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(54) CONNECTOR DEVICE

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(57) ABSTRACT

It is aimed to improve transmission characteristics. A connector device is provided with a first terminal including a first inner conductor and to be mounted on a first circuit board, and an elongated movable terminal including a movable-side inner conductor and to be arranged between the first terminal and a second terminal. The first inner conductor includes a mounting portion to be connected to the first circuit board and a first connecting portion extending from the mounting portion toward the movable terminal. The movable-side inner conductor includes a movable-side connecting portion to be connected to the first connecting portion while being fit to the first connecting portion in a length direction of the movable terminal and a shaft-like body portion extending from the movable-side connecting portion toward the mating terminal. An outer diameter of the body portion and an outer diameter of the mounting portion are set equal.

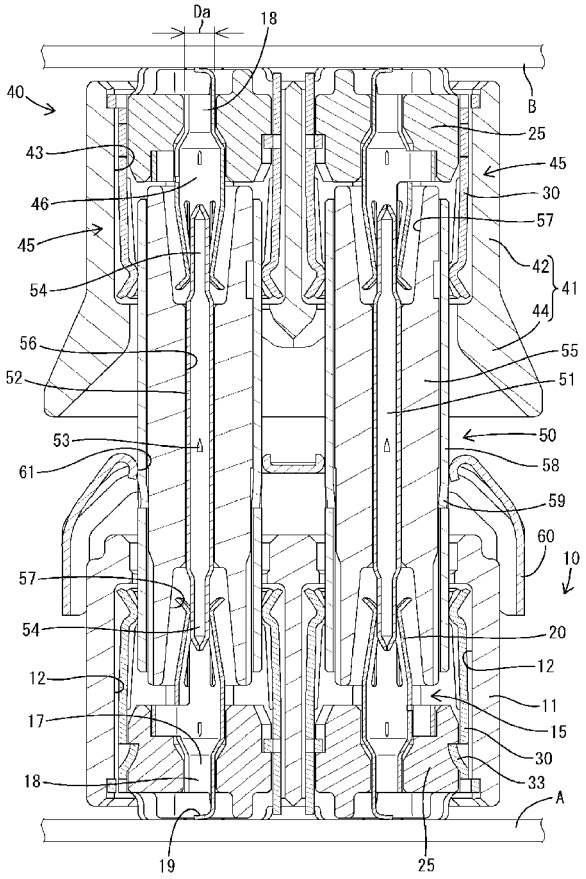

FIG. 1

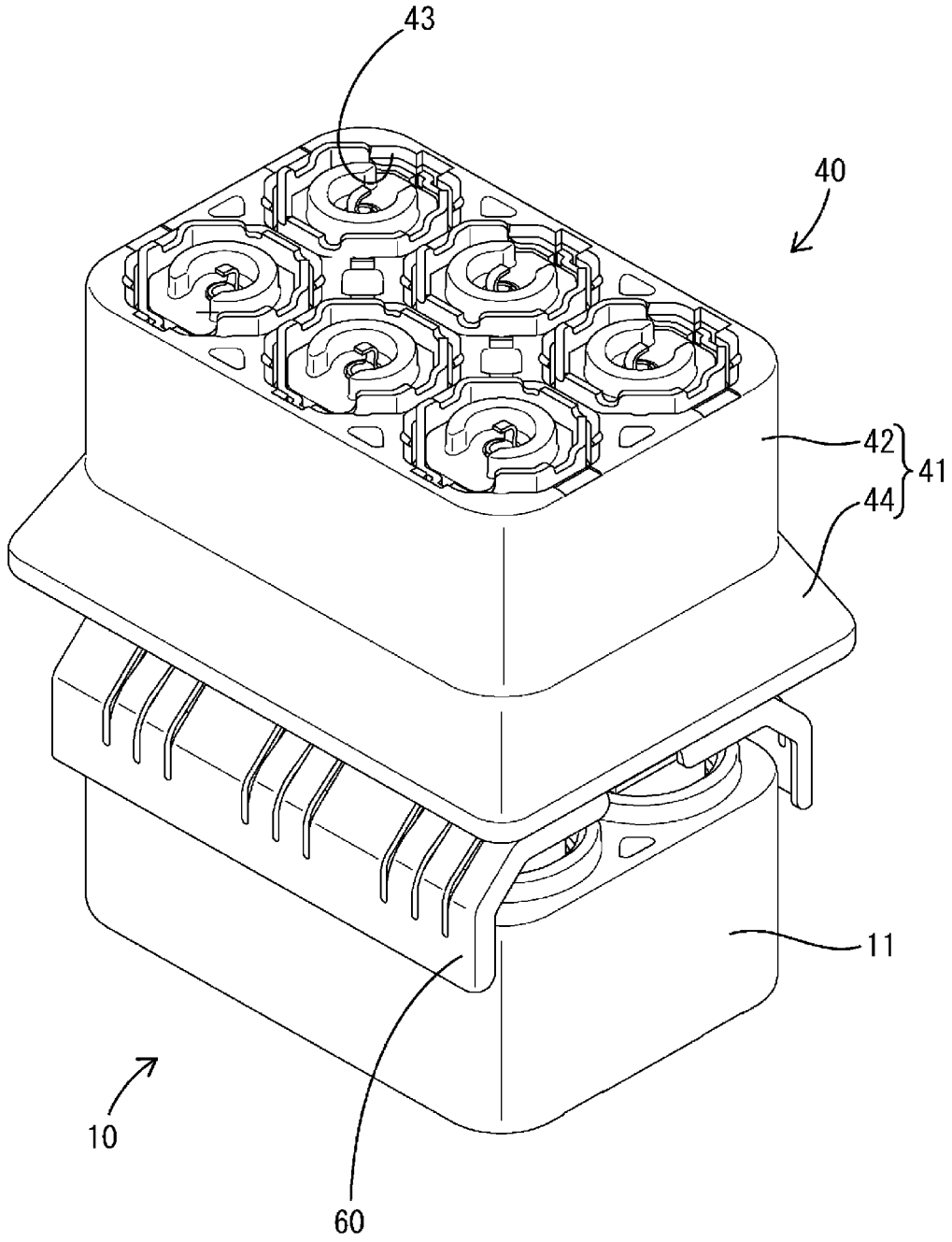

FIG. 2

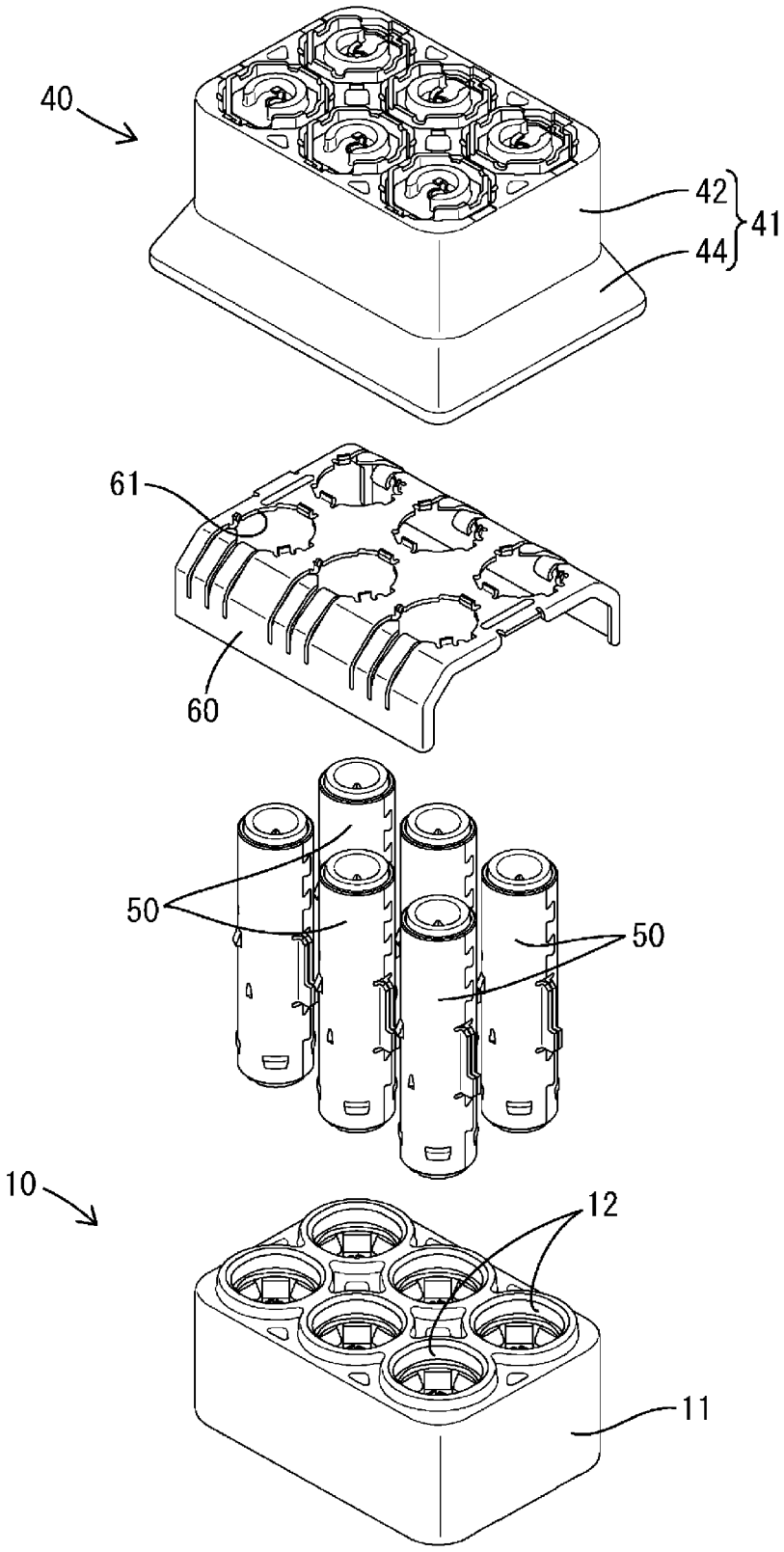

FIG. 3

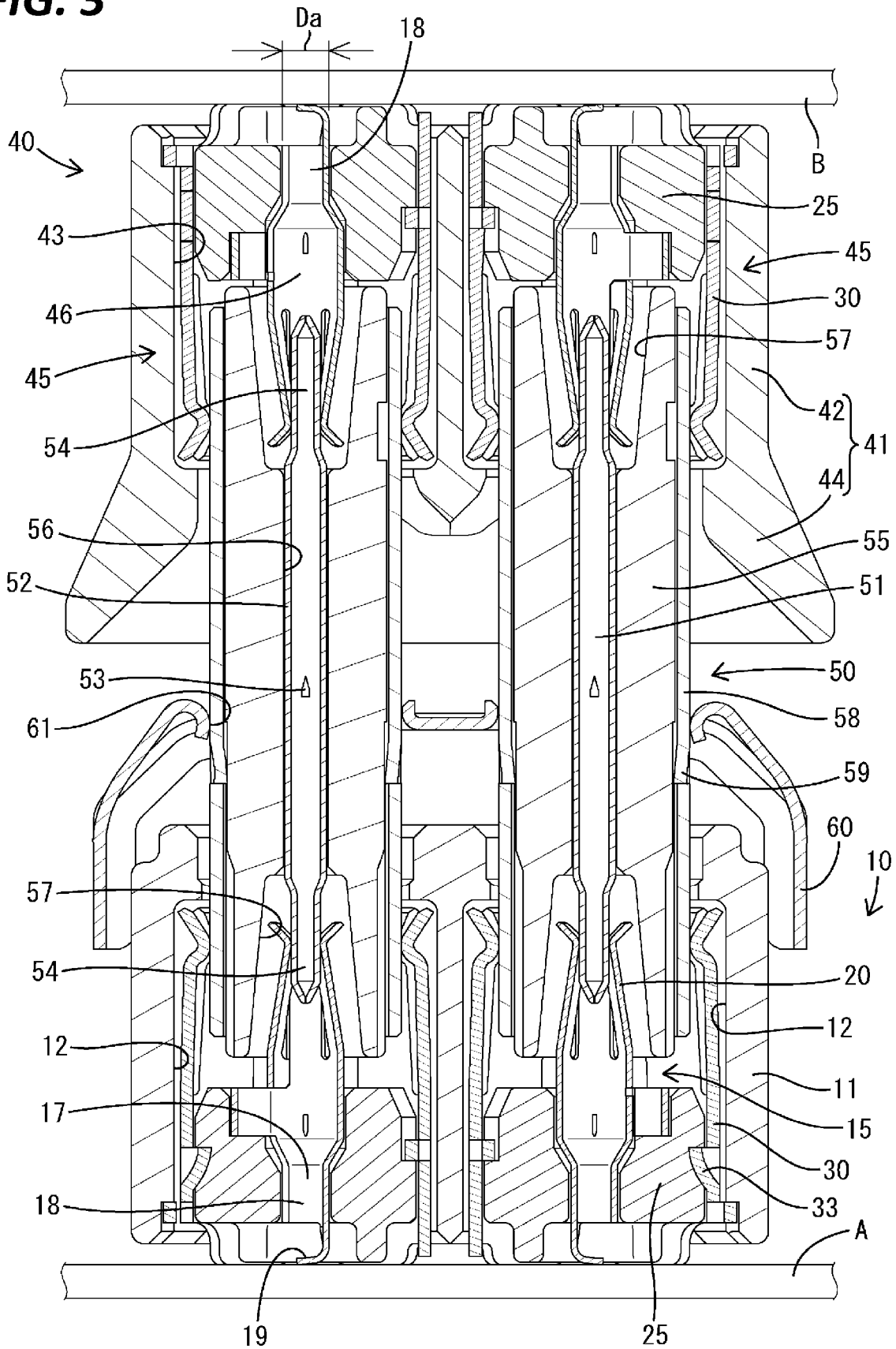
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FIG. 4

