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ELECTRIC COMPRESSOR

Abstract

An electric compressor includes a compression part, a motor, and an inverter. The inverter has a circuit board and a connector mounted on the circuit board, the connector having a case in which a connecting terminal that is electrically connected to a circuit pattern formed on the circuit board is accommodated. The circuit board has a through hole. The case has a protruding portion that is inserted into the through hole and in which an insertion port is opened, the insertion port guiding a lead that is electrically connected to the connecting terminal toward the connecting terminal. A hole from which the lead is exposed is formed on a side of the case opposite to the insertion port across the connecting terminal.

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Background/Summary

CROSS-REFERENCE OF THE RELATED APPLICATION

[0001] This application claims priority to Japanese Patent Application No. 2024-017770 filed on Feb. 8, 2024, the entire disclosure of which is incorporated herein by reference.

BACKGROUND ART

[0002] The present disclosure relates to an electric compressor.

[0003] The electric compressor includes a compression part and a motor. The compression part compresses a fluid. The motor drives the compression part. In addition, for example, as in Japanese Patent Application Publication No. 2019-203448, the electric compressor includes an inverter. The inverter drives the motor. The inverter has a circuit board. In addition, as in Japanese Patent Application Publication No. 2022-137909, the inverter has a connector that is mounted on the circuit board. The connector has a case in which connecting terminals are accommodated. Insertion ports into which leads are inserted are opened in the case. The connecting terminals electrically connect the leads to a circuit pattern formed on the circuit board.

[0004] In such electric compressors, the circuit board may be provided between the leads and the connector in a direction into which the leads are inserted. In this case, it is necessary to form a through hole in the circuit board and to insert the leads into the insertion ports as well as into the through hole of the circuit board. Here, when the leads are inserted into the insertion ports of the connector, for example, each of the leads may be accidentally inserted into a gap between the through hole of the circuit board and the case of the connector instead of being inserted into the insertion ports of the connector. Accordingly, an electric compressor in which a worker can easily confirm that the leads are connected to the connecting terminals has been desired.

SUMMARY

[0005] In accordance with an aspect of the present disclosure, there is provided an electric compressor that includes a compression part configured to compress a fluid, a motor configured to drive the compression part, and an inverter configured to drive the motor. The inverter has a circuit board and a connector mounted on the circuit board, the connector having a case in which a connecting terminal that is electrically connected to a circuit pattern formed on the circuit board is accommodated. The circuit board has a through hole. The case has a protruding portion that is inserted into the through hole and in which an insertion port is opened, the insertion port guiding a lead that is electrically connected to the connecting terminal toward the connecting terminal. A hole from which the lead is exposed is formed on a side of the case opposite to the insertion port across the connecting terminal.

[0006] Other aspects and advantages of the disclosure will become apparent from the following description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The disclosure, together with objects and advantages thereof, may best be understood by reference to the following description of the embodiments together with the accompanying drawings in which:

[0008] FIG. **1** is a cross-sectional view of an electric compressor according to an embodiment;
[0009] FIG. **2** is an enlarged cross-sectional view illustrating a part of the electric compressor;
[0010] FIG. **3** is a cross-sectional view illustrating a relationship between a protruding portion and a through hole;
[0011] FIG. **4** is a perspective view illustrating a state in which leads are inserted in insertion ports; and
[0012] FIG. **5** is a perspective view illustrating a state in which the leads extend out through holes.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] The following will describe an embodiment of an electric compressor according to the present disclosure with reference to FIGS. **1** to **5**. The electric compressor of the present embodiment is used, for example, in a vehicle air conditioner.

