product. For example, here, the plug-in end may be a female plug or a male plug.

[0057] The elastic clamping piece 5 is mounted inside the chamber 11, with an elastic free portion 52 and a fixed portion 51; the fixed portion 51 of the elastic clamping piece 5 is connected to the electric conductor 4, and the force applying portion 31 of the transmitting piece 3 resists against the elastic free portion 52; and an adjustable gap G is formed between the elastic free portion 52 and the electric conductor 4, for receiving a wire passing through the wire access hole 10. As for the fixation mode for the fixed portion 51 and the electric conductor 4, the electric conductor may have an adaptation portion adapted to the fixation of the fixed portion 51 of the elastic clamping piece 5. For example, the fixed portion 51 of the elastic clamping piece 5 is fixed to the electric conductor 4 though concave and convex structures which are matched with each other. For example, the adaptation portion on the electric conductor 4 may be a groove for receiving the fixed portion 51, and the elastic free portion 52 of the elastic clamping piece 5 is resisted against the electric conductor 4 to form an included angle.

[0058] The cover 6 is assembled with the insulating housing 1 forming the chamber 11. The cover 6 and the insulating housing 1 are preferably assembled in a detachable manner. For example, the cover 6 and the insulating housing 1 may be assembled through fastening structures or bolt fixation structures which are matched with each other.

[0059] With reference to Figs. 10 and 11, when it is necessary to perform wiring, after a user pulls and turns up the head end 21 of the operating handle 2, the tail end 22 of the operating handle 2 will apply a pressing force to the force bearing portion 32 of the transmitting piece 3, and then the force applying portion 31 of the transmitting piece 3 presses the elastic free portion 52 of the elastic clamping piece 5 downward, so that the elastic free portion 52 is pressed down. At this time, a gap G will be formed between the elastic free portion 52 of the elastic clamping piece 5 and the electric conductor 4, so that a wire to be introduced can be inserted into the gap G.

[0060] Moreover, when the operating handle 2 is turned up and rotated to the angle defined by the rotation limiting portion, the rotation limiting portion 12 on the insulating housing 1 limits the tail end 22 of the operating handle 2, so that the operating handle 2 stays in the current state and is not easy to rotate. Consequently, the presence of the gap G can be maintained, and the user does not need to continuously apply a pulling force to the operating handle 2. Thus, the user can insert the wire into the gap G of the wire connector.

[0061] Then, the head end 21 of the operating handle 2 is pulled reversely. At this time, the force bearing portion 32 of the transmitting piece 3 is not subjected to the pressing force. Hence, the elastic free portion 52 will not be pressed down by the force applying portion 31 of the

transmitting piece 3, and the elastic free portion 52 of the elastic clamping piece 5 is restored to the original state due to the resilience force. That is, the elastic free portion 52 will apply a force to the wire, so that the wire comes into electrical contact with the electric conductor 4.

[0062] When it is necessary to take out the wire, the user also pulls and turns up the operating handle 2, so that a gap G is finally formed again between the elastic free portion 52 of the elastic clamping piece 5 and the electric conductor 4. Hence, the wire can be taken out toward the outer side of the wire access hole 10. When the operating handle 2 is turned up and rotated to the angle defined by the rotation limiting portion, due to the action of the rotation limiting portion 12, the gap G will exist continuously. At this time, the user does not need to continuously apply a pulling force to the operating handle 2. Thus, the user can take out the wire in the wire connector without continuously applying a force to the operating handle 2.

[0063] To be more convenient for the user to operate the operating handle 2, with reference to Figs. 2 and 4, in this embodiment, the rotation limiting portion 12 is a groove formed by the insulating housing 1, the rotation limiting portion 12 comprises a groove bottom 120 and an inclined wall 121 connected to the groove bottom 120; the operating handle 2 has a rotating portion 220 at the tail end 22, and the rotating portion 220 is capable of rotating inside the rotation limiting portion 12 along with the rotation of the tail end 22 of the operating handle 2. Of course, here, the rotation limiting portion 12 may also be a limiting edge. The limiting edge is formed by extending a bottom edge of the insulating housing 1 and located outside the chamber 11. The rotating portion 220 rotates in the space defined by the rotating shaft 13 and the limiting edge. In this embodiment, the rotating portion 220 is preferably of an arc-shaped structure to satisfy the smoothness of the tail end 22 of the operating handle 2 during its rotation.

