communication between the airflow path (7) and the interior of the driving unit (6).

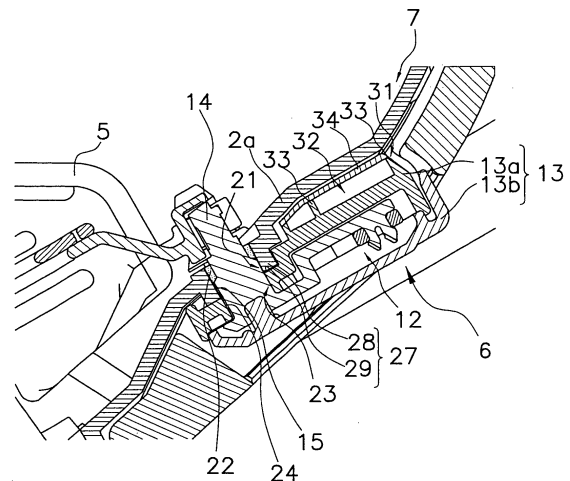


FIG. 4

Description

TECHNICAL FIELD

[0001] The present invention relates to an indoor unit for an air conditioner, provided with a motor for driving horizontal airflow direction louvers.

BACKGROUND ART

[0002] As described in Patent Document 1, an indoor unit for an air conditioner, provided with a motor for driving horizontal airflow direction louvers, has been conventionally produced. In the indoor unit, a through hole is formed in a sidewall forming an airflow path. A coupling rod of horizontal airflow direction louvers is coupled to a motor and mechanical components (e.g., a link), disposed outside the airflow path in the interior of a main body of the indoor unit, via the through hole.

<Patent Document 1>

[0003] Japanese Raid-open Patent Application No. 2005-140460

DISCLOSURE OF THE INVENTION

<Technical Problem>

[0004] According to the indoor unit described in Patent Document 1, however, conditioned air, produced as a result of cooling of air by an indoor heat exchanger, may leak out of the airflow path via the through hole, and thereby condensation may occur in the motor and the mechanical components. The indoor unit described in Patent Document 1 is provided with a cover for blocking the motor and the mechanical components from external air. However, it is difficult to completely block heat transfer between the inside and the outside of the main body of the indoor unit. Therefore, it is difficult to inhibit occurrence of condensation in the motor and the mechanical components.

[0005] An object of the present invention is to provide an indoor unit for an air conditioner for preventing occurrence of condensation in a motor and mechanical components due to leakage of conditioned air from an airflow path to a driving unit of airflow direction change means.

<Solution to Problem>

[0006] An indoor unit for an air conditioner according to a first aspect of the present invention includes an airflow path formation member, airflow direction change means and a driving unit. The airflow path formation member is a member for forming an airflow path. The airflow direction change means is disposed in the interior of the airflow path. The airflow direction change means is configured to change an airflow direction of a condi-

tioned air to be blown out to an indoor space. The driving unit is disposed outside the airflow path. The driving unit is configured to drive the airflow direction change means. The driving unit includes a motor, a mechanical component, a case and a rotation output shaft. The mechanical component is configured to transmit power of the motor. The case covers the motor and the mechanical component. The rotation output shaft is configured to output power of the motor to the outside of the case after receiving transmission of power of the motor through the mechanical component. The airflow path formation member includes a first through hole. The first through hole is formed for allowing the rotation output shaft to reach the inside of the airflow path therethrough. A periphery of the first through hole includes a blocking structure. The blocking structure is configured to block communication between the airflow path and the interior of the driving unit.

[0007] According to the first aspect of the present invention, the blocking structure is formed for blocking communication between the airflow path and the interior of the driving unit. With the structure, it is possible to prevent occurrence of condensation in the motor and the mechanical components due to leakage of conditioned air from the airflow path to the driving unit for the airflow direction change means.

[0008] An indoor unit for an air conditioner according to a second aspect of the present invention is the indoor unit according to the first aspect of the present invention. In the indoor unit, the blocking structure includes a first engagement part. The first engagement part is formed by engagement of the rotation output shaft and the first through hole formed in the airflow path formation member.

[0009] According to the second aspect of the present invention, the blocking structure includes the first engagement part formed by the engagement between the rotation output shaft and the first through hole formed in the airflow path formation member. Accordingly, it is possible to prevent leakage of conditioned air with the engagement between the rotation output shaft and the first through hole formed in the airflow path formation member.

[0010] An indoor unit for an air conditioner according to a third aspect of the present invention is the indoor unit according to the second aspect of the present invention. In the indoor unit, the first engagement part further includes sealing material. The sealing material is applied between the rotation output shaft and the inner peripheral surface of the first through hole.

[0011] According to the third aspect of the present invention, the first engagement part further includes the sealing material applied between the rotation output shaft and the inner peripheral surface of the first through hole. With the structure, air tightness in the first engagement part is enhanced. Accordingly, it is possible to enhance a leakage prevention effect for conditioned air.

[0012] An indoor unit for an air conditioner according

to a fourth aspect of the present invention is the indoor unit according to the third aspect of the present invention. In the indoor unit, the sealing material is grease.

[0013] According to the fourth aspect of the present invention, the sealing material is grease. Therefore, it is possible to enhance a leakage prevention effect for conditioned air. Furthermore, it is possible to enhance lubrication of the rotation output shaft.

[0014] An indoor unit for an air conditioner according to a fifth aspect of the present invention is the indoor unit according to one of the first to fourth aspects of the present invention. In the indoor unit, the blocking structure includes a second engagement part. The second engagement part is formed by engagement between the rotation output shaft and the second through hole formed in the case.