<Overview of Electric Compressor>

[0014] As illustrated in FIG. **1**, the electric compressor **10** includes a housing **11**. The housing **11** has a discharge housing **12** and a motor housing **13**. The discharge housing **12** and the motor housing **13** are each formed in a tubular shape. The motor housing **13** is connected to the discharge housing **12**. The discharge housing **12** and the motor housing **13** are made of metal material. The discharge housing **12** and the motor housing **13** are made of aluminum, for example. The motor housing **13** has an end wall **13***a* formed in a plate shape and a peripheral wall **13***b* formed in a tubular shape. The peripheral wall **13***b* extends from an outer peripheral portion of the end wall **13***a*.
[0015] The electric compressor **10** includes a rotary shaft **14**. The rotary shaft **14** is accommodated in the motor housing **13**. That is, the rotary shaft **14** is accommodated in the housing **11**. The rotary shaft **14** is rotatably supported by the motor housing **13**.
[0016] The electric compressor **10** includes a compression part **15** and a motor **16**. The compression part **15** and the motor **16** are accommodated in the motor housing **13**. That is, the compression part **15** and the motor **16** are accommodated in the housing **11**. The compression part **15** and the motor **16** are arranged in an axial direction of the rotary shaft **14**, which is a direction in which a rotating axis of the rotary shaft **14** extends. The motor **16** is located closer to the end wall **13***a* of the motor housing **13** than the compression part **15**.
[0017] The compression part **15** is driven by the rotation of the rotary shaft **14**. The compression part **15** compresses a refrigerant as a fluid. The compression part **15** is, for example, a scroll type compression part having a fixed scroll that is fixed to the motor housing **13** therein and an orbiting scroll that is disposed so as to face the fixed scroll. Note that illustrations of the fixed scroll and the orbiting scroll are omitted.
[0018] The motor **16** has a stator **17** formed in a tubular shape and a rotor **18** formed in a tubular shape. The rotor **18** is disposed inside the stator **17**. The rotor **18** is formed so as to be rotatable integrally with the rotary shaft **14**. The rotor **18** has a rotor core **18***a* and a plurality of permanent magnets **18***b*. The rotor core **18***a* is fixed to the rotary shaft **14**. The plurality of permanent magnets **18***b* are provided in the rotor core **18***a*. The stator **17** surrounds the rotor **18**. The stator **17** has a stator core **17***a* formed in a tubular shape and a motor coil **19**. The motor coil **19** is formed by being wound around the stator core **17***a*. A power is supplied to the motor coil **19** to rotate the rotor **18** and the rotary shaft **14** rotates integrally with the rotor **18**. The compression part **15** is driven with the rotation of the rotary shaft **14**. Thus, the motor **16** drives the compression part **15**.
[0019] The housing **11** has a suction port **13***h*. The suction port **13***h* is formed at a portion of the peripheral wall **13***b* near the end wall **13***a* in the motor housing **13**. The refrigerant is sucked into the motor housing **13** through the suction port **13***h*. A first end of an external refrigerant circuit **20** is connected to the suction port **13***h*. The housing **11** has a discharge port **12***h*. The discharge port **12***h* is formed in the discharge housing **12**. A second end of the external refrigerant circuit **20** is connected to the discharge port **12***h*.
[0020] The refrigerant sucked into the motor housing **13** from the first end of the external

refrigerant circuit **20** through the suction port **13***h* is compressed by the driving of the compression part **15**. The refrigerant compressed by the compression part **15** flows into the second end of the external refrigerant circuit **20** through the discharge port **12***h*. Then, the refrigerant that has flowed into the external refrigerant circuit **20** flows to a heat exchanger and an expansion valve of the external refrigerant circuit **20**, and then, returns into the motor housing **13** through the suction port **13***h*. The electric compressor **10** and the external refrigerant circuit **20** are a part of a vehicle air conditioner **21**.

[0021] The motor housing **13** has a protruding wall **22** and an extending wall **23**. The protruding wall **22** protrudes outward in a radial direction of the peripheral wall **13***b* from a portion of an outer peripheral surface of the peripheral wall **13***b* in the motor housing **13**. The protruding wall **22** is continuous with the end wall **13***a* of the motor housing **13** in the radial direction of the peripheral wall **13***b* of the motor housing **13**. A thickness direction of the protruding wall **22** coincides with a thickness direction of the end wall **13***a* of the motor housing **13**. The extending wall **23** is formed in a tubular shape extending from the outer peripheral portion of the protruding wall **22** and the outer peripheral portion of the end wall **13***a* of the motor housing **13** away from the peripheral wall **13***b*.

