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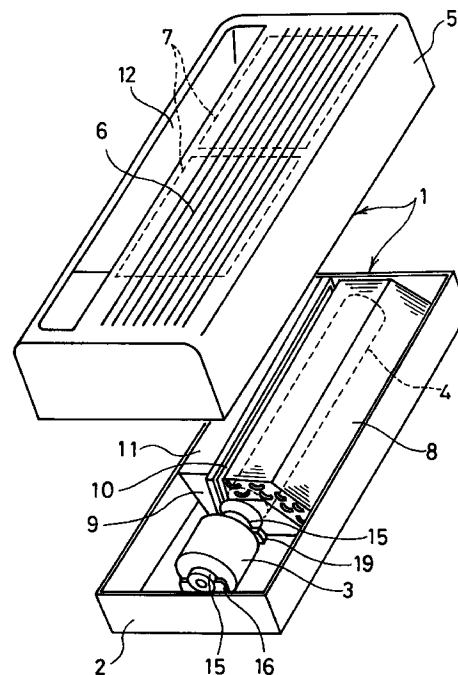
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(54) **Motor fixing device for use in air conditioner**

(57) In the conventional air conditioner, a slidable movement of a motor (3) is prohibited because of rubber isolations (15) locked by fixed motor receiving portions (19). Accordingly, the replacement of a motor (3) requires the removal of a discharge grille (9) and the like. One of the motor receiving portions (16,19) provided at a base frame (2) is formed as a separate component removably attached to the base frame (2) such that the above motor receiving portion (16) on one side may be removed for allowing the slidable movement of the motor (3). This offers an easy and quick replacement of the motor (3) without removing the discharge grille (9) and the like.

FIG.1



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Description

TECHNICAL FIELD

The present invention relates to a motor fixing device for use in an air conditioner.

BACKGROUND ART

With reference to Figs. 5 and 6, this type of conventional air conditioner will be described.

Referring to Figs. 5 and 6, an indoor unit of the air conditioner will be described. The main body of the indoor unit 101 comprises a base frame 102 shaped like a box and a front grille 105 shaped like a box attachable to the base frame 102.

A motor 103 disposed within the base frame 102 drives a cross-flow fan 104 whereby a room air sucked through a suction port 106 formed in the top of the front grille 105 is drawn through an air filter 107 disposed rearward of the suction port 106 and then through a heat exchanger 108 installed within the base frame 102 where the air thus drawn is subject to heat absorption and dehumidification processes. Condensation resulting from the processes is received by a drain pan 110 disposed at a discharge grille 109 whereas the air through the heat exchange process is sent to a discharge portion 111 of the discharge grille 109 to be discharged from a discharge port 112 formed in the bottom of the front grille 105.

The aforesaid indoor unit is assembled through the following procedure. First, rubber isolations 114 mounted to the opposite ends of the motor 103 are locked by motor receiving portions 113 provided at the base frame 102. After a shaft 116 of the motor 103 is inserted into a fan boss 115 of the cross-flow fan 104, the shaft 116 is secured to the fan boss 115 by means of a bolt 117. The other end of the cross-flow fan 104 is fixed with a bearing 118, which is fitted into a bearing portion 119 disposed at the base frame 102.

Next, the heat exchanger 108 is installed forward of the cross-flow fan 104 whereas mounted below the heat exchanger 108 is the discharge grille 109 incorporating the drain pan 110 and the discharge portion 111. Because of a lead wire 120 extending from the motor 103 locked to the base frame 102, the motor 103 itself is aligned to position by means of a jig or the like. Then, installed forward of the motor 103 is a power board 121 incorporating electric equipments, which is secured to the base frame 102. Thus, by mounting the power board 121, the rubber isolations 114 mounted to the opposite ends of the motor 103 are gripped between the motor receiving portions 113 of the base frame 102 and the power board 121. Finally, the front grille 105 is attached to the base frame.

In the aforementioned conventional air conditioner, however, the rubber isolations 114 of the motor 103 are locked by a pair of fixed motor receiving portions 113 so that a slidable movement of the motor 103 is prohibited.

Hence, when replacing the motor 103 at market, the motor 103 cannot be dismantled from the base frame unless the power board 121, discharge grille 109 and cross-flow fan 104 are removed.

Additionally, when the motor 103 is replaced at market, it is difficult to install a new motor 103 at a normal position and therefore, the installation thereof takes quite a long time. A failure to install the motor 103 at the normal position results in contact between the lead wire 120 of the motor 103 and the base frame 102, which causes the occurrence of vibration and noise.

DISCLOSURE OF THE INVENTION

In view of the foregoing, it is an object of the invention to provide a motor fixing device for use in an air conditioner which provides an easy and quick replacement of the motor at market.

It is another object of the invention to provide a motor fixing device for use in an air conditioner which allows the motor to be remounted to a normal position of design when it is replaced.

