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(54) **MOTOR CONNECTOR AND MOTOR HAVING SAME**

MOTORVERBINDER UND MOTOR DAMIT

CONNECTEUR DE MOTEUR ET MOTEUR COMPORTANT LE CONNECTEUR DE MOTEUR

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Description

Technical Field

[0001] The teachings of this invention relate to a motor connector according to claim 1 and a motor having the same. The motor connector may be configured to be used for a dual clutch transmission improved in hermeticity (sealing, airtightness) by preventing introduction of moisture or foreign object from outside, and a motor having the motor connector.

Background Art

[0002] JP 2008 283816 A discloses a motor connector according to the preamble of claim 1.

[0003] In general, motors are used in various sectors of industrial fields. A type of motor, called a BLDC (Brushless DC) motor, is used for a DCT (Dual Clutch Transmission) applied to transmissions of a vehicle, electric propulsion engines and electric vehicles.

[0004] A motor used for DCT may include a connector in order to provide electricity or a control signal from outside to the motor.

[0005] A motor operated along with a vehicle under a harsh environment such as moisture and water on a road, and snows piled on a road and a connector mounted on a motor require high hermeticity characteristics and high airtightness against the moisture and humidity that may cause a motor with an erroneous operation by infiltration of moisture and humidity.

[0006] In general, a connector coupled to a motor used for a DCT may be indirectly measured in hermeticity and airtightness through an air leak test.

[0007] The air leak test for hermeticity characteristic and airtightness of a motor and connector may be implemented by measuring a degree of leaked air by providing air of a predetermined pressure into the motor and the connector coupled to the motor.

[0008] The air leak to be generated from a connector and a motor is largely generated by a difference of expansion coefficient between a terminal transmitting a power and sensing signal and a mold forming a body of connector, a difference of expansion coefficient between a cable sheath and a mold forming a body of a connector, and a difference of expansion coefficient between a core wire wrapped by the cable sheath and a mold forming a body of a connector.

[0009] Furthermore, the air leak to be generated from the connector and motor may be generated by a gap formed between a conductive wire of electric wire and insulation sheath.

[0010] When moisture or humidity is introduced through the connector by various reasons, the moisture or humidity introduced into the connector may cause an erroneous operation of motor.

[0011] JP 2015 149852 A relates to a rotating electric machine that rotates by a current supplied through a wir-

ing. DE 10 2015 211459 A1 discloses another motor.

Detailed Description of the Invention

5 Technical Subject

[0012] The present invention provides a motor connector configured to prevent an erroneous operation of motor by preventing introduction of humidity and moisture caused by a difference of expansion coefficient between a terminal transmitting a power and sensing signal and a mold forming a body of connector, a difference of expansion coefficient between a cable sheath and a mold forming a body of a connector, and a difference of expansion coefficient between a core wire wrapped by the cable sheath and a mold forming a body of a connector, and a motor having the motor connector.

[0013] Furthermore, the present invention provides a motor connector configured to prevent an erroneous operation of motor by preventing introduction of humidity and moisture by preventing formation of a gap between a conductive wire of a cable and an insulation sheath and a gap between an insulation sheath and a molding member.

25 Technical Solution

[0014] In one general aspect of the present invention, there is provided a motor connector according to claim 1.

[0015] Preferably, but not necessarily, the grommet may be formed with a cylindrical shape.

[0016] Preferably, but not necessarily, an internal diameter of grommet may be formed to be smaller by 60%~70% than an outer diameter of insulating sheath based on a center of electric wire.

[0017] Preferably, but not necessarily, the molding member may include any one of a rubber, an epoxy and a silicon having flexibility and adhesive property.

[0018] Preferably, but not necessarily, the first molding part may include a trench-type groove formed along an upper edge of the first molding part based on a center of the first molding part, and the groove is formed by being filled with the molding member formed in the second molding part.

[0019] Preferably, but not necessarily, the grommet may include any one of silicon and rubber.

[0020] Preferably, but not necessarily, the electric wire may include a plurality of electric source wires applied with an electric source, and a plurality of sensing wires inputted and outputted by a sensing signal.

[0021] Preferably, but not necessarily, the floor part may include a staircase formed by being upwardly protruded from an upper surface of floor part, and the floor part may include a terminal reception groove having a slit shape concavely formed at an upper surface of the staircase, and any one of the plurality of lateral wall parts may be formed with an electric wire reception groove disposed with the electric wire.

[0022] Preferably, but not necessarily, the lateral wall part of second molding part formed with the electric wire reception groove may be formed with a first coupling part coupled with the fixing member, and the fixing member may be formed with a second coupling part coupled with the first coupling part.

[0023] In another general aspect of the present invention, there is provided a motor, comprising: a motor connector according to claim 1.

[0024] A bearing is disposed at a center of the base and a motor body includes an axis coupled with the bearing.

Advantageous Effects

[0025] The motor connector and motor having the same can prevent an erroneous operation of motor by improving hermeticity (sealing) and airtightness despite a difference of expansion coefficient between a terminal transmitting a power and sensing signal and a mold forming a body of connector, a difference of expansion coefficient between a cable (electric wire) sheath and a mold forming a body of a connector, and a difference of expansion coefficient between a core wire wrapped by the cable sheath and a mold forming a body of a connector.

[0026] Furthermore, the present invention provides a motor connector configured to prevent an erroneous operation of motor by preventing introduction of humidity and moisture by preventing formation of a gap between a conductive wire of a cable and an insulation sheath, and a gap between an insulation sheath and a molding member.

Brief Description of Drawings

[0027]

FIG. 1 is a schematic perspective view of exterior look of motor connector according to an exemplary embodiment of present invention.

FIG. 2 is an exploded perspective view illustrating a cover of motor connector of FIG. 1.

FIG. 3 is a schematic perspective view illustrating a wiring unit of FIG. 2.

FIG. 4 is a perspective view illustrating a grommet according to an exemplary embodiment of present invention.

FIG. 5 is a cross-sectional view taken along line I-I' of FIG. 3.

FIG. 6 is a cross-sectional view illustrating an electric wire (cable), a grommet and a molding member.

FIG. 7 is a perspective view illustrating a base of

FIG. 2.

FIG. 8 is a perspective view illustrating a disengagement prevention protrusion formed on a base.

FIG. 9 is a perspective view illustrating a fixing member according to an exemplary embodiment of present invention.

FIG. 10 is a plane view illustrating a wiring unit, an electric wire and a fixing member being coupled.

FIG. 11 is an exploded view of a motor having a motor connector according to an exemplary embodiment of present invention.

BEST MODE

[0028] The present invention to be explained hereunder may have various variations, and exemplary embodiments, and particular exemplary embodiments will be exemplified through drawings and explained in detail in the detailed description of the present invention.

[0029] The present subject matter may, however, be embodied in many different forms and modifications, and should not be construed as limited to the specific embodiments set forth herein. It will be appreciated that the described aspect is intended to embrace all such alterations, modifications, and variations that fall within the scope of the invention as defined in claim 1. Accordingly, in describing the present invention, detailed descriptions of well-known art may be omitted to avoid obscuring appreciation of the invention.

[0030] As used herein, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises," "includes" and/or "comprising," "including" when used in this specification, specify the presence of stated features, integers, Steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0031] It will be understood that, although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another.

[0032] FIG. 1 is a schematic perspective view of exterior look of motor connector according to an exemplary embodiment of present invention, and FIG. 2 is an exploded perspective view illustrating a cover of motor connector of FIG. 1.

[0033] Referring to FIGS. 1 and 2, a motor connector (800) includes a wiring unit (100), a base (200), a fixing member (300) and a molding member (400). In addition, the motor connector (800) may further include a cover (500) coupled with the base (200).

[0034] FIG. 3 is a schematic perspective view illustrating a wiring unit of FIG. 2.

[0035] Referring to FIG. 3, the wiring unit (100) includes an electric wire (110), a terminal (120) and a grommet (150).

[0036] The electric wire (110) includes an insulating sheath (114) and a conductive wire (112, or core wire) wrapped by the insulating sheath (114), and a distal end of the insulating sheath (114) may be removed from the conductive wire (112) and as a result, the distal end of the insulating sheath (114) may be exposed to outside.

