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(54) **Centrifugal blower for vacuum cleaner**

Kreiselgebläse für Staubsauger

Soufflante centrifugal pour aspirateur

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a centrifugal blower for a vacuum cleaner capable of achieving an improvement in motor cooling efficiency, and more particularly to a centrifugal blower for a vacuum cleaner in which air is blown toward a rotor generating a large amount of heat during operation of its motor, thereby being capable of achieving an improvement in motor cooling efficiency.

Description of the Related Art

[0002] As well known, a vacuum cleaner is a cleaning appliance adapted to generate a sucking force, thereby removing foreign matters such as dust. Such a vacuum cleaner is equipped with a dust collecting bag for filtering air sucked along a suction path, and a centrifugal blower adapted to generate a sucking force for sucking air.

[0003] A known centrifugal blower for a vacuum cleaner is disclosed in JP 08 303 394 A.

[0004] Fig. 1 is a sectional view illustrating another conventional centrifugal blower for a vacuum cleaner. Fig. 2 is a perspective view illustrating a diffuser included in the conventional centrifugal blower. Fig. 3 is a cross-sectional view taken along the line A - A of Fig. 1.

[0005] As shown in Fig. 1, the conventional centrifugal blower for a vacuum cleaner includes an impeller 4 rotatably installed in an impeller housing 2 provided at a front end thereof with a suction port 2a, and a motor 10 installed in a motor housing 3, and adapted to rotate the impeller 4. The motor housing 3 is coupled at a front end thereof to a rear end of the impeller housing 2, and provided at side portions thereof with a plurality of discharge ports 3a.

[0006] A diffuser 8 is installed between the impeller 4 and the motor 10. As shown in Figs. 2 and 3, the diffuser 8 is provided at its front surface with diffuser vanes 6 for feeding air discharged from the outlet of the impeller 4 in a pressurized state. The diffuser 8 is also provided at its rear surface with guide vanes 7 for guiding the pressurized air fed by the diffuser vanes 6 to the motor 10.

[0007] Fig. 4 is a perspective view illustrating the motor of the conventional centrifugal blower used for vacuum cleaners. Fig. 5 is a plan view illustrating a bearing supporter mounted to the motor of the conventional centrifugal blower.

[0008] As shown in Fig. 4, the motor, which is denoted by the reference numeral 10, includes a stator 12 having a field core 12a fixedly mounted to an inner wall of the motor housing 3, and a field coil 12b wound around the field core 12a. The motor 10 also includes a rotor 14 having an armature core 14a mounted to a rotating shaft 9 connected to the impeller 4 while being inwardly spaced apart from the rotor 12, and an armature coil 14b wound around the armature core 14a. The motor 10 further includes a brush 15, and a commutator 16 which are arranged at the rear of the rotor 14, that is, connected to a rear end of the rotating shaft 9, in order to supply external electric power to the field coil 12b and the armature coil 14b. An air gap G with a desired dimension is defined between the stator 12 and the rotor 14.

[0009] The motor 10 having the above mentioned configuration is driven by single-phase power. When current flows through the field coil 12b and armature coil 14b in accordance with serial connection of the field coil 12b, brush 15, commutator 16, and armature coil 14b to the single-phase power, magnetic flux is generated at the field coil 12b and armature coil 14b.

[0010] As a result, interacting electromagnetic forces are generated between the stator 12 and the rotor 14, so that a torque is generated. By the torque, the rotor 14 rotates, so that the rotating shaft 9 connected to the rotor 14 is rotated.

[0011] Air passing through the impeller 4 and diffuser 8 is collected by an air collecting plate 20 which, in turn, discharges the collected air in a concentrated fashion toward the air gap G defined between the stator 12 and the rotor 14 via cooling holes 20a and 20b formed at the air collecting plate 20, and toward the rotor 14, thereby cooling the motor 10. After cooling the motor 10, the air is outwardly discharged through the discharge ports 3a of the motor housing 3.

[0012] Although the air emerging from the impeller 4 and diffuser 8 is discharged in a concentrated fashion toward the air gap G defined between the stator 12 and the rotor 14 by the air collecting plate 20, the rotor 14 generating a relatively large amount of heat during operation of the motor 10 is insufficiently cooled because the armature coil 14b is shielded by a bearing supporter 22 arranged between the impeller housing 2 and the motor housing 3 to support a bearing 23 for rotatably supporting the rotating shaft 9 of the motor 10, as shown in Fig. 5.

[0013] Although the air emerging from the air collecting plate 20 is fed toward the rotor 14, it is forced to move toward the stator 12 without reaching the rotor 14 as the rotor 14 rotates at high speed. For this reason, it is difficult to cool the rotor 14 maintained at a relatively high temperature, as compared to the stator 12.

[0014] As a result, the armature coil 14b of the rotor 14 is excessively increased in temperature, so that the cooling characteristics of the armature coil 14b are degraded, thereby causing a degradation in the reliability of the motor 10. Furthermore, the life span of the motor 10 is reduced. In order to extend the life span of the motor 10, it is necessary to improve the insulation grade of the motor 10. For example, the material of the armature coil 14b should be replaced. Thus, there is a problem of inconvenience.

SUMMARY OF THE INVENTION

[0015] Therefore, the present invention has been made in view of the above mentioned problems involved with the related art, and an object of the invention is to provide a centrifugal blower for a vacuum cleaner in which air passing through an impeller and a diffuser is blown toward the armature coil of a rotor having great influence on the reliability and life span of a motor including the rotor, thereby being capable of achieving an improvement in the reliability of the motor while extending the life span of the motor.

[0016] Another object of the invention is to provide a centrifugal blower for a vacuum cleaner in which air fed toward a motor included in the blower is allowed to mainly pass through the rotor even when the rotor of the motor rotates at high speed, thereby being capable of achieving an enhancement in motor cooling efficiency while reducing the insulation grade of the motor.

[0017] These objects are achieved with a centrifugal blower according to the independent claim 1. Preferred embodiments are disclosed in the dependent claims.

