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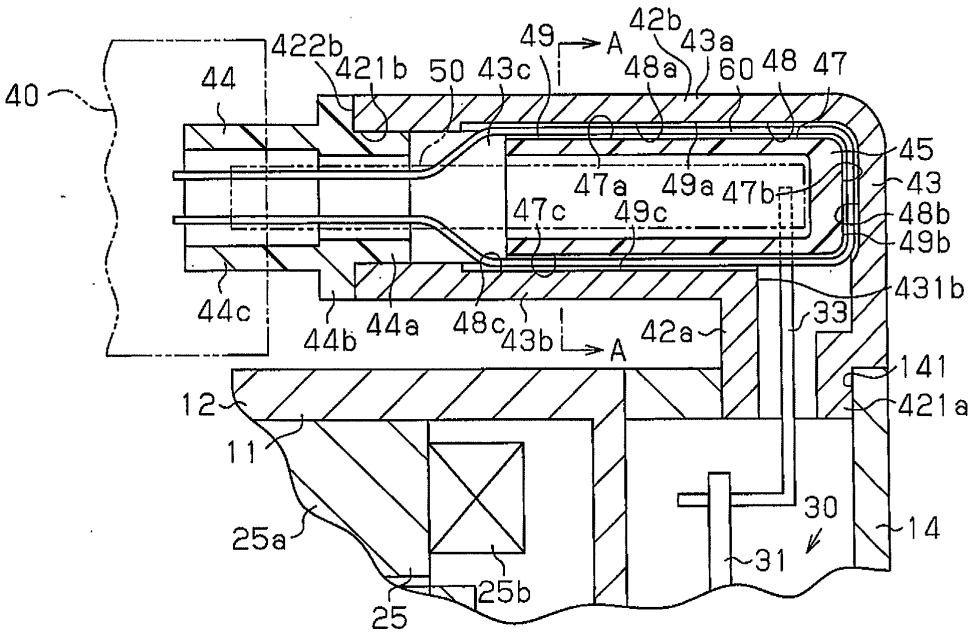
(54) Motor-driven compressor

(57) 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. An insulating member provided inside the connector receiving portion insulates the wiring connection portion and the connector receiving portion from each other. An electrical wire is arranged between the inner surface of the connector receiving portion and the insulating member. The electric wire is used for a purpose other than supply of electricity to the motor drive circuit. A recess is formed in at least one of the inner surface of the connector receiving portion and the outer surface of the insulating member. The recess forms a wiring space, in which the electrical wire is arranged, between the connector receiving portion and the insulating member.

Fig.1B



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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 Japanese Laid-Open Patent Publication No. 2009-74517. As shown in Fig. 6, a motor housing member 103, which forms a part of the housing, accommodates an electric motor 103a. An inverter housing member 108 is coupled to the end face of the motor housing member 103. A motor drive circuit 101 is accommodated in a space defined by the motor housing member 103 and the inverter housing member 108. The motor drive circuit 101 is driven by receiving electricity from an external power source 102.

[0003] A tubular connector receiving portion 104, which protrudes outward, is connected to the outer surface of the inverter housing member 108. A wiring connection portion 105 is arranged in the connector receiving portion 104 to supply electricity from the external power source 102 to the motor drive circuit 101. A cluster block 106 (an insulating member) made of plastic is located between the wiring connection portion 105 and the connector receiving portion 104. The cluster block 106 ensures insulation between the wiring connection portion 105 and the connector receiving portion 104.

[0004] An electrical wire 107, which is used for a purpose other than supply of electricity to the motor drive circuit 101 from the external power source 102, is arranged, or routed, between the connector receiving portion 104 and the cluster block 106. The electrical wire 107 includes, for example, wiring such as an interlock wire described in Japanese Laid-Open Patent Publication No. 2007-331606. In general, at least one end of the electrical wire 107 is connected to a terminal connecting portion (not shown) provided in the external power source 102. Thus, the electrical wire 107 is located in a narrow clearance between the connector receiving portion 104 and the cluster block 106.

[0005] However, when the cluster block 106 is inserted in the connector receiving portion 104, the electrical wire 107 may be caught and crushed between the connector receiving portion 104 and the cluster block 106.

[0006] Accordingly, it is an objective of the present invention to provide a motor-driven compressor that reduces the likelihood of an electrical wire being caught and crushed between a connector receiving portion and an insulating member.