[0037] The terminal (120) is electrically connected to a distal end of the conductive wire (112) exposed by the insulating sheath (114). For example, the terminal (120) may be connected to the conductive wire (112) exposed by the insulating sheath (114) by a clamping method. Alternatively, the terminal (120) and the conductive wire (112) may be electrically connected by various methods including welding and coupling.

[0038] The terminal (120) may be manufactured with a conductive material, for example, and a distal end of terminal (120) may be formed with a ring-shaped or bent shaped terminal part (122). The distal end of terminal (120) is electrically connected to a terminal part of motor.

[0039] In an exemplary embodiment of the present invention, the wiring unit (100) including the electric wire (110) and the terminal (120) may be classified to an electric power source wire (130) and a sensing wire (140) depending on types of applied signals.

[0040] The electric power source wire (130) may provide an electric power to the motor, and the sensing wire (140) may input or output a control signal or a sensing signal.

[0041] In an exemplary embodiment of present invention, the electric power source wire (130) may be formed with three pieces to allow being applied with a 3-phase electric power, for example, and the sensing wire (140) may be formed with 5 pieces, for example.

[0042] The electric wire (110) of wiring unit (100) includes a conductive wire (112) and an insulating sheath (114), where, when there is formed a fine gap between the conductive wire (112) and the insulating sheath (114), moisture or humidity may be introduced through the gap formed between the conductive wire (112) and the insulating sheath (114).

[0043] Moreover, the insulating sheath (114) of electric wire (110) is used with a PE (Polyethylene) resin excellent in insulation and durability, and the PE resin is poor in adhesive property unlike the other resins, and when there is no adhesive property on the molding member (400), there may be generated a gap between the molding member (400) and the insulating sheath (114) due to there being no adhesiveness with the molding member (400) to thereby allow introducing the moisture or humidity.

[0044] A grommet (150, described later) is coupled to the insulating sheath (114) of electric wire (110) in order to prevent moisture or humidity from being introduced

through a gap to be possibly formed between the insulating sheath (114) and the conductive wire (112) and a gap to be possibly formed between the molding member (400) and insulating sheath (114).

[0045] FIG. 4 is a perspective view illustrating the grommet 150, FIG. 5 is a cross-sectional view taken along line I-I' of FIG. 3, and FIG. 6 is a cross-sectional view illustrating the electric wire (cable) (110), the grommet 150 and a molding member 400.

[0046] Referring to FIGS. 4, 5, and 6, the grommet (150) is formed in a shape by being inserted into an outside of the insulating sheath (114). For example, when a cross-section of the electric wire (110) including the insulating sheath (114) and the conductive wire (112) is formed in a round shape, the grommet (150) may be also formed in a cylindrical shape, for example.

[0047] Although the exemplary embodiment of present invention has illustrated and explained that the grommet (150) is formed in a cylindrical shape, alternatively, the grommet (150) may be formed in various 3D shape formed with a hollow hole thereinside.

[0048] The grommet (150) may be manufactured with a silicon material or rubber material having a low hardness and having an excellent shrinkage force, and the grommet (150) may be used with various materials that may be shrunken or deformed by pressure applied from outside. The grommet (150) prevents humidity and moisture from penetrating between the insulating sheath (114) and conductive wire (112) by removing a gap existing between the insulating sheath (114) and conductive wire (112) by locally applying a pressure to the insulating sheath (114) of electric wire (110).

[0049] In order to allow the grommet (150) to locally apply a pressure to the insulating sheath (114) of electric wire (110), an internal diameter of grommet before the grommet (150) is coupled with the insulating sheath (114) of electric wire (110) is formed to be smaller than an outer diameter (or diameter of outside) of insulating sheath. The internal diameter of grommet (150) may be formed to be smaller by 60%~70% than an outer diameter of insulating sheath (114) of electric wire (110). For example, when an outer diameter of insulating sheath (150) is $\Phi 2\text{mm}$, an internal diameter of grommet (150) may be $\Phi 1.2\text{mm} \sim \Phi 1.5\text{mm}$.

[0050] FIG. 6 is a cross-sectional view illustrating an electric wire (cable), a grommet and a molding member.

[0051] Referring to FIG. 6, when the molding member (400, described later) is injected on the outside of grommet (150), according to the invention the grommet (150) is compressed by the injection pressure of molding member (400) to apply a pressure to the insulating sheath (114) of electric wire (110) with bad adhesive force whereby a gap formed between the insulating sheath (114) and the grommet (150), and a gap formed between the grommet (150) and the molding member (400) can be removed to prevent humidity and moisture from being introduced.

[0052] FIG. 7 is a perspective view illustrating a base

of FIG. 2.

[0053] Referring to FIG. 7, the base (200) includes the first molding part (210) and the second molding part (220). The first molding part (210) is a portion coupled with an axis of motor, and is formed at a center with a through hole (212) to mount a bearing coupled with the axis of motor. The first molding part (210) may be manufactured with various shapes, but the first molding part (210) according to an exemplary embodiment of present invention may be formed with a short cylindrical shape.

[0054] Three holes (214) passing through the first molding part (210), each spaced apart at an equidistance, may be formed about the through hole (212) of the first molding part (210), for example. The said three holes (214) formed around the through hole (212) of first molding part (210) may be respectively disposed with a terminal part (122) of terminal (120).

[0055] Meantime, an upper surface of first molding part (210) may be formed with a trench-shaped groove (216) along an edge of the upper surface.

[0056] The second molding part (220) is formed by being extended outside of first molding part (210).

[0057] The second molding part (220) provides a reception space fixing and accommodating portions of electric wire (110) and terminal (120) illustrated in FIG. 3, and accommodating a molding member (400, see FIG. 2) that prevents moisture and humidity from being introduced into the first molding part (210) from the second molding part (220) and the grommet (150).

[0058] The second molding part (220) includes a floor part (222) and a lateral wall part (224) in order to form the reception space.

[0059] The floor part (222) of second molding part (220) is formed with a plate shape and outwardly extended from the first molding part (210). In the exemplary embodiment of the present invention, the floor part (222) of second molding part (220) may be formed with a staircase (stepped portion) having a height difference.

[0060] An area, where a height is relatively higher on the floor part (222) formed with the staircase, may be formed with a terminal reception groove (223) to a direction facing to a lower surface from an upper surface.

[0061] The terminal reception groove (223) may be formed with a slip shape, for example, and inserted into the terminal (120), where the terminal (120) inserted into the terminal reception groove (223) may not horizontally move inside the second molding part (220).

[0062] Although the terminal (120) inserted into the terminal reception groove (223) may not horizontally move inside the second molding part (220), the terminal (120) may still move to a vertical direction inside the second molding part (220).

[0063] FIG. 8 is a perspective view illustrating a disengagement prevention protrusion formed on a base.

[0064] Referring to FIG. 8, in the exemplary embodiment of present invention, a disengagement prevention protrusion (223a) may be formed an inner lateral surface formed by the terminal reception groove (223) in order

to prevent the terminal (120) inserted into the terminal reception groove (223) from vertically moving inside the terminal reception groove (223).

[0065] The disengagement prevention protrusion (223a) may prevent the terminal (120) from vertically moving inside the terminal reception groove (223) by pressing an upper surface of terminal (120) inserted into the terminal reception groove (223), for example. The disengagement prevention protrusion (223a) may help allow the terminal (120) to be smoothly inserted into the terminal reception groove (223), and, after the terminal (120) is inserted into the terminal reception groove (223), a lateral surface of disengagement prevention protrusion (223a) may be slantly formed relative to an inner lateral surface formed by the terminal reception groove (223) in order to prevent the terminal (120) from arbitrarily being disengaged, and a lower surface of disengagement prevention protrusion (223a) may be formed in parallel with the floor part (222).

[0066] Referring to FIG. 7 again, the lateral wall surfaces (224) of second molding part (220) includes a first lateral wall part (224a), a second lateral wall part (224b) and a third lateral wall part (224c).

[0067] The first to third lateral wall parts (224a, 224b, 224c) are respectively extended from an edge of floor part (222) toward an upper surface, and the reception space is formed inside of the second molding part (220) by the first to third lateral wall parts (224a, 224b, 224c) and the floor part (222).

[0068] Distal ends of first and second lateral wall parts (224a, 224b) contacting the third lateral wall part (224c) may be respectively formed with a first coupling part (225). Each of the first coupling parts (225) may take a protruding pillar shape, for example, and may be coupled to a fixing member (300, described later).