For achieving the above objects, the motor fixing device for use in the air conditioner of the invention is included in a main body of an indoor unit comprising a base frame shaped like a box and a front grille attachable to the base frame, the indoor unit in which an air flow passage interconnects a suction port formed in the top of said front grille and a discharge port formed in the bottom of the front grille and contains therein a removable air filter, a heat exchanger, a cross-flow fan for sending to the aforesaid discharge port an air through a heat exchange process and the like, the aforesaid cross-flow fan having a motor with rubber isolations mounted to the opposite ends thereof, the rubber isolations being locked by motor receiving portions provided at the aforesaid base frame and being gripped between the base frame and a power board disposed in front of the aforesaid motor, the motor fixing device characterized in that one of the motor receiving portions disposed at the aforesaid base frame is a separate component removably attached to the base frame.

With the above construction of the invention, a slidable movement of the motor is allowed by removing one of the motor receiving portions. This provides an easy and quick operation for replacing the motor at market, which does not require the removal of the discharge grille, cross-flow fan and the like.

Another motor fixing device for use in an air conditioner of the invention is included in an air conditioner of the same construction with the above, and is characterized in that one of the motor receiving portions disposed at the base frame is formed of a part of the base frame and is removably attached to the rest of the base frame.

With the above construction of the invention, a slidable movement of the motor is allowed by removing one of the motor receiving portions from the rest of the base frame. This provides an easy and quick operation for replacing the motor at market, which operation does not

require the removal of the discharge grille, cross-flow fan and the like. In addition, the construction does not employ a separate component as one of the motor receiving portions that is adapted to be removably attached to the base frame, thus reducing the number of components.

In a mode carrying out the invention, one of the motor receiving portions is provided with a claw releasably engaged with the base frame.

According to this mode, one of the motor receiving portions may be attached to or removed from the base frame by engaging or disengaging the claw with or from the base frame. Hence, an easy and quick replacement of the motor is realized at market without using tools or removing the discharge grille, cross-flow fan and the like.

In another mode of carrying out the invention, one of the motor receiving portions is slidable to be engaged with or disengaged from the base frame.

According to the mode, one of the motor receiving portions can be attached to or removed from the rest of the base frame by slidably moving the above motor receiving portion. Hence, an easy and quick replacement of the motor is realized at market without using tools or removing the discharge grille, cross-flow fan and the like.

In yet another mode of carrying out the invention, one of the motor receiving portions is formed with a hole, projection or recess.

According to the above mode, one of the motor receiving portions may be readily removed by utilizing the hole, projection or recess.

In a preferred mode of carrying out the invention, one of the motor receiving portions is provided with a marking.

According to the preferred mode, when the motor is replaced at market, the motor can be mounted to a normal position of design by aligning the motor with the marking. This prevents a lead wire of the motor from contacting the base frame, thus avoiding the occurrence of vibration or noise.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view for illustrating the configuration of an indoor unit of an air conditioner according to an embodiment of the invention.

Fig. 2 is a perspective view of the above air conditioner for illustrating the principal parts thereof as they appear during assembly thereof.

Fig. 3 is a perspective view for illustrating a part of a base frame and motor receiving portions of the above air conditioner.

Fig. 4 is a perspective view for illustrating a part of a base frame and motor receiving portions of an air conditioner according to another embodiment hereof.

Fig. 5 is a perspective view for illustrating the configuration of a conventional air conditioner.

Fig. 6 is a perspective view for illustrating the princi-

pal parts of the above air conditioner as they appear during assembly thereof.

EMBODIMENTS

Now referring to Figs. 1 through 3, an embodiment of the invention will be described.

The construction of an outdoor unit of an air conditioner is the same as the conventional example and therefore, the description thereof is omitted. An indoor unit of the air conditioner will be described with reference to Figs. 1 through 3. The main body of an indoor unit 1 comprises a base frame 2 shaped like a box and a front grille 5 shaped like a box attachable to the base frame 2, and the like.

A cross-flow fan 4 is driven by a motor 3 installed within the base frame 2 whereby a room air is sucked through a suction port 6 formed in the top of the front grille 5 attached to the base frame 2 and through an air filter 7 disposed rearward of the suction port 6. Then the air is further drawn through a heat exchanger 8 installed within the base frame 2 so as to be subject to heat absorption and dehumidification processes. Condensation resulting from the processes is received by a drain pan 10 of a discharge grille 9 whereas an air through the heat exchanging process is sent to a discharge portion 11 of the discharge grille 9 to be discharged from a discharge port 12 formed in the bottom of the front grille 5.

The indoor unit is assembled through the following procedure. First, a bearing 14 of the cross-flow fan 4 is fitted into a bearing portion 13 provided at the base frame 2. A motor receiver 16 as a separate component (a motor receiving portion on one side) receives one (on one side of the motor) of rubber isolations 15 mounted to the opposite ends of the motor 3 and then is mounted to the base frame 2 while a shaft 17 of the motor 3 is inserted into a fan boss 18 of the cross-flow fan 4. The rubber isolation 15 on the other side is received by a motor receiving portion 19 provided at the base frame 2. The shaft 17 inserted in the fan boss 18 is secured thereto by means of a bolt 20.