[0018] In accordance with the present invention a centrifugal blower for a vacuum cleaner comprises a motor including a stator, and a rotor rotatably installed in the stator; an impeller connected with the rotor by a rotating shaft, and adapted to rotate in accordance with a drive force received from the motor via the rotating shaft, thereby sucking air; a diffuser installed between the motor and the impeller, the diffuser having guide vanes adapted to guide air discharged from the impeller toward the motor; and guide means for guiding the air emerging from the guide vanes toward the rotor of the motor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The above objects, and other features and advantages of the present invention will become more apparent after a reading of the following detailed description when taken in conjunction with the drawings, in which:

Fig. 1 is a sectional view illustrating a conventional centrifugal blower for a vacuum cleaner;
Fig. 2 is a perspective view illustrating a diffuser included in the conventional centrifugal blower;
Fig. 3 is a cross-sectional view taken along the line A - A of Fig. 1;
Fig. 4 is a perspective view illustrating a motor used in the conventional centrifugal blower;
Fig. 5 is a plan view illustrating a bearing supporter mounted to the motor of the conventional centrifugal blower;
Fig. 6 is a sectional view illustrating a centrifugal blower for a vacuum cleaner according to the present invention;
Fig. 7 is a perspective view illustrating a diffuser included in the centrifugal blower according to the present invention;
Fig. 8 is a cross-sectional view taken along the line B - B of Fig. 6;
Fig. 9 is a perspective view illustrating a motor included in the centrifugal blower according to the present invention;
Fig. 10 is a plan view illustrating a bearing supporter mounted to the motor of the centrifugal blower according to the present invention;
Fig. 11 is a sectional view illustrating the bearing supporter according to the present invention;
Fig. 12 is a plan view illustrating a bearing supporter plate according to an embodiment of the present invention; and
Fig. 13 is a plan view illustrating a bearing supporter plate according to another embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Now, preferred embodiments of the present invention will be described in detail, with reference to the annexed drawings.

[0021] Fig. 6 is a sectional view illustrating a centrifugal blower for a vacuum cleaner according to the present invention. Fig. 7 is a perspective view illustrating a diffuser included in the centrifugal blower according to the present invention. Fig. 8 is a cross-sectional view taken along the line B - B of Fig. 6. Fig. 9 is a perspective view illustrating a motor included in the centrifugal blower according to the present invention. Fig. 10 is a plan view illustrating a bearing supporter mounted to the motor of the centrifugal blower according to the present invention. Fig. 11 is a sectional view illustrating the bearing supporter according to the present invention.

[0022] As shown in Fig. 6, the centrifugal blower for vacuum cleaners according to the present invention includes an impeller housing 52 centrally provided at a front wall thereof with a suction port 52a, an impeller 54 rotatably installed in the impeller housing 52, and adapted to suck air from the suction port 52a, a motor housing 53 connected at a front wall thereof to a rear wall of the impeller housing 52, and provided at side walls thereof with a plurality of discharge ports 53a, and a motor 60 installed in the motor housing 53, and adapted to rotate the impeller 54. The motor 60 includes a stator 62, and a rotor 64. The centrifugal blower also includes a diffuser 58 installed between the impeller 54 and the motor 60, and adapted to guide air discharged from the impeller 54 toward the motor 60 while increasing the pressure of the air, and a guide means for guiding the air emerging from the diffuser 58 toward the rotor 64 in a concentrated fashion.

[0023] As shown in Fig. 7, the diffuser 58 is provided at its front surface with diffuser vanes 56 for increasing the pressure of air emerging from the outlet of the impeller 54. The diffuser 58 is also provided at its rear surface with guide vanes 7 for guiding the pressurized air fed by the diffuser vanes 56 to the motor 60.

[0024] The motor 60 includes a stator 62 having a field core 62a fixedly mounted to an inner wall of the motor housing 53, and a field coil 62b wound around the field core 62a. The motor 60 also includes a rotor 64 having an armature core 64a mounted to a rotating shaft 59 connected to the impeller 54, and an armature coil 64b wound around the armature core 64a. The motor 10 further includes a brush 65, and a commutator 66 which are arranged at the rear of the rotor 64, that is, connected to a rear end of the rotating shaft 59, in order to supply external electric power to the field coil 62b and the armature coil 64b. An air gap G is defined between the stator 62 and the rotor 64.

[0025] As shown in Figs. 8 and 9, a bearing supporter 72 is arranged between the impeller housing 52 and the motor housing 53 to support a bearing 73 for rotatably supporting the rotating shaft 59 of the motor 60. An air collecting plate 70 is also installed between the bearing supporter 72 and the motor housing 53. The air collecting plate 70 collects air fed toward the motor 60 after emerging from the impeller 54, and discharges the collected air toward the air gap G defined between the stator 62 and the rotor 64 in a concentrated fashion.

[0026] The air collecting plate 70 is provided at its central portion with a cooling hole 70a opened to the front surface of the rotor 64, and at its opposite lateral portions with cooling holes 70b opened to the air gap G.

[0027] As shown in Figs. 7 and 8, the guide means comprises holes 82 formed at the bearing support 72, and opened to the front surface of the rotor 64, air guides 57a adapted to guide air discharged from the guide vanes 57 to the holes 82, and guide portions 86 each formed at the bearing supporter 72 to have a structure bent toward an associated one of the holes 82 by a desired angle θ, and adapted to guide air emerging from the associated hole 82 to the rotor 64.

[0028] The guide means has two holes 82 respectively formed at opposite portions of the bearing support 72. The holes 82 may have diverse shapes, for example, a rectangular shape, or an arc shape with a desired width. Each of the air guides 57a is provided by extending the tip of a selected one of the guide vanes 57 toward the center of the diffuser 58 so as to guide air guided by the selected guide vane 57 to the holes 82.

[0029] That is, a plurality of guide vanes 57 are arranged at the rear surface of the diffuser 58 around the rotating shaft 59 while being uniformly spaced from one another in a circumferential direction, and having a structure curved in the clockwise direction. The air guides 57a are formed by extending, toward the holes 82, respective outlet ends of the guide vanes 57 positioned near those holes 82.

[0030] As shown in Fig. 10, each guide portion 86 is rearwardly inclined toward the rotor 64 while having an inclined angle θ of 0 to 70 ° with respect to the surface of the bearing supporter 72.