[0022] The electric compressor **10** includes a cover **24**. The cover **24** is a part of the housing **11**. That is, the housing **11** has the cover **24**. The cover **24** is formed in a plate shape. The cover **24** is connected to the extending wall **23** while covering an opening of the extending wall **23**. An inverter chamber **25** is defined by the end wall **13***a* of the motor housing **13**, the protruding wall **22**, the extending wall **23**, and the cover **24**. Thus, the inverter chamber **25** is defined by the housing **11**.

[0023] The protruding wall **22** has an attachment hole **26**. The attachment hole **26** extends through the protruding wall **22** in the thickness direction thereof. The attachment hole **26** is, at a first end thereof, opened in a surface of the protruding wall **22**, which is located far from the extending wall **23**. The attachment hole **26** is, at a second end thereof, opened to the inverter chamber **25**.

[0024] The electric compressor **10** includes a connector connecting portion **27**. The connector connecting portion **27** is formed in a tubular shape. The connector connecting portion **27** is made of resin. The connector connecting portion **27** is attached to the attachment hole **26**. A first end of the connector connecting portion **27** extends out through the attachment hole **26** to an outside of the housing **11**. A second end of the connector connecting portion **27** extends out through the attachment hole **26** into the inverter chamber **25**. The connector connecting portion **27** is of a female type, and an external connector **28** of a male type is connectable to the first end of the connector connecting portion **27**. The external connector **28** is electrically connected to a vehicle side low voltage battery, which is not illustrated. In addition, the external connector **28** is also electrically connected to a vehicle ECU as an upper-level ECU, which is not illustrated.

[0025] The electric compressor **10** includes leads **29**. The leads **29** are held by the connector connecting portion **27**. That is, the connector connecting portion **27** holds three leads **29**. The leads **29** are each formed in a rectangular plate shape. The leads **29** are held by the connector connecting portion **27** in a state where the leads **29** are arranged in a line. The leads **29** extend through the connector connecting portion **27**. A first end of each of the leads **29** is located inside the connector connecting portion **27** at the first end thereof. A second end of each of the leads **29** extends out through the second end of the connector connecting portion **27** into the inverter chamber **25**. When the external connector **28** is connected to the first end of the connector connecting portion **27**, the external connector **28** and the leads **29** are electrically connected to each other.

[0026] The electric compressor **10** includes an inverter **30**. The inverter **30** is accommodated in the inverter chamber **25**. That is, the inverter chamber **25** accommodates the inverter **30**. The inverter **30** drives the motor **16**. The compression part **15**, the motor **16**, and the inverter **30** are arranged in this order in the axial direction of the rotary shaft **14**.

[0027] The inverter **30** has, for example, a switching element that performs switching operation in order to drive the motor **16**, a filter element that reduces noise, and the like. In addition, the inverter **30** has, for example, a control circuit that controls the switching operation of the switching element.