Next, the heat exchanger 8 is installed forward of the cross-flow fan 4. Installed below the heat exchanger 8 is the discharge grille 9 incorporating the drain pan 10 and discharge portion 11. A lead wire 21 extends from the motor 3 locked by the motor receiving portion 19 on the base frame 2 side and the motor receiver 16, and therefore, the motor 3 itself is aligned to position by means of a jig or the like. Then a power board 22 incorporating electric equipments is installed forward of the motor 3 and is secured to the base frame 2.

Thus, by installing the power board 22, the rubber isolations 15 mounted to the opposite ends of the motor 3 are gripped between the motor receiving portion 19 and the motor receiver 16, and the power board 22, respectively, whereby the motor 3 is secured. Finally, the front grille 5 is attached to place.

The motor receiver 16 is provided with claw portions comprised of a U-shaped leaf spring or the like at

plural places thereon, each claw portion having a claw 24. Each claw 24 is so constructed as to fit with a claw receiver 25 provided at the base frame 2 so that the motor receiver 16 as a separate component may be removably attached to the base frame 2. It is to be noted that a wall at the claw receiver 25 is eliminated so that the motor receiver 16 may be readily attached or removed. Additionally, the motor receiver 16 is formed with a hole 26, a projection or a recess.

To remove the motor receiver 16, the aforesaid claw portion 23 is manipulated to disengage the claw 24 from the claw receiver 25 and then, the motor receiver 16 is pulled up with a finger inserted in the hole 26. In this manner, the motor receiver 16 on one side of the motor can be readily removed. The removal of the motor receiver 16 on one side of the motor allows a slidable movement of the motor 3 for dismounting. This provides an easy and quick operation for replacing the motor 3 at market without using tools or removing the discharge grille 9, cross-flow fan 4 and the like.

Another embodiment of the invention will be described with reference to Fig.4.

A motor receiver 30, or one of the motor receiving portions provided at the aforesaid base frame 2 is formed of a part of the base frame 2 which is cut off therefrom, and is adapted to be attached to or removed from the rest of the base frame 2. More specifically, the motor receiver 30 is provided with a pair of grooved guided portions 31 which are guided via grooves 32 by guide portions 33 defined at the rest of the base frame 2.

To remove the motor receiver 30, claws 36 are first disengaged from the base frame to allow the motor receiver 30 to be pulled out with the grooved guided portions 31 thereof guided by the guide portions 33. Thus, the motor receiver 30 is readily removed from the base frame.

By removing the motor receiver 30 on one side of the motor in this manner, the motor 3 is allowed to slide for removal. Hence, an easy and quick replacement of the motor 3 at market is offered without using tools or the like, because it does not require the removal of the discharge grille 9, cross-flow fan 4 and the like. In addition, the construction of this embodiment does not employ a separate component as one of the motor receiver 30 which is removably attached, thus reducing the number of components. Incidentally, if the grooved guided portion 31 is provided at the rest of the base frame 2, a same effect may be obtained.

The aforesaid motor receiver 30 is provided with a marking 34 such that during assembly of the indoor unit or replacement of the motor 3, the motor 3 may be readily installed (set) at a normal position of design by aligning the marking 34 with a marking 35 on the motor 3. Accordingly, the motor 3 may be assembled so as to prevent the lead wire 21 of the motor 3 from contacting the base frame 2, whereby the occurrence of vibration or noise may be avoided.

Claims

1. A motor fixing device for use in an air conditioner in which an indoor unit is comprised of a main body comprising a base frame shaped like a box and a front grille attachable to the base frame, and an air flow passage interconnecting a suction port formed in the top of the front grille and a discharge port formed in the bottom of the front grille, said air flow passage having therein a removable air filter, a heat exchanger, a cross-flow fan for sending to the discharge port a heat-exchanged air by the heat exchanger, said cross-flow fan having a motor being attached at its opposite ends with rubber isolations which are locked by motor receiving portions disposed at the base frame and gripped between the base frame and a power board installed in front of the motor,

said motor fixing device being characterized in that one of the motor receiving portions disposed at the base frame is a separate component removably attached to the base frame.

2. A motor fixing device for use in an air conditioner in which an indoor unit is comprised of a main body comprising a base frame shaped like a box and a front grille attachable to the base frame, and an air flow passage interconnecting a suction port formed in the top of the front grille and a discharge port formed in the bottom of the front grille, said air flow passage having therein a removable air filter, a heat exchanger, a cross-flow fan for sending to the discharge port a heat-exchanged air by the heat exchanger, said cross-flow fan having a motor being attached at its opposite ends with rubber isolations which are locked by motor receiving portions disposed at the base frame and gripped between the base frame and a power board installed in front of the motor,

said motor fixing device being characterized in that one of the motor receiving portions disposed at the base frame is formed of a part of the base frame and is removably attached to the base frame.