[0031] As shown in Fig. 9, the motor 60 includes two poles 62a' protruded from the inner surface of the field core 62a while facing each other. The field coils 62b are wound around the poles 62a', respectively. The motor 60 also includes air guide members 88 mounted to inner surface portions of the field core 62a not formed with the poles 62a'. Each of the air guide members 88 prevents air fed toward the rotor 64 from being moved toward the stator 12 without reaching the rotor as the rotor 14 rotates at high speed, so as to allow the air to be effectively guided to the rotor 64.

[0032] The air guide members 88 are arranged at the portions of the field core 62a not formed with the poles 62a' while facing each other. Each air guide member 88 has a convex central portion, and opposite ends fixedly mounted to the inner surface of the field core 62a.

[0033] Since each air guide member 88 is arranged between the stator 62 and rotor 64 generating interacting electromagnetic forces, it should be made of an insulating material.

[0034] By the poles 62a' and air guide members 88, the air fed toward the rotor 64 is reliably guided to pass through the rotor 64 even when the rotor 64 rotates at high speed. Thus, the rotor 64 is effectively cooled.

[0035] Fig. 12 is a plan view illustrating a bearing supporter plate according to an embodiment of the present invention. Fig. 13 is a plan view illustrating a bearing supporter plate according to another embodiment of the present invention.

[0036] The embodiment of Fig. 12 is associated with a bearing supporter plate 90 in which the above described bearing supporter and air collecting plate are integral with each other. As shown in Fig. 12, the bearing supporter plate 90 is provided at its left and right portions with first holes 92 for discharging a part of air emerging from the guide vanes 57 toward the stator 62 of the motor 60, and at its upper and lower portions with second holes 94 for discharging the remaining part of the air emerging from the guide vanes 57 toward the rotor 64.

[0037] A pair of first holes 92 are symmetrically arranged around the rotating shaft 59. Similarly, a pair of second holes 94 are symmetrically arranged around the rotating shaft 59.

[0038] Each first hole 92 has an arc shape with a desired width, whereas each second hole 94 has a rectangular shape with a desired width. The first holes 92 are radially spaced from the center of the rotating shaft 59 by a distance longer than that of the second holes 94 from the center of the rotating shaft 59.

[0039] Now, the operation of the centrifugal blower having the above described configuration according to the present invention will be described.

[0040] When current from an external power supply is supplied to the motor 60 via the brush 65 and commutator 66, magnetic flux is generated at the field coil 62b and armature coil 64b. As a result, interacting electromagnetic forces are generated between the stator 62 and the rotor 64, so that a torque is generated. By the torque, the rotor 14 rotates, so that the rotating shaft 59 connected to the rotor 64 is rotated. Thus, the impeller 54 is rotated.

[0041] In accordance with the rotation of the impeller 54, air is introduced into the impeller housing 52, so that it passes through the impeller 54. The air discharged from the impeller 54 then flows along the guide vanes 57 after flowing along the diffuser vanes 56.

[0042] A part of the air discharged from the guide vanes 57 is guided by the air guides 57a to enter the holes 82 formed at the bearing supporter 72, and then discharged toward the rotor 64 in a concentrated fashion along the guide portions 86 formed at the holes 82.

[0043] The remaining air part guided along the guide vanes 57 without being guided by the air guides 57a is collected by the air collecting plate 70 while being increased in pressure. Thus, the collected air is discharged at high speed toward the air gap G defined between the stator 62 and the rotor 64 via the cooling holes 70a and 70b formed at the air collecting plate 70, and toward the rotor 64.

[0044] Although the air discharged toward the rotor 64 tends to move radially outwardly due to a centrifugal force generated as the rotor 64 rotates at high speed, it is guided to pass through the rotor 64 without flowing toward the stator 62 by virtue of the poles 62a' and air guide members 88 arranged around the rotor 64. Thus, the rotor 64 is effectively cooled in a concentrated fashion.

[0045] Meanwhile, the air discharged toward the air gap G defined between the stator 62 and the rotor 64 cools both the stator 62 and the rotor 64, thereby preventing the motor 60 from overheating.

[0046] After cooling the motor 60, the air is outwardly discharged through the discharge ports 53a of the motor housing 53.

[0047] As apparent from the above description, the present invention provides a centrifugal blower for a vacuum cleaner in which air passing through an impeller and a diffuser is guided to holes and guide portions formed at a bearing supporter by air guides, so that it is discharged toward the armature coil of a rotor having great influence on the reliability and life span of a motor including the rotor, thereby being capable of achieving an improvement in the reliability of the motor while extending the life span of the motor.

[0048] In accordance with the present invention, air fed toward the motor is allowed to mainly pass through the rotor even when the rotor rotates at high speed. Accordingly, it is possible to achieve an enhancement in motor cooling efficiency while reducing the insulation grade of the motor.

[0049] Although the preferred embodiments of the invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A centrifugal blower for a vacuum cleaner comprising:

- a motor (60) including a stator (62), and a rotor (64) rotatably installed in the stator (62);
- an impeller (54) connected with the rotor (64) by a rotating shaft (59), and adapted to rotate in accordance with a drive force received from the motor (60) via the rotating shaft (59), thereby sucking air;
- a diffuser (58) installed between the motor (60) and the impeller (54), the diffuser having guide vanes (57) adapted to guide air discharged from the impeller (54) toward the motor (60); and
- a bearing supporter (72) installed between the diffuser (58) and the motor (60), said bearing supporter (72, 90, 100) having holes (82) for guiding the air emerging from the guide vanes (57) toward the rotor of the motor (60),

characterized in that
at least one of said holes (82) is formed to be opened to the front surface of the rotor (64) such that the air emerging from the guide vanes (57) of the diffuser (58) is discharged toward the rotor (64).

2. The centrifugal blower according to claim 1, wherein the bearing supporter (72) has a central hole in which a bearing (73) fitted around the rotating shaft (59) is fitted.

3. The centrifugal blower according to claim 1, wherein the hole (82) has a rectangular shape.

4. The centrifugal blower according to claim 1, wherein the hole (82) has an arc shape with a desired width.

5. The centrifugal blower according to claim 1, wherein the number of the holes (82) is two, and the holes (82) are symmetrically arranged around a center of the bearing supporter (72).