<Circuit Board>
[0028] The inverter **30** has a circuit board **31**. The circuit board **31** is disposed in the inverter chamber **25** with a thickness direction of the circuit board **31** coinciding with the thickness direction of the end wall **13***a* of the motor housing **13** and the thickness direction of the protruding wall **22**. A part of the circuit board **31** is overlapped with the connector connecting portion **27** in the thickness direction of the circuit board **31**. The circuit board **31** has a first surface **31***a* and a second surface **31***b*. The first surface **31***a* is a surface of the circuit board **31** that is located near the connector connecting portion **27**. The second surface **31***b* is a surface that is located opposite to the first surface **31***a*. The second surface **31***b* faces the cover **24** in the thickness direction of the circuit board **31**.
<Circuit Pattern>
[0029] As illustrated in FIG. **2**, the circuit board **31** has a circuit pattern **32**. The circuit pattern **32** is formed on the circuit board **31**.
<Through Hole>
[0030] As illustrated in FIGS. **2** to **4**, the circuit board **31** has a through hole **33**. As illustrated in FIG. **2**, the through hole **33** is formed at a position in the circuit board **31** at which the through hole **33** is overlapped with the connector connecting portion **27** in the thickness direction of the circuit board **31**. The through hole **33** is, at a first end thereof, opened in the first surface **31***a* of the circuit board **31**. The through hole **33** is, at a second end thereof, opened in the second surface **31***b* of the circuit board **31**. As illustrated in FIGS. **3** and **4**, the through hole **33** has an elongated circular shape. A longitudinal direction of the through hole **33** coincides with a direction in which the three leads **29** are arranged.
<Connector>
[0031] As illustrated in FIGS. **2** to **4**, the inverter **30** has a connector **40**. The connector **40** is made of resin. The connector **40** is mounted on the circuit board **31**. The connector **40** has a case **41**. The case **41** has a case main body **42** and a protruding portion **43**. The case main body **42** is formed in a rectangular box shape.
[0032] As illustrated in FIG. **2**, connecting terminals **44** are accommodated in the case main body **42**. That is, the connecting terminals **44** are accommodated in the case **41**. Note that although the three connecting terminals **44** corresponding to the leads **29** are accommodated in the case main body **42**, one of the three connecting terminals **44** is illustrated in FIG. **2** for the sake of illustration. The connecting terminals **44** are electrically connected to the circuit pattern **32**.
[0033] The case main body **42** has a first wall **42***a* and a second wall **42***b*. The first wall **42***a* and the second wall **42***b* face each other. The first wall **42***a* faces the second surface **31***b* of the circuit board **31**. The second wall **42***b* is located opposite to the first wall **42***a* across the connecting terminals **44**. The case **41** is disposed on the circuit board **31** that is interposed between the case **41** and the connector connecting portion **27**.
[0034] The protruding portion **43** protrudes from the first wall **42***a*. As illustrated in FIGS. **3** and **4**, the protruding portion **43** is formed in a rectangular tubular shape. The protruding portion **43** is inserted in the through hole **33**. Specifically, the protruding portion **43** is inserted into the through hole **33** from a side opposite to the connector connecting portion **27** across the circuit board **31**. When the protruding portion **43** and the through hole **33** are viewed in a plan view, a longitudinal direction of the protruding portion **43** coincides with the longitudinal direction of the through hole **33**. A portion of the first wall **42***a* closes a gap **45** between the protruding portion **43** and the through hole **33**.
[0035] Three insertion ports **46** are opened in the protruding portion **43**. The insertion ports **46** are each formed in a quadrilateral shape. As illustrated in FIG. **2**, each of the insertion ports **46** is, at a first end thereof, opened in a surface of the protruding portion **43**, which is located far from the first wall **42***a*. Each of the insertion ports **46**, at a second end thereof, communicates with an inside of the case main body **42**. As illustrated in FIGS. **3** and **4**, the three insertion ports **46** are arranged in

the longitudinal direction of the protruding portion **43**. In each of the insertion ports **46**, inner surfaces defining the insertion port **46** are formed so as to be tapered surfaces such that an opening area of the insertion port **46** is gradually decreased as the inner surfaces extend from the surface of the protruding portion **43**, which is located far from the first wall **42***a*. Then, each of the insertion ports **46** guides the corresponding lead **29**, which is electrically connected to the corresponding connecting terminal **44**, toward the connecting terminal **44**. Thus, the insertion ports **46** are opened in the protruding portion **43** and the insertion ports **46** guide the leads **29**, which are electrically connected to the connecting terminals **44**, toward the connecting terminals **44**.

<Relationship Between Lead and Gap>

[0036] As illustrated in FIG. **3**, a dimension of the gap **45** between the protruding portion **43** and the through hole **33** is greater than a thickness T**1** of a portion of each of the leads **29**, which is inserted into the corresponding insertion port **46**. Note that a cross-sectional shape of the portion of each of the leads **29**, which is inserted into the insertion port **46**, is square. Here, the connector **40** is mounted on the circuit board **31** with some play, so that the dimension of the gap **45** between the protruding portion **43** and the through hole **33** changes according to a movement of the protruding portion **43** relative to the through hole **33**. At this time, even when the protruding portion **43** moves relative to the through hole **33**, there is always a portion of the gap **45** between the protruding portion **43** and the through hole **33** at which the dimension therebetween is greater than the thickness T**1** of each of the leads **29** around the entire circumference of the protruding portion **43**. Thus, the dimension of the gap **45** between the protruding portion **43** and the through hole **33** is greater than the thickness T**1** of each of the leads **29**.