3. A motor fixing device for use in an air conditioner as defined in Claim 1 or 2, characterized in that one of the motor receiving portions is provided with a claw releasably engaged with the base frame.
4. A motor fixing device for use in an air conditioner as defined in Claim 1 or 2, characterized in that one of the motor receiving portions is slidable to be attached to or removed from the base frame.
5. A motor fixing device for use in an air conditioner as defined in Claim 1 or 2, characterized in that one of

the motor receiving portions is formed with a hole, projection or recess.

6. A motor fixing device for use in an air conditioner as defined in Claim 1 or 2, characterized in that one of the motor receiving portions is provided with a marking.

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FIG.1

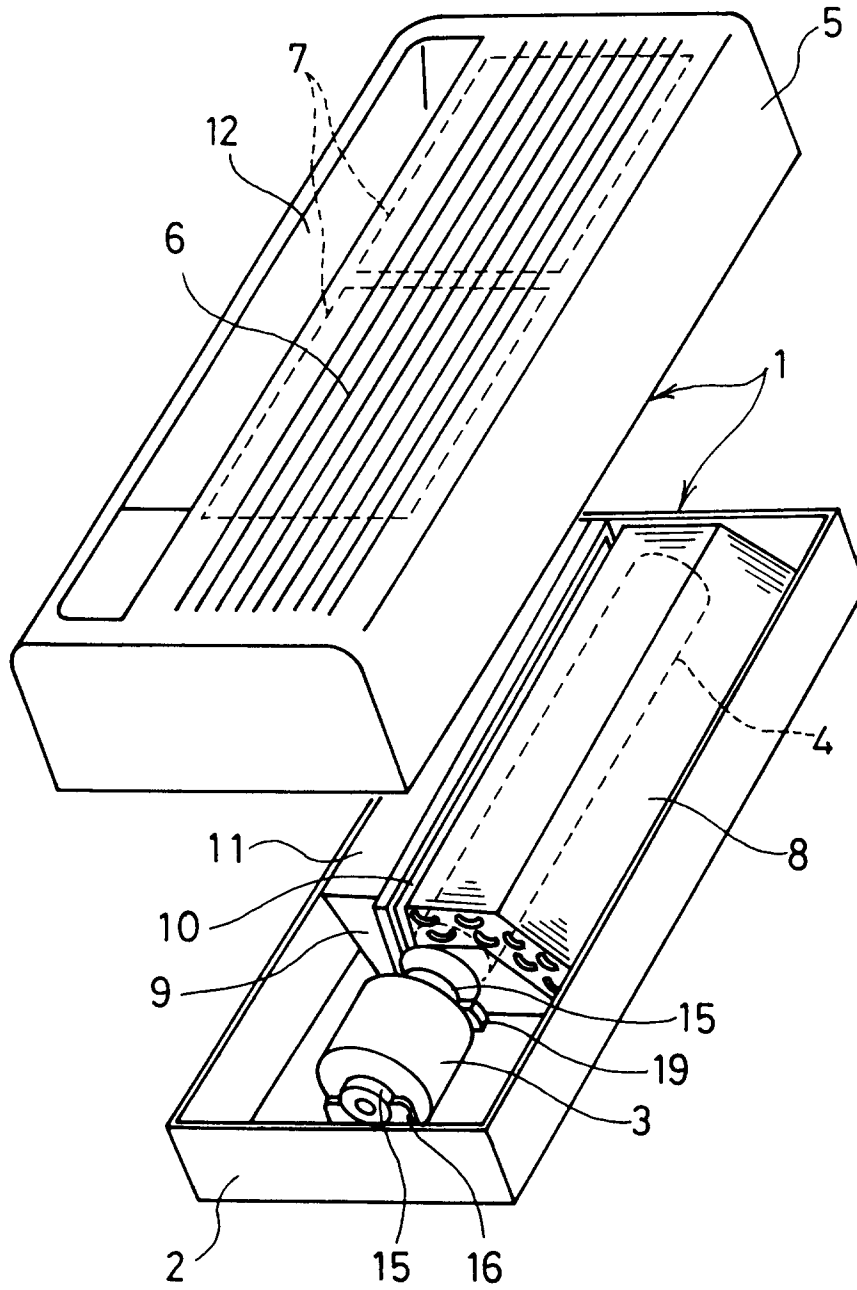


FIG.2

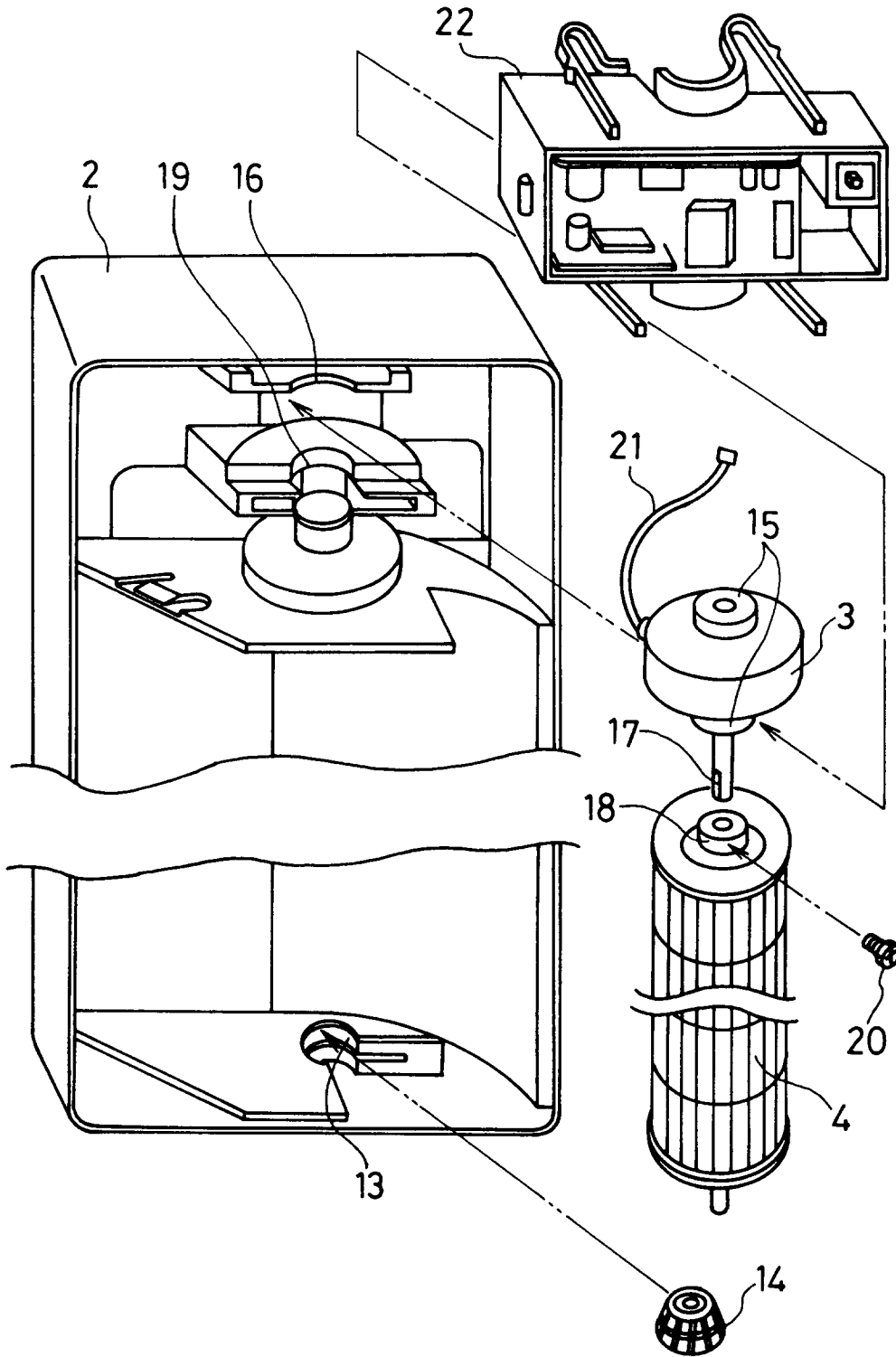


FIG.3

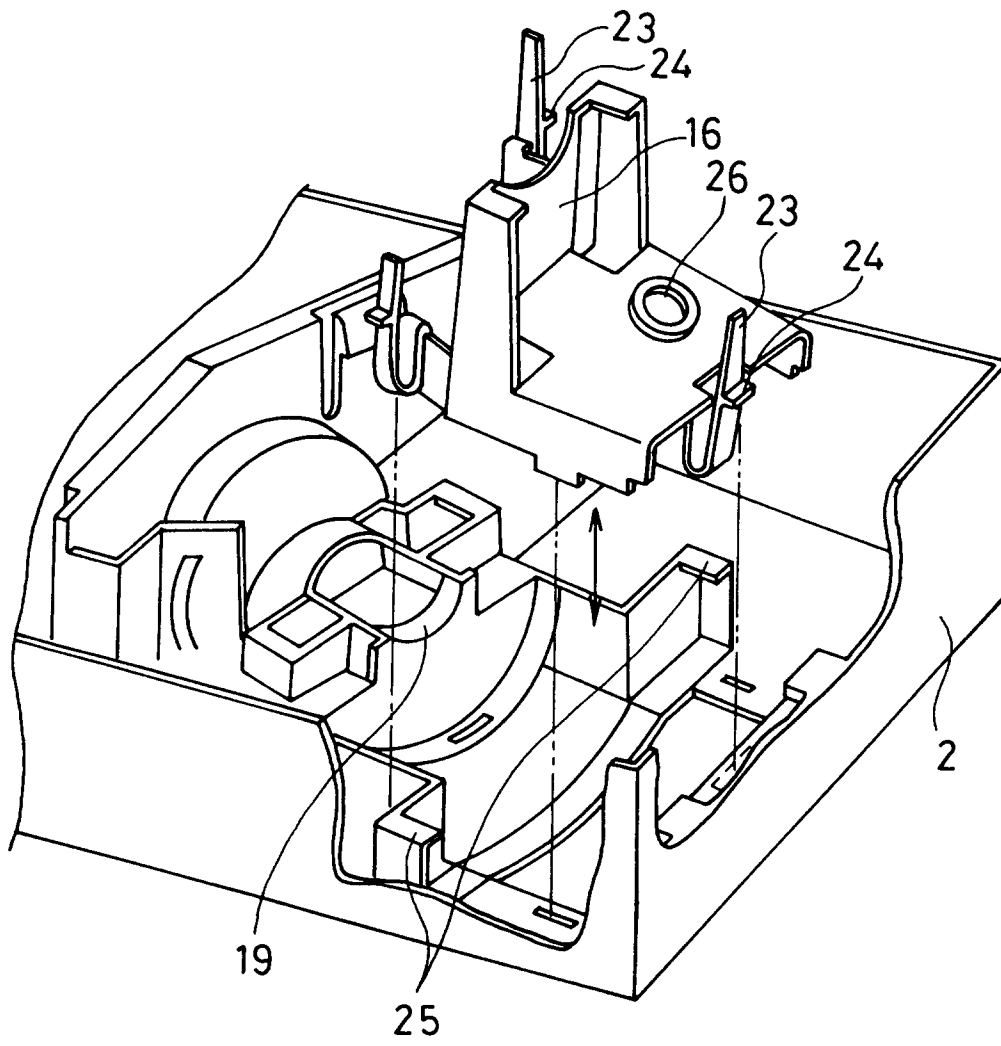


FIG.4

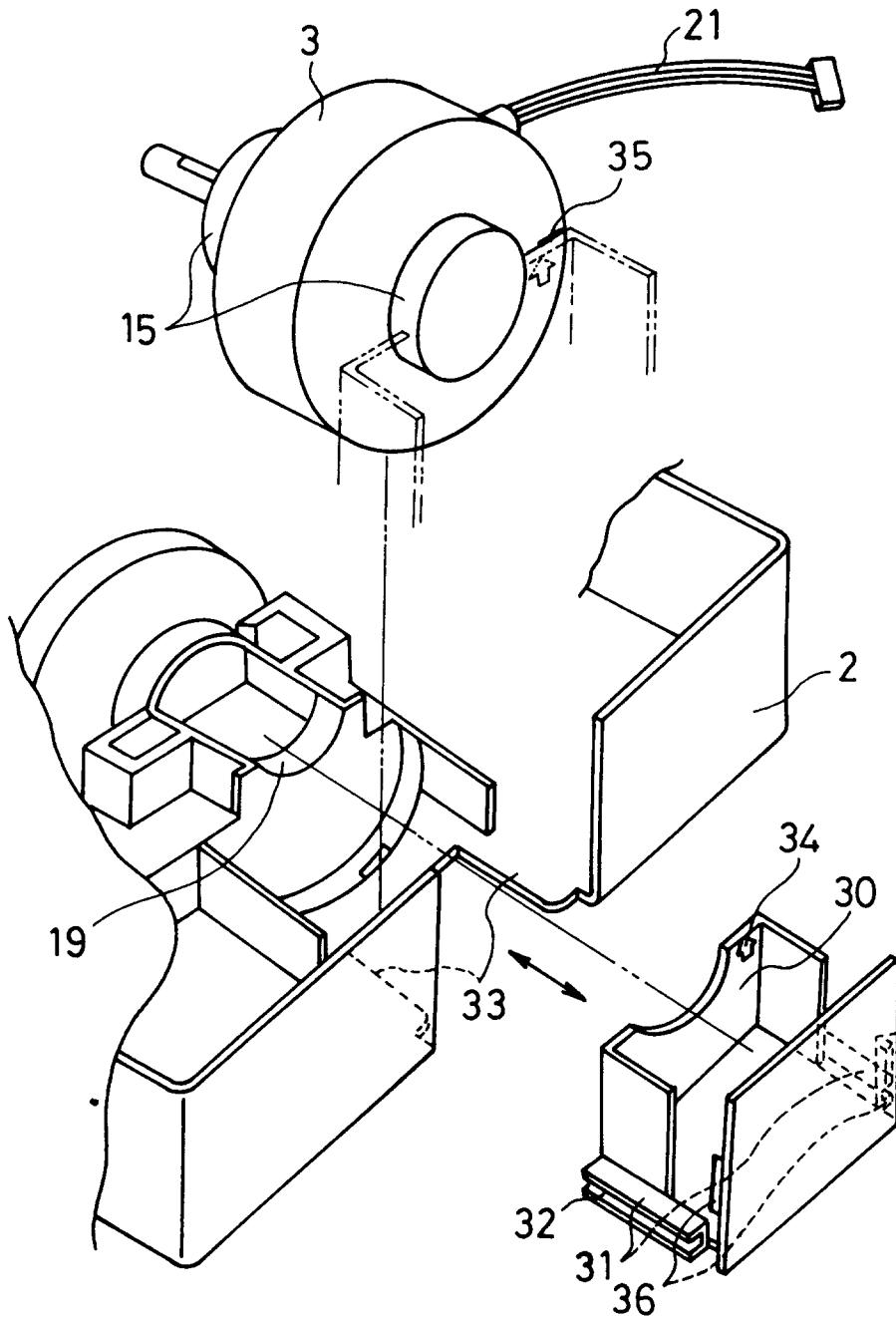


FIG.5

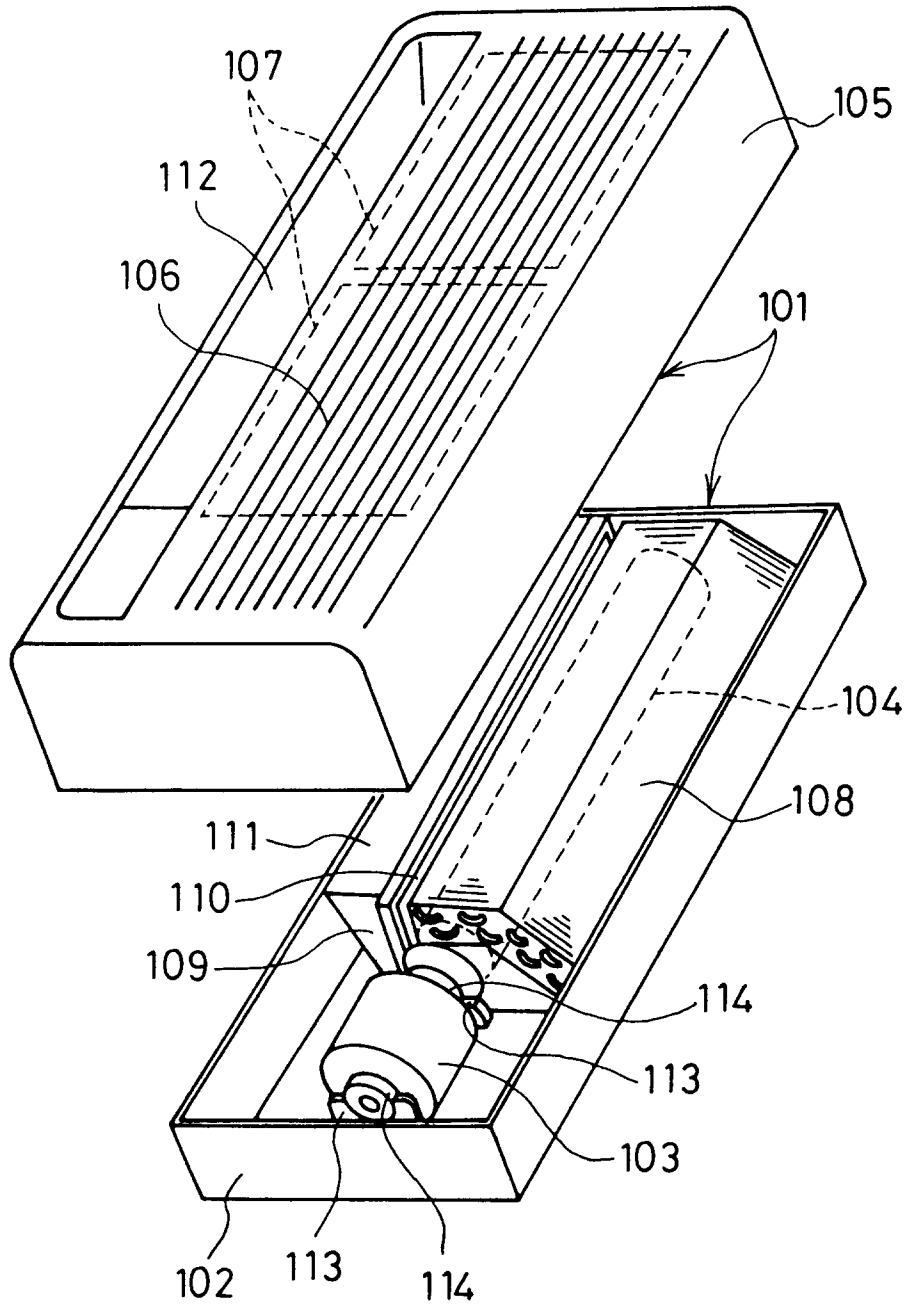
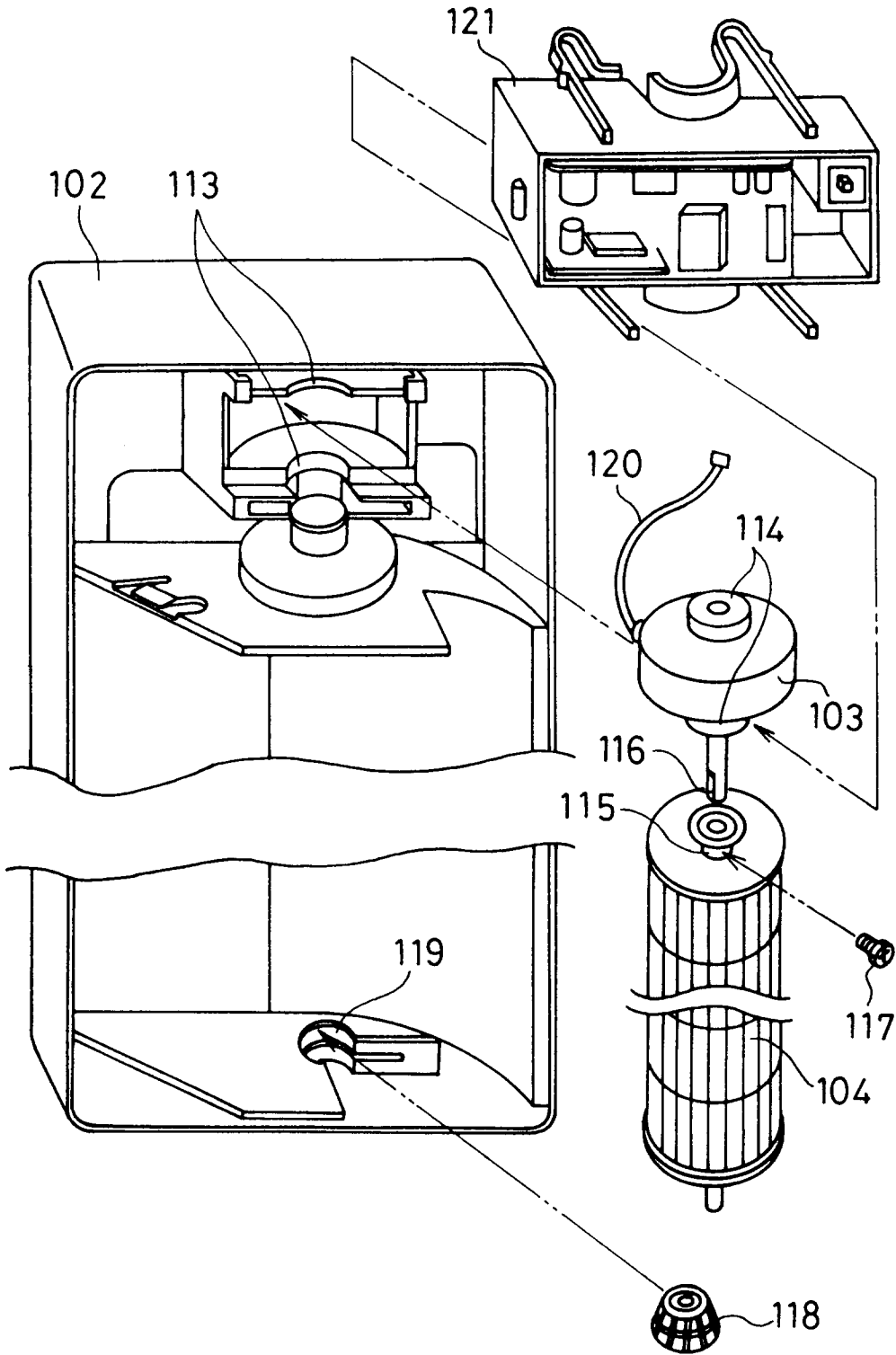