6. The centrifugal blower according to claim 1, further comprising guide portions (86) each formed at the bearing supporter (72) to have a structure bent toward an associated one of the holes (82) by a desired angle, and adapted to guide air emerging from the associated hole (82) to the rotor (64).

7. The centrifugal blower according to claim 6, wherein each of the guide portions (86) is inclined toward the rotor (64) while having an inclined angle of 0 to 70° with respect to a main surface of the bearing supporter (72).

8. The centrifugal blower according to claim 1, wherein

the diffuser (57) further has air guides (57a) adapted to guide air toward the hole (82).

9. The centrifugal blower according to claim 8, wherein the air guides (57a) are formed by extending respective tips of selected ones of the guide vanes toward the hole (82), the selected guide vanes (57a) being at least a part of all the guide vanes (57).

10. The centrifugal blower according to claim 1, wherein at least one hole (94, 104) is to be opened to the stator (62).

11. The centrifugal blower according to claim 10, wherein the holes (94, 104) formed to be opened to the stator (62) are symmetrically arranged around the center of the bearing supporter (90, 100).

12. The centrifugal blower according to claim 10, wherein the holes (94, 104) formed to be opened to the stator have an arc shape with a desired width.

13. The centrifugal blower according to claim 1, wherein the motor (60) is provided with air guide members (88) for guiding air introduced between the stator (62) and the rotor (64) to pass through the rotor (64) without flowing toward the stator (62).

14. The centrifugal blower according to claim 13, wherein each of the air guide members (88) has a convex central portion, and opposite ends fixedly mounted to the stator (62).

15. The centrifugal blower according to claim 13, wherein each of the air guide members (88) is made of an insulating material.

Patentansprüche

1. Zentrifugalgebläse für einen Staubsauger, das umfasst:

- einen Motor (60), der einen Stator (62) und einen im Stator (62) drehbar installierten Rotor (64) enthält;
- ein Laufrad (54), das mit dem Rotor (64) durch eine Drehwelle (59) verbunden ist und dazu ausgelegt ist, sich entsprechend einer Antriebskraft, die vom Motor (60) über die Antriebswelle (59) aufgenommen wird, zu drehen, um dadurch Luft anzusaugen;
- einen Diffusor (58), der zwischen dem Motor (60) und dem Laufrad (54) installiert ist, wobei der Diffusor Führungsschaufeln (57) besitzt, die dazu ausgelegt sind, die vom Laufrad (54) geförderte Luft zum Motor (60) zu führen; und
- eine Lagerunterstützung (72), die zwischen dem Diffusor (58) und dem Motor (60) installiert ist, wobei die Lagerunterstützung (72, 90, 100) Löcher (82) besitzt, um die von den Führungsschaufeln (57) austretende Luft zum Rotor des Motors (60) zu führen,

dadurch gekennzeichnet, dass
wenigstens eines der Löcher (82) so ausgebildet ist, dass es in die vordere Oberfläche des Rotors (64) mündet, so dass die von den Führungsschaufeln (57) des Diffusors (58) austretende Luft zum Rotor (64) gefördert wird.

2. Zentrifugalgebläse nach Anspruch 1, wobei die Lagerunterstützung (72) ein mittiges Loch besitzt, in das ein um die Drehwelle (59) angebrachtes Lager (73) eingesetzt ist.

3. Zentrifugalgebläse nach Anspruch 1, wobei das Loch (82) eine rechtwinklige Form hat.

4. Zentrifugalgebläse nach Anspruch 1, wobei das Loch (62) eine Bogenform mit einer gewünschten Breite hat.

5. Zentrifugalgebläse nach Anspruch 1, wobei die Anzahl der Löcher (62) gleich zwei ist und die Löcher (62) um ein Zentrum der Lagerunterstützung (72) symmetrisch angeordnet sind.

6. Zentrifugalgebläse nach Anspruch 1, das ferner Führungsabschnitte (86) umfasst, wovon jeder an der Lagerunterstützung (72) so ausgebildet ist, dass er eine Struktur besitzt, die zu einem Zugeordneten der Löcher (82) um einen gewünschten Winkel gebogen ist, und dazu ausgelegt ist, die von dem zugeordneten Loch (82) austretende Luft zum Rotor (64) zu führen.

7. Zentrifugalgebläse nach Anspruch 6, wobei jeder der Führungsabschnitte (86) zum Rotor (64) geneigt ist und dabei einen Neigungswinkel im Bereich von 0 bis 70° in Bezug auf eine Hauptoberfläche der Lagerunterstützung (72) besitzt.

8. Zentrifugalgebläse nach Anspruch 1, wobei der Diffusor (57) ferner Luftführungen (57a) besitzt, die dazu ausgelegt sind, Luft zu dem Loch (82) zu führen.

9. Zentrifugalgebläse nach Anspruch 8, wobei die Luftführungen (57a) durch Verlängern jeweiliger Spitzen ausgewählter Führungsschaufeln zum Loch (62) gebildet sind, wobei die ausgewählten Führungsschaufeln (57a) wenigstens einen Teil aller Führungsschaufeln (57) bilden.

10. Zentrifugalgebläse nach Anspruch 1, wobei wenigstens ein Loch (94, 104) zum Stator (62) geöffnet ist.

11. Zentrifugalgebläse nach Anspruch 10, wobei die Löcher (94, 104), die so geformt sind, dass sie zum Stator (62) geöffnet sind, um das Zentrum der Lagerunterstützung (90, 100) symmetrisch angeordnet sind.

12. Zentrifugalgebläse nach Anspruch 10, wobei die Löcher (94, 104), die so geformt sind, dass sie zum Stator geöffnet sind, eine Bogenform mit einer gewünschten Breite haben.

13. Zentrifugalgebläse nach Anspruch 1, wobei der Motor (60) mit Luftführungselementen (88) versehen ist, um Luft, die zwischen den Stator (62) und den Rotor (64) eingeleitet wird, so zu führen, dass sie sich durch den Rotor (64) bewegt, ohne zum Stator (62) zu strömen.