[0015] According to the fifth aspect of the present invention, the blocking structure includes the second engagement part formed by the engagement between the rotation output shaft and the second through hole formed in the case. Accordingly, it is possible to block leakage of conditioned air with the engagement between the rotation output shaft and the second through hole formed in the case.

[0016] An indoor unit for an air conditioner according to a sixth aspect of the present invention is the indoor unit according to the second aspect of the present invention. In the indoor unit, the blocking structure includes a third engagement part. The third engagement part is formed by engagement between a convex part and a concave part. The convex part is formed in a periphery of the first through hole formed in the airflow path formation member. The concave part is formed in the case.

[0017] According to the sixth aspect of the present invention, the blocking structure includes the third engagement part formed by the engagement between the convex part formed in the periphery of the first through hole formed in the airflow path formation member and the concave part formed in the case. Accordingly, the engagement between the convex part of the airflow path formation member and the concave part of the case enhances adhesiveness between the rotation output shaft and the inner peripheral surface of the first through hole. Consequently, it is possible to further enhance a leakage prevention effect for conditioned air.

[0018] An indoor unit for an air conditioner according to a seventh aspect of the present invention is the indoor unit according to one of the first to sixth aspects of the present invention. The indoor unit further includes an air layer formation part for forming an air layer on a surface of the case opposing to the airflow path formation member.

[0019] According to the seventh aspect of the present invention, the indoor unit further includes the air layer formation part for forming the air layer on the surface of the case opposing to the airflow path formation member. Accordingly, the air layer prevents heat transfer between the airflow path and the interior of the case. Consequently,

ly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

[0020] An indoor unit for an air conditioner according to an eighth aspect of the present invention is the indoor unit according to the seventh aspect of the present invention. In the indoor unit, the air layer formation part includes a plurality of ribs. Additionally, the air layer is formed between adjacent two ribs.

[0021] According to the eighth aspect of the present invention, the air layer, formed between adjacent two ribs, blocks heat transfer between the airflow path and the interior of the case. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

[0022] An indoor unit for an air conditioner according to a ninth aspect of the present invention is the indoor unit according to one of the first to eighth aspects of the present invention. The indoor unit further includes a heat insulator. The heat insulator is disposed between the airflow path formation member and the case.

[0023] According to the ninth aspect of the present invention, the heat insulator, disposed between the airflow path formation member and the case, blocks heat transfer between the airflow path and the interior of the case. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

<Advantageous Effects of Invention>

[0024] According to the first aspect of the present invention, it is possible to prevent occurrence of condensation in the motor and the mechanical components due to leakage of conditioned air from the airflow path to the driving unit for the airflow direction change means.

[0025] According to the second aspect of the present invention, it is possible to prevent leakage of conditioned air with the engagement between the rotation output shaft and the first through hole formed in the airflow path formation member.

[0026] According to the third aspect of the present invention, air tightness in the first engagement part is enhanced, and it is thereby possible to enhance a leakage prevention effect for conditioned air.

[0027] According to the fourth aspect of the present invention, it is possible to enhance a leakage prevention effect for conditioned air, and is also possible to enhance lubrication of the rotation output shaft.

[0028] According to the fifth aspect of the present invention, it is possible to block leakage of conditioned air with the engagement between the rotation output shaft and the second through hole formed in the case.

[0029] According to the sixth aspect of the present invention, the engagement between the convex part of the airflow path formation member and the concave part of the case enhances adhesiveness between the rotation output shaft and the inner peripheral surface of the first

through hole. Accordingly, it is possible to enhance a leakage prevention effect for conditioned air.

[0030] According to the seventh aspect of the present invention, the air layer prevents heat transfer between the airflow path and the interior of the case. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

[0031] According to the eighth aspect of the present invention, the air layer, formed between adjacent two ribs, blocks heat transfer between the airflow path and the interior of the case. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

[0032] According to the ninth aspect of the present invention, the heat insulator, disposed between the airflow path formation member and the case, blocks heat transfer between the airflow path and the interior of the case. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033]

Fig. 1 is a vertical cross-sectional view of an indoor unit for an air conditioner according to an embodiment of the present invention.

Fig. 2 is a structural view of a vicinity of horizontal airflow direction louvers of the indoor unit illustrated in Fig. 1.

Fig. 3 is an exploded perspective view for illustrating a pre-attached condition of a driving unit for the components of Fig. 2.

Fig. 4 is an enlarged cross-sectional view of a vicinity of a rotation output shaft of the indoor unit illustrated in Fig. 1.

Fig. 5 is a perspective view for illustrating an interior structure of the driving unit for the components of Fig. 2.

EXPLANATION OF THE REFERENCE NUMERALS

[0034]

- 1 indoor unit
- 2 bottom frame
- 2a airflow path formation part
- 5 horizontal airflow direction louver
- 6 driving unit
- 7 airflow path
- 11 motor
- 12 link mechanism
- 13 case
- 14 rotation output shaft
- 15 first through hole
- 21 first engagement part
- 22 grease

- 23 second engagement part
- 24 second through hole
- 27 third engagement part
- 28 convex part
- 5 29 concave part
- 31 air layer formation part
- 32 air layer
- 33 rib
- 34 heat insulator

10

BEST MODE FOR CARRYING OUT THE INVENTION

<Overall Structure of Indoor Unit 1 for Air conditioner>

15 **[0035]** Fig. 1 is a vertical cross-sectional view for illustrating an interior structure of an indoor unit for an air conditioner according to an embodiment of the present invention.