SUMMARY OF THE INVENTION

[0007] To achieve the foregoing objective and in accordance with one aspect of the present invention, an motor-driven compressor is provided that includes a housing, a compression portion, an electric motor, a motor drive circuit, a connector receiving portion, a wiring connection portion, an insulating member, and an electrical wire. The compression portion, the electric motor, and the motor drive circuit are accommodated in the housing. The connector receiving portion is provided on an outer surface of the housing. The wiring connection portion is provided in the connector receiving portion, and is adapted for supplying electricity from an external power source to the motor drive circuit. The insulating member is provided inside the connector receiving portion and insulates the wiring connection portion and the connector receiving portion from each other. The electrical wire is located between an inner surface of the connector receiving portion and an outer surface of the insulating member. The electrical wire is used for a purpose other than supply of electricity to the motor drive circuit from the external power source. A recess is formed in at least one of the inner surface of the connector receiving portion and the outer surface of the insulating member. The recess forms a wiring space, in which the electrical wire is arranged, between the connector receiving portion and the insulating member.

[0008] 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

[0009] 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. 1 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. 3A is a perspective view showing the cluster block as seen from above;

Fig. 3B is a perspective view showing the cluster block as seen from below;

Fig. 4 is a perspective view illustrating another embodiment, in which an interlock wire is secured to a cluster block with adhesive tape;

Fig. 5A is a longitudinal cross-sectional view illustrating a connector receiving portion according to another embodiment of the present invention;

Fig. 5B is a perspective view showing the cluster block as seen from above; and

Fig. 6 is a partially enlarged vertical cross-sectional view illustrating the connector receiving portion of a conventional motor-driven compressor and its surroundings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] A motor-driven compressor according to one embodiment of the present invention will now be described with reference to Figs. 1 to 3. The motor-driven compressor of the present embodiment is mounted on vehicle, which is a hybrid automobile, and employed for a vehicle air conditioner.

[0011] 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 blots 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.

[0012] 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.

[0013] 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.

[0014] The compression portion 18 will now be described.

[0015] 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. A discharge valve 29 is located at an end face of the fixed scroll 20.

[0016] Next, the electric motor 19 will be described.

[0017] 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.

[0018] The motor drive circuit 30 will now be described.

[0019] 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. 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.

[0020] As shown in Fig. 1B, the connector receiving portion 42 includes a tubular first extended portion 42a, which has a rectangular cross-section, and a tubular second extended portion 42b, which also has a rectangular cross-section. 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 421 a, 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 421 a to each other.

[0021] A connector housing 44, which is made of plastic, is attached to an opening 421 b of the second extended portion 42b. The connector housing 44 is tubular and has a rectangular cross-section, and includes a fitting portion 44a, a contact portion 44b, and a main body 44c. The fitting portion 44a is fitted in the opening 421 b. 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.

[0022] As shown in Figs. 1B and 2, the second extended portion 42b has an upper wall 43a, a lower wall 43b, a left wall 43c, a right wall 43d, which extend in a direction in which the second extended portion 42b extends, and an end wall 43. The upper wall 43a and the lower wall 43b are arranged to face each other and extend parallel in a direction in which the second extended portion 42b extends. The left wall 43c and the right wall 43d are arranged to face each other and extend parallel in a direction in which the second extended portion 42b extends. The upper wall 43a, the left wall 43c, and the right wall 43d are continuous with the end wall 43. A passage portion 431 b is formed between the lower wall 43b and the end wall 43. The passage portion 431 b communicates with the interior of the first extended portion 42a and allows the conductive member 33 to pass therethrough. An insulating member, which is a cluster block 45, is arranged in the second extended portion 42b.

[0023] As shown in Figs. 3A and 3B, the cluster block 45 is shaped as a rectangular box with an opening on one side. The outline of the cluster block 45 is formed by a rectangular plate-like end wall 46, an upper wall 46a, a lower wall 46b, a left wall 46c, and a right wall 46d. The walls 46a, 46b, 46c, and 46d extend from the periphery of the end wall 46 and are each formed like a rectangular plate. The upper wall 46a and the lower wall 46b are arranged to face each other and extend parallel. The left wall 46c and the right wall 46d are arranged to face each other and extend parallel.

[0024] When the cluster block 45 is fitted in the second extended portion 42b, the end wall 46, the upper wall 46a, the lower wall 46b, the left wall 46c, and the right wall 46d of the cluster block 45 face the end wall 43, the upper wall 43a, the lower wall 43b, the left wall 43c, and the right wall 43d of the second extended portion 42b, respectively.

[0025] The cluster block 45 has in it a partition wall 46e, which extends parallel with the left wall 46c and the right wall 46d, and connects the upper wall 46a and the lower wall 46b to each other. The partition wall 46e divides the interior of the cluster block 45 into two accommodation spaces 45a, 45b. A wiring connection portion 50 is arranged in each of the accommodation spaces 45a, 45b to supply electricity from the external power source 40 to the motor drive circuit 30. The cluster block 45 ensures insulation between the wiring connection portions 50 and the connector receiving portion 42.

