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(54) **Motor-driven compressor**

Motorbetriebener Verdichter

Compresseur motorisé

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**US-A- 4 966 559 US-A1- 2011 175 470**

**EP 2 623 788 B1**

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## Description

### BACKGROUND OF THE INVENTION

**[0001]** The present invention relates to a motor-driven compressor including a compression portion, an electric motor, and a motor drive circuit, which are accommodated in a housing.

**[0002]** Conventionally, motor-driven compressors including a compression portion, an electric motor, and a motor drive circuit, which are accommodated in a housing, have been known. The compression portion is driven through rotation of a rotary shaft, which is rotated by the electric motor. The electric motor is driven by the motor drive circuit. For example, refer to JP 2009 74517 A. The motor drive circuit is driven by receiving electricity from an external power source. A tubular connector-receiving portion, which protrudes outward from the outer surface of the housing, is formed on the housing. A wiring connection portion is accommodated in the connector-receiving portion to supply electricity from the external power source to the motor drive circuit. A substrate on which electric parts such as a switching element are mounted is located in the motor drive circuit. A conductive member extending into the connector-receiving portion and connecting the substrate with the wiring connection portion is mounted on the substrate.

**[0003]** As shown in Fig. 4, a conventional wiring connection portion 80 is located in a connector-receiving portion 92, which is formed on an external surface of a housing (not shown). The wiring connection portion 80 is configured by a wire 81, a first terminal 82, which is connected to a first end of the wire 81 and electrically connected to an external power source 90, and a second terminal 83, which is connected to a second end of the wire 81 and electrically connected to the motor drive circuit (not shown). The wire 81 is formed by covering a lead portion 81a, which is formed by binding up a plurality of leads with an insulating coating 81b.

**[0004]** A swage portion 82a (first end-connection portion) is formed at a first end of the first terminal 82, while a connection portion 82b (second end-connection portion), which is electrically connected to the external power source 90, is formed at a second end of the first terminal 82. A swage portion 83a (first end-connection portion) is formed at a first end of the second terminal 83, while a connection portion 83b (second end-connection portion), which is electrically connected to a conductive member 91, is formed at a second end of the second terminal 83.

**[0005]** At the opposite ends of the wire 81, the lead portion 81a is exposed from the insulating coating 81 b. The first end of the wire 81 and the first terminal 82 are connected to each other by swaging the lead portion 81 a exposed from the insulating coating 81 b at the first end of the wire 81 by the swage portion 82a of the first terminal 82. Also, the second end of the wire 81 and the second terminal 83 are connected to each other by swaging the lead portion 81a exposed from the insulating coating 81b

at the second end of the wire 81 by the swage portion 83a of the second terminal 83.

**[0006]** There is a need for the length in the direction in which the connector-receiving portion 92 extends to be shortened as required in accordance with the position and size of a space in the vehicle allotted for the motor-driven compressor. Therefore, it is also necessary to shorten the length of the wire 81 of the wiring connection portion 80 in accordance with the length of the connector-receiving portion 92.

**[0007]** If the swaging of the lead portion 81a by the swage portion 82a of the first terminal 82 and the swaging of the lead portion 81a by the swage portion 83a of the second terminal 83 are performed using, for example, a swage tool while a machine such as a robot arm grasps the wire 81, the position of the swaging (connecting position) is shifted due to the flexibility of the wire 81, resulting in poor connecting operability. Therefore, generally, the swaging of the lead portion 81a by the swage portion 82a of the first terminal 82 and the swaging of the lead portion 81a by the swage portion 83a of the second terminal 83 are performed using the swage tool while an operator holds the wire 81 by hand. Accordingly, such manual operation by the operator allows the swage position to be adjusted finely, and the operability of the swaging is improved.

**[0008]** The shorter the length of the wire 81 becomes, however, the shorter the distance between the operator's hand and the swage tool becomes. Accordingly, such a connecting operation cannot be easily performed, and thus it becomes difficult to shorten the length of the entire wiring connection portion 80. As a result, the length in the direction in which the connector-receiving portion 92 extends cannot be shortened as necessary in accordance with the position and size of an allotted space in the vehicle.

**[0009]** US 4 964 788 A1 discloses a motor driven compressor, comprising: a housing; a compression portion, an electric motor, and a motor drive circuit, which are accommodated in the housing; a connector-receiving portion provided on an outer surface of the housing; and a wiring connection portion provided in the connector-receiving portion, the wiring connection portion being adapted for supplying electricity from an external power source to the motor drive circuit. The wiring connection portion includes a first terminal having a first end-connection portion at an end thereof and a second end-connection portion at another end thereof, the second end-connection portion being electrically connected to the external power source, a second terminal having a first end-connection portion at an end thereof and a second end-connection portion at another end thereof, the second end-connection portion being electrically connected to the motor drive circuit.

**[0010]** US 3 160 460 A discloses a further motor-driven compressor.

**[0011]** An objective of the present invention is to provide a motor-driven compressor that readily shortens the

length of the entire wiring connection portion compared with a wiring connection portion in which a wire is used.

#### SUMMARY OF THE INVENTION

**[0012]** The objective of the invention is achieved with a motor-driven compressor having the features of claim 1.

**[0013]** Further advantageous developments of the invention are subject-matter of the dependent claims.

**[0014]** Other aspects and advantages of the present invention will become apparent from the following description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0015]** The invention, together with objects and advantages thereof, may best be understood by reference to the following description of the presently preferred embodiments together with the accompanying drawings in which:

Fig. 1A is a longitudinal cross-sectional view illustrating a motor-driven compressor according to one embodiment of the present invention;

Fig. 1B is a partially enlarged longitudinal cross-sectional view illustrating the connector-receiving portion and its surrounding in the motor-driven compressor shown in Fig. 1A;

Fig. 2 is a cross-sectional view taken along line A-A of Fig. 1B;

Fig. 3 is a partially enlarged longitudinal cross-sectional view illustrating a connector-receiving portion and its surrounding according to another embodiment of the present invention; and

Fig. 4 is a partially enlarged lateral cross-sectional view illustrating the connector-receiving portion of a conventional motor-driven compressor and its surroundings.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0016]** A motor-driven compressor according to one embodiment of the present invention will now be described with reference to Figs. 1 and 2. The motor-driven compressor of the present embodiment is mounted on vehicle, which is a hybrid automobile, and employed for a vehicle air conditioner.