20 **[0036]** An indoor unit 1 is attached to a wall of an indoor space and the like. The indoor unit 1 is mainly composed of a bottom case 2, a top case 3, a main body section, horizontal airflow path direction louvers 5 and a driving unit 6. The bottom base 2 includes an airflow formation part 2a. The main body section includes an indoor heat exchanger 4 and a cross-flow fan 8. The horizontal airflow direction louvers 5 function as airflow direction change means.

25 **[0037]** The bottom case 2 covers the bottom side and the back side of the main body section including the indoor heat exchanger 4, the cross-flow fan 8 and the like. The top case 3 is engaged with the bottom case 2 for covering the front side of the main body section. The airflow path formation part 2a, forming a flow path 7, is formed above the upper surface of the bottom case 2. As illustrated in Fig. 3, the airflow path formation part 2a includes a first through hole 15 formed for allowing a rotation output shaft 14 to reach the inside of the airflow path 7 therethrough.

30 **[0038]** The top case 3 forms a front part of the indoor unit 1. The top case 3 is provided with suction ports 3a and 3b. The indoor heat exchanger 4 is opposed to the circumferential surface of the cross-flow fan 8. The indoor heat exchanger 4 is attached to the indoor unit 1 so as to surround the cross-flow fan 8 from the above, front and behind thereof. The indoor heat exchanger 4 is configured to conduct heat exchange between refrigerant passing through the interior of the indoor heat exchanger 4 and air to be sucked into the cross-flow fan 8 through the suction ports 3a and 3b when the cross-flow fan 8 is rotated.

35 **[0039]** Further, the top case 3 is provided with a blow-out port 9. The blow-out port 9 is composed of an opening formed along an elongated direction (i.e., width direction) of the indoor unit 1. Airflow, generated by the cross-flow fan 8, is blown out of the blow-out port 9 to the indoor space.

40 **[0040]** The airflow path 7 appropriately regulates airflow produced by the cross-flow fan 8, and guides it to

the blow-out port 9. The airflow path 7 is formed by the combination of the bottom case 2 and the top case 3. A plurality of the horizontal airflow direction louvers 5 and a plurality of horizontal flaps 10 are provided in the airflow path 7.

[0041] As illustrated in Fig. 2, upper portions of a plurality of the horizontal airflow direction louvers 5 are attached to an attachment plate 20. Each of the horizontal airflow direction louvers 5 is thereby allowed to swing from side to side. The attachment plate 20 is fixed to the bottom case 2.

[0042] Further, a plurality of the horizontal airflow direction louvers 5 are coupled to the rotation output shaft 14 through coupling pins 19, a coupling rod 17, a coupling pin 18 and an arm 16 for swinging from side to side by means of rotation drive force of the rotation output shaft 14 of the driving unit 6. Specifically, a plurality of the horizontal airflow direction louvers 5 is coupled to the common coupling rod 17 through the coupling pin 19. Each of the horizontal airflow direction louvers 5 is coupled to the coupling rod 17 for rotating about the coupling pin 19. The coupling rod 17 is coupled to the arm 16 through the coupling pin 18 while the arm 16 is fixed to the rotation output shaft 14. The coupling rod 17 is coupled to the arm 16 for rotating around the coupling pin 18.

[0043] The horizontal flaps 10 are configured to guide airflow to be blown out to the indoor space up and down. The horizontal flaps 10 are disposed in a vicinity of the blow-out port 9. The horizontal flaps 10 are rectangular-shaped plate members elongated in an elongated direction of the blow-out port 9. Each of the horizontal flaps 10 is allowed to rotate about an axis parallel to the elongated of the blow-out port 9. The horizontal flaps 10 are rotationally driven by a flap motor (not illustrated in the figure). Accordingly, the horizontal flaps 10 are capable of guiding airflow up and down, and are also capable of closing the blow-out port 9.

<Structure of Driving Unit 6>

[0044] As illustrated in Figs. 3 to 5, the driving unit 6 includes a motor 11, a link mechanism 12, a case 13, and the rotation output shaft 14. The link mechanism 12 is a mechanical component for transmitting power of the motor 11. The case 13 covers the motor 11 and the link mechanism 12. The rotation output shaft 14 is configured to output power of the motor 11, which is transmitted through the link mechanism 12, to the outside the case 13.

[0045] The motor 11 is composed of a stepping motor. The motor 11 is capable of selecting a direction of rotation (either a clockwise direction or a counter-clockwise direction) and an angle of rotation corresponding to an input signal, and is capable of transmitting rotation drive force to the link mechanism 12 based on the selected direction and angle of rotation.

[0046] The link mechanism 12 is configured to transmit the rotation drive force of the motor 11 to the rotation

output shaft 14. The link mechanism 12 is composed of a first arm 12a, a coupling rod 12b, a coupling pin 12c, a second arm 12d and a coupling pin 12e. The first arm 12a is coupled to a driving shaft 11a of the motor 11. The coupling pin 12c couples the first arm 12a and the coupling rod 12b for allowing them to couple rotatably. The second arm 12d is coupled to the rotation output shaft 14. The coupling pin 12e couples the coupling rod 12b and the second arm 12d for allowing them to couple rotatably.

[0047] The case 13 is composed of a case body 13a opened downward and a bottom cover 13b.

[0048] As illustrated in Fig. 4, a blocking structure is formed in a periphery of the first through hole 15 formed in the airflow path formation part 2a of the bottom case 2. The blocking structure is configured to block communication between the airflow path 7 and the interior of the driving unit 6. The blocking structure according to the present embodiment includes three engagement parts: a first engagement part 21; a second engagement part 23; and a third engagement part 27.

