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TERMINAL

Abstract

A terminal includes a terminal connection unit into which a counterpart terminal is inserted. The terminal connection unit includes an inner circumferential wall that includes a slit and an insertion space, folded units that are folded and bent outward in a radial direction, and outer circumferential walls that are formed in an elastically deformable. The inner circumferential wall includes through-holes that penetrate in the radial direction. The outer circumferential walls include outer circumferential wall contacts that protrude to the insertion space through the through-holes. In an insertion state, the outer circumferential wall contacts come into contact with the counterpart terminal, and press the counterpart terminal due to elastic deformation of the outer circumferential walls.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION(S)
[0001] The present application claims priority to and incorporates by reference the entire contents of Japanese Patent Application No. 2024-017551 filed in Japan on Feb. 8, 2024.
BACKGROUND OF THE INVENTION
1. Field of the Invention
[0002] The present invention relates to a terminal.
2. Description of the Related Art
[0003] Some terminals include a terminal body that has a cylindrical shape and into which an electric contactor is inserted, and an elastic contact member that is housed in the terminal body, has a cylindrical shape, and applies contact pressure to the electric contactor (see, for example, Japanese Patent Application Laid-open No. 2018-195439).
[0004] Meanwhile, some conventional terminals are constituted by the terminal body and the elastic contact member, and therefore there is room for improvements in terms of a reduction in the number of parts.
SUMMARY OF THE INVENTION
[0005] It is an object of the present invention to provide a terminal that can achieve a reduction in the number of parts.
[0006] In order to achieve the above mentioned object, a terminal according to one aspect of the present invention includes a terminal connection unit that is formed into a tubular shape in an axial direction, a counterpart terminal being inserted into the terminal connection unit from one opening toward another opening, the terminal connection unit being electrically connected to the counterpart terminal, wherein the terminal connection unit includes: an inner circumferential wall that has the tubular shape, and includes a slit that is formed in the axial direction, and an insertion space that communicates with an outside through the slit, the counterpart terminal being inserted into the insertion space from the one opening; a folded unit that is formed at each of slit side ends in a circumferential direction around an axis of the inner circumferential wall, the folded unit being folded and bent outward in a radial direction that is orthogonal to the axial direction; and an outer circumferential wall that extends in the circumferential direction along the inner circumferential wall from the folded unit, the outer circumferential wall being formed in an elastically deformable manner to be separated from the inner circumferential wall with the folded unit as a fulcrum, the inner circumferential wall includes at least one through-hole that penetrates the inner circumferential wall in the radial direction, the outer circumferential wall includes at least one outer circumferential wall contact that is formed to protrude to the insertion space through the through-hole, and the outer circumferential wall contact performs coming into contact with the counterpart terminal and pressing the counterpart terminal due to elastic deformation of the outer circumferential wall, in an insertion state where the counterpart terminal has been inserted into the terminal connection unit.
[0007] The above and other objects, features, advantages and technical and industrial significance of this invention will be better understood by reading the following detailed description of presently preferred embodiments of the invention, when considered in connection with the accompanying drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view illustrating a schematic configuration of a terminal according to an embodiment;

[0009] FIG. **2** is a view illustrating the terminal according to the embodiment when viewed in an axial direction;

[0010] FIG. **3** is a view illustrating a terminal connection unit of the terminal according to the embodiment when viewed from a lower side;

[0011] FIG. **4** is a sectional view in an arrow direction of line A-A of FIG. **3**;

[0012] FIG. **5** is a perspective view illustrating a schematic configuration of a terminal according to a first variation of the embodiment;

[0013] FIG. **6** is a view illustrating the terminal according to the first variation of the embodiment when viewed in an axial direction;

[0014] FIG. **7** is a view illustrating a terminal connection unit of the terminal according to the first variation of the embodiment when viewed from a lower side;

[0015] FIG. **8** is a sectional view in an arrow direction of line B-B of FIG. **7**;

[0016] FIG. **9** is a view illustrating a change in a state of the terminal according to the first variation of the embodiment;

