

[0047] In steps S14 and S15, the bent part 20c does not stay at the third target point P3 in response to the movement of the capillary 8 from the third target point P3 to the fourth target point P4. In step S14 and step S15, the bent part 20c slightly moves from the third target point P3 to the fourth target point P4 side. The bent part 20c after movement is not located on the normal line of the electrode 31 that passes through the bonding part 20a. The bent part 20c is located at a position deviated from the normal line that passes through the bonding part 20a. Therefore, the axial direction of the wire part 20b that extends from the bonding part 20a to the bent part 20c is inclined from the normal direction D1. Further, the axial direction of the wire part 20d that extends from the bent part 20c to the capillary 8 is also inclined from the normal direction D1. More specific shapes of the wire 20 in steps S14 and S15 will be described later.

[0048] In step S14, the capillary 8 may be moved along the trajectory of a straight line connecting the third target point P3 and the fourth target point P4. In step S14, the capillary 8 may be moved along the trajectory of an arc passing through the third target point P3 and the fourth target point P4. In step S14, the capillary 8 does not have to be moved directly from the third target point P3 to the fourth target point P4. The capillary 8 may be moved from the third target point P3 to the fourth target point P4 after passing through another target point. For example, the capillary 8 may be moved in the right direction from the third target point P3 to another target point, and then the capillary 8 may be moved in the upward direction from another target point to the fourth target point P4.

[0049] <Third Step>

The control unit 4 provides a third control signal to the bonding unit 3. The third control signal includes an operation of stopping the feeding of the wire 20 from the capillary 8, an operation of moving the capillary 8 to the fifth target point P5 (step S16), and an operation of reciprocally moving the capillary 8 between the fourth target point P4 and the fifth target point P5 (step S17).

[0050] The bonding unit 3 that has received the third control signal closes the wire clasper 9.

repeatedly lowered and raised. In the present invention, the wire clasper 9 is closed when the capillary 8 is repeatedly lowered and raised. In a state where the feeding of the wire 20 from the capillary 8 is stopped, the capillary 8 is repeatedly lowered and raised. As a result, repeated stress can be efficiently applied to the bent part 20c. Therefore, the bent part 20c can be more reliably processed into the planned cut part C having a lower mechanical strength than the bonding part 20a.

[0055] <Fourth Step>

The control unit 4 provides a fourth control signal to the bonding unit 3. The fourth control signal includes an operation of moving the capillary 8 to the sixth target point P6 (step S18) and an operation of moving the capillary 8 to the seventh target point P7 (step S19).

[0056] The bonding unit 3 that has received the fourth control signal moves the capillary 8 from the fifth target point P5 to the sixth target point P6 in a state where the feeding of the wire 20 from the capillary 8 is stopped (see step S18 and (a) of FIG. 7). The wire part 20b, the planned cut part C, and the wire part 20d are pulled in the upward direction as the capillary 8 is raised. As a result, the wire part 20b, the planned cut part C, and the wire part 20d are in a state along the normal direction D1.

[0057] Next, the bonding unit 3 moves the capillary 8 from the sixth target point P6 to the seventh target point P7 in a state where the feeding of the wire 20 from the capillary 8 is stopped (see step S19 and (b) of FIG. 7). The capillary 8 is further raised from the state shown in (a) of FIG. 7. At this time, the wire 20 is pulled in the axial direction (upward direction) with the raise of the capillary 8. The mechanical strength of the planned cut part C is lower than the mechanical strength of the bonding part 20a. The mechanical strength of the planned cut part C is the lowest as compared with the other parts of the wire 20. When the wire 20 is pulled in the axial direction, the wire 20 is cut at the planned cut part C having the lowest mechanical strength. As a result, the pin wire 21A is formed on the electrode 31A (step S20).

[0058] Next, the control unit 4 forms a FAB at the tip of the wire 20. Next, the control unit 4

[0063] In the present invention, the angle θ_1 is equal to the angle θ_3 . The angle θ_2 is equal to the angle θ_4 . The shape of the wire part 20d is symmetrical to the shape of the wire part 20b with respect to the parallel axis that passes through the center of the bent part 20c. Therefore, the length of the wire part 20b in the axial direction D3 is equal to the length of the wire part 20d in the axial direction D4. The length L1 from the parallel axis that passes through the center of the bent part 20c in the up-down direction to the surface of the electrode 31A is equal to the length L2 from the parallel axis to the tip surface 8a of the capillary 8. The ratio (L1/L2) of the length L1 to the length L2 is 1. The ratio (L1/L2) of the length L1 to the length L2 is "L1:L2 = 1:1". As an example, the length L1 is 300 μm . The length L2 is also 300 μm . The length L1 and the length L2 do not have to be equal to each other. The length L1 and the length L2 may be different from each other. The ratio (L1/L2) of the length L1 to the length L2 may be a value included in the range of greater than or equal to 0.5 and less than or equal to 2.0. Preferably, the ratio (L1/L2) of the length L1 to the length L2 may be a value included in the range of greater than or equal to 0.7 and less than or equal to 1.5. Each of the length L1 and the length L2 may be, for example, a value included in the range of greater than or equal to 200 μm and less than or equal to 400 μm . Preferably, each of the length L1 and the length L2 may be a value included in the range of greater than or equal to 250 μm and less than or equal to 350 μm .

[0064] The length of the wire part 20b in the axial direction D3 corresponds to the distance from the first target point P1 to the third target point P3. The movement distance d1 and the movement distance d2 are defined. The movement distance d1 is the distance for which the capillary 8 moves from the first target point P1 to the third target point P3 along the normal direction D1. The movement distance d1 can also be said to be the distance for which the capillary 8 moves from the first target point P1 to the third target point P3 when viewed from the parallel axial direction D2. The movement distance d2 is the distance for which the capillary 8 moves from the first target point P1 to the third target point P3 along the parallel axial direction