**[0017]** As shown in Fig. 1A, a motor-driven compressor 10 includes a housing 11, which is made of metal (aluminum in the present embodiment). The housing 11 is formed by an intermediate housing member 12, a discharge housing member 13, and an inverter housing member 14. The intermediate housing member 12 constitutes an intermediate part of the housing 11 and is

formed to be cylindrical with a closed end. The discharge housing member 13 is joined to the open end of the intermediate housing member 12. The inverter housing member 14 is joined to the closed end of the intermediate housing member 12. The intermediate housing member 12 and the discharge housing member 13 are fastened to each other by bolts B1 with a gasket G in between. Also, the intermediate housing member 12 and the inverter housing member 14 are fastened to each other by bolts B2. An accommodation space 17 is defined between the intermediate housing member 12 and the inverter housing member 14.

**[0018]** A discharge chamber 15 is defined between the intermediate housing member 12 and the discharge housing member 13. A discharge port 16 is formed in an end face of the discharge housing member 13. The discharge chamber 15 is connected to an external refrigerant circuit (not shown) via the discharge port 16. A suction port (not shown) is formed at a position near the inverter housing 14 in the intermediate housing member 12. The space in the intermediate housing member 12 is connected to the external refrigerant circuit (not shown) via the suction port.

**[0019]** A rotary shaft 23 is rotationally supported in the intermediate housing member 12. The intermediate housing member 12 accommodates a compression portion 18 for compressing refrigerant and an electric motor 19 for driving the compression portion 18. The accommodation space 17 accommodates a motor drive circuit 30, which controls operation of the electric motor 19. Therefore, the compression portion 18, the electric motor 19, and the motor drive circuit 30 are accommodated in the housing 11 to be arranged in that order in the axial direction of the rotary shaft 23.

**[0020]** The compression portion 18 will now be described.

**[0021]** The compression portion 18 includes a fixed scroll 20, which is fixed to the intermediate housing member 12, and an orbiting scroll 21, which is arranged to face the fixed scroll 20. Compression chambers 22, the volume of which is variable, are defined between the fixed scroll 20 and the orbiting scroll 21. A discharge passage 28, which connects the compression chambers 22 and the discharge chamber 15 to each other, is formed in the fixed scroll 20.

**[0022]** A discharge valve 29 is located at an end face of the fixed scroll 20.

**[0023]** Next, the electric motor 19 will be described.

**[0024]** The electric motor 19 includes a rotor 24, which rotates integrally with the rotary shaft 23, and a stator 25, which is fixed to the inner circumferential surface of the intermediate housing member 12 to surround the rotor 24. The rotor 24 includes a rotor core 24a, which is fixed to and rotates integrally with the rotary shaft 23, and permanent magnets 24b, which are provided on the circumferential surface of the rotor core 24a. The stator 25 is substantially annular. A stator core 25a is fixed to the inner circumferential surface of the intermediate housing

member 12. A coil 25b is wound about each of teeth (not shown) of the stator core 25a.

**[0025]** The motor drive circuit 30 will now be described.

**[0026]** The motor drive circuit 30 includes a flat plate-like circuit board 31 and electrical components 32a to 32d mounted on the circuit board 31. The circuit board 31 is located in the accommodation space 17 and fixed to the inner surface of the inverter housing member 14. The circuit board 31 is arranged in the inverter housing member 14 to extend in a radial direction of the rotary shaft 23. The motor drive circuit 30 supplies electricity to the stator 25 of the electric motor 19 based on commands from an electronic control unit (ECU) for controlling the air conditioner (not shown). The circuit board 31 has a conductive member 33, which protrudes from the outer circumferential surface of the inverter housing member 14 and extends toward a connector-receiving portion 42.

**[0027]** As shown in Fig. 1B, the connector-receiving portion 42 is made of metal (aluminum in the present embodiment). The connector-receiving portion 42 includes a tubular first extended portion 42a and a tubular second extended portion 42b. The first extended portion 42a extends outward from the outer circumferential surface of the inverter housing member 14 in a radial direction of the rotary shaft 23. The second extended portion 42b is continuous with the first extended portion 42a and extends in the axial direction of the rotary shaft 23 and toward the electric motor 19. The first extended portion 42a has a connection portion 421a, which is connected to a connection hole 141 formed in the inverter housing member 14. The connector-receiving portion 42 is connected to the inverter housing member 14 by joining the connection hole 141 and connection portion 421a to each other.

**[0028]** The length of the second extended portion 42b in a longitudinal direction is adjusted in accordance with the position and size of a space in a hybrid car allotted for the motor-driven compressor 10 according to the present embodiment. A connector housing 44, which is made of plastic, is attached to an opening 421b of the second extended portion 42b. The connector housing 44 is tubular and includes a fitting portion 44a, a contact portion 44b, and a main body 44c. The fitting portion 44a is fitted in the opening 421b. The contact portion 44b is continuous with the fitting portion 44a and contacts an open end 422b of the second extended portion 42b. The main body 44c is continuous with the contact portion 44b and is connected to an external power source 40.