[0017] FIG. **10** is a perspective view illustrating a schematic configuration of a terminal according to a second variation of the embodiment;

[0018] FIG. **11** is a view illustrating the terminal according to the second variation of the embodiment when viewed in the axial direction;

[0019] FIG. **12** is a view illustrating a terminal connection unit of the terminal according to the second variation of the embodiment when viewed from a lower side; and

[0020] FIG. **13** is a sectional view in an arrow direction of line C-C of FIG. **12**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] An embodiment according to the present invention is described in detail below with reference to the drawings. Note that the embodiment described below is not restrictive of the present invention. Stated another way, components according to the embodiment described below include components that those skilled in the art could easily conceive of or substantially the same components, and various omissions, replacements, or changes can be made without departing from the gist of the invention.

[0022] Note that in the description below, for convenience's sake, it is assumed that an X-direction illustrated in FIGS. **1** to **4** (including FIGS. **5** to **13**) is an “axial direction X”, a Y-direction is a “width direction Y”, and a Z-direction is a “height direction Z”. The axial direction X, the width direction Y, and the height direction Z are orthogonal to each other. The axial direction X corresponds to, for example, an extending direction of a terminal, an insertion/removal direction of a counterpart terminal, or the like. Here, it is assumed that one direction of the axial direction X is an insertion direction X**1** of a counterpart terminal **50**, and another direction is a removal direction X**2** of the counterpart terminal **50**. Furthermore, it is assumed that one direction of the height direction Z is a first direction Z**1**, and another direction is a second direction Z**2**. Note that respective directions to be used in the description below are described as directions in a state where a terminal **1** has been fixed to equipment **51**, unless otherwise specified.

Embodiment

[0023] FIG. **1** is a perspective view illustrating a schematic configuration of a terminal according to an embodiment. FIG. **2** is a view illustrating the terminal according to the embodiment when viewed in an axial direction. FIG. **3** is a view illustrating a terminal connection unit of the terminal according to the embodiment when viewed from a lower side. FIG. **4** is a sectional view in an arrow direction of line A-A of FIG. **3**.

[0024] The terminal **1** is mounted on, for example, the equipment **51** equipped in a vehicle, as illustrated in FIG. **1**, and is connected to the counterpart terminal **50**, and therefore the terminal **1** electrically connects the counterpart terminal **50** to the equipment **51**. The counterpart terminal **50** is formed into a columnar shape, and is constituted by a conductive metal member.

[0025] The terminal **1** is constituted by, for example, a conductive metal material the entirety of which is integrally formed. For example, various types of processing, such as punching, press working, or folding, are performed on a single metal plate in accordance with shapes that correspond to respective units, such as a terminal connection unit **2**, an equipment fixing unit **3**, or a coupler **4**, to mold the terminal **1**, and therefore the respective units are formed three-dimensionally and integrally. In the terminal **1**, the terminal connection unit **2**, the coupler **4**, and the equipment fixing unit **3** are coupled to each other in this order from a side in the removal direction X**2** to a side in the insertion direction X**1** in the axial direction X.

[0026] The terminal connection unit **2** is formed into a cylindrical shape in the axial direction X as a whole, as illustrated in FIG. **1**. The counterpart terminal **50** is inserted into the terminal connection unit **2** from one opening **10** toward another opening **11**, and the terminal connection unit **2** is electrically connected to the counterpart terminal **50**. The terminal connection unit **2** is constituted by an inner circumferential wall **5**, two folded units **6**, and two outer circumferential walls **7**.

[0027] The inner circumferential wall **5** is formed into a cylindrical shape in the axial direction X, and is coupled to each of the outer circumferential walls **7** via each of the folded units **6**, as illustrated in FIGS. **1**, **2**, and **4**. The inner circumferential wall **5** includes a slit **12**, an insertion space **13**, four through-holes **15**, **15**, **16**, and **16**, and four inner circumferential wall contacts **17**, **17**, **18**, and **18**.