14. Zentrifugalgebläse nach Anspruch 13, wobei jedes der Luftführungselemente (88) einen konvexen Mittelabschnitt und gegenüberliegende Enden, die am Stator (62) fest montiert sind, besitzt.

15. Zentrifugalgebläse nach Anspruch 13, wobei jedes der Luftführungselemente (88) aus einem Isoliermaterial hergestellt ist.

Revendications

1. Soufflerie centrifuge pour aspirateur comprenant :

un moteur (60) incluant un stator (62) et un rotor (64) installé pour tourner dans le stator (62) ;
une turbine (54) reliée au rotor (64) par un arbre rotatif (59) et adaptée à tourner en fonction d'une force d'entraînement reçue depuis le moteur (60) par l'intermédiaire de l'arbre rotatif (59) de façon à aspirer l'air ;
un diffuseur (58) installé entre le moteur (60) et la turbine (54), le diffuseur comportant des aubes de guidage (57) adaptées à guider vers le moteur (60) l'air évacué par la turbine (54) ; et
un support de palier (72) installé entre le diffuseur (58) et le moteur (60) ledit support de palier (72, 90, 100) comportant des trous (82) pour guider vers le rotor du moteur (60) l'air sortant des aubes de guidage (57),

caractérisé en ce que
au moins l'un desdits trous (82) est formé de manière à être ouvert vers la surface avant du rotor (64) de sorte que l'air sortant des aubes de guidage (57) du diffuseur (58) est évacué vers le rotor (64).

2. Soufflerie centrifuge selon la revendication 1, dans laquelle le support de palier (72) comporte un trou central dans lequel est ajusté un palier (73) ajusté autour de l'arbre rotatif (59).

3. Soufflerie centrifuge selon la revendication 1, dans laquelle le trou (82) a une forme rectangulaire.

4. Soufflerie centrifuge selon la revendication 1, dans laquelle le trou (82) a la forme d'un arc avec une largeur désirée.

5. Soufflerie centrifuge selon la revendication 1, dans laquelle le nombre de trous (82) est de deux et les trous (82) sont agencés symétriquement par rapport au centre du support de palier (72).

6. Soufflerie centrifuge selon la revendication 1, comprenant en outre des parties de guidage (86) formées chacune au niveau du support de palier (72) de manière à avoir une structure courbée vers un trou associé parmi les trous (82) d'un angle désiré et adapté à guider vers le rotor (64) l'air sortant du trou associé (82).

7. Soufflerie centrifuge selon la revendication 6, dans laquelle chacune des parties de guidage (86) est inclinée vers le rotor (64) tout en faisant un angle d'inclinaison de 0 à 70° par rapport à la surface principale du support de palier (72).

8. Soufflerie centrifuge selon la revendication 1, dans laquelle le diffuseur (57) comporte en outre des guides d'air (57a) adaptés à guider l'air vers le trou (82).

9. Soufflerie centrifuge selon la revendication 8, dans laquelle les guides d'air (57a) sont formés en prolongeant vers le trou (82) les extrémités respectives de certaines aubes sélectionnées parmi les aubes de guidage, les aubes de guidage sélectionnées (57a) faisant au moins partie de l'ensemble des aubes de guidage (57).

10. Soufflerie centrifuge selon la revendication 1, dans laquelle au moins un trou (94, 104) doit être ouvert vers le stator (62).

11. Soufflerie centrifuge selon la revendication 10, dans laquelle les trous (94, 104) formés pour être ouvert vers le stator (62) sont agencés symétriquement par rapport au centre du support de palier (90, 100).

12. Soufflerie centrifuge selon la revendication 10, dans laquelle les trous (94, 104) formés pour être ouvert vers le stator ont une forme d'arc avec une largeur désirée.

13. Soufflerie centrifuge selon la revendication 1, dans laquelle le moteur (60) est muni d'organes de guidage de l'air (88) pour guider l'air introduit entre le stator (62) et le rotor (64) pour traverser le rotor (64)

sans s'écouler vers le stator (62).

14. Soufflerie centrifuge selon la revendication 13, dans laquelle chacun des organes de guidage d'air (88) comporte une partie centrale convexe et des extrémités opposées montées fixement sur le stator (62).

15. Soufflerie centrifuge selon la revendication 13, dans laquelle chacun des organes de guidage d'air (88) est fait d'un matériau isolant.

FIG. 1(Prior Art)