[0069] The third lateral wall part (224c) is formed with an electric wire reception groove (226) in order to prevent interference with the electric wire (110) of wiring unit (100) illustrated in FIG. 3.

[0070] The size and depth of electric wire reception groove (226) may be formed to correspond to a diameter of electric wire (110), and the electric wire reception groove (226) may be differently formed depending on the diameter of electric wire (110).

[0071] A blocking wall (218) may be formed between the first and second molding parts (210, 220) in order to prevent the molding member (400) from being excessively leaked, and the blocking wall (218) may be formed with a groove to prevent the interference with the terminal (120) according to an exemplary embodiment of present invention.



[0072] FIG. 9 is a perspective view illustrating a fixing member according to an exemplary embodiment of present invention, and FIG. 10 is a plane view illustrating a wiring unit, an electric wire and a fixing member being coupled.

[0073] Referring to FIGS. 9 and 10, the fixing member (300) prevents the insulating sheath (112) from being

disengaged from the third lateral wall part (224c) of second molding part (220) by pressing the insulating sheath (112) in the wiring unit (100) inserted into the second molding part (220), and allows forming the reception space inside the second molding part (220). Although the exemplary embodiment of the present invention has illustrated and explained that the fixing member (300) presses the insulating sheath (112), the fixing member (300) may be coupled with the grommet (150) coupled to the insulating sheath (112).

[0074] The fixing member (300) may be formed with a rod shape corresponding to that of the third lateral wall part (224c).

[0075] For example, a lower surface facing the third lateral wall part (224c) on the rod-shaped fixing member

(300) may be formed with a concave/convex () part (310) that presses the insulating sheath (112) of electric wire (110). The length of the concave/convex () part (310) formed at the fixing member (300) may be differently formed depending on a diameter of the electric wire (110).

[0076] The fixing member (300) may be formed with a second coupling part (320) formed on the second molding part (220) and coupled to the first coupling part (225) illustrated in FIG. 7.

[0077] The first coupling part (225) formed on the second molding part (220) according to an exemplary embodiment of present invention may be formed with a pillar shape, for example, and the second coupling part (320) formed on the fixing member (300) may be formed with a groove or a hole shape coupled by being inserted into the first coupling part (225).

[0078] Although the exemplary embodiment of present invention has illustrated and explained that the first coupling part (225) is formed with a pillar shape, and the second coupling part (320) is formed with a groove or a hole shape, alternatively, it may be possible that the first coupling part (225) is formed with a groove or a hole shape, and the second coupling part (320) is formed with a pillar shape.

[0079] Referring to FIG. 2 again, the molding member (400) is filled in the reception space formed on the second molding part (220) to prevent moisture or humidity from being introduced into the first molding part (210) through the second molding part (220).

[0080] The molding member (400) may be formed by an LSR (Liquid Silicon Rubber) injection method, for example.

[0081] A material to form the molding member (400) may be used with a material having flexibility (or elasticity) and adhesive physical property when cured after being injected in a liquid state.

[0082] For example, a material useable for the molding member (400) may be one of rubber material, an epoxy material and silicon material that has flexibility and adhesive physical property when cured after being injected

in a liquid state.

[0083] According to the present invention, when the molding member (400) is formed inside a reception space formed at the second molding part (220), the molding member (400) can prevent the degradation in sealing performances, despite a difference of expansion coefficient between the insulating sheath (112) and second molding part (220), a difference of expansion coefficient between the conductive wire (114) and the second molding part (220) and a difference of expansion coefficient between the terminal (120) and the second molding part (220), and even if the adhesive performance between the grommet (150) and insulating sheath (114), because the molding member (400) respectively encompasses a joined area between the insulating sheath (112) of electric wire (110), the conductive wire (114) of electric wire (110) and the conductive wire (114) and the terminal (120).

[0084] Particularly, the molding member (400), when having both flexibility and adhesive physical property, may prevent generation of gaps caused by deviation of expansion coefficient from various areas, whereby introduction of moisture or humidity into the first molding part (210) through the second molding part (220) can be fundamentally prevented.

[0085] Meantime, in the exemplary embodiment of present invention, a portion of molding member (400) is also provided with a trench-shaped groove (216) when the molding member (400) is formed on the second molding member (220) using an LSR injection method, and the molding member (400) provided with the trench-shaped groove (216) may function as a molding ring (or O-ring).

[0086] Thus, the number of parts for assembly and the number of assembly processes may be reduced, because a separate molding ring is dispensed with by providing a portion of molding member (400) to the trench-shaped groove (216) formed on the first molding part (210).

[0087] FIG. 11 is an exploded view of a motor having a motor connector according to an exemplary embodiment of present invention.

[0088] The motor connector of a motor illustrated in FIG. 11 may have a substantially same configuration as that of the motor connector illustrated in the previous FIGS. 1-10. Thus, like numbers refer to like elements throughout and explanations that duplicate one another will be omitted.

[0089] Referring to FIG. 11, the motor (900) comprises a bearing (850), a motor connector (800) and a motor body (870).

[0090] The base (200) of motor connector (800) is coupled by the bearing (850).

[0091] The motor body (870) includes a rotation shaft (872), a rotor rotating the rotation shaft (872) and a stator wrapping the rotor, and an upper end of motor body (870) may be formed with a coupling part (874) coupled to the base (200) of motor connector (800).

[0092] The coupling part (874) functions to prevent introduction of moisture or foreign object from outside when coupled with the base (200).

[0093] As explained in detail from the foregoing discussion, the present invention can improve hermeticity and airtightness and prevent an erroneous operation of motor, despite a difference of expansion coefficient between a terminal transmitting a power and sensing signal and a mold forming a body of connector, a difference of expansion coefficient between a cable sheath and a mold forming a body of a connector, and a difference of expansion coefficient between a core wire wrapped by the cable sheath and a mold forming a body of a connector, and a motor having the motor connector.

[0094] Furthermore, the present invention provides a motor connector configured to prevent an erroneous operation of motor by preventing introduction of humidity and moisture by preventing formation of a gap between a conductive wire of a cable and an insulation sheath, and a gap between an insulation sheath and a molding member.

[0095] Meantime, the exemplary embodiments disclosed in the drawings have been provided to assist in a comprehensive understanding of the embodiments of the invention.

Industrial Applicability

[0096] The present invention may be applicable to a connector applied to a motor used for a DCT (Dual Clutch Transmission) and to the DCT.

Claims

1. A motor connector (800), comprising:

a wiring unit (100), which includes an electric wire (110) having an insulating sheath (114) and a conductive wire (112), and a terminal (120) coupled to the conductive wire (112) and having the terminal (120) formed at an end thereof;
a base (200) including a first molding part (210), configured to be coupled to an axis of a motor (900), the axis defining an axial direction, and in which the terminal (120) is arranged, and a second molding part (220) extending radially outside from the first molding part (210) and having a reception space for accommodating the conductive wire (112) and a part of the insulating sheath (114), wherein the first molding part (210) is formed at a center thereof with a through hole (212), in which a bearing (850) is mounted that is coupleable to the axis of the motor (900);
a fixing member (300) coupled to the second molding part (220), and fixing the sheath (114),
a grommet (150) arranged in the reception space and coupled with the insulating sheath

(114) to an outer surface of the electric wire (110) so as to press the electric wire (110), wherein an internal diameter of the uncoupled grommet (150) is formed to be smaller than an outer diameter of insulating sheath (114) based on a center of electric wire (110),

characterized in that

the second molding part includes a floor part (222) and lateral wall parts (224a, 224b, 224c) extending from the floor part (222) and the reception space is formed inside of the second molding part (220) by the floor part (222), the lateral wall parts (224a, 224b, 224c) and the fixing member (300) which prevents the insulating sheath (112) from being disengaged from one (224c) of the lateral wall parts,
a molding member (400) is filled and molded in the reception space formed on the second molding part (220) and configured to prevent moisture or humidity from being introduced into the first molding part (210) through the second molding part (220), wherein the grommet (150) is pressed by the molding member (400) to have a shrinkage force.