[0028] The slit **12** is a clearance that is linearly formed in the axial direction X of the terminal connection unit **2**. The slit **12** is formed by a pair of folded units **6** that face each other in a circumferential direction around an axis XO of the inner circumferential wall **5**. The slit **12** is formed to penetrate from one opening **10** to the other opening **11** of the inner circumferential wall **5**, and causes the insertion space **13** to communicate with an external space.

[0029] The insertion space **13** is a portion that is formed by the inner circumferential wall **5**, and communicates with the outside via the slit **12**, and into which the counterpart terminal **50** is inserted from the one opening **10**. The insertion space **13** is formed between a pair of openings **10** and **11** that face each other in the axial direction X.

[0030] The through-holes **15**, **15**, **16**, and **16** are through-holes that penetrate the inner circumferential wall **5** in a radial direction that is orthogonal to the axial direction X, as illustrated in FIGS. **1** to **3**. The two through-holes **15** and **15** are formed on a side in the removal direction X**2**, and the two through-holes **16** and **16** are formed on a side in the insertion direction X**1**. All of the four through-holes **15**, **15**, **16**, and **16** are formed into a rectangular shape when viewed in the height direction z.

[0031] Each of the inner circumferential wall contacts **17**, **17**, **18**, and **18** is a portion that is formed to protrude from an inner circumferential face of the inner circumferential wall **5** toward the insertion space **13**, and comes into contact with the counterpart terminal **50** in an insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**. The two inner circumferential wall contacts **17** and **17** are provided on a side in the removal direction X**2** of the inner circumferential wall **5**, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z. The two inner circumferential wall contacts **18** and **18** are provided on a side in the insertion direction X**1** of the inner circumferential wall **5**, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z.

[0032] All of the inner circumferential wall contacts **17**, **17**, **18**, and **18** are formed into a convex shape in such a way that a sectional shape when viewed in the axial direction X is curved to expand from the inner circumferential face of the inner circumferential wall **5** toward the insertion space

13, as illustrated in FIG. **4**. The inner circumferential wall contacts **17**, **17**, **18**, and **18** are formed to have, for example, a roughly semicircular sectional shape when viewed in the axial direction X. All of the inner circumferential wall contacts **17**, **17**, **18**, and **18** come into point contact with the counterpart terminal **50** in the insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**.

[0033] The folded units **6** are portions that are formed at slit side ends **14** in the circumferential direction around the axis XO of the inner circumferential wall **5**, and are folded and bent outward in the radial direction. The folded units **6** according to the present embodiment have a slight clearance inside in the illustrated example, but are bent in such a way that the inner circumferential wall **5** and the outer circumferential walls **7** overlap each other in the radial direction.

[0034] The outer circumferential walls **7** are portions that are formed in an elastically deformable manner to extend in the circumferential direction along the inner circumferential wall **5** from the respective folded units **6**, and be separated from the inner circumferential wall **5** with the respective folded units **6** as a fulcrum. The outer circumferential walls **7** face the inner circumferential wall **5** in the radial direction, and are located outside in the radial direction. The outer circumferential walls **7** include outer circumferential wall bodies **20** and four outer circumferential wall contacts **21**, **21**, **22**, and **22**.

[0035] The outer circumferential wall body **20** is formed along the inner circumferential wall **5** in the circumferential direction from the folded unit **6**, and is formed to cover a portion of an outer circumferential face of the inner circumferential wall **5**.

[0036] The outer circumferential wall contacts **21**, **21**, **22**, and **22** are portions that are provided on the inner circumferential wall **5**, are formed to protrude to the insertion space **13** through the though-holes **15**, **15**, **16**, and **16** that face each other in the radial direction, and come into contact with the counterpart terminal **50** in the insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**. Each of the outer circumferential wall contacts **21**, **21**, **22**, and **22** is formed to protrude from an end **20***a* in the circumferential direction of the outer circumferential wall body **20**. The two outer circumferential wall contacts **21** and **21** are provided on a side in the removal direction X**2** of the outer circumferential walls **7**, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z. The two outer circumferential wall contacts **22** and **22** are provided on a side in the insertion direction X**1** of the outer circumferential walls **7**, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z.