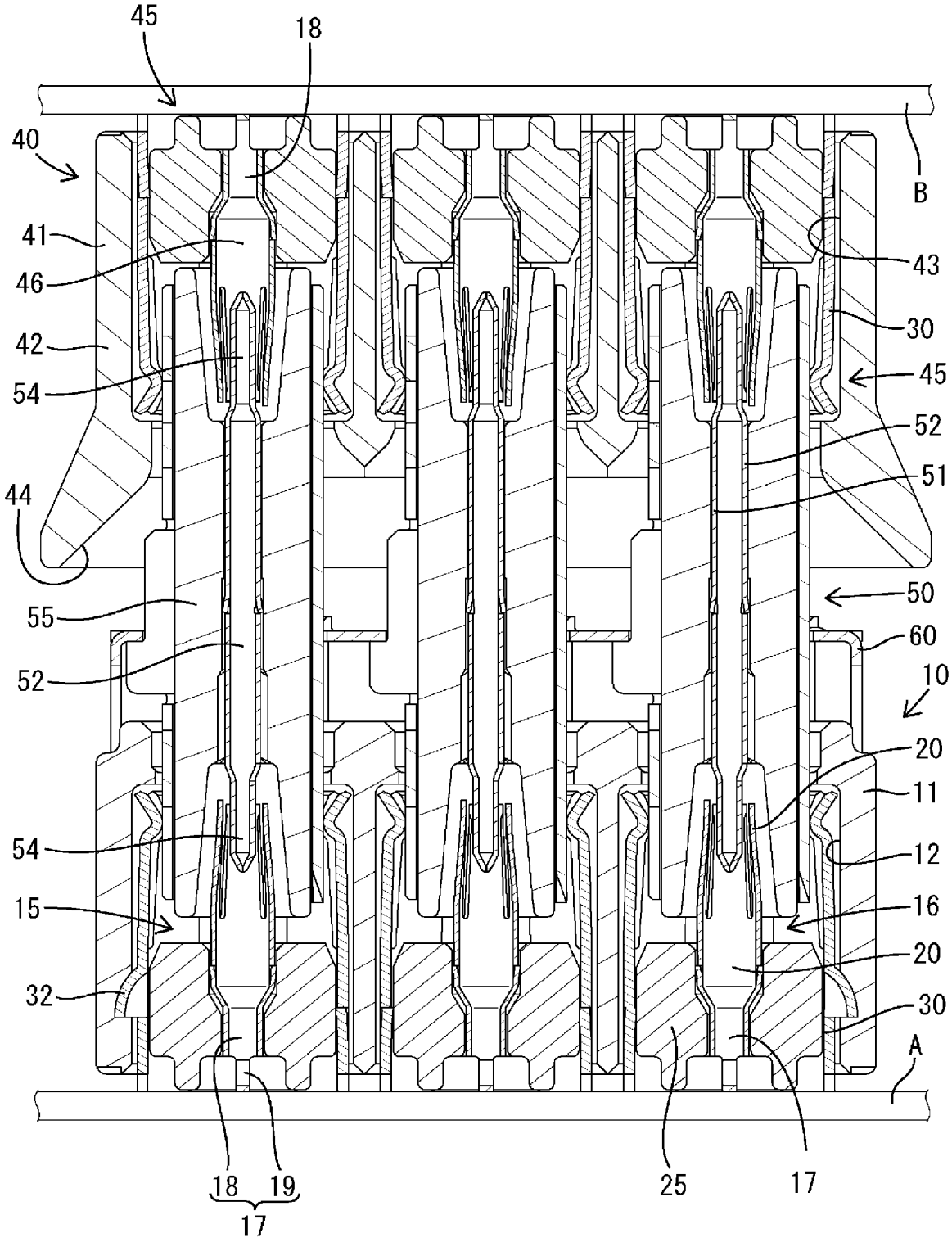
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FIG. 5