[0026] As shown in Fig. 3A, a straight first groove section 47a is formed in the outer surface of the upper wall 46a of the cluster block 45. The first groove section 47a extends from the open end of the cluster block 45 to the end wall 46. Also, as shown in Fig. 3B, a straight second groove section 47b is formed in the outer surface of the end wall 46 of the cluster block 45. The second groove section 47b is continuous with the first groove section 47a and extends from the upper wall 46a to the lower wall 46b. Further, a straight third groove section 47c is formed in the outer surface of the lower wall 46b of the cluster block 45. The third groove section 47c is continuous with the second groove section 47b and extends from the end wall 46 to the open end. Each of the first, second, and third groove sections 47a, 47b, and 47c is formed by inwardly and arcuately recessing an outer surface of the cluster block 45.

[0027] As shown in Fig. 1B, a straight fourth groove section 48a is formed in the inner surface of the upper wall 43a of the second extended portion 42b. The fourth groove section 48a extends to the end wall 43 from a position that is closer to the opening 421 b of the second extended portion 42b than the open end of the cluster block 45. Also, a fifth groove section 48b is formed in the inner surface of the end wall 43 of the second extended portion 42b. The fifth groove section 48b is continuous with the fourth groove section 48a and extends from the upper wall 43a to the passage portion 431 b. The fifth groove section 48b communicates with the passage portion 431 b. Further, a sixth groove section 48c is formed in the inner surface of the lower wall 43b of the second extended portion 42b. The sixth groove section 48c extends to the passage portion 431 b from a position that is closer to the opening 421 b of the second extended portion 42b than the open end of the cluster block 45. The sixth groove section 48c communicates with the passage portion 431 b. Each of the fourth, fifth, and sixth groove sections 48a, 48b, and 48c is formed by outwardly and arcuately recessing an inner surface of the second extended portion 42b.

[0028] The first groove section 47a faces the fourth groove section 48a, so that the first groove section 47a and the fourth groove section 48a form a first routing cavity 49a. The second groove section 47b faces the fifth groove section 48b, so that the second groove section 47b and the fifth groove section 48b form a second routing cavity 49b. The third groove section 47c faces the sixth groove section 48c, so that the third groove section 47c and the sixth groove section 48c form a third routing cavity 49c.

[0029] An electrical wire, which is an interlock wire 60, is arranged, or routed, between the connector receiving portion 42 and the cluster block 45. The interlock wire 60 is used for a purpose other than supply of electricity to the motor drive circuit 30 from the external power source 40. Specifically, the interlock wire 60 is used for detecting the state of connection between the external power source 40 and the wiring connection portions 50.

[0030] A first end of the interlock wire 60 is connected to a first current-carrying portion (not shown) provided in the external power source 40. The interlock wire 60 passes and extends through the space inside the connector housing 44, the first routing cavity 49a, the second routing cavity 49b, a space between the third groove section 47c and the passage portion 431 b, the third routing cavity 49c, and the space inside the connector housing 44. The interlock wire 60 has a second end, which is connected to a second current-carrying portion (not shown) provided in the external power source 40.

[0031] In the present embodiment, the first, second, and third routing cavities 49a, 49b, and 49c form a wiring space 49, which is formed between the connector receiving portion 42 and the cluster block 45. Also, the first, second, and third groove sections 47a, 47b, 47c form a groove 47, which is a recess formed in the outer surface of the cluster block 45. Further, the fourth, fifth, and sixth groove sections 48a, 48b, 48c form a groove 48, which is a recess formed in the inner surface of the connector receiving portion 42.

[0032] One end of each wiring connection portion 50 is electrically connected to the conductive member 33, and the other end of the wiring connection portion 50 is electrically connected to the external power source 40, so that the external power source 40 is electrically connected to the motor drive circuit 30 via the wiring connection portions 50 and the conductive member 33.

[0033] 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 member 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.

[0034] Operation of the present embodiment will now be described.

[0035] In the motor-driven compressor 10, the interlock wire 60 is arranged in, or routed through, the wiring space 49, which is formed by combining the grooves 47, 48. Thus, when the cluster block 45 is inserted in the connector receiving portion 42, the likelihood of the interlock wire 60 being caught and crushed between the connector receiving portion 42 and the cluster block 45 is reduced. As a result, the interlock wire 60 is not broken by being caught and crushed between the connector receiving portion 42 and the cluster block 45. Thus, when the external power source 40 is connected to the wiring connection portions 50, erroneous detection of disconnection between the external power source 40 and the wiring connection portions 50 is prevented. Therefore, performance of the hybrid automobile mounting the motor-driven compressor 10 of the present embodiment is prevented from degraded.

[0036] The above described embodiment provides the following advantages.