[0037] All of the outer circumferential wall contacts **21**, **21**, **22**, and **22** are formed into a convex shape or an inverted U-shape in such a way that a sectional shape when viewed in the axial direction X is curved to expand toward the insertion space **13**, as illustrated in FIG. **4**. The outer circumferential wall contacts **21**, **21**, **22**, and **22** come into contact with the counterpart terminal **50**, and press the counterpart terminal **50** due to elastic deformation of the outer circumferential walls **7**, in the insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**. All of the outer circumferential wall contacts **21**, **21**, **22**, and **22** come into line contact with the counterpart terminal **50** in the axial direction X in the insertion state described above.

[0038] When viewed in the axial direction X in a non-insertion state where the counterpart terminal **50** has not been inserted into the terminal connection unit **2**, portions of the outer circumferential wall contacts **21** and **21** are inserted into the through-holes **15** and **15**, and portions that will come into contact with the counterpart terminal **50** protrude from the inner circumferential face of the inner circumferential wall **5** to a side of the insertion space **13**. When viewed in the axial direction X in the non-insertion state described above, portions of the outer circumferential wall contacts **22** and **22** are inserted into the through-holes **16** and **16**, and portions that will come into contact with the counterpart terminal **50** protrude from the inner circumferential face of the inner

circumferential wall **5** to a side of the insertion space **13**.
[0039] The equipment fixing unit **3** is a portion that fixes the terminal **1** to the equipment **51**. The equipment fixing unit **3** is formed into a flat rectangular shape, and includes some through-holes into which a fastening member such as a bolt is inserted.
[0040] The coupler **4** is a portion that couples the equipment fixing unit **3** and the inner circumferential wall **5**.
[0041] As described above, the terminal **1** according to the present embodiment includes the terminal connection unit **2** into which the counterpart terminal **50** is inserted and that is electrically connected to the counterpart terminal **50**. The terminal connection unit **2** includes the inner circumferential wall **5** that has a tubular shape, and includes the slit **12** that is formed in the axial direction X and the insertion space **13** into which the counterpart terminal **50** is inserted, the folded units **6** that are folded and bent outward in the radial direction that is orthogonal to the axial direction X, and the outer circumferential walls **7** that are formed in an elastically deformable manner to be separated from the inner circumferential wall **5** with the folded units **6** as a fulcrum. The inner circumferential wall **5** includes the through-holes **15** and **16** that penetrate in the radial direction. The outer circumferential walls **7** include the outer circumferential wall contacts **21** that protrude to the insertion space **13** through the through-holes **15** and **16**. In the insertion state, the outer circumferential wall contacts **21** come into contact with the counterpart terminal **50**, and press the counterpart terminal **50** due to elastic deformation of the outer circumferential walls **7**.
[0042] In the terminal **1**, when the counterpart terminal **50** has been inserted into the insertion space **13** from the opening **10** of the terminal connection unit **2**, an outer circumferential face of the counterpart terminal **50** abuts onto the inner circumferential wall contacts **17** and **17** and the outer circumferential wall contacts **21** and **21**. Then, when the counterpart terminal **50** has moved in the insertion direction X**1**, the counterpart terminal **50** presses the inner circumferential wall contacts **17** and **17**, each of the inner circumferential walls **5** elastically deforms outward in the radial direction together with each of the outer circumferential walls **7**, by using, as a fulcrum, a portion that faces the slit **12** in the radial direction, and the slit **12** becomes relatively wider in the radial direction. Simultaneously, the counterpart terminal **50** presses the outer circumferential wall contacts **21** and **21**, and each of the outer circumferential walls **7** elastically deforms outward in the radial direction with the folded units **6** as a fulcrum. Then, when a distal end of the counterpart terminal **50** has moved to a side of the opening **11**, the inner circumferential wall contacts **18** and **18** and the outer circumferential wall contacts **22** and **22** come into contact with the outer circumferential face of the counterpart terminal **50**. When the counterpart terminal **50** has been completely inserted into the terminal connection unit **2**, the outer circumferential wall contacts **21**, **21**, **22**, and **22** press the counterpart terminal **50** due to the elastic force of each of the outer circumferential walls **7**, and the inner circumferential wall contacts **17**, **17**, **18**, and **18** press the counterpart terminal **50** due to the elastic force of each of the inner circumferential walls **5**, and therefore the counterpart terminal **50** is held by the terminal **1**. At this time, the counterpart terminal **50** is made conductive to the terminal **1** due to contact of the outer circumferential face of the counterpart terminal **50** with the inner circumferential wall contacts **17**, **17**, **18**, and **18** and the outer circumferential wall contacts **21**, **21**, **22**, and **22**, and the counterpart terminal **50** is electrically connected to the terminal **1**.
[0043] Furthermore, in a state where the counterpart terminal **50** has been completely inserted into the terminal connection unit **2**, in a case where an axis of the counterpart terminal **50** deviates in a direction that is orthogonal to the axial direction X, the terminal **1** operates to cause the counterpart terminal **50** to return to an original position due to the elastic force of each of the inner circumferential walls **5** and the elastic force of each of the outer circumferential walls **7**. This enables the terminal **1** to easily prevent the axis of the counterpart terminal **50** from deviating.
[0044] In the terminal **1**, the configuration described above enables a terminal body to be provided with a function of an elastic contact member in comparison with a conventional terminal, and