**[0029]** Wiring connection portions 50 are accommodated in the second extended portion 42b and the connector housing 44 to supply electricity from the external power source 40 to the motor drive circuit 30. Each of the wiring connection portions 50 includes a first terminal 51 electrically connected to the external power source 40, a second terminal 52 electrically connected to the motor drive circuit 30 and a metal plate 53 connecting the first terminal 51 with the second terminal 52.

**[0030]** A first end-connection portion 51a is formed at

a first end of the first terminal 51, while a second end-connection portion 51b, which is electrically connected to the external power source 40, is formed at a second end of the first terminal 51. Also, a first end-connection portion 52a is formed at a first end of the second terminal 52, while a second end-connection portion 52b, which is electrically connected to the conductive member 33, is formed at a second end of the second terminal 52. The metal plate 53 is an elongated board. The length of the metal plate 53 in the longitudinal direction is less than the length of the second extended portion 42b in the direction in which the second extended portion 42b extends. The first end of the metal plate 53 and the first end-connection portion 51a of the first terminal 51 are joined to each other; that is, connected to each other by welding (in the present embodiment, resistance welding). The second end of the metal plate 53 and the first end-connection portion 52a of the second terminal 52 are joined to each other; that is, connected to each other by welding (in the present embodiment, resistance welding).

**[0031]** As shown in Fig. 2, the motor-driven compressor 10 according to the present embodiment is provided with two wiring connection portions 50, which are arranged side by side. The second terminal 52 and a part of the metal plate 53 of each of the wiring connection portions 50 are located in a plastic cluster block 45 having a shape of a rectangular box accommodated in the second extended portion 42b. The inside of the cluster block 45 is sectioned into a first accommodation section 45a and a second accommodation section 45b. The first accommodation section 45a accommodates the second terminal 52 and a part of the metal plate 53 of one of the wiring connection portions 50. The second accommodation section 45b accommodates the second terminal 52 and a part of the metal plate 53 of the other one of the wiring connection portions 50. The cluster block 45 ensures insulation between i) the second terminal 52 and the part of the metal plate 53 of one of the wiring connection portions 50 and ii) the second terminal 52 and the part of the metal plate 53 of the other wiring connection portion 50. Further, the cluster block 45 ensures insulation between each of the wiring connection portions 50 and the connector-receiving portion 42. Therefore, in the present embodiment, the cluster block 45 functions as an insulating member.

**[0032]** The connector housing 44 accommodates the first terminal 51 and a part of the metal plate 53 of each wiring connection portion 50. The inside of the connector housing 44 is sectioned into a first accommodation section 441 and a second accommodation section 442. The first accommodation section 441 accommodates the first terminal 51 and a part of the metal plate 53 of one of the wiring connection portions 50. The second accommodation section 442 accommodates the first terminal 51 and a part of the metal plate 53 of the other wiring connection portion 50. The connector housing 44 ensures insulation between i) the first terminal 51 and the part of the metal plate 53 of one of the wiring connection portions 50 and

ii) the first terminal 51 and the part of the metal plate 53 of the other one of the wiring connection portions 50. Further, the connector housing 44 ensures insulation between each wiring connection portion 50 and the connector-receiving portion 42. Therefore, in the present embodiment, the connector housing 44 functions as an insulating member.

**[0033]** The second end-connection portions 52b of the second terminals 52 and the conductive members 33 are electrically connected to each other, and the second end-connection portions 51 b of the first terminals 51 and the external power source 40 are electrically connected to each other, so that the external power source 40 and the motor drive circuit 30 are electrically connected to each other via the wiring connection portions 50 and the conductive members 33.

**[0034]** According to the above described motor-driven compressor 10, electricity from the external power source 40 is supplied to the motor drive circuit 30 via the wiring connection portions 50 and the conductive members 33. When the electricity is supplied to the electric motor 19 from the motor drive circuit 30, the rotor 24 is rotated. Accordingly, the rotary shaft 23 rotates. As the rotary shaft 23 rotates, the volume of each compression chamber 22 between the orbiting scroll 21 and the fixed scroll 20 is reduced in the compression portion 18. Then, refrigerant is drawn into the intermediate housing member 12 from the external refrigerant circuit via the suction port. The refrigerant taken into the intermediate housing member 12 is drawn into the compression chambers 22 in the intermediate housing member 12 via a suction passage 27 provided in the intermediate housing member 12 to be compressed. The refrigerant that has been compressed in the compression chambers 22 is discharged to the discharge chamber 15 via the discharge passage 28, while flexing the discharge valve 29. The refrigerant discharged to the discharge chamber 15 is conducted to the external refrigerant circuit via the discharge port 16 and then returned to the intermediate housing member 12.

**[0035]** Operation of the present embodiment will now be described.

**[0036]** For example, a case is considered where the first end of the metal plate 53 is connected to the first end-connection portion 51a of the first terminal 51 or the second end of the metal plate 53 is connected to the first end-connection portion 52a of the second terminal 52, while a machine such as a robot arm grasps the metal plate 53. In this case, since the metal plate 53 is more rigid than a wire used in a conventional motor-driven compressor, the likelihood of shifting of the connecting position of the metal plate 53 with respect to the first end-connection portion 51a of the first terminal 51 or to the first end-connection portion 52a of the second terminal 52 is reduced. As a result, it is not necessary for an operator to perform connecting operation while holding the metal plate 53 by hand. Even if the length of the entire metal plate 53 is shortened, the operation of connecting

the first end of the metal plate 53 with the first end-connection portion 51 a of the first terminal 51 or the second end of the metal plate 53 with the first end-connection portion 52a of the second terminal 52 is facilitated.