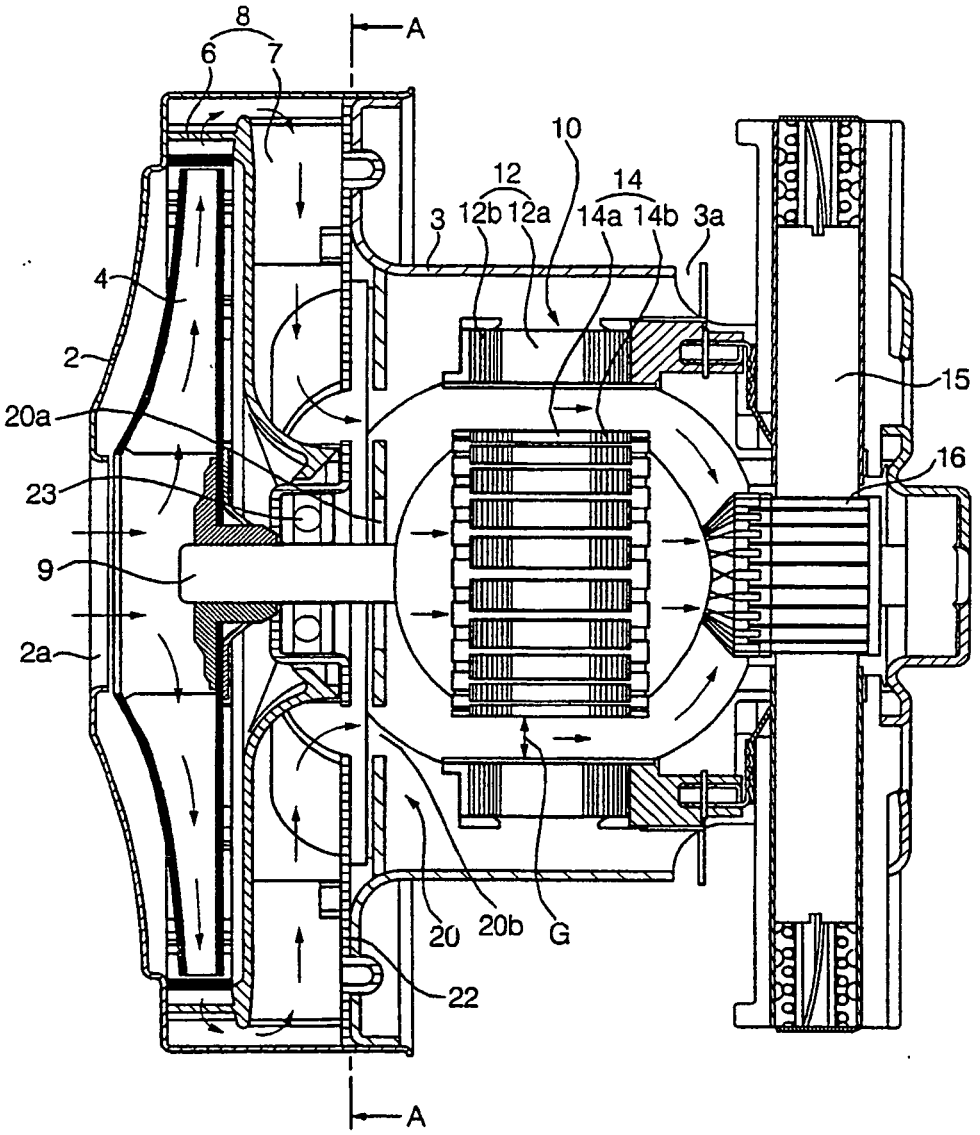


FIG. 2(Prior Art)

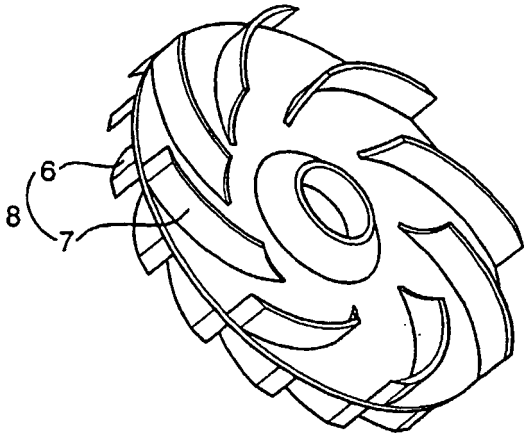


FIG. 3(Prior Art)

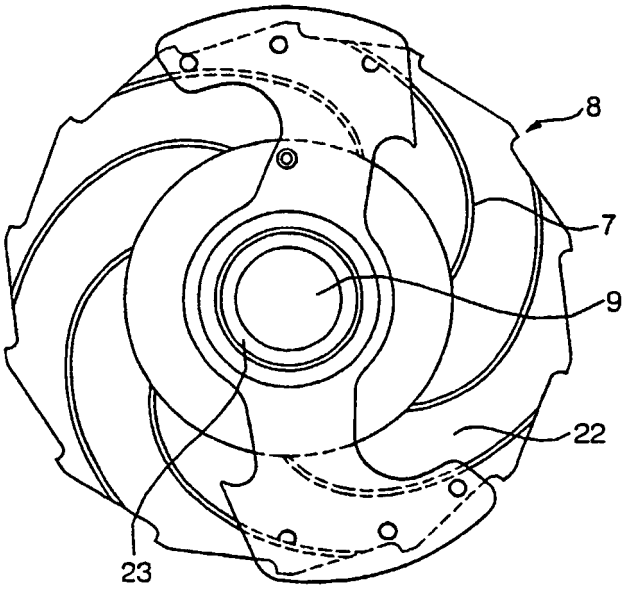


FIG. 4(Prior Art)

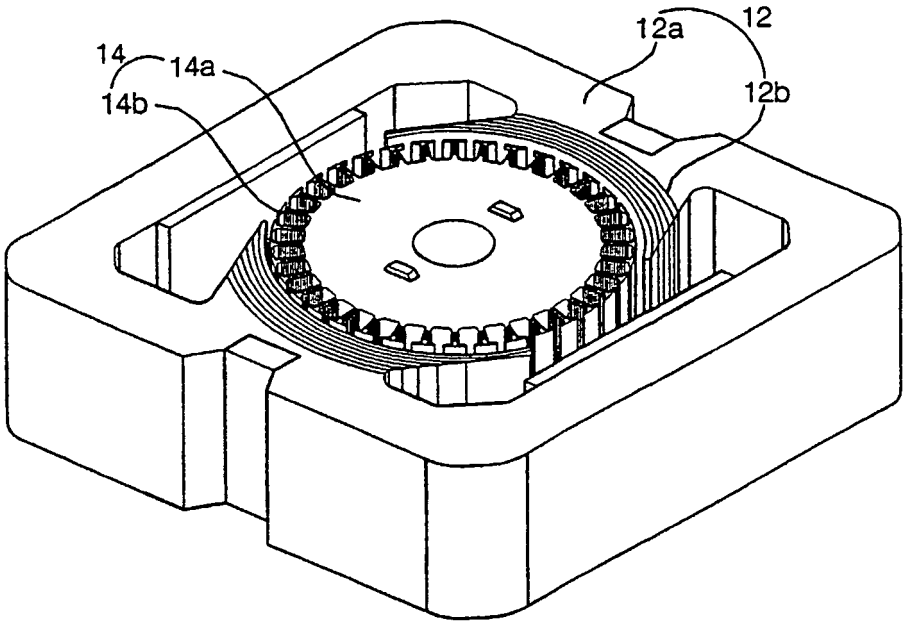


FIG. 5(Prior Art)