FIG.6





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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 6265

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	PATENT ABSTRACTS OF JAPAN vol. 008, no. 148 (M-308), 11 July 1984 & JP 59 046432 A (MATSUSHITA DENKI SANGYO KK), 15 March 1984, * abstract *	1,2	F24F1/00 F24F13/20
A	--- US 4 733 542 A (BLAIR ROBERT R) 29 March 1988 * column 3, line 68 - column 4, line 16; figures *	1,2,5	
A	--- PATENT ABSTRACTS OF JAPAN vol. 009, no. 128 (M-384), 4 June 1985 & JP 60 011032 A (MATSUSHITA DENKI SANGYO KK), 21 January 1985, * abstract *	1,2	
A	--- PATENT ABSTRACTS OF JAPAN vol. 012, no. 227 (M-713), 28 June 1988 & JP 63 021427 A (MATSUSHITA ELECTRIC IND CO LTD), 29 January 1988, * abstract *	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	--- US 5 203 400 A (TSUNEKAWA SHOJI ET AL) 20 April 1993 * abstract; figures *	1,2	F24F F28D
A	--- PATENT ABSTRACTS OF JAPAN vol. 008, no. 148 (M-308), 11 July 1984 & JP 59 046433 A (MATSUSHITA DENKI SANGYO KK), 15 March 1984, * abstract *	1,2	

The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		27 January 1997	Gonzalez-Granda, C
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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