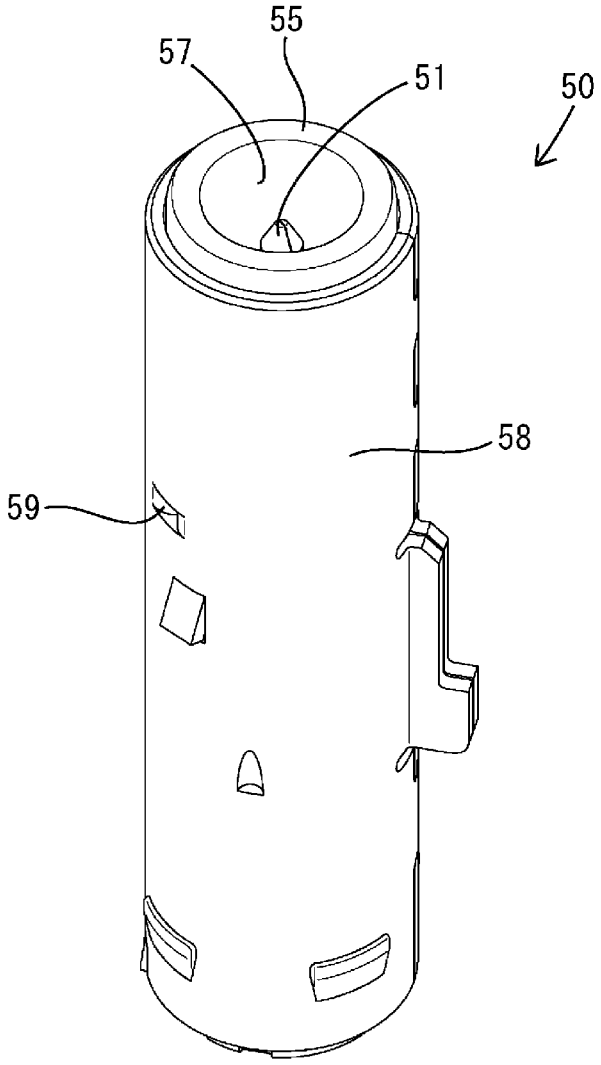


FIG. 6

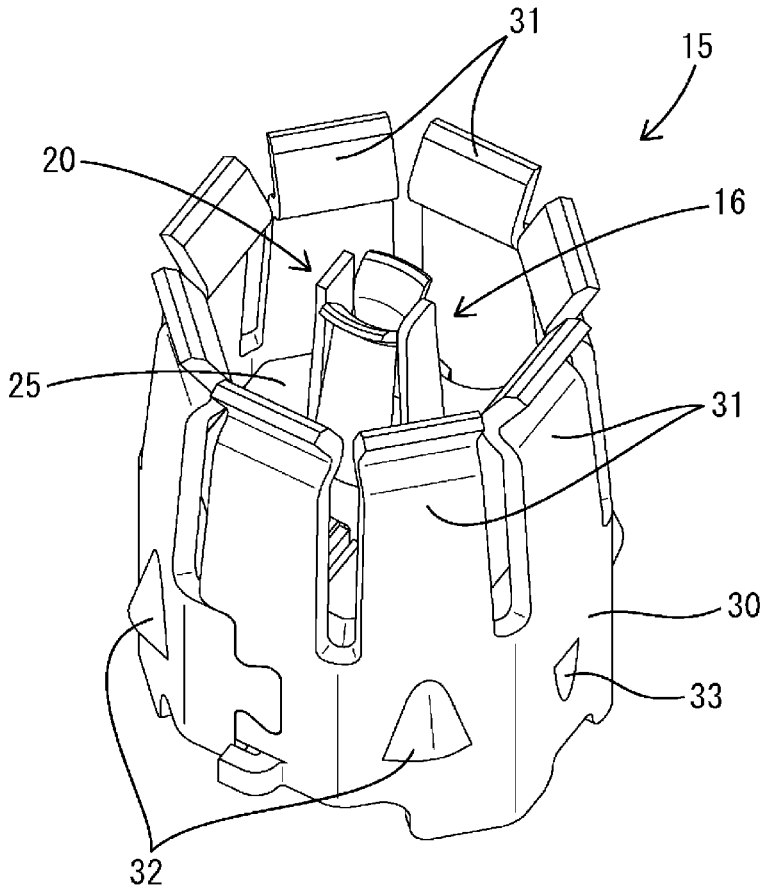


FIG. 7

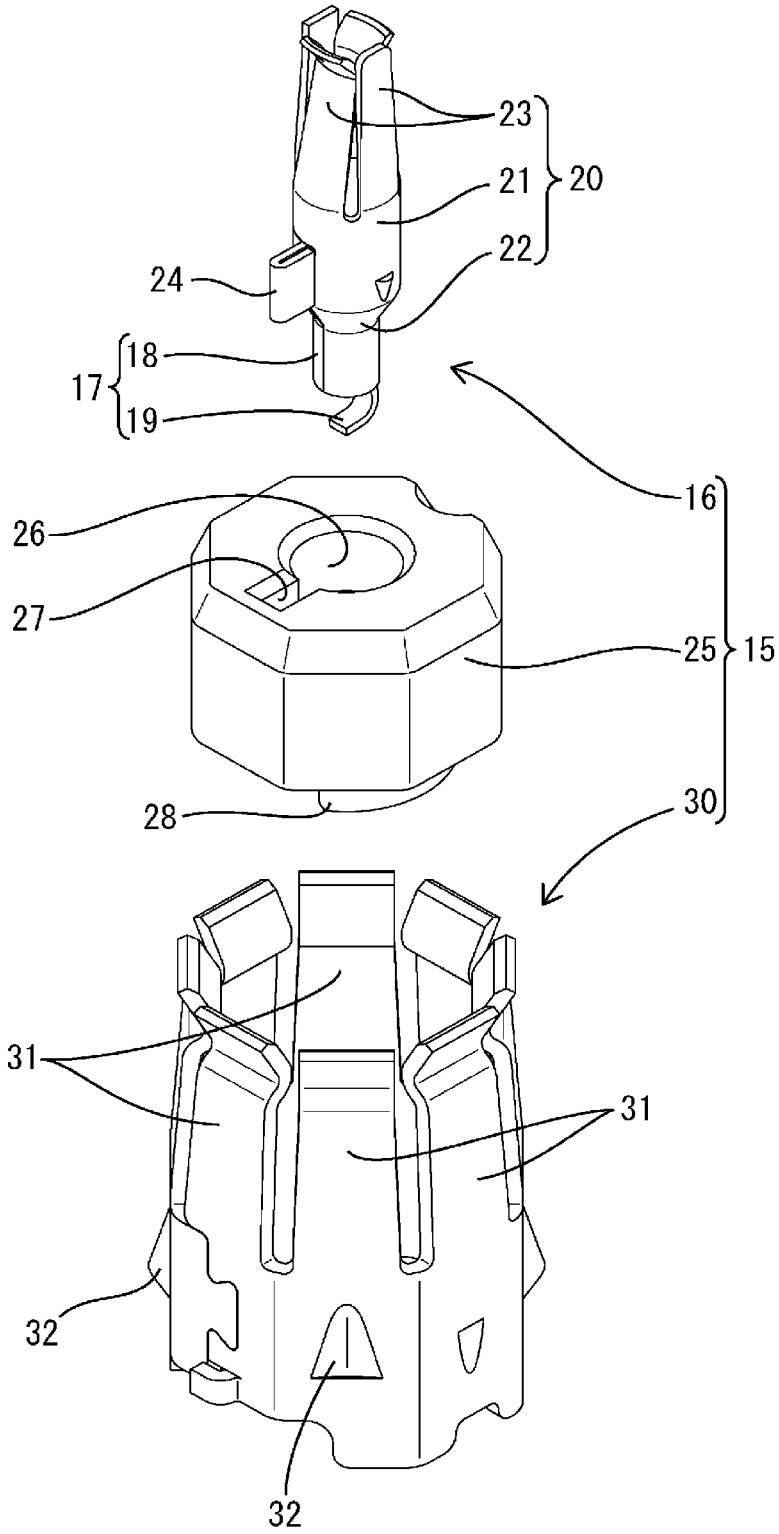
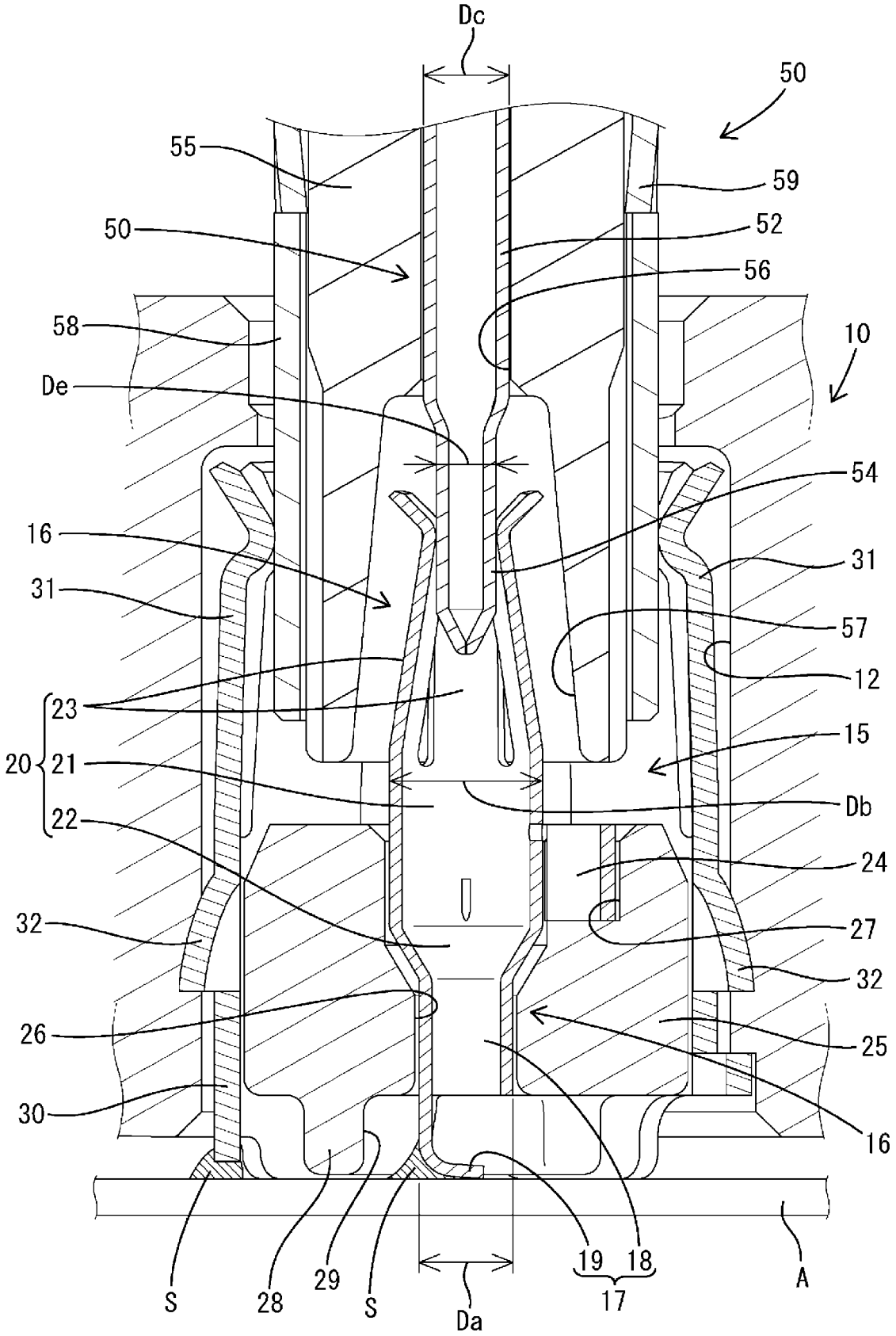


FIG. 8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CONNECTOR DEVICE

TECHNICAL FIELD

[0001] The present disclosure relates to a connector device.

BACKGROUND

[0002] Patent Document 1 discloses a connector device configured to connect a first connector and a second connector facing each other via an adapter. The adapter is relatively rockably connected to the first and second connectors. The first and second connectors can be respectively mounted on a first circuit board and a second circuit board. When the first and second circuit boards are shifted in position in a direction intersecting a facing direction, the adapter is inclined to accommodate position shifts of the first and second circuit boards.