(1) The groove 48 is formed in the inner surface of the connector receiving portion 42, and the groove 47 is formed in the outer surface of the cluster block 45. The grooves 47, 48 form the wiring space 49 for arranging the interlock wire 60 between the connector receiving portion 42 and the cluster block 45, and the interlock wire 60 is routed through the wiring space 49. Therefore, the likelihood of the interlock wire 60 being caught and crushed between the connector receiving portion 42 and the cluster block 45 is more effectively reduced than in case in which neither of the grooves 47, 48 are formed in the outer surface of the cluster block 45 nor the inner surface of the connector receiving portion 42, and the interlock wire 60 is installed in the narrow clearance between the connector receiving portion 42 and the cluster block 45.

(2) The groove 48 is formed in the connector receiving portion 42, and the groove 47 is formed in the cluster block 45, so that the grooves 47, 48 are combined to form the wiring space 49. Therefore, the wiring space 49 is large as compared to a case in which, for example, a wiring space is formed only by the groove 48 formed in the connector receiving portion 42. This further effectively reduces the likelihood of the interlock wire 60 being caught and crushed between the connector receiving portion 42 and the cluster block 45.

(3) The wiring space 49 is formed by the groove 48, which is formed in the connector receiving portion 42, and the groove 47, which is formed in the cluster block 45. The wiring space 49 is therefore easily formed between the connector receiving portion 42 and the cluster block 45.

[0037] The above described embodiment may be modified as follows.

[0038] When the interlock wire 60 is fitted in the groove 47 of the cluster block 45, an adhesive tape 70, which serves as a fixing member, may be wrapped around the entire circumference of the cluster block 45 as shown in Fig. 4 to fix the interlock wire 60 to the cluster block 45.

This configuration prevents the interlock wire 60 from being displaced when the hybrid automobile mounting the motor-driven compressor 10 vibrates, for example, during driving. Alternatively, the interlock wire 60 may be fixed to the connector receiving portion 42 by bonding the adhesive tape 70, which serves as a fixing member, to the entire inner circumference of the connector receiving portion 42 in a state where the interlock wire 60 is fitted in the groove 48 of the connector receiving portion 42.

[0039] As shown in Figs. 5A and 5B, a groove 80, which serves as a recess, may be formed only on the upper wall 46a of the cluster block 45. The groove 80 extends linearly from the open end to the end wall of the cluster block 45 and arcuately curved from a point on the upper wall 46a to face the open end of the cluster block 45. The groove 80 then extends linearly to the open end. A groove 81, which serves as a recess and has the same shape as the groove 80, is formed in a part of the connector receiving portion 42 that faces the groove 80. The grooves 80, 81 form a wiring space 90. Although the groove 80 is formed only in the outer surface of the upper wall 46a of the cluster block 45, a groove, which serves as a recess, may be formed only in the outer surface of the lower wall 46b of the cluster block 45. In this case, a groove, which serves as a recess, is formed in a part of the connector receiving portion 42 that corresponds to the groove in the lower wall 46b of the cluster block 45, and these grooves form a wiring space.

[0040] Either the groove 48 in the connector receiving portion 42 or the groove 47 in the cluster block 45 may be omitted.

[0041] The first, second, and third groove sections 47a, 47b, 47c are formed by inwardly and arcuately recessing the cluster block 45. However, the shape of the first to third groove sections 47a to 47c is not particularly limited to an arcuate shape.

[0042] The fourth, fifth, and sixth groove sections 48a, 48b, and 48c are formed by outwardly and arcuately recessing the second extended portion 42b. However, the shape of the fourth to sixth groove sections 48a to 48c is not particularly limited to an arcuate shape.

[0043] The electrical wire is not limited to the interlock wire 60, but may be, for example, a communication harness for electrically connecting the air conditioner ECU and the motor drive circuit 30 to each other. In this case, the communication harness is routed from the external power source 40 to pass through the wiring space formed between the connector receiving portion 42 and the cluster block 45 and reach the motor drive circuit 30.

[0044] The connector receiving portion 42 is tubular and has a rectangular cross-section. However, the connector receiving portion 42 may have a circular cross-section. In this case, the cluster block 45 is preferably formed to have a circular cross-section.

[0045] The connector receiving portion 42 may be simultaneously formed when the inverter housing member 14 is formed.

[0046] 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 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 position and size of a space in the vehicle allotted for the motor-driven compressor.

[0047] 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.

[0048] 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.

[0049] 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.

[0050] 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.

[0051] Instead of a vehicle air conditioner, the present invention may be applied to other types of air conditioners.

[0052] The present invention is applied to the motor-driven compressor 10, which is mounted on a hybrid automobile 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.

[0053] 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.

[0054] 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. An insulating member provided inside the connector receiving portion insulates the wiring connection portion and the connector receiving portion from each other. An electrical wire is arranged between the inner surface of the connector receiving portion and the insulating member. The electric wire is used for a purpose other than supply of electricity to the motor drive circuit. A recess is formed in at least one of the inner surface of the connector re-

ceiving portion and the outer surface of the insulating member. The recess forms a wiring space, in which the electrical wire is arranged, between the connector receiving portion and the insulating member.