2. The motor connector (800) of claim 1, wherein the grommet (150) is formed with a cylindrical shape.
3. The motor connector (800) of claim 1, wherein the grommet (150) is formed therein with a hole, and the grommet (150) encompasses an outer surface of the sheath (114).
4. The motor connector (800) of claim 1, wherein an internal diameter of the uncoupled grommet (150) is formed to be smaller by 60%~70% than an outer diameter of the insulating sheath (114) based (200) on a center of electric wire (114).
5. The motor connector (800) of claim 1, wherein the molding member encompasses an outer surface of grommet (150).
6. The motor connector (800) of claim 1, wherein the molding member includes any one of a rubber, an epoxy and a silicon having flexibility and adhesive property.
7. The motor connector (800) of claim 1, wherein the first molding part (210) includes a trench-type groove (216) formed along an upper edge of the first molding part (210) based on a center of the first molding part (210), and the groove (216) is formed by being filled with the molding member formed in the second molding part (220).
8. The motor connector (800) of claim 1, wherein the fixing member (300) is coupled to the grommet (150).

9. The motor connector (800) of claim 1, wherein the grommet (150) includes any one of silicon and rubber.
10. The motor connector (800) of claim 1, wherein the electric wire (110) includes a plurality of electric source wires (130) applied with an electric source, and a plurality of sensing wires (140) inputted and outputted by a sensing signal.
11. The motor connector (800) of claim 1, wherein the floor part (222) includes a staircase formed by being upwardly protruded from an upper surface of floor part (222), and the floor part (222) includes a terminal reception groove (223) having a slit shape concavely formed at an upper surface of the staircase, and any one of the plurality of lateral wall parts (224) is formed with an electric wire reception groove (226) disposed with the electric wire (110).
12. The motor connector (800) of claim 11, wherein the lateral wall part (224) of second molding part (220) formed with the electric wire reception groove (226) is formed with a first coupling part (225) coupled with the fixing member (300), and the fixing member (300) is formed with a second coupling part (320) coupled with the first coupling part (225).
13. A motor, comprising:
- a motor connector according to claim 1,
 - a bearing (850) disposed at a center of the base (200); and
 - a motor body (870) including an axis coupled with the bearing (850).

Patentansprüche

1. Motorverbinder (800), umfassend:

eine Verdrahtungseinheit (100), die einen elektrischen Draht (110), der eine isolierende Hülle (114) und einen leitfähigen Draht (112) aufweist, und eine Klemme (120) einschließt, die mit dem leitfähigen Draht (112) gekoppelt ist, und die Klemme (120) aufweist, die an einem Ende davon ausgebildet ist;

eine Basis (200), die ein erstes Formteil (210), das konfiguriert ist, um mit einer Achse eines Motors (900) gekoppelt zu werden, wobei die Achse eine axiale Richtung definiert, und in dem die Klemme (120) eingerichtet ist, und ein zweites Formteil (220) einschließt, das sich radial außerhalb des ersten Formteils (210) erstreckt und einen Aufnahmeraum zum Unterbringen des leitfähigen Drahtes (112) und einen Teil der isolierenden Hülle (114) aufweist, wobei das

erste Formteil (210) an einer Mitte davon mit einem Durchgangsloch (212) ausgebildet ist, in dem ein Lager (850) montiert ist, das mit der Achse des Motors (900) koppelbar ist;

ein Befestigungselement (300), das mit dem zweiten Formteil (220) gekoppelt ist und die Hülle (114) befestigt,

eine Tülle (150), die in dem Aufnahmeraum eingerichtet und mit der isolierenden Hülle (114) mit einer Außenoberfläche des elektrischen Drahtes (110) gekoppelt ist, um den elektrischen Draht (110) zu drücken, wobei ein Innendurchmesser der entkoppelten Tülle (150) ausgebildet ist, um kleiner als ein Außendurchmesser der isolierende Hülle (114) zu sein, basierend auf einer Mitte des elektrischen Drahtes (110),

dadurch gekennzeichnet, dass

das zweite Formteil einen Bodenteil (222) und seitliche Wandteile (224a, 224b, 224c) einschließt, die sich von dem Bodenteil (222) erstrecken, und der Aufnahmeraum innerhalb des zweiten Formteils (220) durch den Bodenteil (222), die seitlichen Wandteile (224a, 224b, 224c) und das Befestigungselement (300) ausgebildet ist, wobei verhindert wird, dass die isolierende Hülle (112) von einem (224c) der seitlichen Wandteile gelöst wird,

ein Formelement (400) gefüllt und in dem Aufnahmeraum geformt wird, das an dem zweiten Formteil (220) ausgebildet ist und konfiguriert ist, um zu verhindern, dass Feuchtigkeit oder Feuchtigkeit durch das zweite Formteil (220) in das erste Formteil (210) eingeführt wird,

wobei die Tülle (150) durch das Formelement (400) gedrückt wird, um eine Schrumpfkraft aufzuweisen.

2. Motorverbinder (800) nach Anspruch 1, wobei die Tülle (150) mit einer zylindrischen Form ausgebildet ist.
3. Motorverbinder (800) nach Anspruch 1, wobei die Tülle (150) darin mit einem Loch ausgebildet ist und die Tülle (150) eine Außenoberfläche der Hülle (114) umgibt.
4. Motorverbinder (800) nach Anspruch 1, wobei ein Innendurchmesser der entkoppelten Tülle (150) ausgebildet ist, um 60%~70% kleiner als ein Außendurchmesser der isolierenden Hülle (114) zu sein, basierend (200) auf einer Mitte des elektrischen Drahtes (114).
5. Motorverbinder (800) nach Anspruch 1, wobei das Formelement eine Außenoberfläche der Tülle (150) umgibt.

6. Motorverbinder (800) nach Anspruch 1, wobei das Formelement ein beliebiges von einem Kautschuk, einem Epoxid und einem Silizium einschließt, der/das Flexibilität und eine Hafteneigenschaft einschließt.
7. Motorverbinder (800) nach Anspruch 1, wobei das erste Formteil (210) eine schlitzartige Rille (216) einschließt, die entlang einer Oberkante des ersten Formteils (210) basierend auf einer Mitte des ersten Formteils (210) ausgebildet ist, und die Rille (216) dadurch ausgebildet ist, dass sie mit dem Formelement gefüllt wird, das in dem zweiten Formteil (220) ausgebildet ist.
8. Motorverbinder (800) nach Anspruch 1, wobei das Befestigungselement (300) mit der Tülle (150) gekoppelt ist.
9. Motorverbinder (800) nach Anspruch 1, wobei die Tülle (150) ein beliebiges von Silizium und Kautschuk einschließt.
10. Motorverbinder (800) nach Anspruch 1, wobei der elektrische Draht (110) eine Vielzahl von Drähten (130) einer elektrischen Quelle, die mit einer elektrischen Quelle angewendet werden, und eine Vielzahl von Sensorleitungen (140) einschließt, die ein Sensorsignal eingeben und ausgeben.
11. Motorverbinder (800) nach Anspruch 1, wobei der Bodenteil (222) eine Treppe einschließt, die dadurch ausgebildet ist, dass er nach oben von einer Oberseite des Bodenteils (222) herausragt, und der Bodenteil (222) eine Klemmaufnahmerille (223) einschließt, die eine Schlitzform aufweist, die konkav an einer Oberseite der Treppe ausgebildet ist, und wobei ein beliebiger der Vielzahl von seitlichen Wandteilen (224) mit einer Aufnahmerille (226) des elektrischen Drahtes ausgebildet ist, die mit dem elektrischen Draht (110) angeordnet ist.
12. Motorverbinder (800) nach Anspruch 11, wobei der seitliche Wandteil (224) des zweiten Formteils (220), das mit der Aufnahmerille (226) des elektrischen Drahtes ausgebildet ist, mit einem ersten Kopplungsteil (225) ausgebildet ist, das mit dem Befestigungselement (300) gekoppelt ist, und das Befestigungselement (300) mit einem zweiten Kopplungsteil (320) ausgebildet ist, das mit dem ersten Kopplungsteil (225) gekoppelt ist.
13. Motor, umfassend:
- einen Motorverbinder nach Anspruch 1,
- ein Lager (850), das in einer Mitte der Basis (200) angeordnet ist; und
- einen Motorkörper (870), der eine Achse ein-

schließt, die mit dem Lager (850) gekoppelt ist.