therefore it is sufficient if only the terminal body is used, the elastic contact member can be omitted, and a reduction in the number of parts of the terminal can be achieved.
[0045] Furthermore, in the terminal **1** according to the present embodiment, the inner circumferential wall **5** is coupled to the outer circumferential walls **7** via the folded units **6**, and therefore even if the thickness of the terminal **1** is set to be smaller than the thickness of a conventional terminal, a certain volume of the entirety of the terminal can be secured, and conductor resistance can be made less likely to increase.
[0046] Furthermore, in the terminal **1** according to the present embodiment, the terminal connection unit **2** is formed into a cylindrical shape to correspond to the counterpart terminal **50** that is formed into a columnar shape or a cylindrical shape. Moreover, the inner circumferential wall **5** includes four inner circumferential wall contacts **17**, **17**, **18**, and **18** that protrude toward the insertion space **13**, are formed in positions that face the outer circumferential wall contacts **21**, **21**, **22**, and **22** in the radial direction across the axis XO in the axial direction X, and come into contact with the counterpart terminal **50** in the insertion state described above. Therefore, in the terminal **1**, the outer circumferential wall contacts **21**, **21**, **22**, and **22** and the inner circumferential wall contacts **17**, **17**, **18**, and **18** can come into contact with the counterpart terminal **50** from both sides in the radial direction, and pressing balance can be secured between contacts that face each other in the radial direction.
First Variation
[0047] Next, a terminal **1**A according to a first variation of the embodiment is described with reference to FIGS. **5** to **9**. FIG. **5** is a perspective view illustrating a schematic configuration of a terminal according to the first variation of the embodiment. FIG. **6** is a view illustrating the terminal according to the first variation of the embodiment when viewed in an axial direction. FIG. **7** is a view illustrating a terminal connection unit of the terminal according to the first variation of the embodiment when viewed from a lower side. FIG. **8** is a sectional view in an arrow direction of line B-B of FIG. **7**. FIG. **9** is a view illustrating a change in a state of the terminal according to the first variation of the embodiment.
[0048] The terminal **1**A according to the first variation is different from the terminal **1** described above in that a portion of the shape of an outer circumferential wall **7**A in a terminal connection unit **2**A is different. The terminal **1**A is constituted by the terminal connection unit **2**A, the coupler **4**, and the equipment fixing unit **3**, as illustrated in FIG. **5**.
[0049] The terminal connection unit **2**A is constituted by the inner circumferential wall **5**, the folded units **6**, and the outer circumferential walls **7**A.
[0050] The outer circumferential walls **7**A include outer circumferential wall bodies **20**A, four outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A, and extending units **23**A.
[0051] The outer circumferential wall body **20**A is formed along the inner circumferential wall **5** in the circumferential direction from the folded unit **6**, and is formed to cover a portion of an outer circumferential face of the inner circumferential wall **5**.
[0052] The outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A are formed to protrude to the insertion space **13** through the though-holes **15**, **15**, **16**, and **16**, and come into contact with the counterpart terminal **50** in an insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**A. The two outer circumferential wall contacts **21**A and **21**A are provided on a side in the removal direction X**2** of the outer circumferential walls **7**A, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z. The two outer circumferential wall contacts **22**A and **22**A are provided on a side in the insertion direction X**1** of the outer circumferential walls **7**A, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z.
[0053] All of the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A are formed in such a way that a sectional shape when viewed in the axial direction X is bent toward the insertion space