Claims

1. An 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);
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);
an insulating member (45) provided inside the connector receiving portion (42), the insulating member (45) insulating the wiring connection portion (50) and the connector receiving portion (42) from each other; and
an electrical wire (60) located between an inner surface of the connector receiving portion (42) and an outer surface of the insulating member (45), the electrical wire (60) being used for a purpose other than supply of electricity to the motor drive circuit (30) from the external power source (40),
the an motor-driven compressor being **characterized in that**
a recess (47, 48; 80, 81) is formed in at least one of the inner surface of the connector receiving portion (42) and the outer surface of the insulating member (45), and
the recess (47, 48; 80, 81) forms a wiring space (49), in which the electrical wire (60) is arranged, between the connector receiving portion (42) and the insulating member (45).

2. The motor-driven compressor according to claim 1, wherein the recess is formed by a groove (47, 48; 80, 81) that extends along the electrical wire (60).

3. The motor-driven compressor according to claim 1 or 2, wherein
the recess is a first recess (47; 80) formed in the outer surface of the insulating member (45), the compressor further comprising a second recess (48) formed in the inner surface of the connector receiving portion (42), and
the first and second recesses (47, 48; 80, 81) are combined to form the wiring space (49).

4. The motor-driven compressor according to claim 3, wherein
each of the connector receiving portion (42) and the insulating member (45) is tubular and has a rectangular cross-section,
the first recess (47) extends on three outer surfaces of the insulating member (45),
and
the second recess (48) extends on three inner surfaces of the connector receiving portion (45).

5. The motor-driven compressor according to claim 3, wherein
each of the connector receiving portion (42) and the insulating member (45) is tubular and has a rectangular cross-section,
the first recess (80) extends on a single outer surface of the insulating member (45),
and
the second recess (48) extends on a single inner surface of the connector receiving portion (42).

6. The motor-driven compressor according to claim 1 or 2, further comprising a fixing member (70) for fixing the electrical wire (60).

7. 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).