<Hole>

[0037] As illustrated in FIG. **5**, three holes **47** for exposure are formed in the second wall **42***b* of the case main body **42**. The holes **47** extend through the second wall **42***b* of the case main body **42** in a thickness direction of the second wall **42***b*. The three holes **47** are arranged in a longitudinal direction of the case main body **42**. The holes **47** are each formed in a quadrilateral shape. As illustrated in FIG. **2**, each of the holes **47** is, at a first end thereof, opened to an inside of the case main body **42**. Each of the holes **47** is, at a second end thereof, opened to an outside of the case main body **42**. Each of the holes **47** is located at a position at which the hole **47** is overlapped with the corresponding insertion port **46** in the thickness direction of the circuit board **31**. With this configuration, the holes **47** are located opposite to the insertion ports **46** across the connecting terminals **44**.

[0038] As illustrated in FIGS. **2** and **5**, the second end of each of the leads **29** connected to the corresponding connecting terminal **44** extends out through the case main body **42** and the corresponding hole **47** to the outside of the case main body **42**. Accordingly, the leads **29** extend out through the holes **47**. With this configuration, the holes **47** through which the leads **29** are exposed are formed on a side of the case **41** opposite to the insertion ports **46** across the connecting terminals **44**.

Operation of Embodiment

[0039] The following will describe an operation of the present embodiment.

[0040] When the external connector **28** is connected to the connector connecting portion **27**, a low voltage power from the vehicle side low voltage battery is supplied to the circuit pattern **32** of the circuit board **31** through the external connector **28**, the leads **29**, and the connecting terminals **44**. This drives the inverter **30**. In addition, when the external connector **28** is connected to the connector connecting portion **27**, control signals from the vehicle ECU are input to the circuit pattern **32** of the circuit board **31** through the external connector **28**, the leads **29**, and the connecting terminals **44**.

[0041] Then, the inverter **30** controls the switching operation of the switching element based on the control signals from the vehicle ECU. As a result, the inverter **30** is driven based on the control signals from the vehicle ECU. The inverter **30** converts a DC power from a vehicle side high

voltage battery, which is not illustrated, to an AC power by the switching operation of the switching element. Then, the AC power is supplied to the motor **16** to drive the motor **16**. Thus, the inverter **30** converts the DC power to the AC power and supplies the AC power to the motor **16** to drive the motor **16**.

[0042] In such an electric compressor **10**, when each of the leads **29** is connected to the corresponding connecting terminal **44** in the case **41** through the corresponding insertion port **46**, the lead **29** may be accidentally inserted into a gap between the through hole **33** and the case **41** of the connector **40** instead of being inserted into the insertion port **46**. Specifically, when each of the leads **29** is connected to the corresponding connecting terminal **44** in the case **41** through the corresponding insertion port **46**, the lead **29** may be accidentally inserted into the gap **45** between the protruding portion **43** and the through hole **33** instead of being inserted into the insertion port **46**. At this time, a worker can find each of the leads **29** not to be connected to the corresponding connecting terminal **44** by checking that the lead **29** is not exposed from the holes **47**. In particular, since the case **41** closes the gap **45** between the protruding portion **43** and the through hole **33**, when each of the leads **29** is inserted into the gap **45** between the protruding portion **43** and the through hole **33** instead of being inserted into the corresponding insertion port **46**, the lead **29** comes in contact with the case **41**. Accordingly, the worker easily finds the accidental insertion of each of the leads **29**.

[0043] On the contrary, when each of the leads **29** is connected to the corresponding connecting terminal **44**, the lead **29** is exposed from the corresponding hole **47**. Thus, the worker can easily confirm that each of the leads **29** is connected to the corresponding connecting terminal **44**. In particular, each of the leads **29** extends out through the corresponding hole **47**, so that the worker further easily confirm that the lead **29** is connected to the connecting terminal **44** as compared with a case where the lead **29** do not extend out through the hole **47**.

Advantageous Effects of Embodiment

[0044] The above-described embodiment provides advantageous effects as follows.

[0045] (1) The holes **47** from which the leads **29** are exposed are formed on the side of the case **41** opposite to the insertion ports **46** across the connecting terminals **44**, so that when the leads **29** are connected to the connecting terminals **44**, the leads **29** are exposed from the holes **47**. Thus, the worker can easily confirm that the leads **29** are connected to the connecting terminals **44**.