[0064] In order to enable the transmitting piece 3 to more effectively apply a pressing force to the elastic clamping piece 5 to realize the elastic deformation of the elastic free portion 52 under stress, with reference to Figs. 2 and 6, the transmitting piece 3 has a transmitting body 30, the force bearing portion 32 is connected to top of the transmitting body 30; the transmitting piece 3 has at least one bending arm 33 extends downwardly from the top of the transmitting body 30. Of course, in this embodiment, the transmitting piece 3 has two bending arms 33, and two force applying portions 31 are respectively formed on each bending arm 33, and the two bending arms 33 are preferably formed on two sides of the transmitting body 30 symmetrically. Of course, the two bending arms 33 may be formed on two sides of the transmitting body 30 asymmetrically.

[0065] As a mating structure for the bending arm of the transmitting piece 3, the elastic free portion 52 of the elastic clamping piece 5 comprises at least one support edge 521 on the

elastic free portion 52, and at least one wire clamping edge 522 formed at an end of the elastic free portion 52;

[0066] the force applying portion 31 of the transmitting piece 3 resists against the support edge 521;

[0067] the wire clamping edge 522 allows a wire inserting through the wire access hole 10 to resist against the electric conductor 4, the fixed portion 51 and the elastic free portion 52 of the elastic clamping piece 5 is connected together through a bent transition portion 53. Here, the transition portion 53 is preferably arc-shaped, so that the elastic free portion 52 has a higher elastic deformation strength under stress to enhance the clamping force applied by the elastic free portion 52 to the wire entering the gap G. Here, the elastic clamping piece 5 may have the following two structural modes. With reference to FIG. 8, in the first kind of the elastic clamping piece 5 in this embodiment, the support edge 521 is a cross section; while with reference to FIG. 9, in the second kind of the elastic clamping piece 5, the support edge 521 is a bent edge formed by the elastic free portion 52. For example, the support edge 521 can be bent downward or upward.

[0068] In order to enable the transmitting piece 3 to effectively apply a pressing force to the elastic free portion of the elastic clamping piece 5 after it is pressed by the operating handle 2, with reference to FIG. 6 and 10, the force bearing portion 32 of the transmitting piece 3 has a resisting end 320, the wire is capable of resisting against the top edge 42 of the electric conductor 4, and the resisting end 320 is capable of being resisted against the top edge 42 of the electric conductor 4 during rotation. In this embodiment, the resisting end 320 is an arc shape that is bent upward, and an accommodating groove 14 for allowing the resisting end 320 to move therein is disposed in the insulating housing 1. Correspondingly, the top edge 42 of the electric conductor 4 is fixed inside the chamber 11 and located below the accommodating groove 14. The movement of the resisting end 320 in the accommodating groove 14 is preferably rotation, so that the transmitting piece 3 can be turned over toward the top of the insulating housing 1 due to the elastic restoring force of the elastic free portion 52.

[0069] Embodiment 2

[0070] As shown in Figs. 12-17, a second preferred embodiment of the wire connector of the present invention is shown. This embodiment differs from the wire connector in Embodiment 1 in that: the electric conductor 4 has a top edge 42 for contacting the wire, and a connecting portion 421 protruding upward from the top edge 42; the transmitting piece 3 has a limiting hole