13, as illustrated in FIG. **8**. The outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A come into contact with the counterpart terminal **50**, and press the counterpart terminal **50** due to elastic deformation of the outer circumferential walls **7**A, in the insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**A. All of the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A come into line contact with the counterpart terminal **50** in the axial direction X in the insertion state described above.

[0054] In the outer circumferential wall contacts **21**A and **21**A, when viewed in the axial direction X in a non-insertion state where the counterpart terminal **50** has not been inserted into the terminal connection unit **2**A, ends that will come into contact with the counterpart terminal **50** are inserted into the through-holes **15** and **15**, and portions of the ends protrude as a contact from the inner circumferential face of the inner circumferential wall **5** to a side of the insertion space **13**. In the outer circumferential wall contacts **22**A and **22**A, when viewed in the axial direction X in the non-insertion state described above, ends that will come into contact with the counterpart terminal **50** are inserted into the through-holes **16** and **16**, and portions of the ends protrude as a contact from the inner circumferential face of the inner circumferential wall **5** to a side of the insertion space **13**.

[0055] The extending units **23**A are portions that extend from the outer circumferential wall bodies **20**A toward one side in the circumferential direction, and extend from the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A along the inner circumferential wall **5** toward a side that is opposite to a side of the slit side ends **14** in the circumferential direction. Each of the extending units **23**A includes through-holes **24** and **25** for each of the outer circumferential walls **7**A, as illustrated in FIG. **7**. The through-holes **24**, **24**, **25**, and **25** correspond to what are called punching holes for forming the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A.

[0056] The extending unit **23**A has a clearance S in the radial direction between the extending unit **23**A and the inner circumferential wall **5**. Stated another way, the outer circumferential walls **7**A are provided on a side that is opposite to a side of the folded units **6** in the circumferential direction of the outer circumferential walls **7**A, and form the clearance S between the outer circumferential walls **7**A and the inner circumferential wall **5**. When the counterpart terminal **50** has been inserted into the terminal connection unit **2**A to deviate in a first direction Z**1** (to a side of the slit **12**), a width L of the slit **12** increases to a width L**1**, as illustrated in FIGS. **6** and **9**. An increase in width of the slit **12** causes the inner circumferential wall **5** to warp outward in the radial direction, but there is the clearance S between the inner circumferential wall **5** and the outer circumferential walls **7**A including the extending units **23**A, and therefore the outer circumferential walls **7**A do not warp in conjunction with the inner circumferential wall **5**, and the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A move to a side of the insertion space **13**.

[0057] As described above, the terminal **1**A according to the first variation exhibits an advantageous effect that is similar to an advantageous effect of the terminal **1** according to the embodiment described above.