[0049] The first engagement part 21 is formed by engagement between the rotation output shaft 14 and the first through hole 15 formed in the airflow path formation part 2a of the bottom case 2.

[0050] The first engagement part 21 further includes grease 22 as sealing material applied between the rotation output shaft 14 and the inner peripheral surface of the first through hole 15. With the grease 22, it is possible to further effectively enhance an effect for preventing conditioned air from leaking from the first through hole 15. With the grease 22, and also, it is possible to enhance lubrication of the rotation output shaft 14.

[0051] The second engagement part 23 is formed by engagement between the rotation output shaft 14 and a second through hole 24 formed in the case 13.

[0052] The third engagement part 27 is formed by engagement between a convex part 28 and a concave part 29. The convex part 28 is formed in a periphery of the first through hole 15 formed in the airflow path formation part 2a of the bottom case 2. The concave part 29 is formed in the case 13.

<Structure of Air Layer Formation Part 31>

[0053] The indoor unit 1 further includes an air layer formation part 31 for forming air layers 32 on a surface of the case 13 opposing to the airflow path formation part 2a.

[0054] The air layer formation part 31 includes a plurality of ribs 33. Air layers 32 are formed between adjacent two ribs 33.

[0055] With air layers 32 thus formed on the upper surface of the case 13, it is possible to block heat transfer between the air path 7 and the interior of the case 13.

<Structure of Heat Insulator 34>

[0056] As illustrated in Fig. 3, the indoor unit 1 further includes a heat insulator 34 disposed between the airflow path information part 2a of the bottom case 2 and the case 13 of the driving unit 6. The heat insulator 34 is manufactured with sheet material having thermal insulation property. The heat insulator 34 is disposed for covering a part of the upper surface of the case 13, in which the air layer formation part 31 is formed. Note that an opening 34a is formed in the heat insulator 34, and a position of the opening 34a corresponds to a position of the rotation output shaft 14 and the concave part 29 of the driving unit 6. Accordingly, the rotation output shaft 14 is allowed to be engaged with the first through hole 15 of the bottom case 2 while the concave part 29 is allowed to be engaged with the convex part 28 of the bottom case 2 (see Fig. 4).

<Characteristics>

[0057]

(1) In the indoor unit 1 according to the present embodiment, the blocking structure (i.e., the first engagement part 21, the second engagement part 23 and the third engagement part 27) is formed for blocking communication between the airflow path 7 and the interior of the driving unit 6. Therefore, it is possible to prevent occurrence of condensation in the motor 11 and the mechanical components (e.g., the link mechanism 12) due to leakage of conditioned air from the airflow path 7 to the driving unit 6 for the horizontal airflow direction louvers 5

(2) In the indoor unit 1 according to the present embodiment, the blocking structure includes the first engagement part 21 formed by the engagement between the rotation output shaft 14 and the first through hole 15 formed in the airflow path formation part 2a. Accordingly, with the engagement between the rotation output shaft 14 and the first through hole 15 formed in the airflow path formation part 2a, it is possible to prevent leakage of conditioned air.

(3) In the indoor unit 1 according to the present embodiment, the first engagement part 21 further includes the grease 22 as the sealing material applied between the rotation output shaft 14 and the inner peripheral surface of the first through hole 15. Accordingly, air tightness in the first engagement part 21 is further enhanced. Consequently, it is possible to prevent enhance a leakage prevention effect for conditioned air.

(4) In the indoor unit 1 according to the present embodiment, the grease 22 is used as the sealing material. Accordingly, it is possible to prevent enhance a leakage prevention effect for conditioned air and is possible to simultaneously enhance lubrication of

the rotation output shaft 14.

(5) In the indoor unit 1 according to the present embodiment, the blocking structure includes the second engagement part 23 formed by the engagement between the rotation output shaft 14 and the second through hole 24 formed in the case 13. Accordingly, it is possible to block leakage of conditioned air with the engagement between the rotation output shaft 14 and the second through hole 24 formed in the case 13.

(6) In the indoor unit 1 according to the present embodiment, the blocking structure includes the third engagement part 27 formed by the engagement between the convex part 28 formed in a periphery of the first through hole 15 formed in the airflow path formation part 2a and the concave part 29 formed in the case 13. Therefore, the engagement between the convex part 28 of the airflow path formation part 2a and the concave part 29 of the case 13 enhances adhesiveness between the rotation output shaft 14 and the inner peripheral surface of the first through hole 15. Consequently, it is possible to further enhance a leakage prevention effect for conditioned air.

(7) The indoor unit 1 according to the present embodiment further includes the air layer formation part 31 for forming air layers 32 on the surface of the case 13 opposing to the airflow path formation part 2a. Accordingly, the air layers 32 block heat transfer between the airflow path 7 and the interior of the case 13. Consequently, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case 13.

(8) In the indoor unit 1 according to the present embodiment, air layers 32, formed between adjacent two ribs 33, block heat transfer between the airflow path 7 and the interior of the case 13. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case 13.

(9) In the indoor unit 1 according to the present embodiment, the heat insulator 34, disposed between the airflow path formation part 2a and the case 13, blocks heat transfer between the airflow path 7 and the interior of the case 13. Accordingly, it is possible to prevent occurrence of condensation due to temperature reduction of air in the interior of the case 13.