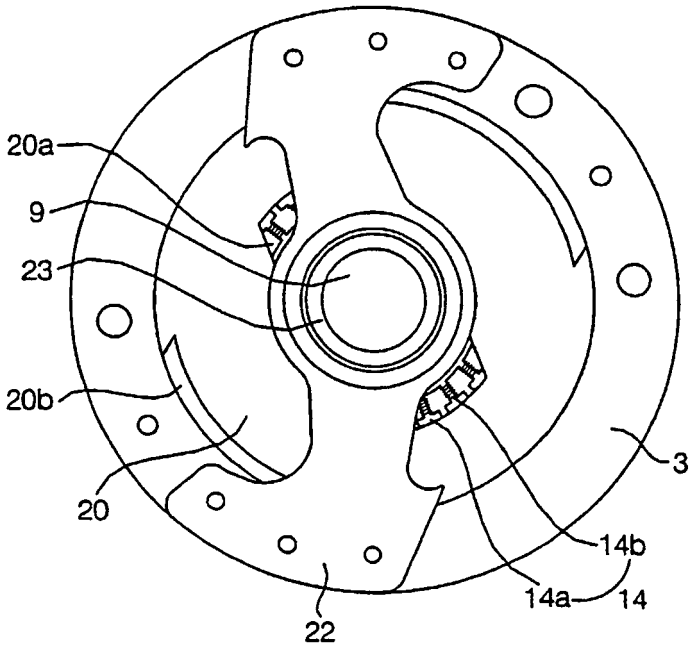


FIG. 6

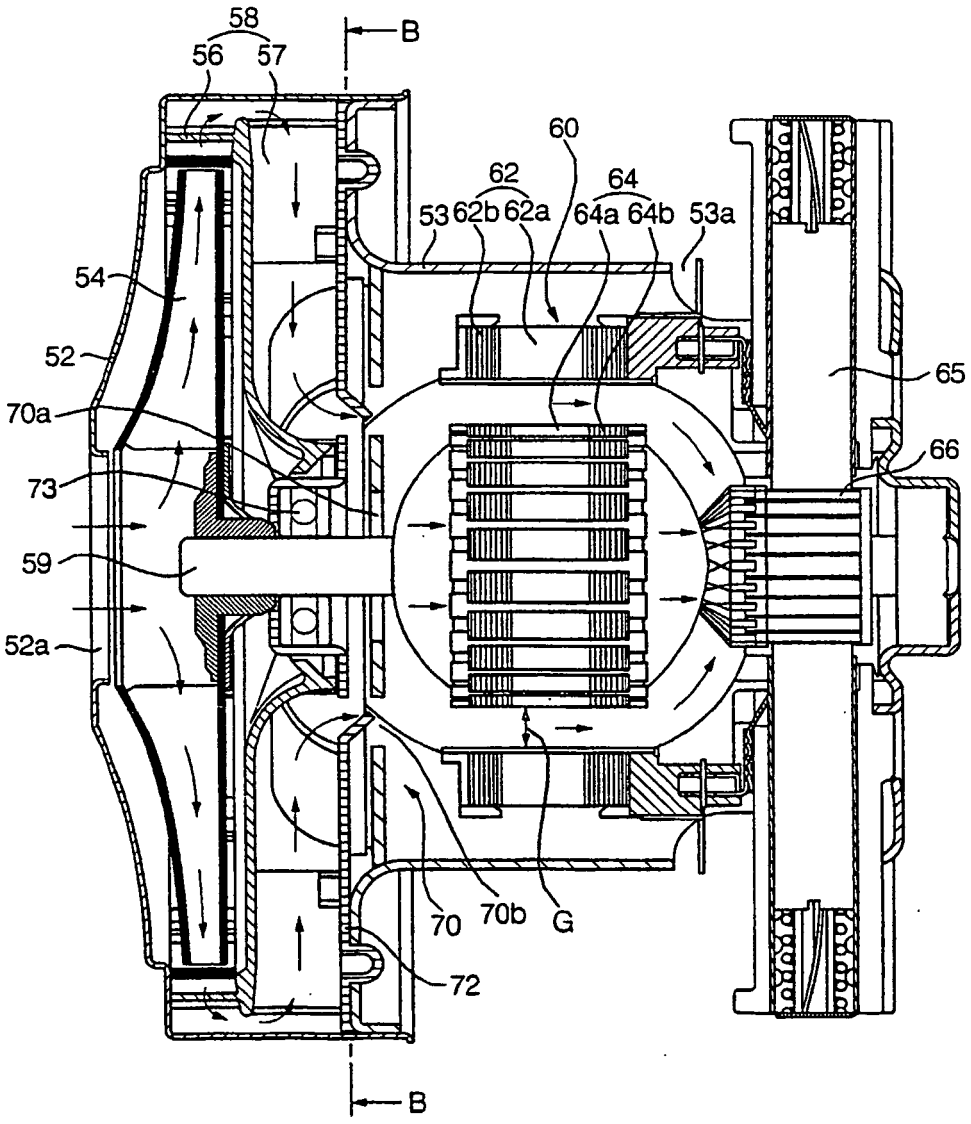

58
56
57
B
60
62
64
53
62b
62a
64a
64b
53a
54
52
70a
73
59
52a
65
66
70
70b
G
72
B