**[0037]** According to the above described motor-driven compressor 10, the length of the metal plate 53 in the longitudinal direction is less than the length of the second extended portion 42b in the direction in which the second extended portion 42b extends. As a result, the length of the second extended portion 42b is shortened in accordance with the position and size of a space in a hybrid car allotted for the motor-driven compressor 10 according to the present embodiment. This facilitates mounting of the motor-driven compressor 10 on a hybrid car.

**[0038]** The above described embodiment has the following advantages.

(1) Each of the wiring connection portions 50 is formed by the first terminal 51, the second terminal 52, and the metal plate 53. More specifically, the wiring connection portion 50 is configured by connecting the first end of the metal plate 53 to the first end-connection portion 51a formed at the first end of the first terminal 51 and by connecting the second end of the metal plate 53 to the first end-connection portion 52a formed at the first end of the second terminal 52. Accordingly, since the metal plate 53 is more rigid than the wire used in the conventional motor-driven compressor, the likelihood of shifting of the connecting position of the metal plate 53 with respect to the first end-connection portion 51 a of the first terminal 51 or to the first end-connection portion 52a of the second terminal 52 is reduced. Accordingly, even if the length of the entire metal plate 53 is shortened, the first end-connection portion 51a of the first terminal 51 or the first end-connection portion 52a of the second terminal 52 can be easily connected to the metal plate 53. As a result, the length of the entire metal plate 53 can be shortened; that is, the length of the entire wiring connection portion 50 can be easily shortened in comparison to a wiring connection portion in which a wire is used.

(2) The first end of the metal plate 53 and the first end-connection portion 51 a of the first terminal 51 are welded to each other, and the second end of the metal plate 53 and the first end-connection portion 52a of the second terminal 52 are welded to each other. Accordingly, the metal plate 53 can be connected to the first terminal 51 or the second terminal 52 more firmly in comparison to a case where, for example, the first end of the metal plate 53 and the first end-connection portion 51 a of the first terminal 51 are connected to each other by swaging or the second end of the metal plate 53 and the first end-connection portion 52a of the second terminal 52 are connected by swaging.

(3) The connector-receiving portion 42 is made of

metal, and the cluster block 45 and the connector housing 44 are located between the wiring connection portions 50 and the connector-receiving portion 42. In order to ensure the strength of the connector-receiving portion 42, it is preferred to form the connector-receiving portion 42 with metal. Further, the cluster block 45 and the connector housing 44 can ensure insulation between the wiring connection portions 50 and the connector-receiving portion 42. Since the positions of the wiring connection portions 50 are determined by the cluster block 45 and the connector housing 44 in the connector-receiving portion 42, movement of the wiring connection portions 50 in the connector-receiving portion 42 due to vibration of the running hybrid car is restricted.

(4) The cluster block 45 and the connector housing 44 ensure insulation between one of the wiring connection portions 50 and the other one of the wiring connection portions 50. Accordingly, for example, the wiring connection portions 50 are prevented from contacting each other to be conductive with each other due to vibration of the running hybrid car.

(5) The first end of the metal plate 53 and the first end-connection portion 51a of the first terminal 51 are resistance-welded to each other, and the second end of the metal plate 53 and the first end-connection portion 52a of the second terminal 52 are resistance-welded to each other. In the conventional motor-driven compressor, when the respective swage portions and the lead portions are resistance-welded to each other, it is relatively hard for current generated by the resistance welding to flow through the lead portions, while it is relatively easy for current to flow through the swage portions, since the lead portions are formed by a plurality of bundled wires. For this reason, there is a problem that it is hard to connect the respective swage portions and the lead portions to each other. According to the present embodiment, however, since the metal plate 53 is resistance-welded to each of the first end-connection portions 51a and 52a, it is easier to perform welding and connect the metal plate 53 with the first terminal 51 or the second terminal 52 compared with a case where the swage portions and the lead portions are resistance-welded to each other.

**[0039]** The above described embodiment may be modified as follows.

**[0040]** The second extended portion 42b of the connector-receiving portion 42 is arranged to extend in the axial direction of the rotary shaft 23. The invention is not limited to this, and as shown in Fig. 3, for example, the second extended portion 42b of the connector-receiving portion 42 may be arranged to extend in the radial direction of the rotary shaft 23. That is, the direction in which the connector-receiving portion extends may be changed as necessary in accordance with the configurations such as the position and size of a space in the vehicle allotted

for the motor-driven compressor.

**[0041]** The connector-receiving portion 42 may be simultaneously formed when the inverter housing member 14 is formed.

5 **[0042]** The connector-receiving portion 42 may be made of plastic, for example. In this case, the insulating member for ensuring the insulation between the wiring connection portions 50 and the connector-receiving portion may be omitted.

10 **[0043]** The first end of the metal plate 53 and the first end-connection portion 51a of the first terminal 51 may be connected to each other by swaging, and the second end of the metal plate 53 and the first end-connection portion 52a of the second terminal 52 may be connected to each other by swaging. Even in this case, when the first end of the metal plate 53 is swaged by the first end-connection portion 51a of the first terminal 51 and the second end of the metal plate 53 is swaged by the first end-connection portion 52a of the second terminal 52, the swaging position is not shifted as is in the case where a wire is used. Accordingly, it is possible to perform a swaging operation by the swage tool while a machine such as a robot arm grasps the metal plate 53, for example. As a result, even if the length of the metal plate 53 is shortened as much as possible, the swaging operation is not difficult. Accordingly, the length of the entire wiring connection portion 50 can be easily shortened in comparison to a wiring connection portion in which a wire is used.

20 **[0044]** The wiring connection portions 50 may be entirely accommodated in the cluster block 45 to ensure insulation between the wiring connection portions 50 and the connector-receiving portion 42. Alternatively, the connector housing 44 may accommodate the wiring connection portions 50 entirely to ensure insulation between the wiring connection portions 50 and the connector-receiving portion 42.