CLAIMS

1. An operable wire connector, comprising:

an insulating housing (1) having a wire access hole (10) and a chamber (11) in communication with the wire access hole (10);

an operating handle (2), mounted on the insulating housing (1), having a head end (21) and a tail end (22);

a transmitting piece (3), placed under the operating handle;

an electric conductor (4) placed under the transmitting piece;

an elastic clamping piece (5), mounted inside the chamber (11), with an elastic free portion (52) and a fixed portion (51); and

a cover (6) assembled with the insulating housing (1) forming the chamber (11);

characterized in that,

the head end (21) of the operating handle (2) extends outside the chamber (11) and the tail end (22) of the operating handle (2) is rotatably mounted inside the insulating housing (1);

the transmitting piece (3) has a force applying portion (31) and a force bearing portion (32) pressing against the tail end (22) of the operating handle (2);

the fixed portion (51) of the elastic clamping piece (5) is connected to the electric conductor (4), and the force applying portion (31) of the transmitting piece (3) resists against the elastic free portion (52); and

an adjustable gap (G) is formed between the elastic free portion (52) and the electric conductor (4), for receiving a wire passing through the wire access hole (10);

the transmitting piece (3) has a transmitting body (30), the force bearing portion (32) is connected to top of the transmitting body (30); the transmitting piece (3) has at least one bending arm (33) extends downwardly from the top of the transmitting body (30), and the force applying portion (31) is formed on the bending arm (33).

2. The wire connector according to claim 1, characterized in that the electric conductor (4) has a top edge (42) for contacting the wire, and a connecting portion (421) protruding upward from the top edge (42);

the transmitting piece (3) has a limiting hole (321) defined on the force bearing portion (32) for receiving the connecting portion (421), the transmitting piece (3) covers the top edge (42), the top edge (42) is located under the force bearing portion (32), and the connecting portion (421) extends through the limiting hole (321).

3. The wire connector according to claim 2, characterized in that the operating handle (2) has an electric test hole (20) defined on the top edge (42), for receiving an electric test tool to pass through to touch the top edge (42).

4. The wire connector according to claim 1, characterized in that the insulating housing (1) has a rotation limiting portion (12) for limiting the rotation angle of the tail end (22) of the operating handle (2), and the rotation limiting portion (12) is formed by a vertical sidewall (15) formed on the insulating housing (1) and an inclined wall (16) connected to the vertical sidewall (15).

5. The wire connector according to claim 1, characterized in that the insulating housing (1) has a groove as a rotation limiting portion (12) for limiting the rotation angle of the tail end (22) of the operating handle (2);

the rotation limiting portion (12) comprises a groove bottom (120) and an inclined wall (121) connected to the groove bottom (120);

the operating handle (2) has a rotating portion (220) at the tail end (22), and the rotating portion (220) is capable of rotating inside the rotation limiting portion (12) along with the rotation of the tail end (22) of the operating handle (2).

6. The wire connector according to claim 1, characterized in that a rotating shaft (13) is attached to the insulating housing (1) and located above the chamber (11);

a rotating shaft hole (221) for receiving the rotating shaft (13) is defined at the tail end (22) of the operating handle (2), and the tail end (22) of the operating handle (2) is rotatably connected to the insulating housing (1) by inserting the rotating shaft (13) into the rotating shaft hole (221).

7. The wire connector according to any one of claims 1-5, characterized in that the elastic free portion (52) of the elastic clamping piece (5) comprises at least one support edge (521) disposed on the elastic free portion (52), and at least one wire clamping edge (522) disposed at an end of the elastic free portion (52);

the force applying portion (31) of the transmitting piece (3) rests against the support edge (521);

the wire clamping edge (522) allows a wire inserting through the wire access hole (10) to resist against the electric conductor (4), the fixed portion (51) and the elastic free portion (52) of the elastic clamping piece (5) is connected together through a bent transition portion (53).

8. The wire connector according to claim 7, characterized in that the support edge (521) is an edge having a planar cross-section or a bent edge formed by the elastic free portion (52).

9. The wire connector according to claim 1, characterized in that the force bearing portion (32) of the transmitting piece (3) has a resisting end (320), the wire is capable of resisting against the top edge (42) of the electric conductor (4), and the resisting end (320) is capable of being resisted against the top edge (42) of the electric conductor (4) during rotation.