PRIOR ART DOCUMENT

Patent Document

[0003] Patent Document 1: U.S. Pat. No. 4,925,403

SUMMARY OF THE INVENTION

Problems to be Solved

[0004] The first connector includes a first inner conductor to be mounted on the first circuit board and the second connector includes a second inner conductor to be mounted on the second circuit board. The adapter includes a movable-side inner conductor, and both end parts of the movable-side inner conductor are connected to the first and second inner conductors while being externally fit to the first and second inner conductors. Since the movable-side inner conductor is shaped to surround the first and second inner conductors, an outer diameter of the movable-side inner conductor is larger than those of the first and second inner conductors. A variation in the outer diameters of these inner conductors degrades transmission characteristics.

[0005] A connector device of the present disclosure was completed on the basis of the above situation and the present disclosure aims to improve transmission characteristics.

Means to Solve the Problem

[0006] The present disclosure is directed to a connector device with a mounting terminal including a mounting-side inner conductor, the mounting terminal being mounted on a circuit board, and an elongated movable terminal including a movable-side inner conductor, the movable terminal being arranged between the mounting terminal and a mating terminal, the mounting-side inner conductor including a mounting portion to be connected to the circuit board and a mounting-side connecting portion extending from the mounting portion toward the movable terminal, the movable-side inner conductor including a movable-side connecting portion to be connected to the mounting-side connecting portion while being fit to the mounting-side connecting portion in a length direction of the movable terminal and a shaft-like body portion extending from the movable-side connecting portion toward the mating terminal, and an outer diameter of the body portion and an outer diameter of the mounting portion being set equal.

Effect of the Invention

[0007] According to the present disclosure, it is possible to improve transmission characteristics.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view of a connector device of one embodiment.

[0009] FIG. **2** is an exploded perspective view of the connector device.

[0010] FIG. **3** is a front view in section of the connector device.

[0011] FIG. **4** is a side view in section of the connector device.

[0012] FIG. **5** is a perspective view of a movable terminal.

[0013] FIG. **6** is a perspective view of a first terminal.

[0014] FIG. **7** is an exploded perspective view of the first terminal.

[0015] FIG. **8** is a partial enlarged front view in section showing a connection structure of the first terminal and the movable terminal.

DETAILED DESCRIPTION TO EXECUTE THE INVENTION

Description of Embodiments of Present Disclosure

[0016] First, embodiments of the present disclosure are listed and described.

[0017] (1) The connector device of the present disclosure is provided with a mounting terminal including a mounting-side inner conductor, the mounting terminal being mounted on a circuit board, and an elongated movable terminal including a movable-side inner conductor, the movable terminal being arranged between the mounting terminal and a mating terminal, the mounting-side inner conductor including a mounting portion to be connected to the circuit board and a mounting-side connecting portion extending from the mounting portion toward the movable terminal, the movable-side inner conductor including a movable-side connecting portion to be connected to the mounting-side connecting portion while being fit to the mounting-side connecting portion in a length direction of the movable terminal and a shaft-like body portion extending from the movable-side connecting portion toward the mating terminal, and an outer diameter of the body portion and an outer diameter of the mounting portion being set equal.

[0018] To improve transmission characteristics in a transmission path from the elongated movable terminal to the circuit board via the mounting terminal, an impedance of the mounting terminal and that of the movable terminal are desirably matched. However, in a connected part in which the movable-side connecting portion and the mounting-side connecting portion are fit in the length direction of the movable terminal, an outer diameter becomes larger than in other parts. Thus, there is a concern for impedance mismatching. Accordingly, in the connector device of the present disclosure, the outer diameter of the mounting portion near the circuit board is set equal to the outer diameter of the shaft-like body portion of the movable terminal. According to this dimensioning, an impedance near the circuit board can be matched with an impedance of the transmission path constituted by the elongated movable terminal. In this way, the transmission characteristics can be improved on the

whole in the transmission path from the elongated movable terminal to the circuit board via the mounting-side terminal.

[0019] (2) Preferably, a length of the body portion is larger than that of the mounting-side inner conductor. According to this configuration, a length of the connected part of the movable-side connecting portion and the mounting-side connecting portion, i.e. a length of a region of impedance mismatching, is shorter than the length of the body portion, wherefore the transmission characteristics can be improved on the whole.

[0020] (3) Preferably, the movable-side connecting portion is connected while being accommodated in the mounting-side connecting portion, and an outer diameter of the movable-side connecting portion is set smaller than that of the body portion. According to this configuration, since the outer diameter of the mounting-side connecting portion can be suppressed to be small and a difference between an impedance in the connected part of the movable-side connecting portion and the mounting-side connecting portion and an impedance in the body portion and the mounting portion can be reduced, the transmission characteristics can be improved on the whole.

[0021] (4) Preferably, the mounting portion is fixed to the circuit board by solder, the mounting terminal includes a tubular mounting-side dielectric for accommodating the mounting-side inner conductor, and a clearance is provided between an end part of an inner peripheral surface of the mounting-side dielectric on the side of the circuit board and an end part of an outer peripheral surface of the mounting portion on the side of the circuit board. According to this configuration, the solder in a molten state can be prevented from intruding into a gap between the inner peripheral surface of the mounting-side dielectric and the outer peripheral surface of the mounting portion by a capillary phenomenon.

[0022] (5) Preferably, the movable terminal includes a movable-side dielectric surrounding the movable-side inner conductor and a movable-side outer conductor surrounding the movable-side dielectric, and an end part of the movable-side dielectric on the side of the mounting terminal projects further toward the mounting-side connecting portion than an end part of the movable-side outer conductor. According to this configuration, the interference of the movable-side outer conductor with the mounting-side connecting portion can be prevented when the movable terminal is assembled with the mounting terminal.

Details of Embodiment of Present Disclosure

Embodiment

[0023] One specific embodiment of a connector device of the present disclosure is described below with reference to FIGS. **1** to **8**. Note that the present invention is not limited to these illustrations and is intended to be represented by claims and include all changes in the scope of claims and in the meaning and scope of equivalents. In this embodiment, an oblique right lower side in FIGS. **1** and **2** is defined as a front side concerning a front-rear direction. Upper and lower sides shown in FIGS. **1** to **8** are directly defined as upper and lower sides concerning a vertical direction. An oblique left lower side in FIGS. **1** and **2** is defined as a left side concerning a lateral direction.

[0024] The connector device of this embodiment includes, as shown in FIGS. **1** and **2**, a first connector **10**, a second connector **40** and movable terminals **50**. As shown in FIGS. **3** and **4**, the first connector **10** is mounted on a first circuit board A, and the second connector **40** is mounted on a second circuit board B.

[0025] The first circuit board A is, for example, provided in an ECU (not shown) mounted in a roof of an automotive vehicle, and horizontally arranged with a mounting surface facing up, i.e. facing toward the side of an antenna (not shown). The second circuit board B is, for example, provided in the antenna (not shown) to be mounted in the roof (not shown) of the automotive vehicle. The second circuit board B is horizontally arranged with a mounting surface facing down, i.e. facing toward a vehicle interior side. The first and second circuit boards A, B are arranged in such a positional relationship that the mounting surfaces of the both are facing in parallel to each other.

[0026] If the first and second circuit boards A, B are brought closer, the both circuit boards A, B are connected via the first connector **10**, the second connector **40** and the movable terminals **50**. Since the first and second circuit boards A, B are connected without via a wiring harness, high-speed communication is possible between the first and second circuit boards A, B. Since assembly tolerances of the roof and the antenna are relatively large in an antenna mounted part in the roof of the automotive vehicle, position shifts possibly occur between the first and second circuit boards A, B in a horizontal direction intersecting a connecting direction of the both connectors **10**, **40**. The connector device of this embodiment is configured such that the both connectors **10**, **40** are connected while the position shifts of the both circuit boards A, B are accommodated by rocking movements of the movable terminals **50**.