30 **[0045]** The two wiring connection portions 50 are provided side by side. However, for example, three wiring connection portions 50 may be arranged side by side. That is, the number of the wiring connection portions 50, which are arranged side by side, is not particularly limited.

35 **[0046]** The compression portion 18, the electric motor 19, and the motor drive circuit 30 are accommodated in the housing 11 to be arranged in that order in the axial direction of the rotary shaft 23. The present invention is not limited to this. For example, the electric motor 19, the compression portion 18, and the motor drive circuit 30 may be accommodated in the housing 11 to be arranged in that order in the axial direction of the rotary shaft 23.

40 **[0047]** The compression portion 18 is not limited to a type that is configured by the fixed scroll 20 and the orbiting scroll 21, but may be a piston type or a vane type.

45 **[0048]** Instead of a vehicle air conditioner, the present invention may be applied to other types of air conditioners.

**[0049]** The present invention is applied to the motor-driven compressor 10, which is mounted on a hybrid au-

tomobile and used in a vehicle air conditioner. However, instead of a hybrid automobile, the present invention may be applied to a motor-driven compressor that is used in a vehicle air conditioner mounted on an automobile driven only by gasoline or on an electric car.

**[0050]** Therefore, the present examples and embodiments are to be considered as illustrative and not restrictive and the invention is not to be limited to the details given herein, but may be modified within the scope and equivalence of the appended claims.

**[0051]** A motor-driven compressor includes a connector-receiving portion provided on the outer surface of a housing. A wiring connection portion is provided in the connector-receiving portion and supplies electricity from an external power source to a motor drive circuit. The wiring connection portion includes a first terminal, a second terminal, and a metal plate for connecting the first and the second terminals to each other. The first and the second terminals have a first end-connection portion and a second end-connection portion, respectively. The second end-connection portion of the first terminal is electrically connected to the external power source, and the second end-connection portion of the second terminal is electrically connected to the motor drive circuit. The metal plate has opposite ends, which are connected to the first end-connection portion of the first terminal and the first end-connection portion of the second terminal, respectively.

## Claims

### 1. A motor-driven compressor, comprising:

a housing (11);  
 a compression portion (18), an electric motor (19), and a motor drive circuit (30), which are accommodated in the housing (11);  
 a connector-receiving portion (42) provided on an outer surface of the housing (11); and  
 a wiring connection portion (50) provided in the connector-receiving portion (42), the wiring connection portion (50) being adapted for supplying electricity from an external power source (40) to the motor drive circuit (30), wherein the wiring connection portion (50) includes  
 a first terminal (51) having a first end-connection portion (51a) at an end thereof and a second end-connection portion (51b) at another end thereof, the second end-connection portion (51b) being electrically connected to the external power source (40),  
 a second terminal (52) having a first end-connection portion (52a) at an end thereof and a second end-connection portion (52b) at another end thereof, the second end-connection portion (52b) being electrically connected to the motor drive circuit (30), and

a metal plate (53) having opposite ends, which are connected to the first end-connection portion (51a) of the first terminal (51) and the first end-connection portion (52a) of the second terminal (52), respectively, to connect the first terminal (51) and the second terminal (52) to each other, wherein

the connector-receiving portion (42) is made of metal, and

an insulating member (44, 45) is located between the wiring connection portion (50) and the connector-receiving portion (42), wherein the insulating member (44, 45) comprises a first housing (44) accommodating the first terminal (51) and a part of the metal plate (53) and a second housing (45) accommodating the second terminal (52) and a part of the metal plate (53).

### 2. The motor-driven compressor according to claim 1, wherein

an end of the metal plate (53) and the first end-connection portion (51a) of the first terminal (51) are welded to each other, and

another end of the metal plate (53) and the first end-connection portion (52a) of the second terminal (52) are welded to each other.

### 3. The motor-driven compressor according to claim 1 or 2, wherein the housing (11) accommodates a rotary shaft (23) having an axial direction, and wherein the connector-receiving portion (42) extends in the axial direction of the rotary shaft (23) and toward the electric motor (19).

### 4. The motor-driven compressor according to claim 3, wherein the compression portion (18), the electric motor (19), and the motor drive circuit (30) are accommodated in the housing (11) to be arranged in that order in the axial direction of the rotary shaft (23).

## Patentansprüche

### 1. Motorbetriebener Kompressor mit:

einem Gehäuse (11);  
 einem Kompressionsabschnitt (18), einem Elektromotor (19) und einem Motorsteuerkreis (30), die in dem Gehäuse (11) beherbergt sind;  
 einem Verbinderaufnahmeabschnitt (42), der an einer Außenfläche des Gehäuses (11) vorgesehen ist; und  
 einem Leitungsverbindungsabschnitt (50), der in dem Verbinderaufnahmeabschnitt (42) vorgesehen ist, wobei der Leitungsverbindungsabschnitt (50) zum Zuführen von Elektrizität von einer externen Leistungsquelle (40) zu dem Mo-

torsteuerkreis (30) angepasst ist, wobei der Leitungsverbindungsabschnitt (50) folgendes hat:

einen ersten Anschluss (51) mit einem ersten Ende-Verbindungsabschnitt (51a) an einem Ende von sich und einem zweiten Ende-Verbindungsabschnitt (51b) an einem anderen Ende von sich, wobei der zweite Ende-Verbindungsabschnitt (51b) mit der externen Leistungsquelle (40) elektrisch verbunden ist,

einen zweiten Anschluss (52) mit einem ersten Ende-Verbindungsabschnitt (52a) an einem Ende von sich und einem zweiten Ende-Verbindungsabschnitt (52b) an einem anderen Ende von sich, wobei der zweite Ende-Verbindungsabschnitt (52b) mit dem Motorsteuerkreis (30) elektrisch verbunden ist, und