[0058] Furthermore, in the terminal **1**A according to the first variation, the outer circumferential walls **7**A have the clearance S between the outer circumferential walls **7**A and the inner circumferential wall **5**, and therefore the outer circumferential walls **7**A do not warp outward in the radial direction in conjunction with the inner circumferential wall **5**, and the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A move to a side of the insertion space **13**. Therefore, in the terminal **1**A, for example, even if the counterpart terminal **50** has been inserted in an axis deviation state of deviation in the first direction Z**1** (to a side of the slit **12**), the followability of the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A relative to the counterpart terminal **50** can be secured.

[0059] Furthermore, in the terminal **1**A according to the first variation, the outer circumferential walls **7**A include the extending units **23**A that extend from the outer circumferential wall contacts **21**A, **21**A, **22**A, and **22**A along the inner circumferential wall **5** toward a side that is opposite to a side of the slit side ends **14** in the circumferential direction. Therefore, in the terminal **1**A, the extending units **23**A increase a surface area of the terminal **1**A, the heat capacity of the terminal **1**A can be increased, and a rise in temperature of the terminal **1**A can be avoided at the time of carrying a current.

Second Variation

[0060] Next, a terminal **1**B according to a second variation of the embodiment is described with reference to FIGS. **10** to **13**. FIG. **10** is a perspective view illustrating a schematic configuration of a terminal according to the second variation of the embodiment. FIG. **11** is a view illustrating the terminal according to the second variation of the embodiment when viewed in an axial direction. FIG. **12** is a view illustrating a terminal connection unit of the terminal according to the second variation of the embodiment when viewed from a lower side. FIG. **13** is a sectional view in an arrow direction of line C-C of FIG. **12**.

[0061] The terminal **1**B according to the second variation is different from the terminal **1** described above in that an inner diameter of a folded unit **6**B and a portion of the shape of an outer circumferential wall **7**B in a terminal connection unit **2**B are different. The terminal **1**B is constituted by the terminal connection unit **2**B, the coupler **4**, and the equipment fixing unit **3**, as illustrated in FIG. **10**.

[0062] The terminal connection unit **2**B is constituted by the inner circumferential wall **5**, folded units **6**B, and outer circumferential walls **7**B.

[0063] The folded units **6**B are portions that are formed at slit side ends **14** in the circumferential direction around the axis XO of the inner circumferential wall **5**, extend inward in the radial direction, and then are folded and bent outward in the radial direction. Stated another way, the folded units **6**B have an inner diameter that is relatively larger than an inner diameter of the folded units **6** described above, and have a large clearance T inside.

[0064] The outer circumferential walls **7**B include outer circumferential wall bodies **20**B and four outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B.

[0065] The outer circumferential wall bodies **20**B are formed along the inner circumferential wall **5** in the circumferential direction from the folded units **6**B, and are formed to cover a portion of the outer circumferential face of the inner circumferential wall **5**.

[0066] The outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B are formed to protrude to the insertion space **13** through the though-holes **15**, **15**, **16**, and **16**, and come into contact with the counterpart terminal **50** in an insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**B. The two outer circumferential wall contacts **21**B and **21**B are provided on a side in the removal direction X**2** of the outer circumferential walls **7**B, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z. The two outer circumferential wall contacts **22**B and **22**B are provided on a side in the insertion direction X**1** of the outer circumferential walls **7**B, and are formed in positions that are symmetrical in the width direction Y with the axis XO as a central axis when viewed in the height direction Z.

[0067] All of the outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B are formed in such a way that a sectional shape when viewed in the axial direction X is bent toward the insertion space **13**, as illustrated in FIG. **13**. The outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B come into contact with the counterpart terminal **50**, and press the counterpart terminal **50** due to elastic deformation of the outer circumferential walls **7**B, in the insertion state where the counterpart terminal **50** has been inserted into the terminal connection unit **2**B. All of the outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B according to the second variation are formed to have a face of contact to the counterpart terminal **50** that is a semispherical face (or a curved face), as illustrated in FIGS. **10** to **13**. Accordingly, the outer circumferential wall contacts **21**B, **21**B, **22**B, and **22**B come into point contact with the counterpart terminal **50** without coming into line contact in the axial direction X in the insertion state described above, in contrast to the embodiment described above and the first variation.