<Modifications>

[0058]

(A) The aforementioned embodiment adopts the horizontal airflow direction louvers 5 as the airflow direction change means. However, the present invention is not limited to this. For example, excluding the horizontal airflow direction louvers, means for changing airflow direction in the vertical direction (e.g., the horizontal flap 10) may be used as the air-

flow direction change means of the present invention.

(B) The aforementioned embodiment adopts the airflow path formation part 2a of the bottom case 2 as an airflow path formation member for forming the airflow path 7. However, the present invention is not limited to this. For example, a member, separately provided from the bottom case 2, may be used as an airflow path formation member.

INDUSTRIAL APPLICABILITY

[0059] It is possible to apply the present invention to an indoor unit for an air conditioner, provided with a motor for driving horizontal airflow direction louvers.

Claims

1. An indoor unit (1) for an air conditioner, comprising:

an airflow path formation member (2a) for forming an airflow path (7);
 airflow direction change means (5) being disposed inside the airflow path (7), the airflow direction change means (5) being configured to change an airflow direction of a conditioned air to be blown out to an indoor space; and
 a driving unit (6) being disposed outside the airflow path (7), the driving unit (6) being configured to drive the airflow direction change means (5),

wherein the driving unit (6) includes a motor (11), a mechanical component (12) for transmitting power of the motor (11), a case (13) for covering the motor (11) and the mechanical component (12), and a rotation output shaft (14) for outputting power of the motor (11) to the outside of the case (13) after receiving transmission of the power of the motor (11) through the mechanical component (12),
 wherein the airflow path formation member (2a) includes a first through hole (15) formed for allowing the rotation output shaft (14) to reach the inside of the airflow path (7) therethrough, and
 wherein a periphery of the first through hole (15) includes a blocking structure for blocking communication between the airflow path (7) and the interior of the driving unit (6).

2. The indoor unit (1) according to claim 1, wherein the blocking structure includes a first engagement part (21) formed by engagement of the rotation output shaft (14) and the first through hole (15) formed in the airflow path formation member (2a).

3. The indoor unit (1) according to claim 2, wherein the first engagement part (21) further includes sealing material applied between the rotation output shaft

(14) and the inner peripheral surface of the first through hole (15).

4. The indoor unit (1) according to claim 3, wherein the sealing material is grease (22).

5. The indoor unit (1) according to one of claims 1 to 4, wherein the blocking structure includes a second engagement part (23) formed by engagement between the rotation output shaft (14) and a second through hole (24) formed in the case (13).

6. The indoor unit (1) according to claim 2, wherein the blocking structure includes a third engagement part (27) formed by engagement between a convex part (28) formed in a periphery of the first through hole (15) formed in the airflow path formation member (2a) and a concave part (29) formed in the case (13).

7. The indoor unit (1) according to one of claims 1 to 6, further comprising an air layer formation part (31) for forming an air layer (32) on a surface of the case (13) opposing to the airflow path formation member (2a).

8. The indoor unit (1) according to claim 7, wherein the air layer formation part (31) includes a plurality of ribs (33), and wherein the air layer (32) is formed between adjacent two ribs (33).

9. The indoor unit (1) according to one of claims 1 to 8, further comprising a heat insulator (34) disposed between the airflow path formation member (2a) and the case (13).