eine Metallplatte (53) mit entgegengesetzten Enden, die mit dem ersten Ende-Verbindungsabschnitt (51a) des ersten Anschlusses (51) bzw. dem ersten Ende-Verbindungsabschnitt (52a) des zweiten Anschlusses (52) verbunden sind, um den ersten Anschluss (51) und den zweiten Anschluss (52) miteinander zu verbinden, wobei

der Verbinderaufnahmeabschnitt (42) aus Metall hergestellt ist, und

ein isolierendes Bauteil (44, 45) zwischen dem Leitungsverbindungsabschnitt (50) und dem Verbinderaufnahmeabschnitt (42) gelegen ist, wobei das isolierende Bauteil (44, 45) ein erstes Gehäuse (44), das den ersten Anschluss (51) und einen Teil der Metallplatte (53) aufnimmt, und ein zweites Gehäuse (45) aufweist, das den zweiten Anschluss (52) und einen Teil der Metallplatte (53) aufnimmt.

2. Motorbetriebener Kompressor nach Anspruch 1, wobei

ein Ende der Metallplatte (53) und der erste Ende-Verbindungsabschnitt (51a) des ersten Anschlusses (51) aneinander geschweißt sind, und ein anderes Ende der Metallplatte (53) und der erste Ende-Verbindungsabschnitt (52a) des zweiten Anschlusses (52) aneinander geschweißt sind.

3. Motorbetriebener Kompressor nach Anspruch 1 oder 2, wobei das Gehäuse (11) eine Drehwelle (23) beherbergt, die eine Axialrichtung hat, und wobei sich der Verbinderaufnahmeabschnitt (42) in der Axialrichtung der Drehwelle (23) und zu dem Elektromotor (19) hin erstreckt.

4. Motorbetriebener Kompressor nach Anspruch 3, wo-

bei der Kompressionsabschnitt (18), der Elektromotor (19) und der Motorsteuerkreis (30) in dem Gehäuse (11) beherbergt sind, um in dieser Reihenfolge in der Axialrichtung der Drehwelle (23) angeordnet zu sein.

## Revendications

1. Compresseur entraîné par moteur, comprenant :

un boîtier (11);

une partie de compression (18), un moteur électrique (19), et un circuit de commande de moteur (30), qui sont reçus dans le boîtier (11) ;

une partie de réception de connecteur (42) prévue sur une surface extérieure du boîtier (11) ; et

une partie de connexion de câblage (50) prévue dans la partie de réception de connecteur (42),

la partie de connexion de câblage (50) étant adaptée pour alimenter en électricité le circuit

de commande de moteur (30) à partir d'une source d'alimentation externe (40), dans lequel

la partie de connexion de câblage (50) comporte

une première borne (51) ayant une première partie de connexion d'extrémité (51a) au niveau

d'une extrémité de celle-ci et une deuxième partie de connexion d'extrémité (51b) au niveau

d'une autre extrémité de celle-ci, la deuxième partie de connexion d'extrémité (51b) étant reliée

électriquement à la source d'alimentation externe (40),

une deuxième borne (52) ayant une première partie de connexion d'extrémité (52a) au niveau

d'une extrémité de celle-ci et une deuxième partie de connexion d'extrémité (52b) au niveau

d'une autre extrémité de celle-ci, la deuxième partie de connexion d'extrémité (52b) étant reliée

électriquement au circuit de commande de moteur (30), et

une plaque métallique (53) ayant des extrémités opposées, qui sont reliées à la première partie

de connexion d'extrémité (51a) de la première borne (51) et à la première partie de connexion

d'extrémité (52a) de la deuxième borne (52), respectivement, pour relier la première borne

(51) et la deuxième borne (52) l'une à l'autre, dans lequel

la partie de réception de connecteur (42) est réalisée en métal, et

un élément isolant (44, 45) est situé entre la partie de connexion de câblage (50) et la partie de

réception de connecteur (42), dans lequel l'élément isolant (44, 45) comprend

un premier boîtier (44) recevant la première borne (51) et une partie de la plaque métallique (53)

et un deuxième boîtier (45) recevant la deuxième borne (52) et une partie de la plaque métal-

lique (53).

2. Compresseur entraîné par moteur selon la revendication 1, dans lequel  
une extrémité de la plaque métallique (53) et la première partie de connexion d'extrémité (51a) de la première borne (51) sont soudées l'une à l'autre, et une autre extrémité de la plaque métallique (53) et la première partie de connexion d'extrémité (52a) de la deuxième borne (52) sont soudées l'une à l'autre.
3. Compresseur entraîné par moteur selon la revendication 1 ou 2, dans lequel le boîtier (11) reçoit un arbre rotatif (23) ayant une direction axiale, et dans lequel la partie de réception de connecteur (42) s'étend dans la direction axiale de l'arbre rotatif (23) et vers le moteur électrique (19).
4. Compresseur entraîné par moteur selon la revendication 3, dans lequel la partie de compression (18), le moteur électrique (19), et le circuit de commande de moteur (30) sont reçus dans le boîtier (11) pour être agencés dans cet ordre dans la direction axiale de l'arbre rotatif (23).