Revendications

1. Connecteur de moteur (800) comprenant:

une unité de câblage (100), qui inclut un fil électrique (110) ayant une gaine isolante (114) et un fil conducteur (112), et une borne (120) couplée au fil conducteur (112) et ayant la borne (120) formée à une extrémité de celle-ci;

une base (200) incluant une première partie de moulage (210), configurée de manière à être couplée à un axe d'un moteur (900), l'axe définissant une direction axiale, et dans lequel la borne (120) est disposée, et une seconde partie de moulage (220) s'étendant radialement vers l'extérieur depuis la première partie de moulage (210) et ayant un espace de réception pour recevoir le fil conducteur (112) et une partie de la gaine isolante (114), dans lequel la première partie de moulage (210) est formée en son centre avec un trou traversant (212), dans lequel un palier (850) est monté et peut être couplé à l'axe du moteur (900);

un élément de fixation (300) couplé à la seconde partie de moulage (220) et fixant la gaine (114);

un passe-fil (150) disposé dans l'espace de réception et couplé avec la gaine isolante (114) à une surface extérieure du fil électrique (110) de manière à presser le fil électrique (110), dans lequel un diamètre interne du passe-fil non-couplé (150) est formé pour être plus petit qu'un diamètre extérieur de la gaine isolante (114) sur la base d'un centre du fil électrique (110),

caractérisé en ce que

la seconde partie de moulage inclut une partie de plancher (222) et des parties de parois latérales (224a, 224b, 224c) s'étendant depuis la partie de plancher (222) et l'espace de réception est formé à l'intérieur de la seconde partie de moulage (220) par la partie de plancher (222), les parties de parois latérales (224a, 224b, 224c) et l'élément de fixation (300) qui empêche la gaine isolante (112) d'être désengagée de l'une (224c) des parties de parois latérales,

un élément de moulage (400) est rempli et moulé dans l'espace de réception formé sur la seconde partie de moulage (220) et configuré pour empêcher l'humidité d'être introduite dans la première partie de moulage (210) à travers la seconde partie de moulage (220),

dans lequel le passe-fil (150) est pressé par l'élément de moulage (400) pour avoir une force de rétraction.

2. Connecteur de moteur (800) selon la revendication

- 1, dans lequel le passe-fil (150) est formé avec une forme cylindrique.
3. Connecteur de moteur (800) selon la revendication 1, dans lequel le passe-fil (150) est formé dans celui-ci avec un trou, et le passe-fil (150) englobe une surface extérieure de la gaine (114). 5
 4. Connecteur de moteur (800) selon la revendication 1, dans lequel un diamètre interne du passe-fil non-couplé (150) est formé pour être plus petit de 60%~70% qu'un diamètre externe de la gaine isolante (114) sur la base (200) d'un centre de fil électrique (114). 10
 5. Connecteur de moteur (800) selon la revendication 1, dans lequel l'élément de moulage englobe une surface externe du passe-fil (150). 15
 6. Connecteur de moteur (800) selon la revendication 1, dans lequel l'élément de moulage inclut l'un quelconque d'un caoutchouc, d'un époxy et d'un silicone ayant une flexibilité et une propriété adhésive. 20
 7. Connecteur de moteur (800) selon la revendication 1, dans lequel la première partie de moulage (210) inclut une rainure de type tranchée (216) formée le long d'un bord supérieur de la première partie de moulage (210) sur la base d'un centre de la première partie de moulage (210), et la rainure (216) est formée en étant remplie par l'élément de moulage formé dans la seconde partie de moulage (220). 25 30
 8. Connecteur de moteur (800) selon la revendication 1, dans lequel l'élément de fixation (300) est couplé au presse-fil (150). 35
 9. Connecteur de moteur (800) selon la revendication 1, dans lequel le passe-fil (150) inclut l'un quelconque du silicone et du caoutchouc. 40
 10. Connecteur de moteur (800) selon la revendication 1, dans lequel le fil électrique (110) inclut une pluralité de fils de source électrique (130) appliqués avec une source électrique, et une pluralité de fils de détection (140) par lesquels entre et sort un signal de détection. 45
 11. Connecteur de moteur (800) selon la revendication 1, dans lequel la partie de plancher (222) inclut un escalier formé en faisant saillie vers le haut depuis une surface supérieure de la partie de plancher (222), et la partie de plancher (222) inclut une rainure de réception de borne (223) ayant une forme de fente formée de manière concave au niveau d'une surface supérieure de l'escalier, et l'une quelconque de la pluralité de parties de paroi latérale (224) est formée avec une rainure de réception de fil électrique (226) 50 55

disposée avec le fil électrique (110).

12. Connecteur de moteur (800) selon la revendication 11, dans lequel la partie de paroi latérale (224) de la seconde partie de moulage (220) formée avec la rainure de réception de fil électrique (226) est formée avec une première partie d'accouplement (225) couplée avec l'élément de fixation (300), et l'élément de fixation (300) est formé avec une seconde partie d'accouplement (320) couplée avec la première partie d'accouplement (225). 5

13. Moteur comprenant:

un connecteur de moteur selon la revendication 1, un palier (850) disposé au centre de la base (200); et un corps de moteur (870) incluant un axe couplé avec le palier (850). 10 15 20 25 30 35 40 45 50 55