[0027] As shown in FIGS. **2** and **3**, the first connector **10** includes a first housing **11** and a plurality of first terminals **15**. With the first connector **10** mounted on the first circuit board A, the lower surface of the first housing **11** is fixed to the first circuit board A and lower end parts of the plurality of first terminals **15** are connected to a printed circuit (not shown) of the first circuit board A. The first terminals **15** function as mounting terminals to be mounted on the first circuit board A.

[0028] The first housing **11** is a single component made of synthetic resin and having a rectangular parallelepiped shape. The first housing **11** is formed with as many first terminal accommodation chambers **12** as the first terminals **15**. The first terminal accommodation chambers **12** vertically penetrate through the first housing **11**. In a plan view of the first housing **11**, the first terminal accommodation chambers **12** are circular. The plurality of first terminal accommodation chambers **12** are divided into two left and right rows, and three chambers are arranged to be aligned in a row in the front-rear direction in each row.

[0029] The plurality of first terminals **15** are individually accommodated in the plurality of first terminal accommodation chambers **12**. As shown in FIGS. **6** and **7**, the first terminal **15** includes a first inner conductor **16**, a first dielectric **25** and a first outer conductor **30**. The first inner conductor **16** is a single component having a tubular shape with an axis oriented in the vertical direction orthogonal to the first circuit board A and including a mounting portion **17** and a first connecting portion **20**. The first inner conductor **16** functions as a mounting-side inner conductor to be mounted on the first circuit board A. The mounting portion **17** includes a hollow cylindrical portion **18** and a leg portion

19 projecting toward the first circuit board A from the lower end edge of the hollow cylindrical portion 18. The leg portion 19 is in the form of a plate bent into an L shape.

[0030] The first connecting portion 20 is a part functioning as a mounting-side connecting portion to be connected to the movable terminal. The first connecting portion 20 includes a hollow cylindrical supporting portion 21, a tapered portion 22 having a truncated conical shape and linking the lower end edge of the supporting portion 21 and the upper end edge of the hollow cylindrical portion 18, and a plurality of resilient contact pieces 23 cantilevered upward (toward the second circuit board B) from the upper end edge of the supporting portion 21. As shown in FIG. 8, an outer diameter Db of the supporting portion 21 is larger than an outer diameter Da of the hollow cylindrical portion 18. The plurality of resilient contact pieces 23 are point-symmetrically arranged at intervals in a circumferential direction. A positioning protrusion 24 is formed on the outer peripheral surface of the supporting portion 21.

[0031] The first dielectric 25 is a member made of synthetic resin and having a hollow cylindrical shape with an axis oriented in the vertical direction. The first dielectric 25 functions as a mounting-side dielectric surrounding the mounting-side inner conductor. The supporting portion 21, the tapered portion 22 and the hollow cylindrical portion 18 of the first inner conductor 16 are accommodated in a center hole 26 of the first dielectric 25, and the positioning protrusion 24 is press-fit into a groove portion 27 of the center hole 26. The resilient contact pieces 23 of the first inner conductor 16 project upward from the upper end surface of the first dielectric 25. An arcuate projection 28 having an arched shape concentric with the first dielectric 25 is formed on the lower end surface (surface facing the first circuit board A) of the first dielectric 25. The arcuate projection 28 surrounds the leg portion 19 projecting from the lower end surface of the first dielectric 25. A clearance 29 is secured between the leg portion 19 and the inner peripheral surface of the arcuate projection 28.

[0032] The first outer conductor 30 is a single component made of metal and in the form of an angular tube having a polygonal shape. The first outer conductor 30 functions as a mounting-side outer conductor surrounding the mounting-side dielectric (first dielectric 25). A plurality of resilient arms 31 divided in the circumferential direction are formed in an upper end side region of the first outer conductor 30. A projection-like press-fit portion 32 is formed on the outer peripheral surface of the first outer conductor 30. A projecting portion 33 is formed on the inner peripheral surface of the first outer conductor 30. The first outer conductor 30 surrounds the first dielectric 25. As shown in FIG. 3, the projecting portion 33 bites into an outer peripheral part of the first dielectric 25, whereby the first outer conductor 30 and the first dielectric 25 are held in an assembled state. By assembling the first inner conductor 16 and the first dielectric 25 and assembling the first dielectric 25 and the first outer conductor 30, the first terminal 15 is configured.

[0033] As shown in FIG. 8, with the first terminal 15 accommodated in the first terminal accommodation chamber 12, the press-fit portion 32 is press-fit into an inner peripheral part of the first terminal accommodation chamber 12, whereby the first terminal 15 is held in a state assembled with the first housing 11. The first dielectric 25 is arranged in a lower end part of the first terminal accommodation chamber 12 and the resilient arms 31 project upward along the inner peripheral surface of the first terminal accommodation chamber 12. The plurality of resilient contact pieces 23 projecting upward from the upper end surface of the first dielectric 25 are surrounded by the plurality of resilient arms 31.

[0034] By accommodating the first terminals 15 into the first terminal accommodation chambers 12, the first connector 10 is configured. The first connector 10 is mounted on the first circuit board A. In mounting the first connector 10, the L-shaped leg portions 19 formed in the mounting portions 17 of the first inner conductors 16 are conductively welded to the mounting surface of the first circuit board A by solder S. The lower end parts of the first outer conductors 30 are also fixed to the mounting surface of the first circuit board A by the solder S. Further, the arcuate projections 28 projecting from the lower end surfaces of the first dielectrics 25 come into contact with the mounting surface of the first circuit board A, but the clearances 29 are secured over the entire peripheries of the leg portions 19 between the inner peripheral surfaces of the arcuate projections 28 and the leg portions 19. Therefore, there is no possibility that the solder S in contact with the leg portions 19 in a molten state intrudes into gaps between the arcuate projections 28 and the leg portions 19 by a capillary phenomenon.

[0035] As shown in FIGS. 3 and 4, the second connector 40 includes a second housing 41 and as many second terminals 45 as the first terminals 15. With the second connector 40 mounted on the second circuit board B, the upper surface of the second housing 41 is fixed to the mounting surface of the second circuit board B and upper end parts of a plurality of the second terminals 45 are connected to a printed circuit (not shown) of the second circuit board B. The second housing 41 is a single component made of synthetic resin and including a terminal holding portion 42 having a rectangular parallelepiped shape and a rectangular guiding portion 44. The terminal holding portion 42 is formed with a plurality of (six in this embodiment) second terminal accommodation chambers 43 vertically penetrating through the terminal holding portion 42. The second terminal accommodation chambers 43 are obtained by vertically inverting the first terminal accommodation chambers 12.

[0036] The plurality of second terminals 45 are individually accommodated in the plurality of second terminal accommodation chambers 43. The second terminal 45 is the same component as the first terminal 15 and mounted in the second terminal accommodation chamber 43 in an orientation vertically inverted from that of the first terminal 15. The guiding portion 44 projects obliquely downward in a skirt-like manner from the outer peripheral edge of the lower end of the terminal holding portion 42. The guiding portion 44 is inclined to become wider toward the bottom with respect to the connecting direction of the both connectors 10, 40. An internal space of the guiding portion 44 communicates with the plurality of second terminal accommodation chambers 43 and is open downward of the second housing 41. The second connector 40 is mounted on the mounting surface of the second circuit board B in a manner similar to a mounting mode of the first connector 10 on the first circuit board A.