8. The motor-driven compressor according to claim 7, 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).

Fig.1A

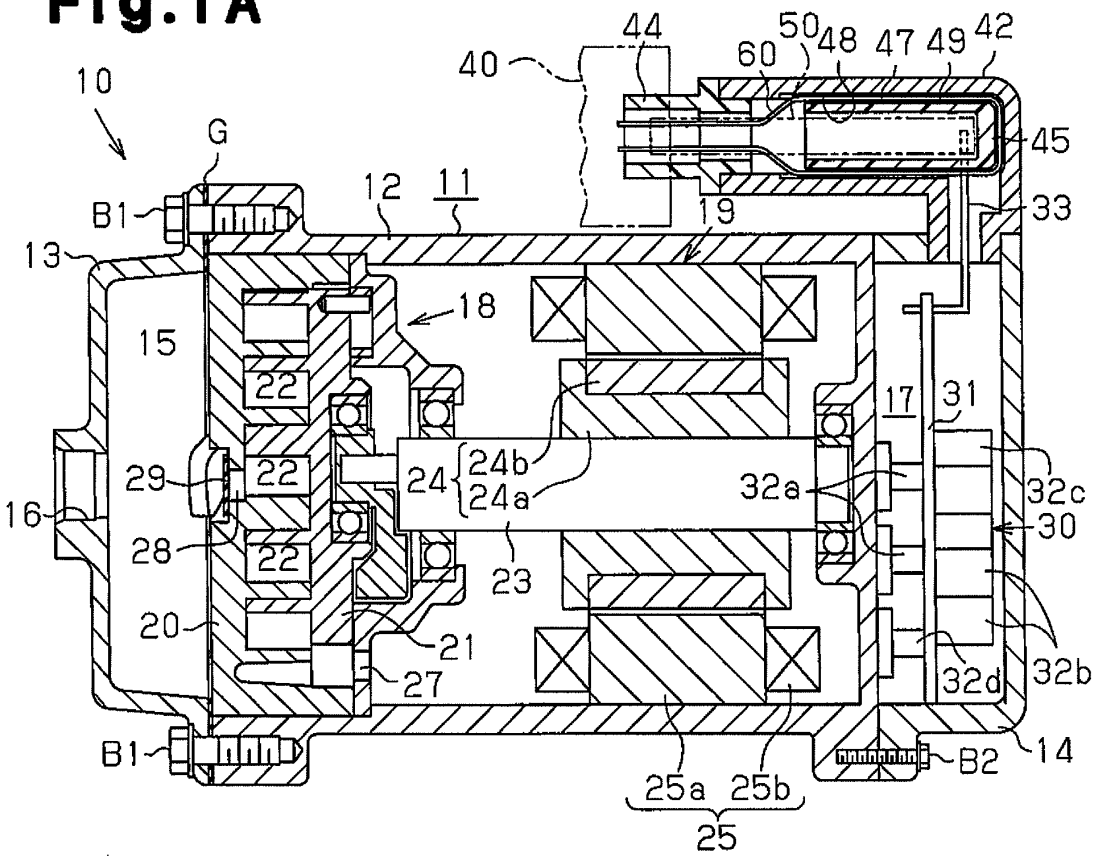
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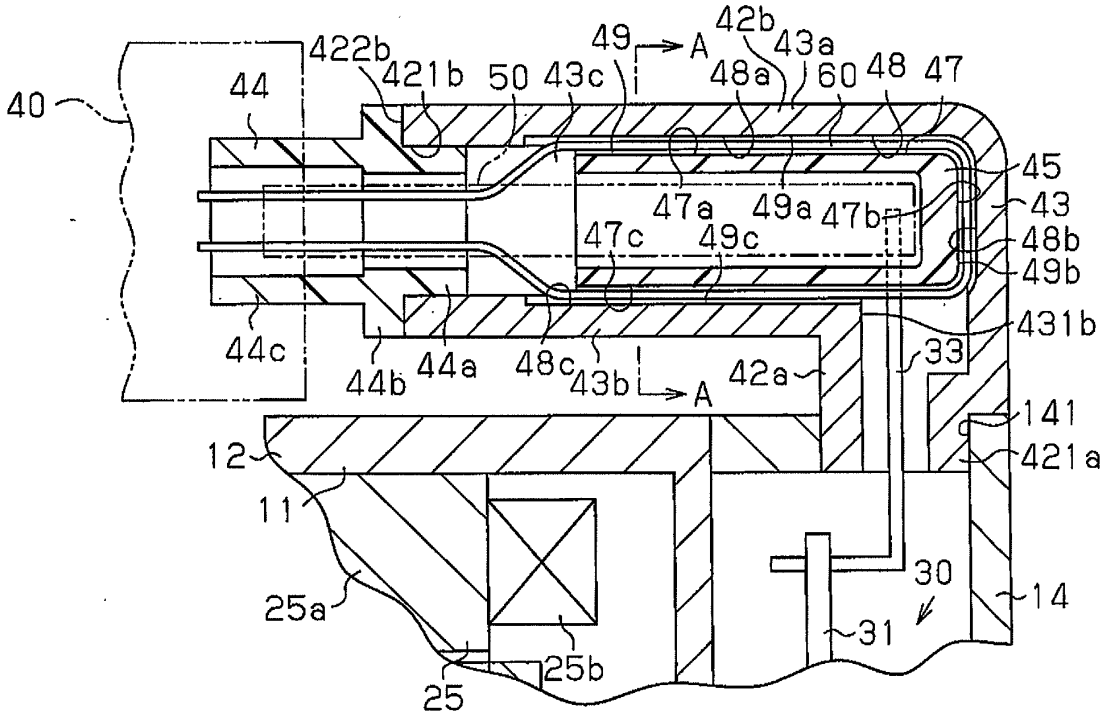
Fig.1B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48b
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33
44c
44b
44a
48c
43b
42a
141
421a
12
11
25a
25b
25
30
31
14