[0046] (2) The dimension of the gap **45** between the protruding portion **43** and the through hole **33** is greater than the thickness T**1** of each of the leads **29**. Thus, even when the electric compressor **10** has a configuration in which the leads **29** are likely to be accidentally inserted into the gap **45** between the protruding portion **43** and the through hole **33**, when the leads **29** are connected to the connecting terminals **44**, the leads **29** are exposed from the holes **47**. Accordingly, even when the electric compressor **10** has the configuration in which the leads **29** are likely to be accidentally inserted into the gap **45** between the protruding portion **43** and the through hole **33**, the worker can easily confirm that the leads **29** are connected to the connecting terminals **44**.

[0047] (3) The case **41** closes the gap **45** between the protruding portion **43** and the through hole **33**. With this configuration, even when each of the leads **29** is accidentally inserted into the gap **45** between the protruding portion **43** and the through hole **33** instead of being inserted into the corresponding insertion port **46**, the lead **29** comes in contact with the case **41**. Accordingly, the worker easily finds the accidental insertion of each of the leads **29**.

[0048] (4) The leads **29** extend out through the holes **47**. With this configuration, the worker can further easily confirm that the leads **29** are connected to the connecting terminals **44** as compared with the case where the leads **29** do not extend out through the holes **47**. In particular, since the leads **29** extend out through the holes **47**, the worker can confirm that the leads **29** are connected to the connecting terminal **44** when viewed in a direction orthogonal to the thickness direction of the circuit board **31**. Accordingly, the worker can further easily confirm that the leads **29** are connected to the connecting terminals **44**.

[0049] (5) In each of the insertion ports **46**, the inner surfaces defining the insertion port **46** are formed so as to be the tapered surfaces such that the opening area of the insertion port **46** is gradually decreased as the inner surfaces extend from the surface of the protruding portion **43**, which is located far from the first wall **42***a*. With this configuration, while each of the leads **29** is guided by the inner surfaces defining the insertion port **46**, the lead **29** passes through the insertion port **46**. Accordingly, each of the leads **29** is easily guided toward the corresponding connecting terminal **44** due to the corresponding insertion port **46**. Thus, this configuration makes the work of connecting the lead **29** to the corresponding connecting terminals **44** easier.

Modification

[0050] The above-described embodiment may be modified as follows. The above-described embodiment and the following modifications may be combined with each other as long as they do not contradict each other.

[0051] In the embodiment, the dimension of the gap **45** between the protruding portion **43** and the through hole **33** may be equal to or less than the thickness T**1** of each of the leads **29**. For example, assume a case where the dimension of the gap **45** between the protruding portion **43** and the through hole **33** is less than the thickness T**1** of each of the leads **29**. Even in this case, when the leads **29** are connected to the connecting terminals **44** in the case **41** through the insertion ports **46**, each of the leads **29** may be inserted into the gap **45** between the protruding portion **43** and the through hole **33**. At this time, the worker can find each of the leads **29** not to be connected to the corresponding connecting terminal **44** by checking that the lead **29** is not exposed from the hole **47**. In addition, when the leads **29** are connected to the connecting terminals **44**, the leads **29** are exposed from the holes **47**. Thus, the worker can easily confirm that the leads **29** are connected to the connecting terminals **44**.

[0052] In the embodiment, the case **41** need not close the gap **45** between the protruding portion **43** and the through hole **33**.

[0053] In the embodiment, the leads **29** need not extend out through the holes **47**. Even in this case, the worker determines whether each of the leads **29** is exposed from the corresponding hole **47** when viewed in the thickness direction of the circuit board **31**. Then, when the leads **29** are exposed from the hole **47**, the worker determines that the leads **29** are connected to the connecting terminals **44**. Thus, the worker can easily confirm that the leads **29** are connected to the connecting terminals **44**.

[0054] In the embodiment, the inner surfaces defining each of the insertion ports **46** need not be formed so as to be the tapered surfaces such that the opening area of the insertion port **46** is gradually decreased as the inner surfaces extend from the surface of the protruding portion **43**, which is located far from the first wall **42***a*.