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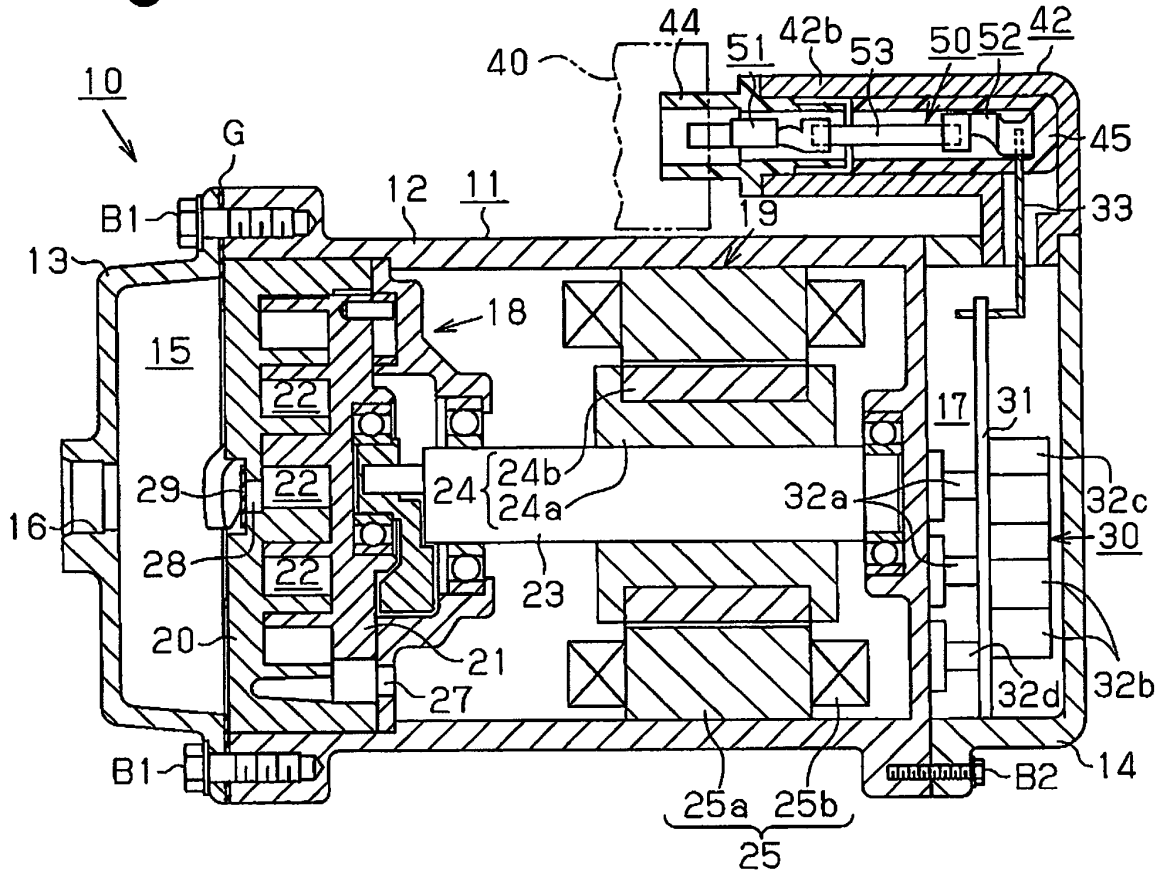
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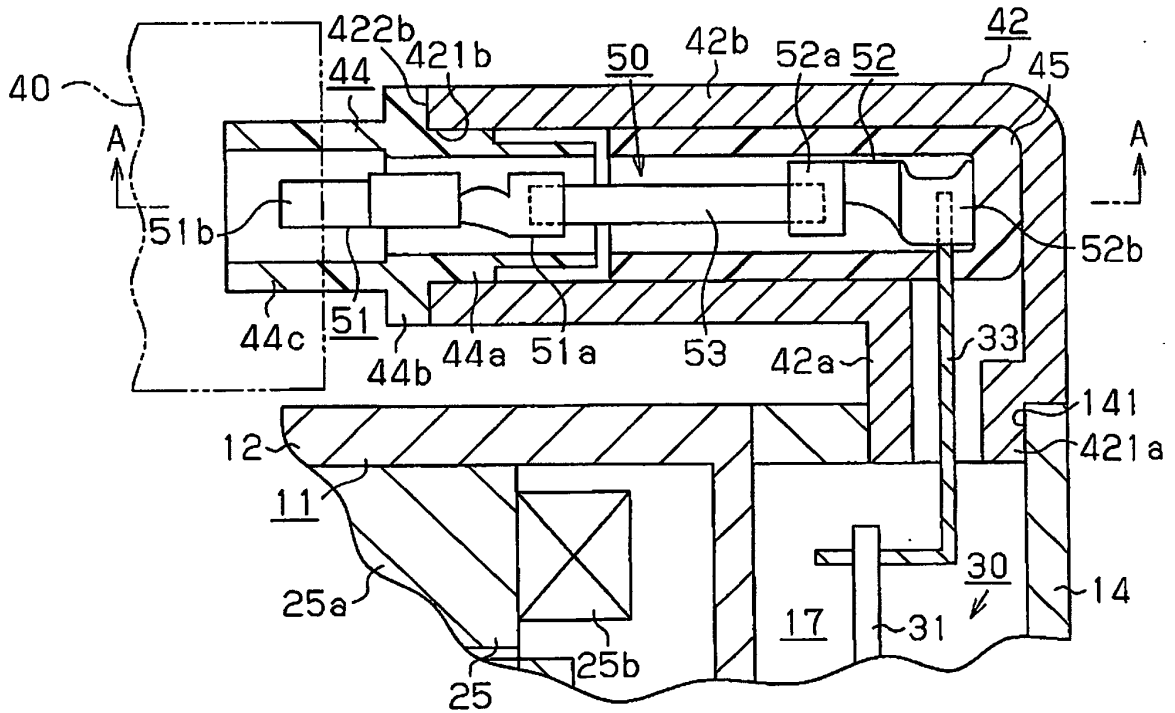
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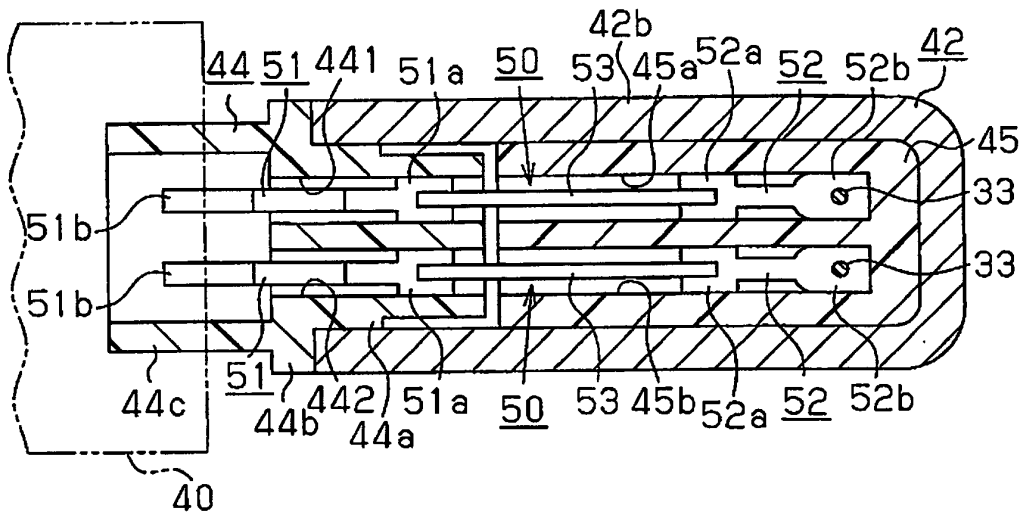
**Fig.1A**