Fig.2

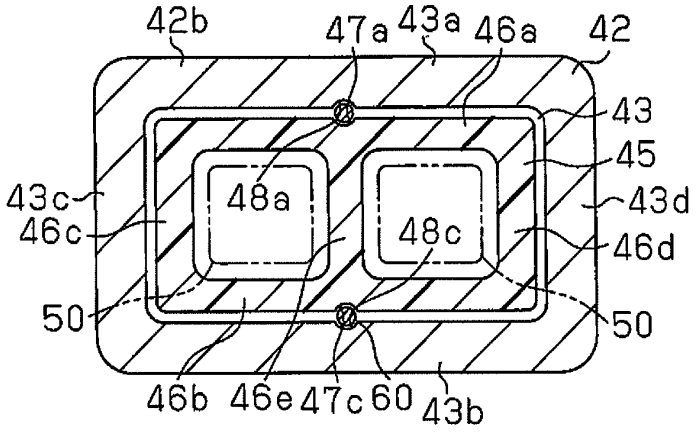


Fig.3A

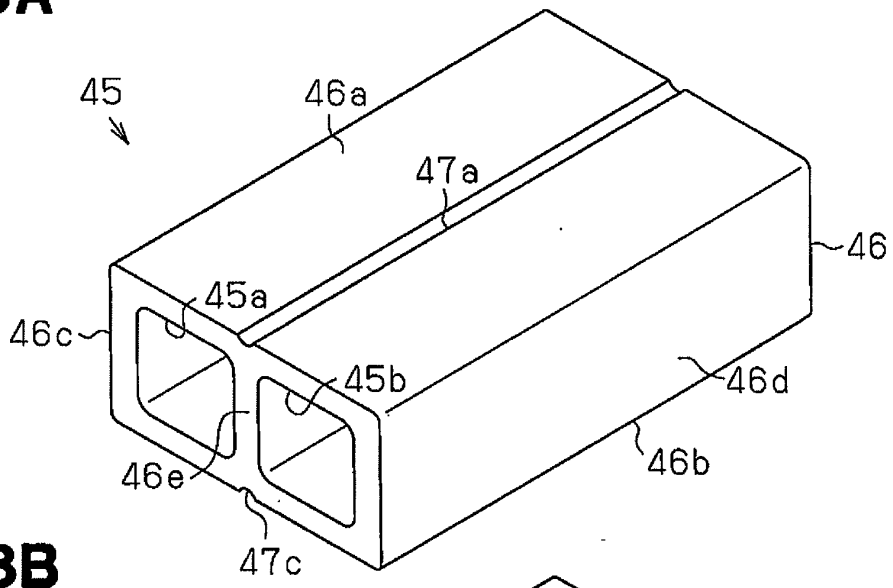


Fig.3B

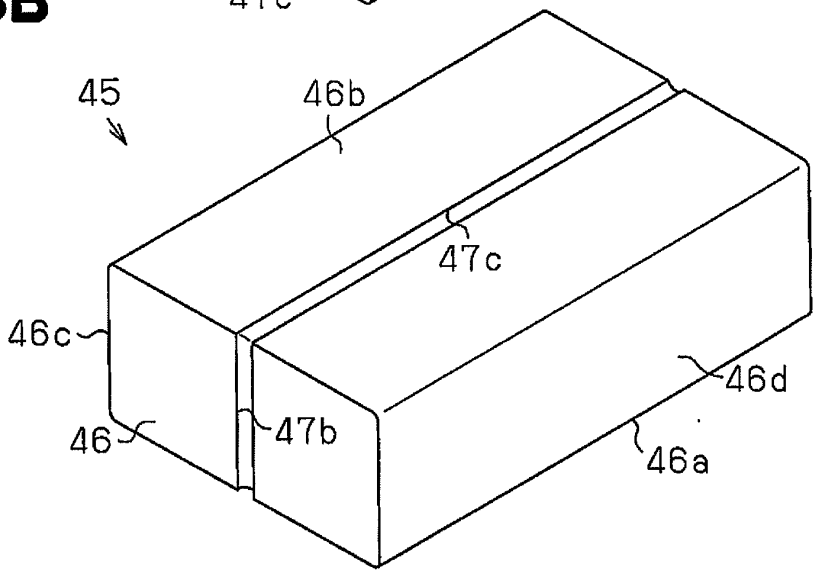


Fig.4

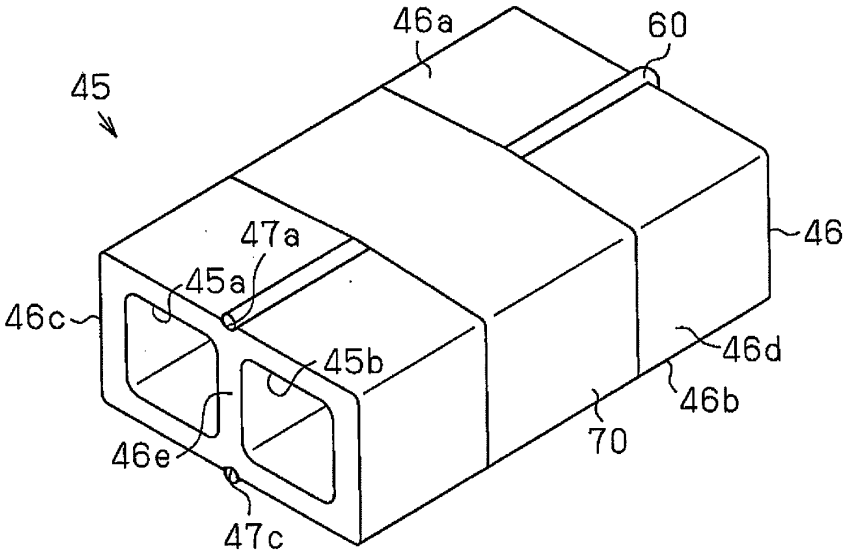


Fig.5A

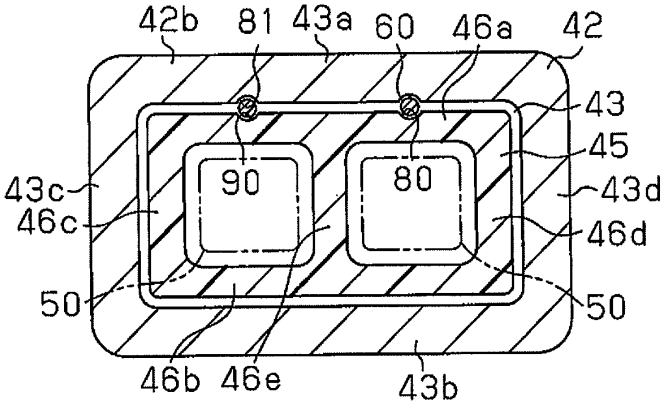


Fig.5B

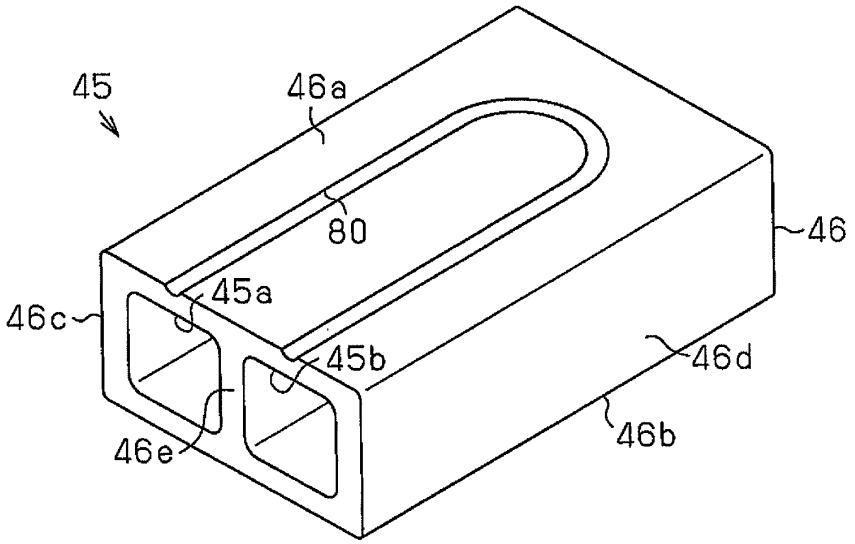