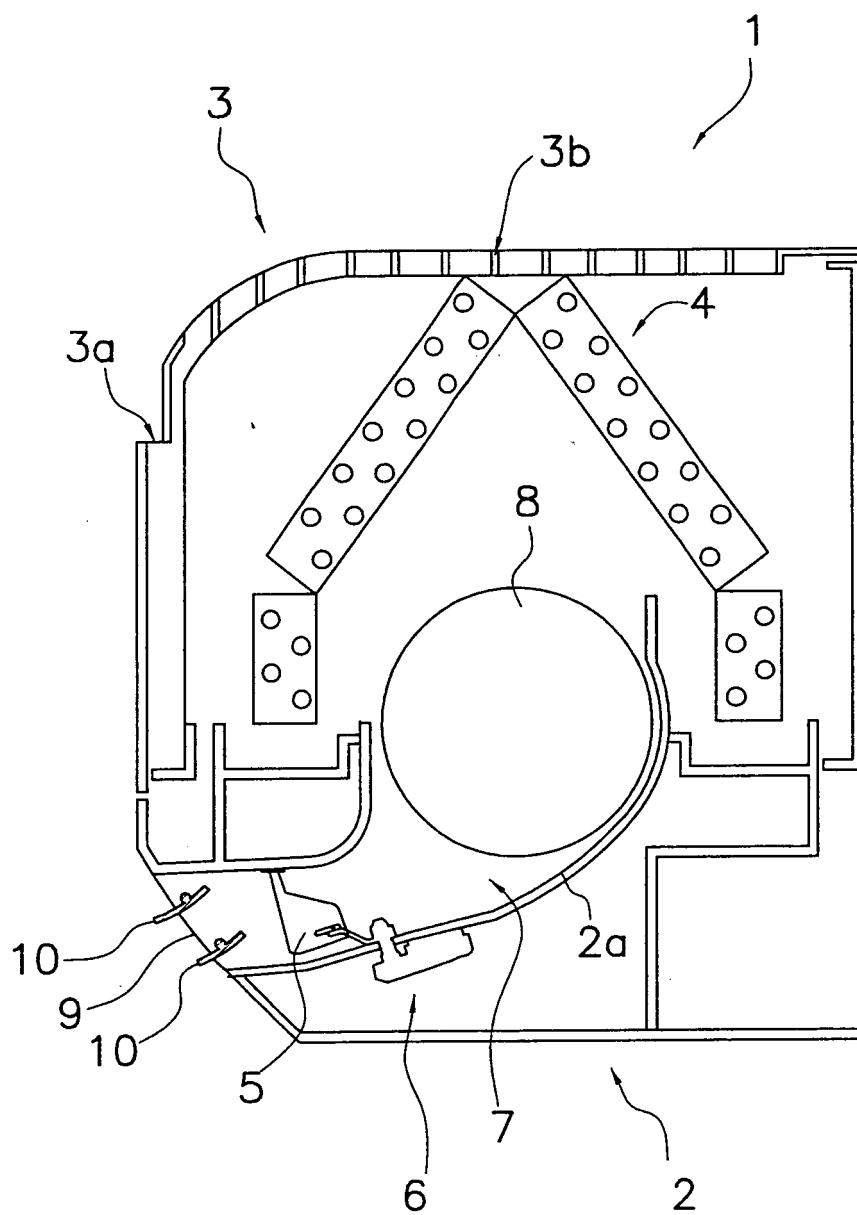


FIG. 1

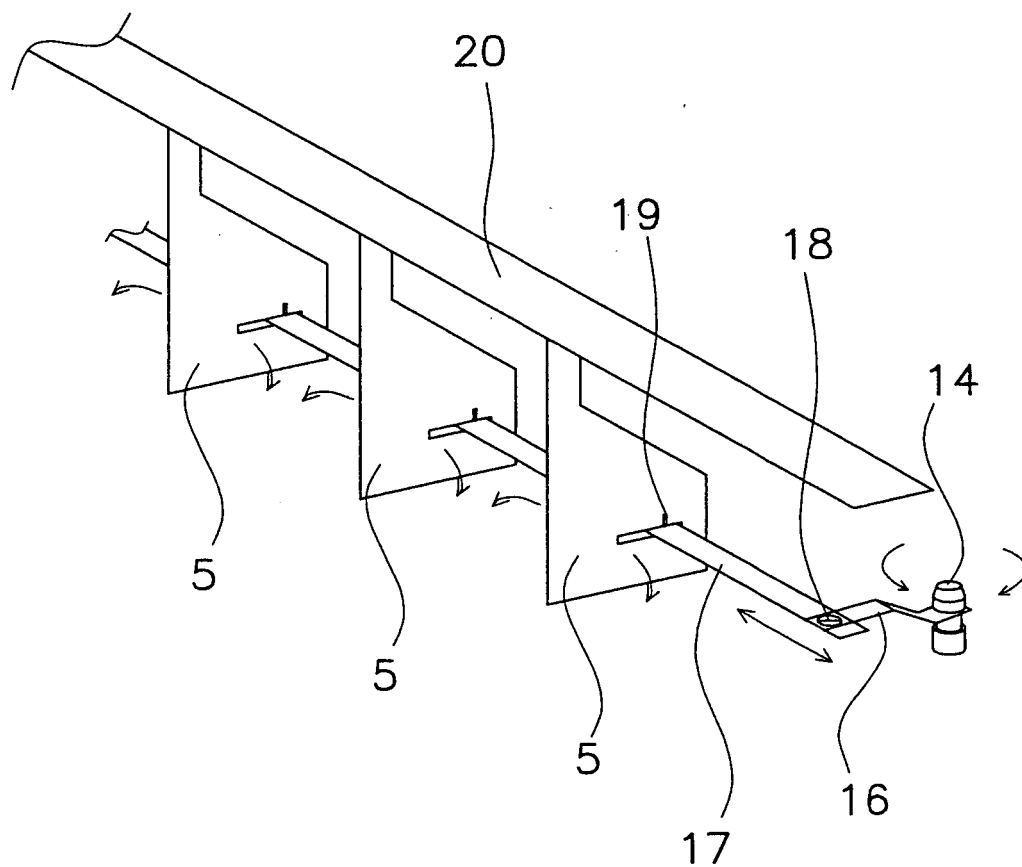


FIG. 2

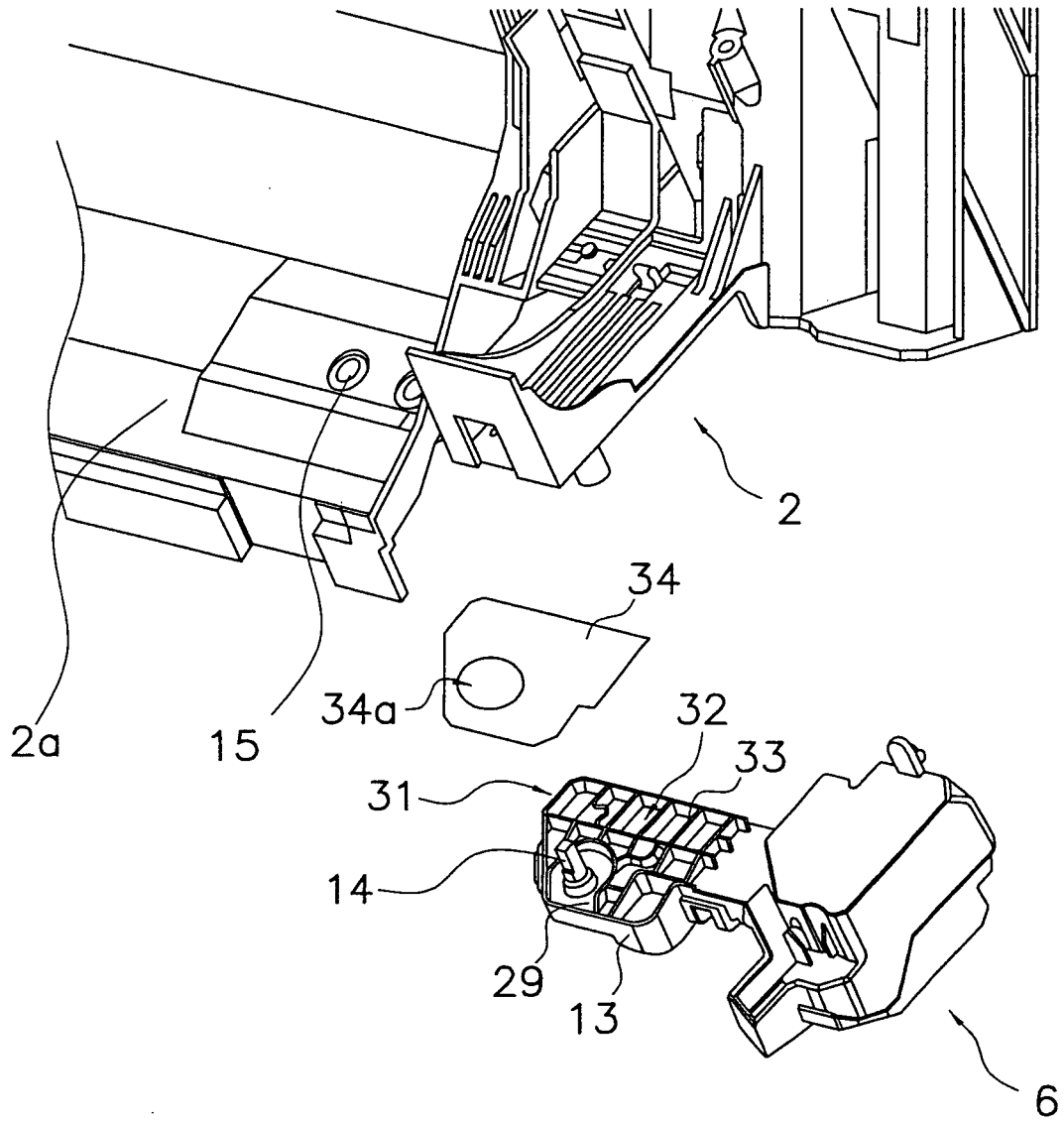


FIG. 3

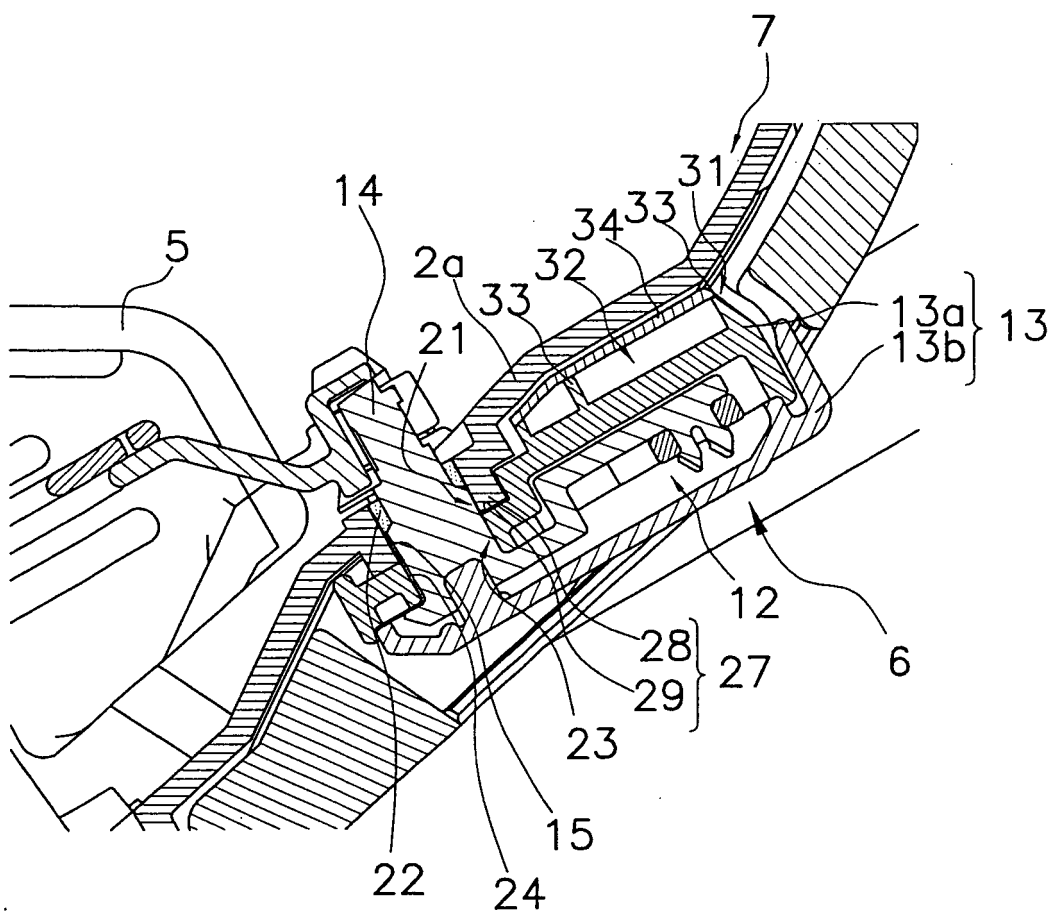


FIG. 4

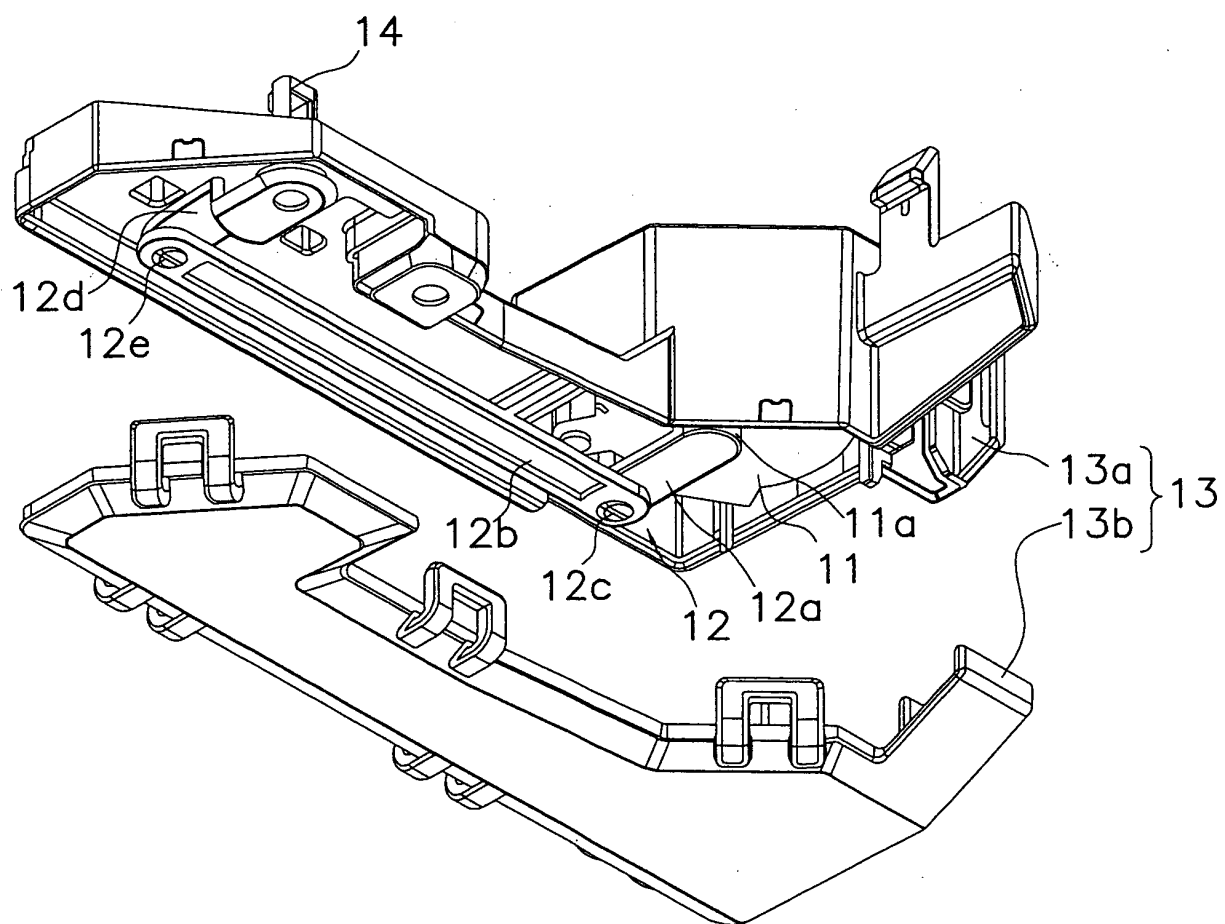


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/324207

A. CLASSIFICATION OF SUBJECT MATTER

F24F13/15(2006.01)i, F24F1/00(2006.01)i, F24F13/14(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F13/15, F24F1/00, F24F13/14

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 1996-2007

Kokai Jitsuyo Shinan Koho 1971-2007 Toroku Jitsuyo Shinan Koho 1994-2007

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.