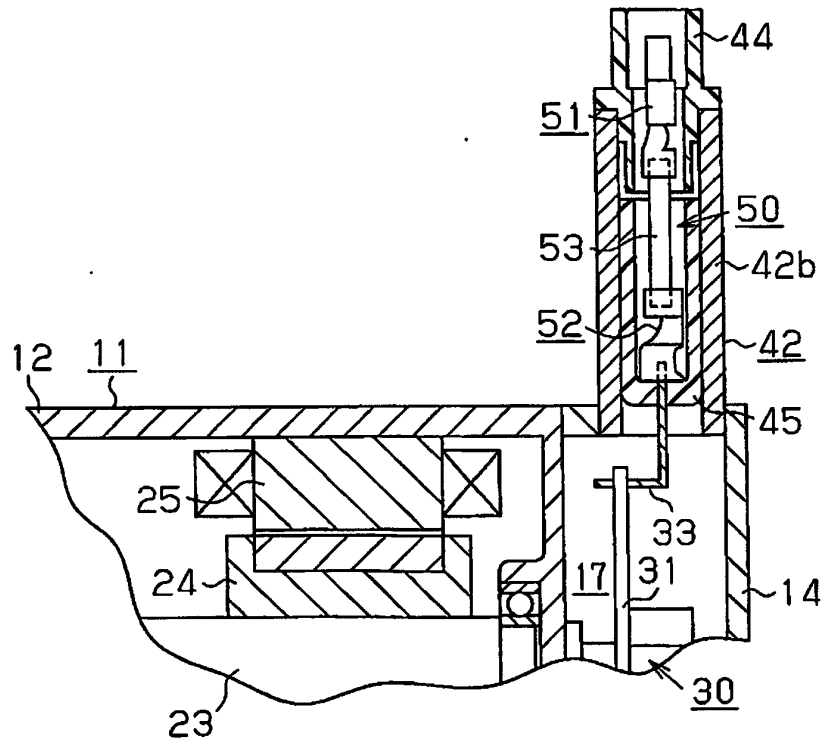
**Fig.1B**



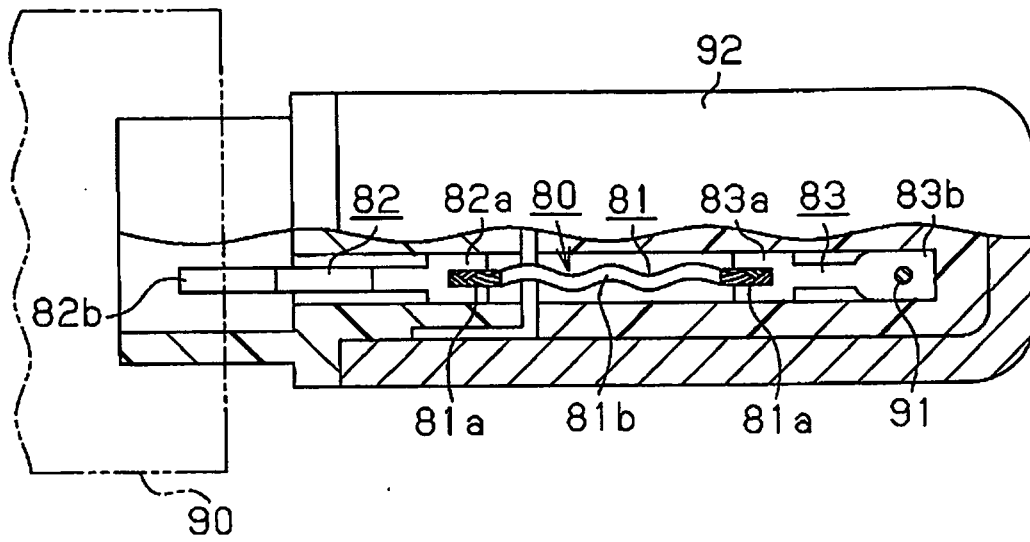
**Fig. 2**



**Fig. 3**



**Fig.4**



**REFERENCES CITED IN THE DESCRIPTION**

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