[0037] As shown in FIGS. 2 to 5, the movable terminal 50 has an elongated shape with an axis oriented in the vertical direction (facing direction of the first and second circuit boards A, B) as a whole. Both end parts in an axial direction of the movable terminal 50 have such symmetry as to have

the same shape when the movable terminal **50** is inverted. As shown in FIGS. **3** and **4**, the movable terminal **50** is a member configured by assembling a movable-side inner conductor **51**, a movable-side dielectric **55** and a movable-side outer conductor **58**.

[0038] The movable-side inner conductor **51** is a metal member having a tubular shape elongated in the axial direction of the movable terminal **50**. The movable-side inner conductor **51** is a single component including a hollow cylindrical body portion **52** and a pair of vertically symmetrical movable-side connecting portions **54**. As shown in FIG. **8**, an outer diameter Dc of the body portion **52** is equal to the outer diameter Da of the hollow cylindrical portion **18** of the first inner conductor **16**. A retaining projection **53** is formed on the outer peripheral surface of the body portion **52**. The upper movable-side connecting portion **54** projects upward coaxially with the body portion **52** from the upper end of the body portion **52**, and the lower movable-side connecting portion **54** projects downward coaxially with the body portion **52** from the lower end of the body portion **52**. An outer diameter De of the movable-side connecting portion **54** is smaller than the outer diameter Dc of the body portion **52** and the outer diameter Da of the hollow cylindrical portion **18**. A length in the axial direction of the movable-side connecting portion **54** is shorter than that of the body portion **52**.

[0039] The movable-side dielectric **55** has a hollow cylindrical shape coaxial with the movable-side inner conductor **51**. The movable-side inner conductor **51** is coaxially accommodated in an insertion hole **56** of the movable-side dielectric **55**. The retaining projection **53** bites into an inner peripheral part of the insertion hole **56**, whereby the movable-side inner conductor **51** and the movable-side dielectric **55** are integrally assembled. Circular accommodation recesses **57** are formed in both end parts in the axial direction of the movable-side dielectric **55** by coaxially recessing both upper and lower end surfaces of the movable-side dielectric **55**. The accommodation recesses **57** communicate with the insertion hole **56**. The movable-side connecting portions **54** are accommodated into the accommodation recesses **57**.

[0040] The movable-side outer conductor **58** has a hollow cylindrical shape as a whole. The movable-side outer conductor **58** is formed with a locking piece **59** cut and raised to project toward an inner peripheral side. The movable-side outer conductor **58** coaxially surrounds the movable-side dielectric **55**. The locking piece **59** bites into an outer peripheral part of the movable-side dielectric **55**, whereby the movable-side outer conductor **58** and the movable-side dielectric **55** are integrated. A lower end part of the movable-side dielectric **55** projects further downward than the lower end of the movable-side outer conductor **58**, and an upper end part of the movable-side dielectric **55** projects further upward than the upper end of the movable-side outer conductor **58**. The movable terminal **50** is configured by assembling the movable-side inner conductor **51**, the movable-side dielectric **55** and the movable-side outer conductor **58**.

[0041] A lower end part (one end part) of the movable terminal **50** is inserted into the first terminal accommodation chamber **12** and mounted in the first terminal **15**. At this time, since the lower end part of the movable-side dielectric **55** projects further downward than the lower end of the movable-side outer conductor **58**, it is possible to prevent the interference of the movable-side outer conductor **58** with the upper surface of the first housing **11** and the interference of the movable-side outer conductor **58** with the upper end part of the first inner conductor **16**.

[0042] With the movable terminal **50** mounted in the first terminal **15**, the resilient arms **31** of the first outer conductor **30** resiliently contact the outer peripheral surface of the movable-side outer conductor **58**. In the accommodation recess **57** of the movable terminal **50**, the resilient contact pieces **23** of the first inner conductor **16** surround the movable-side inner conductor **51** and resiliently contact the outer peripheral surface of the movable-side inner conductor **51**. The movable terminal **50** is rockable in the front-rear direction and lateral direction with the first terminal **15** as a fulcrum.

[0043] The movable terminal **50** mounted in the first terminal **15** projects further upward than the upper end surface of the first housing **11**. The upper end part of the movable terminal **50** is connected to the second terminal **45**, which is a mating terminal. Since one movable terminal **50** is supported in contact with only one first terminal **15**, there is a concern that the plurality of movable terminals **50** individually rock in directions different from the other movable terminals **15**. As a countermeasure against this, the plurality of movable terminals **50** are made integrally rockable by being passed through holding holes **61** of an alignment member **60** as shown in FIG. **3**.

[0044] After the movable terminals **50** are mounted into the first connector **10**, the first and second circuit boards A, B are brought closer to connect the upper end parts of the movable terminals **50** to the second connector **40**. The movable terminals **50** and the second connector **40** are connected in a manner similar to the connection of the movable terminals **50** and the first connector **10**. Transmission paths are configured by the first terminals **15**, the movable terminals **50** and the second terminals **45** between the first and second circuit boards A, B. To improve transmission characteristics of these transmission paths, overall impedance matching of the transmission paths is necessary.

[0045] In the connector device of this embodiment, the outer diameter Dc of the body portion **52** of the movable-side inner conductor **51**, the outer diameter Da of the hollow cylindrical portion **18** of the first inner conductor **16** and an outer diameter Da (see FIG. **3**) of a hollow cylindrical portion **18** of a second inner conductor **46** are set equal as shown in FIGS. **3** and **8** as a means for enhancing impedance matching. As shown in FIGS. **3** and **4**, a length in the axial direction of the body portion **52** accounts for ⅓ of a length of the transmission path between the both circuit boards A and B. Further, the hollow cylindrical portion **18** of the first inner conductor **16** is shorter in axial length than the body portion **52**, but is arranged at a position closer to the first circuit board A than the body portion **52**. The hollow cylindrical portion **18** of the second inner conductor **46** is shorter in axial length than the body portion **52**, but is arranged at a position closer to the second circuit board B than the body portion **52**. Therefore, overall impedance matching of the transmission paths between the both circuit boards A and B is high and the transmission characteristics are high on the whole.

[0046] The connector device of this embodiment includes the first terminals **15** and the movable terminals **50**. The first terminal **15** includes the first inner conductor **16** and is mounted on the first circuit board A. The movable terminal **50** is an elongated member including the movable-side inner

conductor **51**. The movable terminal **50** is arranged between the first terminal **15** serving as the mounting terminal and the second terminal **45** serving as the mating terminal. The first inner conductor **16** includes the mounting portion **17** to be connected to the first circuit board A and the first connecting portion **20** extending from the mounting portion **17** toward the movable terminal **50**. The movable-side inner conductor **51** includes the movable-side connecting portions **54** and the body portion **52**. The movable-side connecting portion **54** is fit into the first connecting portion **20** in a length direction of the movable terminal **50** and connected with peripheral surfaces radially facing each other. The body portion **52** is shaft-like and elongated from the movable-side connecting portion **54** toward the second terminal **45**. The outer diameter Dc of the body portion **52** and the outer diameter Da of the hollow cylindrical portion **18** of the mounting portion **17** are set equal.

[0047] In the transmission path from the elongated movable terminal **50** to the first circuit board A via the first terminal **15**, an impedance of the first terminal **15** and that of the movable terminal **50** are desirably matched to improve transmission characteristics. However, in a connected part in which the movable-side connecting portion **54** is fit in the first connecting portion **20**, the movable-side connecting portion **54** and the first connecting portion **20** radially overlap and an outer diameter becomes larger than in other parts. Thus, there is a concern for impedance mismatching.