X	JP 11-72265 A (Fujitsu General Ltd.), 16 March, 1999 (16.03.99), Par. Nos. [0001] to [0079]; Figs. 2, 4, 9 & US 5943872 A1 & EP 886111 A2 & DE 69825679 T	1, 2, 5, 6, 9
X	JP 11-94344 A (Fujitsu General Ltd.), 09 April, 1999 (09.04.99), Par. Nos. [0001] to [0026]; Figs. 1, 2, 3 (Family: none)	1, 2, 5, 6, 9
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☒ Further documents are listed in the continuation of Box C.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 136049/1985 (Laid-open No. 43059/1987) (Honda Motor Co., Ltd.), 14 March, 1987 (14.03.87), Full text; Figs. 1 to 6 (Family: none)	3, 4
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Y	JP 8-19949 A (Olympus Optical Co., Ltd.), 23 January, 1996 (23.01.96), Par. No. [0035] (Family: none)	3, 4
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 10810/1988 (Laid-open No. 116321/1989) (Fujitsu General Ltd.), 04 August, 1989 (04.08.89), Full text; Fig. 1 (Family: none)	7
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Y	JP 11-159791 A (Matsushita Electric Industrial Co., Ltd.), 15 June, 1999 (15.06.99), Par. Nos. [0013], [0014]; Figs. 1, 2 (Family: none)	7
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Y	JP 6-201148 A (Inoac Corp.), 19 July, 1994 (19.07.94), Par. Nos. [0010] to [0013]; Figs. 1, 2 (Family: none)	8
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