FIG1

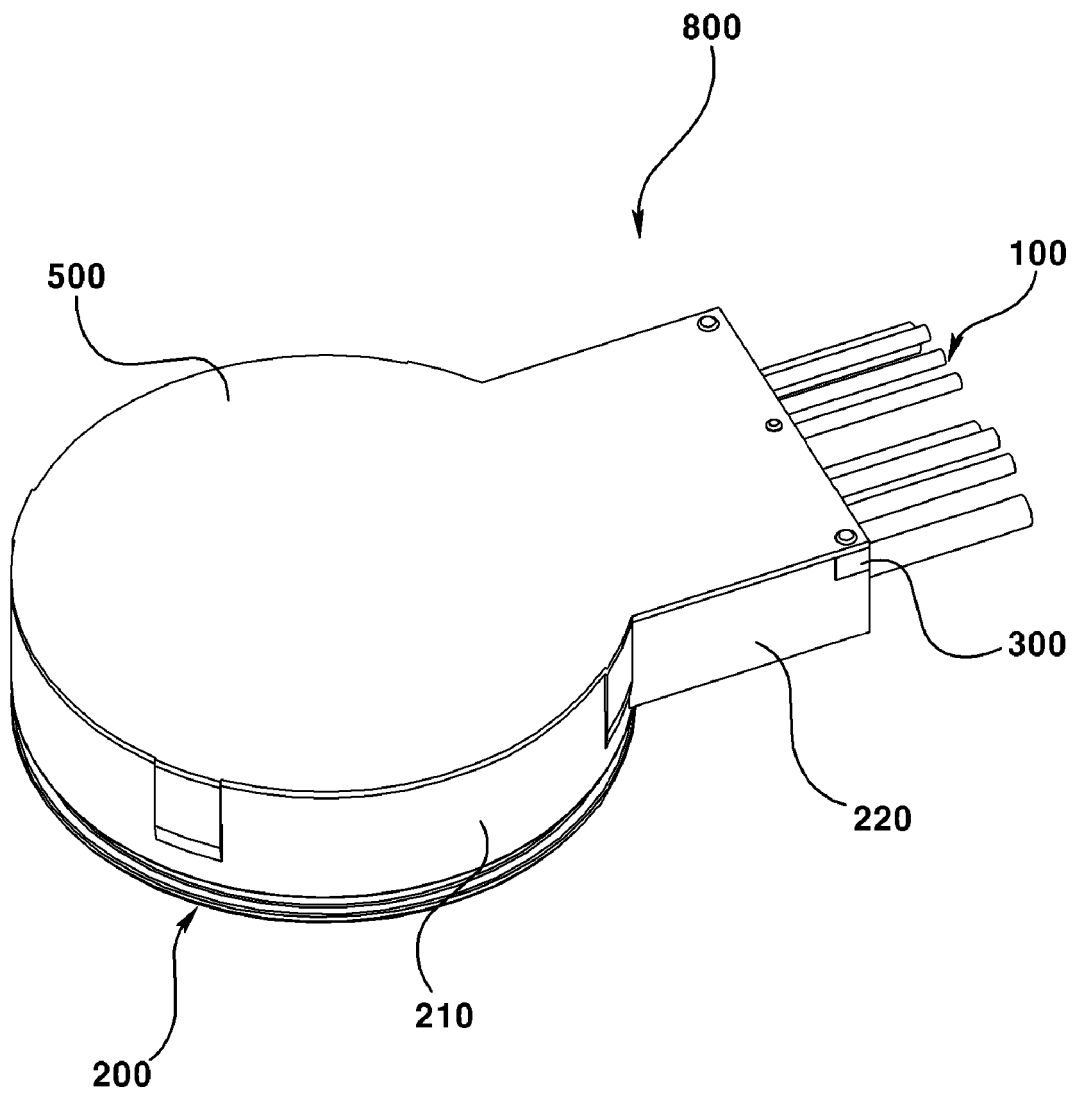


FIG2

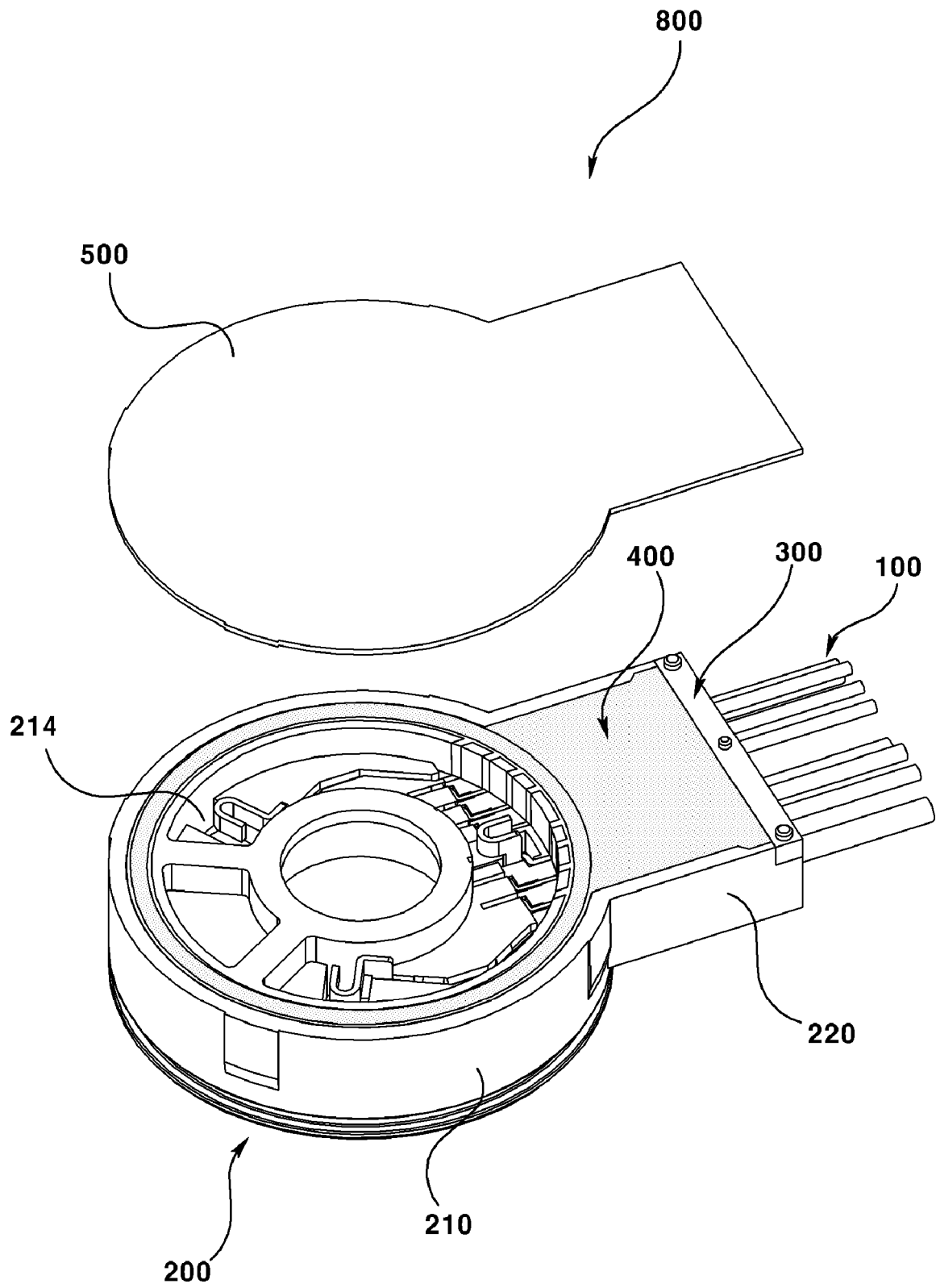


FIG3

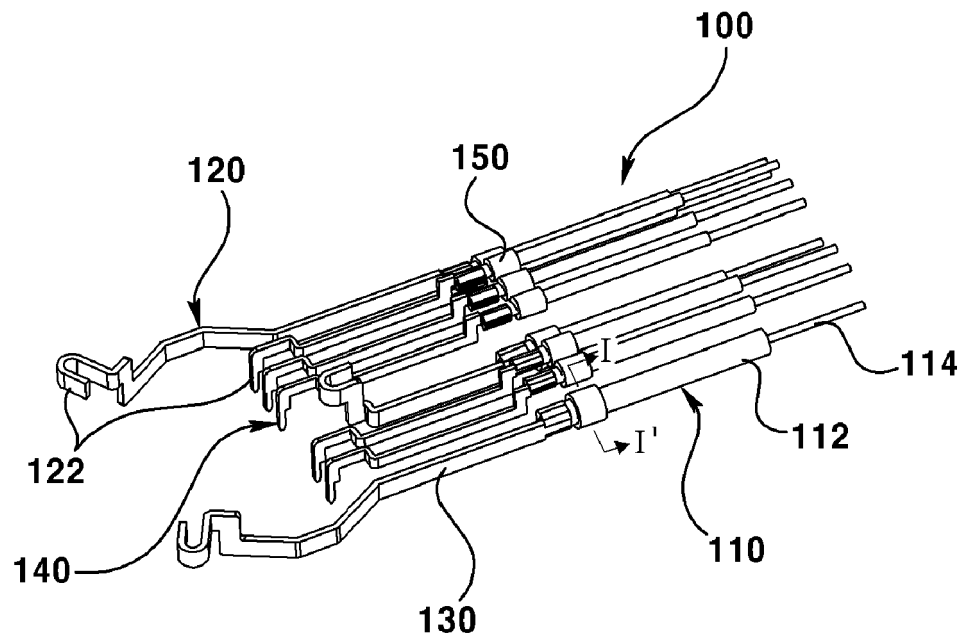


FIG4

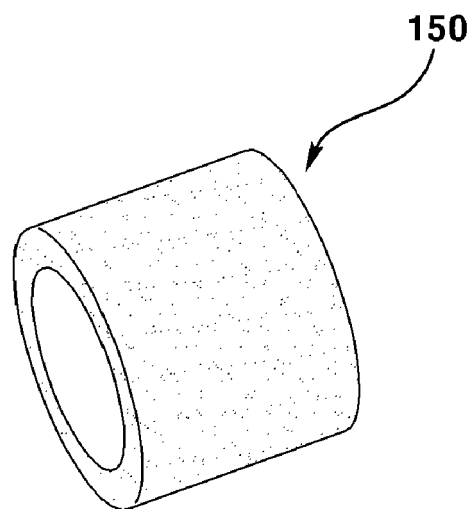


FIG5