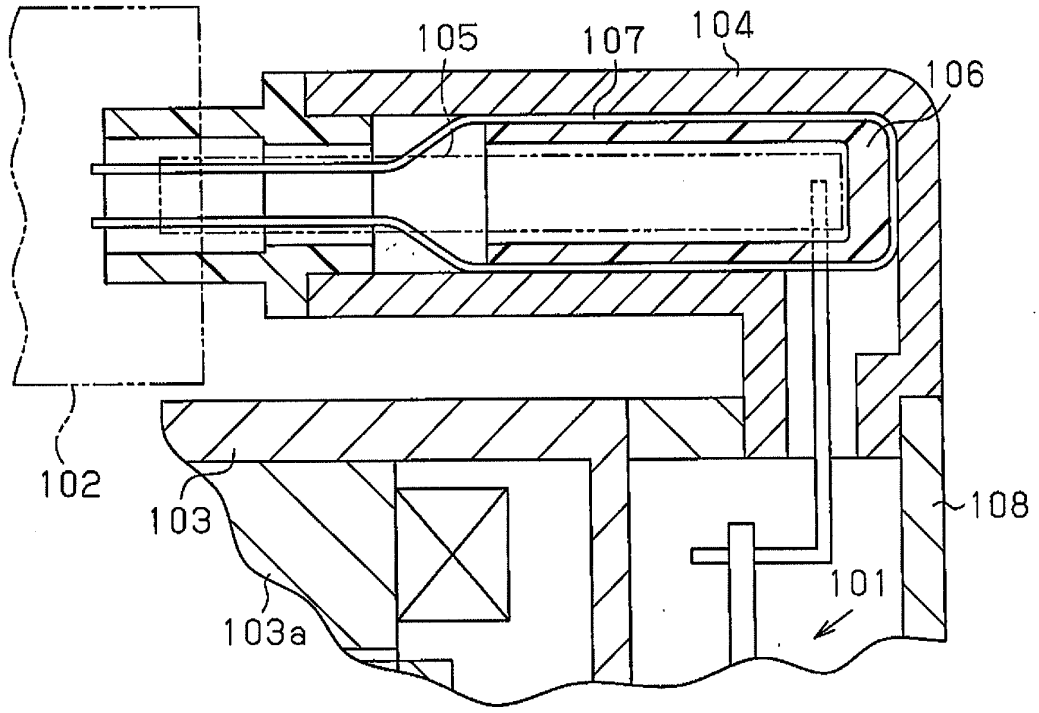


Fig.6



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Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 April 2013	Durante, Andrea

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1

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