[0048] Accordingly, in this embodiment, the outer diameter Da of the mounting portion **17** (hollow cylindrical portion **18**) near the first circuit board A is set equal to the outer diameter Dc of the shaft-like body portion **52**. According to this dimensioning, an impedance near the first circuit board A can be matched with an impedance of the transmission path constituted by the elongated movable terminal **50**. Thus, the transmission characteristics can be improved on the whole in the transmission path from the elongated movable terminal **50** to the first circuit board A via the first terminal **15**.

[0049] The length in the axial direction of the body portion **52** is set longer than that of the first inner conductor **16**. Most of the transmission path from the movable terminal **50** to the first circuit board A is constituted by the body portion **52**. Since a length of the connected part of the movable-side connecting portion **54** and the first connecting portion **20**, i.e. a length of a region of impedance mismatching, is shorter than the length in the axial direction of the body portion **52** and the entire length in the axial direction of the first inner conductor **16**, the degradation of the transmission characteristics is suppressed.

[0050] The movable-side connecting portion **54** is connected while being accommodated in the first connecting portion **20**. The outer diameter De of the movable-side connecting portion **54** is set smaller than the outer diameter Dc of the body portion **52**. According to this configuration, since the outer diameter of the first connecting portion **20** can be suppressed to be small and a difference between an impedance in the connected part of the movable-side connecting portion **54** and the first connecting portion **20** and an impedance in the body portion **52** and the mounting portion **17** can be reduced, the transmission characteristics can be improved on the whole.

[0051] The mounting portion **17** is fixed to the first circuit board A by the solder S. The first terminal **15** includes the tubular first dielectric **25** for accommodating the first inner conductor **16**. The arcuate projection **28** for surrounding an end part of the mounting portion **17** on the side of the first circuit board A is formed on an end part of the inner peripheral surface of the first dielectric **25** on the side of the first circuit board A. The clearance **29** is provided between the inner peripheral surface of the arcuate projection **28** and an end part of the outer peripheral surface of the mounting portion **17** on the side of the circuit board A. According to this configuration, even if the solder S in the molten state is in contact with the outer peripheral surface of the mounting portion **17** and the mounting surface of the first circuit board A, this solder S can be prevented from intruding into the gap between the inner peripheral surface of the first dielectric **25** and the outer peripheral surface of the mounting portion **17** by the capillary phenomenon.

[0052] The movable terminal **50** includes the movable-side dielectric **55** surrounding the movable-side inner conductor **51** and the movable-side outer conductor **58** surrounding the movable-side dielectric **55**. An end part of the movable-side dielectric **55** on the side of the first terminal **15** projects further toward the first connecting portion **20** than an end part of the movable-side outer conductor **58**. According to this configuration, when the movable terminal **50** is assembled with the first terminal **15**, the interference of the movable-side outer conductor **58** with the first connecting portion **20** of the first inner conductor **16** can be prevented.

Other Embodiments

[0053] The present invention is not limited by the above described and illustrated embodiment, but is represented by claims. The present invention is intended to include all changes in the scope of claims and in the meaning and scope of equivalents and also include the following embodiments.

[0054] Although the movable-side connecting portion is accommodated in the mounting-side connecting portion in the above embodiment, the mounting-side connecting portion may be accommodated in the movable-side connecting portion.

[0055] Although the mounting-side connecting portion resiliently contacts the movable-side connecting portion in the above embodiment, the movable-side connecting portion may resiliently contact the mounting-side connecting portion.

[0056] Although the movable-side dielectric projects further toward the mounting-side connecting portion than the movable-side outer conductor in the above embodiment, the movable-side outer conductor may project further toward the mounting-side connecting portion than the movable-side dielectric.

LIST OF REFERENCE NUMERALS

[0057] A . . . first circuit board (circuit board)

[0058] B . . . second circuit board (circuit board)

[0059] Da . . . outer diameter of hollow cylindrical portion (mounting portion)

[0060] Db . . . outer diameter of supporting portion

[0061] Dc . . . outer diameter of body portion

[0062] De . . . outer diameter of movable-side connecting portion

[0063] S . . . solder

[0064] **10** . . . first connector

[0065] **11** . . . first housing (housing)

[0066] **12** . . . first terminal accommodation chamber
[0067] **15** . . . first terminal (mounting terminal)
[0068] **16** . . . first inner conductor (mounting-side inner conductor)
[0069] **17** . . . mounting portion (mounting-side connecting portion)
[0070] **18** . . . hollow cylindrical portion
[0071] **19** . . . leg portion
[0072] **20** . . . first connecting portion
[0073] **21** . . . supporting portion
[0074] **22** . . . tapered portion
[0075] **23** . . . resilient contact piece
[0076] **24** . . . positioning protrusion
[0077] **25** . . . first dielectric (mounting-side dielectric)
[0078] **26** . . . center hole
[0079] **27** . . . groove portion
[0080] **28** . . . arcuate projection
[0081] **29** . . . clearance
[0082] **30** . . . first outer conductor
[0083] **31** . . . resilient arm
[0084] **32** . . . press-fit portion
[0085] **33** . . . projecting portion
[0086] **40** . . . second connector
[0087] **41** . . . second housing
[0088] **42** . . . terminal holding portion
[0089] **43** . . . second terminal accommodation chamber
[0090] **44** . . . guiding portion
[0091] **45** . . . second terminal (mating terminal)
[0092] **46** . . . second inner conductor
[0093] **50** . . . movable terminal
[0094] **51** . . . movable-side inner conductor
[0095] **52** . . . body portion
[0096] **53** . . . retaining projection
[0097] **54** . . . movable-side connecting portion
[0098] **55** . . . movable-side dielectric
[0099] **56** . . . insertion hole
[0100] **57** . . . accommodation recess
[0101] **58** . . . movable-side outer conductor
[0102] **59** . . . locking piece
[0103] **60** . . . alignment member
[0104] **61** . . . holding hole

1. A connector device, comprising:

a mounting terminal including a mounting-side inner conductor, the mounting terminal being mounted on a circuit board; and

an elongated movable terminal including a movable-side inner conductor, the movable terminal being arranged between the mounting terminal and a mating terminal,

the mounting-side inner conductor including:

a mounting portion to be connected to the circuit board; and

a mounting-side connecting portion extending from the mounting portion toward the movable terminal,

the movable-side inner conductor including:

a movable-side connecting portion to be connected to the mounting-side connecting portion while being fit to the mounting-side connecting portion in a length direction of the movable terminal; and

a shaft-like body portion extending from the movable-side connecting portion toward the mating terminal, and

an impedance near the circuit board and an impedance of a transmission path constituted by the movable terminal being matched by setting an outer diameter of the body portion and an outer diameter of the mounting portion equal.

2. The connector device of claim **1**, wherein a length of the body portion is larger than that of the mounting-side inner conductor.

3. The connector device of claim **1**, wherein:

the movable-side connecting portion is connected while being accommodated in the mounting-side connecting portion, and

an outer diameter of the movable-side connecting portion is set smaller than that of the body portion.

4. The connector device of claim **1**, wherein:

the mounting portion is fixed to the circuit board by solder,

the mounting terminal includes a tubular mounting-side dielectric for accommodating the mounting-side inner conductor, and

a clearance is provided between an inner peripheral surface on an end part of the mounting-side dielectric on the side of the circuit board and an outer peripheral surface on an end part of the mounting portion on the side of the circuit board.

5. The connector device of claim **1**, wherein:

the movable terminal includes a movable-side dielectric surrounding the movable-side inner conductor and a movable-side outer conductor surrounding the movable-side dielectric, and

an end part of the movable-side dielectric on the side of the mounting terminal projects further toward the mounting-side connecting portion than an end part of the movable-side outer conductor.

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