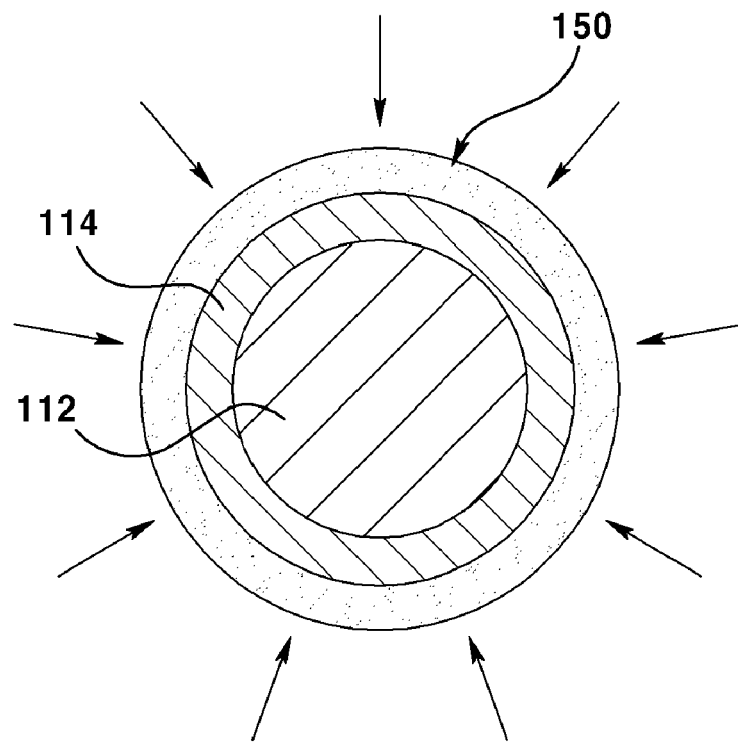


FIG6

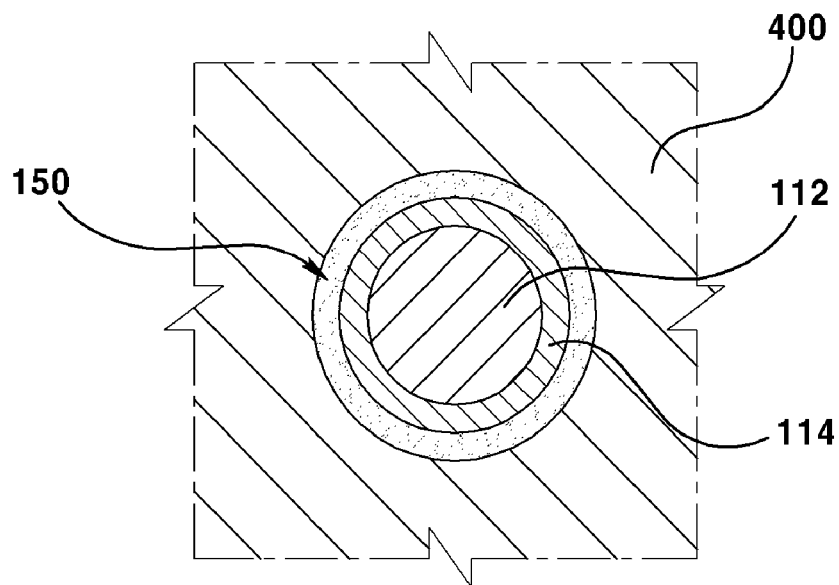


FIG7

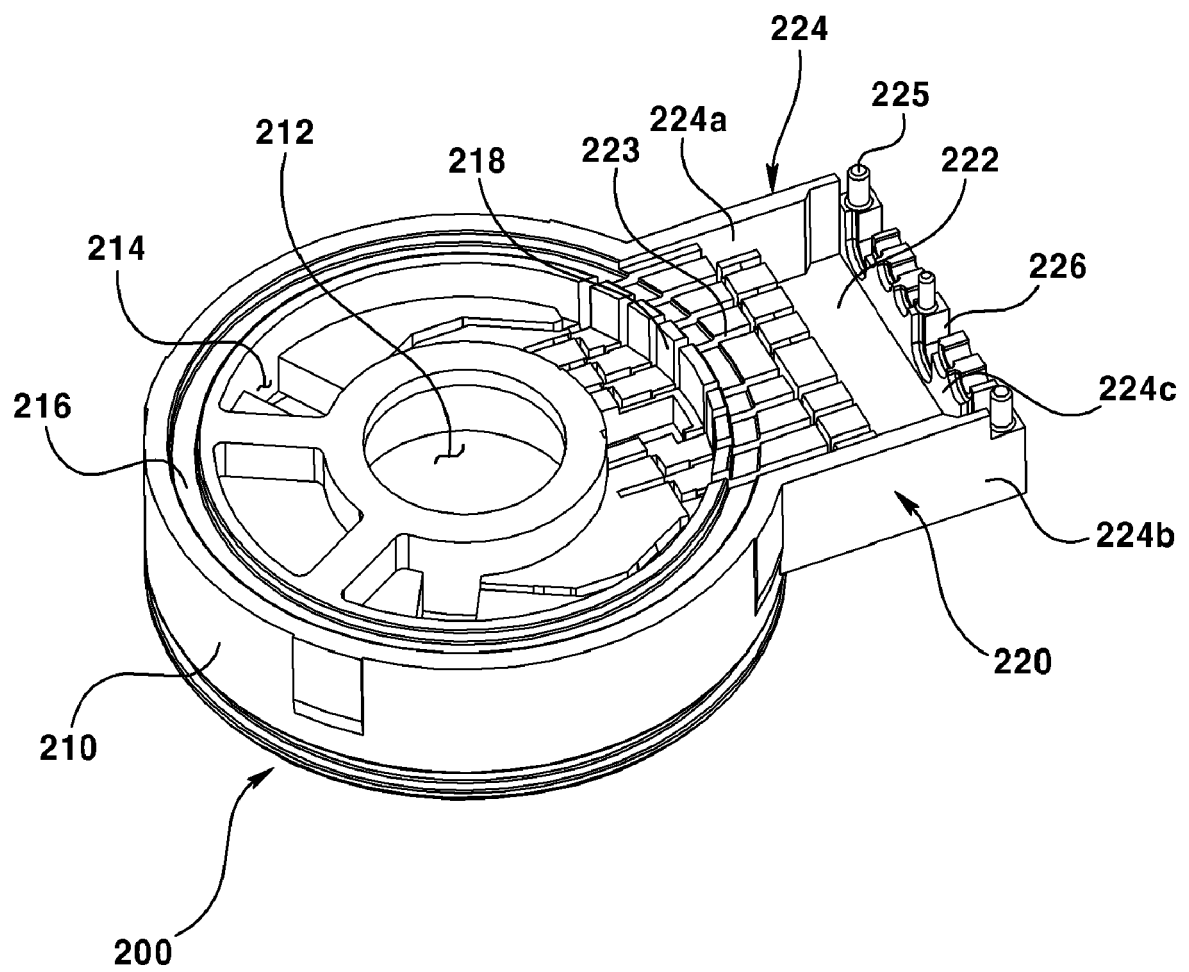


FIG8

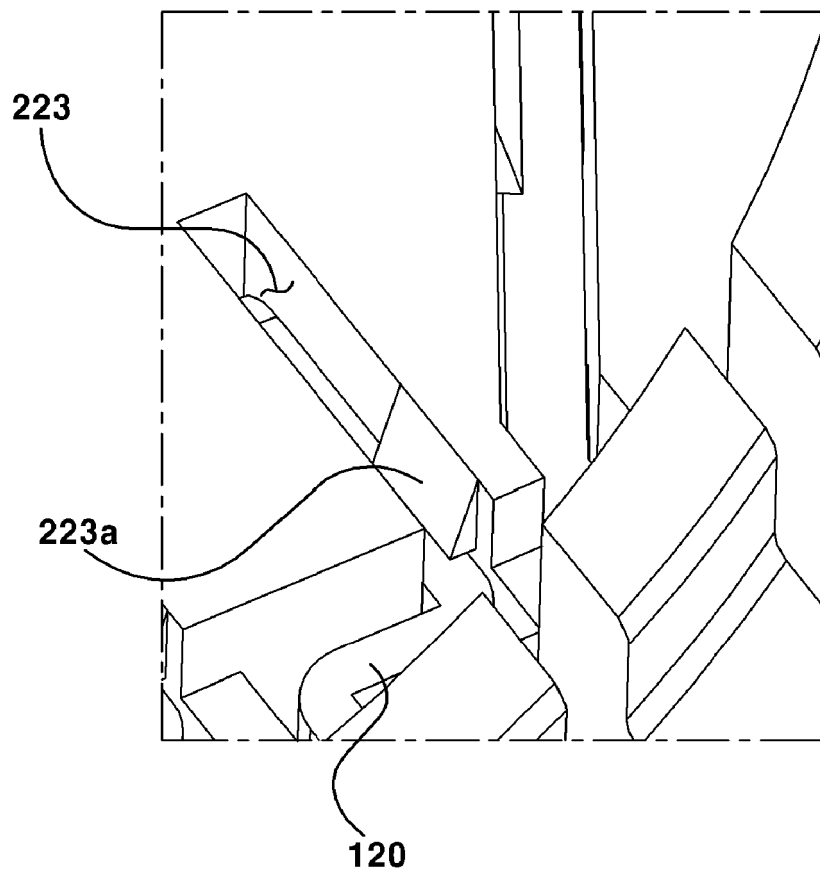


FIG9

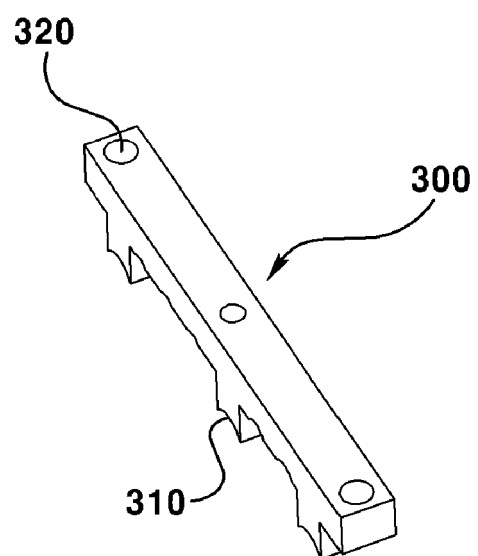