FIG. 7

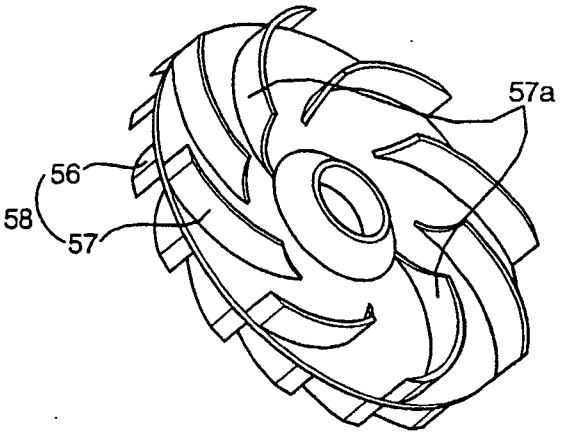


FIG. 8

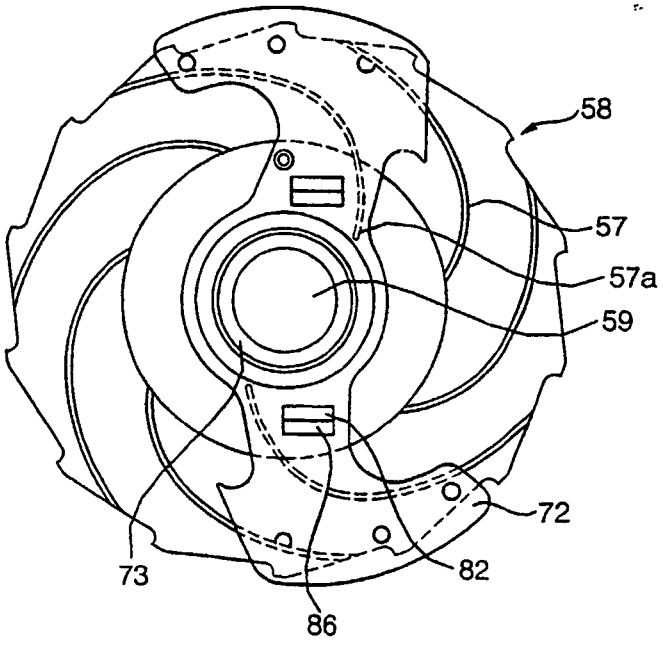


FIG. 9

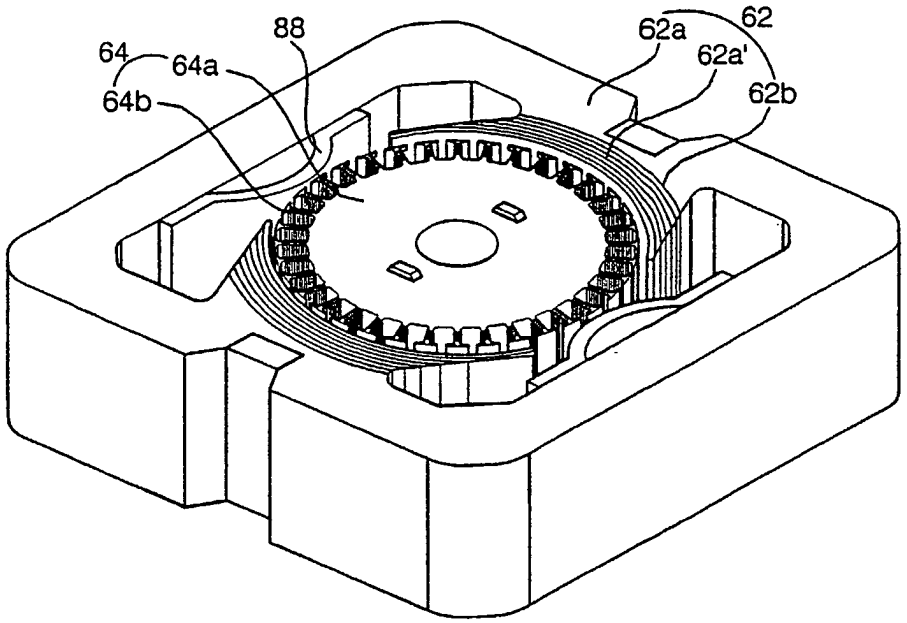


FIG. 10

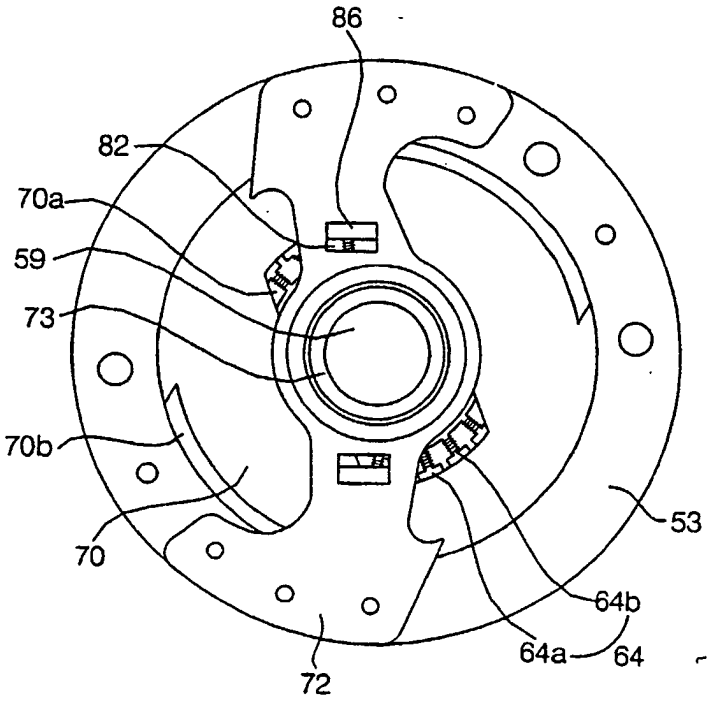


FIG. 11

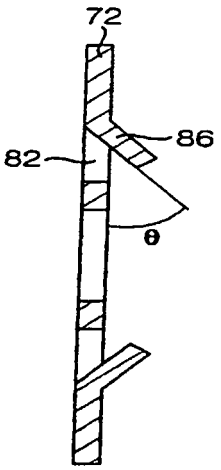


FIG. 12

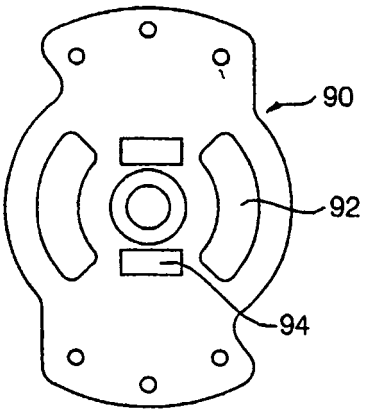
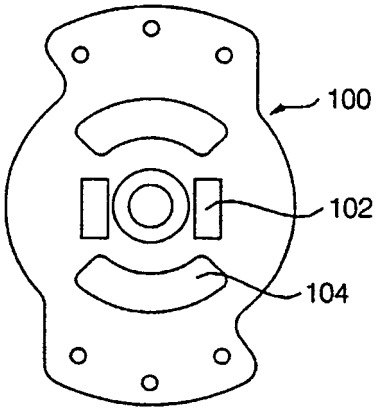


FIG. 13



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Patent documents cited in the description

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