[0068] As described above, the terminal **1**B according to the second variation exhibits an advantageous effect that is similar to an advantageous effect of the terminal **1** according to the embodiment described above.
[0069] Furthermore, in the terminal **1**B according to the second variation, the folded units **6**B extend inward in the radial direction, and then are folded and bent outward in the radial direction. Therefore, the terminal **1**B can prevent a crack or the like from being generated in the folded units **6**B at the time of 180° bending, even in a case where a relatively hard metal material (for example, a copper alloy or the like instead of native copper) is used.
[0070] Note that in the embodiment described above and the first and second variations, the counterpart terminal **50** has been formed into a columnar shape, but is not limited to this, and may be formed into a cylindrical shape.
[0071] The terminal according to the present embodiment exhibits an advantageous effect in which a reduction in the number of parts can be achieved.
[0072] Although the invention has been described with respect to specific embodiments for a complete and clear disclosure, the appended claims are not to be thus limited but are to be construed as embodying all modifications and alternative constructions that may occur to one skilled in the art that fairly fall within the basic teaching herein set forth.

Claims

1. A terminal comprising: a terminal connection unit that is formed into a tubular shape in an axial direction, a counterpart terminal being inserted into the terminal connection unit from one opening toward another opening, the terminal connection unit being electrically connected to the counterpart terminal, wherein the terminal connection unit includes: an inner circumferential wall that has the tubular shape, and includes a slit that is formed in the axial direction, and an insertion space that communicates with an outside through the slit, the counterpart terminal being inserted into the insertion space from the one opening; a folded unit that is formed at each of slit side ends in a circumferential direction around an axis of the inner circumferential wall, the folded unit being folded and bent outward in a radial direction that is orthogonal to the axial direction; and an outer circumferential wall that extends in the circumferential direction along the inner circumferential wall from the folded unit, the outer circumferential wall being formed in an elastically deformable manner to be separated from the inner circumferential wall with the folded unit as a fulcrum, the inner circumferential wall includes at least one through-hole that penetrates the inner circumferential wall in the radial direction, the outer circumferential wall includes at least one outer circumferential wall contact that is formed to protrude to the insertion space through the through-hole, and the outer circumferential wall contact performs coming into contact with the counterpart terminal and pressing the counterpart terminal due to elastic deformation of the outer circumferential wall, in an insertion state where the counterpart terminal has been inserted into the terminal connection unit.
2. The terminal according to claim 1, wherein the counterpart terminal is formed into a columnar shape or a cylindrical shape, the terminal connection unit is formed into a cylindrical shape, and the inner circumferential wall includes at least one inner circumferential wall contact that protrudes toward the insertion space, is formed in a position that faces the outer circumferential wall contact in the radial direction across the axis in the axial direction, and comes into contact with the counterpart terminal in the insertion state.
3. The terminal according to claim 1, wherein the outer circumferential wall is provided on a side that is opposite to a side of the folded unit in the circumferential direction of the outer circumferential wall, and forms a clearance between the outer circumferential wall and the inner circumferential wall in the insertion state.
4. The terminal according to claim 2, wherein the outer circumferential wall is provided on a side

that is opposite to a side of the folded unit in the circumferential direction of the outer circumferential wall, and forms a clearance between the outer circumferential wall and the inner circumferential wall in the insertion state.

5. The terminal according to claim 1, wherein the outer circumferential wall includes an extending unit that extends from the outer circumferential wall contact along the inner circumferential wall toward a side that is opposite to a side of the slit side ends in the circumferential direction.

6. The terminal according to claim 2, wherein the outer circumferential wall includes an extending unit that extends from the outer circumferential wall contact along the inner circumferential wall toward a side that is opposite to a side of the slit side ends in the circumferential direction.

7. The terminal according to claim 1, further comprising: an equipment fixing unit that is fixed and electrically connected to equipment; and a coupler that couples the equipment fixing unit to the inner circumferential wall.