FIG10

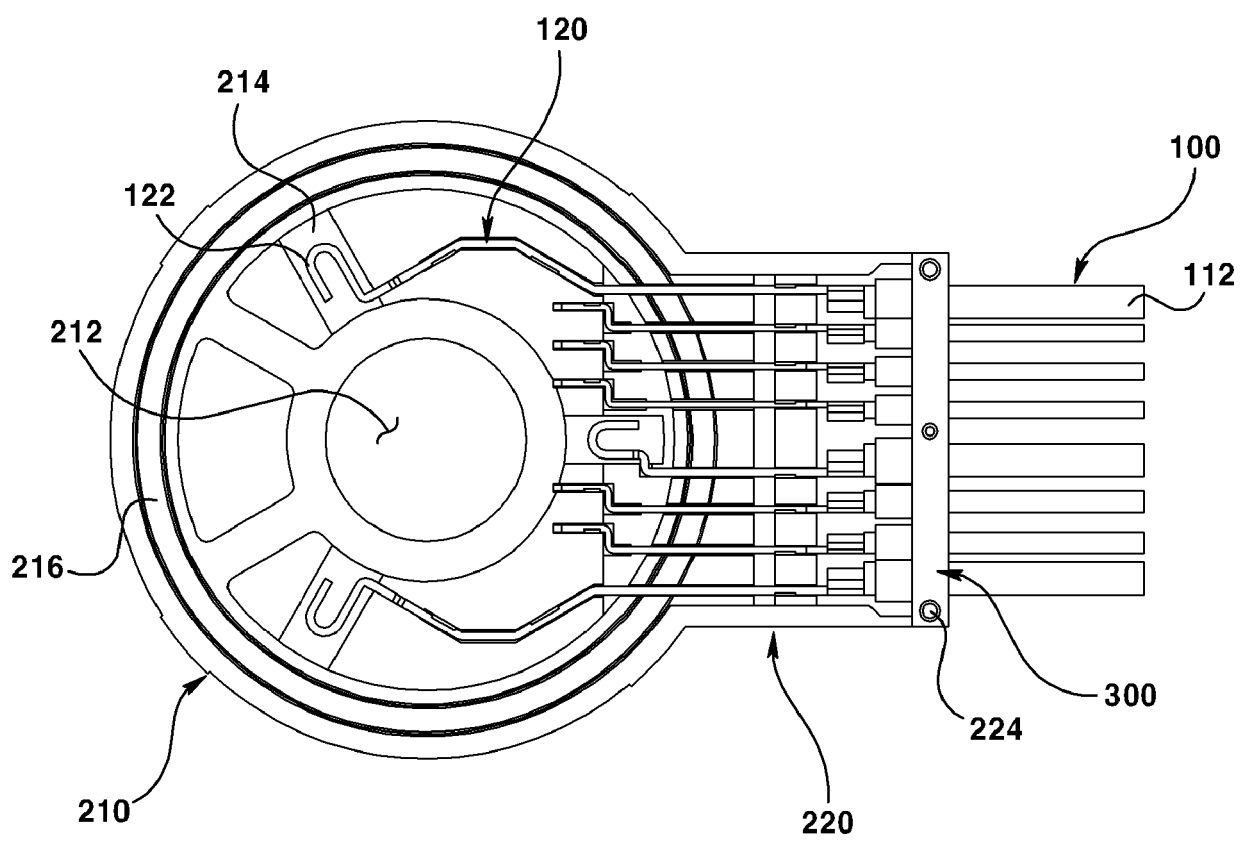
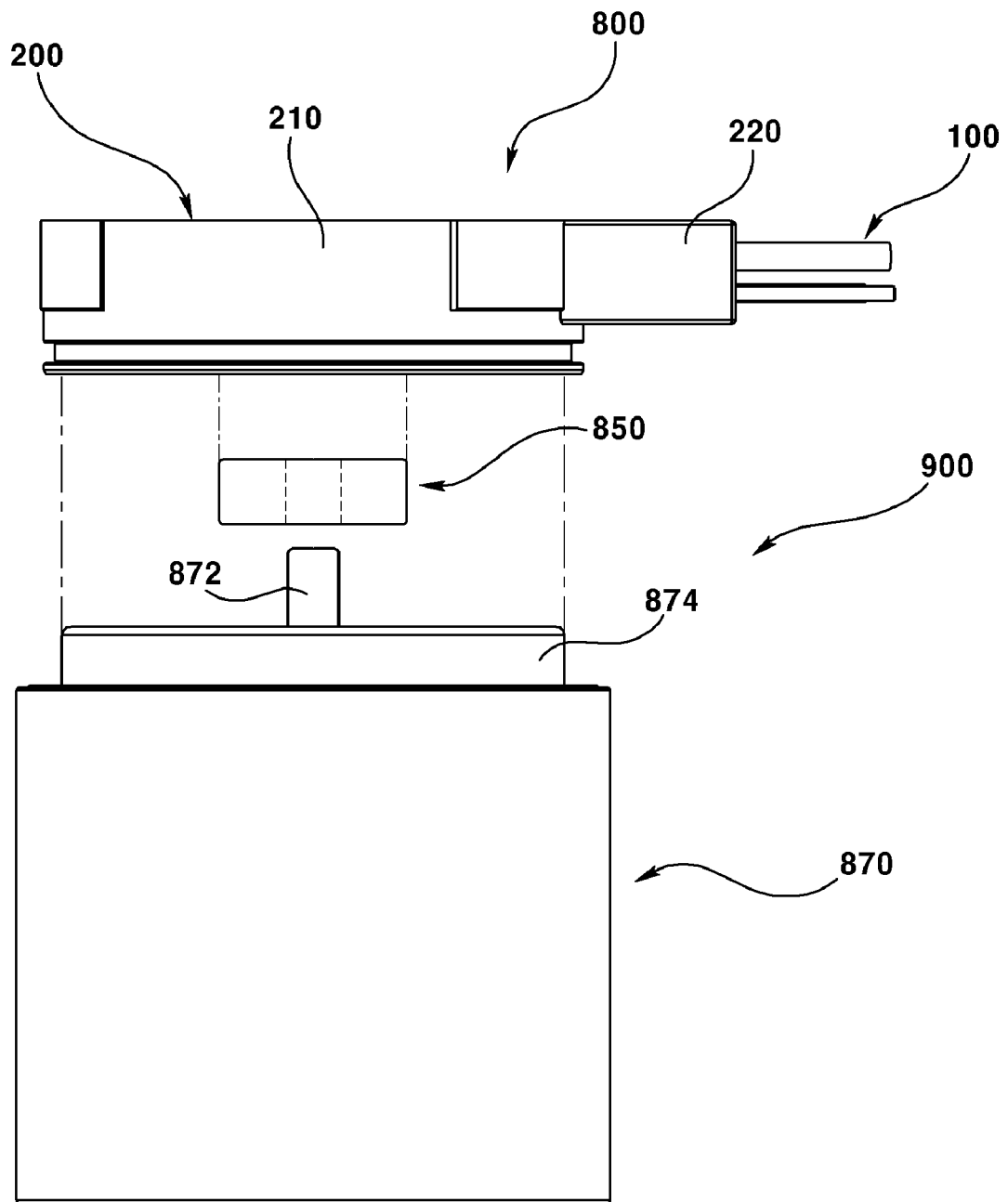


FIG11



REFERENCES CITED IN THE DESCRIPTION

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