[0055] In the embodiment, a shape of the through hole **33** is not particularly limited. A shape of the protruding portion **43** may be changed as appropriate depending on the shape of the through hole **33**.

[0056] In the embodiment, the cross-sectional shape of the portion of each of the leads **29**, which is inserted into the corresponding insertion port **46**, is not limited to the square. For example, it may be circular or rectangular, for example. A shape of each of the insertion ports **46** may be changed as appropriate depending on the cross-sectional shape of the portion of the lead **29**, which is inserted into the insertion port **46**.

[0057] In the embodiment, the number of the leads **29** is not particularly limited. Note that the number of the insertion ports **46** and the number of the holes **47** are changed as appropriate depending on the number of the leads **29**.

[0058] In the embodiment, the external connector **28** that is connected to the connector connecting portion **27** may be a connector through which a high voltage DC power from the vehicle side high voltage battery is supplied to the inverter **30**.

[0059] In the embodiment, for example, the inverter chamber **25** may be defined by a tubular case

main body that is separately provided from the motor housing **13** and attached to the end wall **13***a* of the motor housing **13** and a cover member that covers an opening of the case main body.
[0060] In the embodiment, the electric compressor **10** may have a configuration in which for example, the inverter **30** is disposed outside the housing **11** in a radial direction of the rotary shaft **14**. In short, the compression part **15**, the motor **16**, and the inverter **30** need not be arranged in this order in the axial direction of the rotary shaft **14**.
[0061] In the embodiment, the compression part **15** is not limited to a scroll type compression part and may be a piston type compression part, a vane type compression part, a rotary type compression part, or the like, for example.
[0062] In the embodiment, the electric compressor **10** is a part of the vehicle air conditioner **21**; however, the present disclosure is not limited thereto. For example, the electric compressor **10** may be mounted on a fuel cell vehicle and the compression part **15** of such an electric compressor **10** may compress air as a fluid that is supplied to fuel cells.
Supplementary Notes
[0063] The following will describe technical ideas that can be obtained from the above-described embodiment and the modifications.
<Supplementary Note 1>
[0064] An electric compressor including: [0065] a compression part configured to compress a fluid; [0066] a motor configured to drive the compression part; and [0067] an inverter configured to drive the motor, [0068] the inverter having: [0069] a circuit board; and [0070] a connector mounted on the circuit board, the connector having a case in which a connecting terminal that is electrically connected to a circuit pattern formed on the circuit board is accommodated, [0071] the circuit board having a through hole, and [0072] the case having a protruding portion that is inserted into the through hole and in which an insertion port is opened, the insertion port guiding a lead that is electrically connected to the connecting terminal toward the connecting terminal, characterized in that [0073] a hole from which the lead is exposed is formed on a side of the case opposite to the insertion port across the connecting terminal.
<Supplementary Note 2>
[0074] The electric compressor according to supplementary note 1, characterized in that a dimension of a gap between the protruding portion and the through hole is greater than a thickness of the lead.
<Supplementary Note 3>
[0075] The electric compressor according to supplementary note 1 or 2, characterized in that the case closes the gap between the protruding portion and the through hole.
<Supplementary Note 4>
[0076] The electric compressor according to any one of supplementary notes 1 to 3, characterized in that the lead extends out through the hole.

Claims

1. An electric compressor comprising: a compression part configured to compress a fluid; a motor configured to drive the compression part; and an inverter configured to drive the motor, the inverter having: a circuit board; and a connector mounted on the circuit board, the connector having a case in which a connecting terminal that is electrically connected to a circuit pattern formed on the circuit board is accommodated, the circuit board having a through hole, and the case having a protruding portion that is inserted into the through hole and in which an insertion port is opened, the insertion port guiding a lead that is electrically connected to the connecting terminal toward the connecting terminal, wherein a hole from which the lead is exposed is formed on a side of the case opposite to the insertion port across the connecting terminal.
2. The electric compressor according to claim 1, wherein a dimension of a gap between the

protruding portion and the through hole is greater than a thickness of the lead.

3. The electric compressor according to claim 1, wherein the case closes the gap between the protruding portion and the through hole.

4. The electric compressor according to claim 1, wherein the lead extends out through the hole.