width less than the diameter of the first hole portion and larger than a portion of the support member with the reduced diameter, and after the support members are inserted through the first hole portions, the plate spring is slid with respect to the substrate and the second hole portions are latched onto the support members.

[0010] Moreover, in the socket attachment structure according to the present invention, the holder member includes a screw hole that is screwable, the arm portion includes a second through hole penetrating in the plate thickness direction correspondingly with the screw hole, and the holder member and the spring member are coupled to each other via the screw hole and the second through hole.

[0011] Moreover, in the socket attachment structure according to the present invention, the holder member includes: a protruded portion that protrudes from a principal plane in an approximate column shape and comes into contact with a part of the arm portion; and a claw portion that protrudes from a part of a side surface of the protruded portion, and the holder member and the spring member are fixed to each other by the arm portion being latched onto the claw portion.

[0012] Moreover, in the socket attachment structure according to the present invention, the spring member is a plurality of bar shaped members that are elastically deformable, the spring member includes: a base portion that is approximately bar shaped; and a convex portion that is provided at one end side of the base portion and curved in a convex shape, and the convex portion is latched onto one of the support members and the other end side of the base portion is coupled to another one of the support members.

[0013] Moreover, in the socket attachment structure according to the present invention, ~~one~~ the other end side

of the

principal plane of the first arm portion 512b. The second arm portion 513b and third arm portion 514b form a bending portion.

[0050] In the first arm portions 512a and 512b, through holes ~~52a and~~ 52c and 52d, which are provided correspondingly with the insertion holes ~~412a and~~ 412c and 412d penetrate in a plate thickness direction, are respectively formed. In the ~~bending portions 511c and 511d~~ third arm portions 514a and 514b, through holes 52a and 52b ~~and 52d~~ penetrating in the plate thickness direction are provided correspondingly with the insertion holes 412a and 412b ~~and 412d~~. The through holes 52a to 52d are formed in the above described shape.

[0051] The second arm portions 513a and 513b are respectively formed in the arm portions 51c and 51d such that their concave shaped hollow spaces face each other. Further, an area in which the second arm portions 513a and 513b are formed in the longitudinal direction thereof is larger than an area in which the protruded portions 414a and 414b are formed in the longitudinal direction, considering a sliding distance upon attachment of the plate spring 5a to the holder member 4a.

[0052] The protruded portions 414a and 414b have the claw portions 415a and 415b, which are provided at parts of side surfaces of the protruded portions 414a and 414b, the side surfaces being opposite to the fitting hole 411 inner wall surface sides thereof, and protrude in directions orthogonal to these side surfaces. Further, a distance between the respective side surfaces opposite to the fitting hole 411 inner wall surface sides of the protruded portions 414a and 414b is approximately equal to a distance between the second arm portions 513a and 513b. A distance between bottoms of the claw portions 415a and 415b and the

principal plane of the main body portion 40a is preferably

approximately equivalent (equivalent or of a slightly larger distance) to a thickness of the plate spring 5a.

[0053] By the above described configuration, for the holder member 4a placed on the circuit board 200, just by accommodating the protruded portions 414a and 414b respectively in the concave shaped hollow space of the arm portions 51c and 51d (between stepped portions formed by the first arm portions 512a and 512b, as well as the ~~bending portions 511c and 511d~~ third arm portions 514a and 514b and the second arm portions 513a and 513b) and sliding the plate spring 5a along the ~~guiding~~ protruded portions 414a and 414b while applying a load on the plate spring 5a, the holder member 4a is able to be attached to the circuit board 200. When this is done, in a state where the plate spring 5a is biased in a direction pressing the circuit board 200 by the bending of the ~~bending portions 511c and 511c~~ third arm portions 514a and 514b, the second arm portions 513a and 513b are brought into a state of being fixed to the holder member 4a by being locked by the claw portions 415a and 415b. As a result, the plate spring 5a is able to be prevented from separating from the holder member 4a and the biased state of the plate spring 5a with respect to the holder member 4a is able to be maintained more reliably. Further, with this bias by the plate spring 5a, the holder member 4a is able to be closely contacted with the circuit board 200.

[0054] Further, when the holder member 4a is removed from the circuit board 200, just by sliding the plate spring 5a in a direction reverse of the sliding direction upon the attachment, the holder member 4a is able to be removed from the circuit board 200.

[0055] According to the second embodiment, the above described effects of the first embodiment are able to be

obtained, and further, even if the width (the length in the

[0059] (Third Embodiment)

FIG. 13 is a perspective diagram illustrating a configuration of main parts of a socket according to a third embodiment. FIG. 14 is an exploded perspective diagram illustrating a configuration of main parts of the socket according to the third embodiment. In the diagrams, illustration of the probe and the probe holder is omitted. Similarly to the above described first embodiment, a socket 1b illustrated in FIG. 13 and FIG. 14 is a device used in testing electrical properties of the semiconductor integrated circuit 100 (see FIG. 1), and is a device that electrically connects between the semiconductor integrated circuit 100 and a circuit board 200a, which outputs a test signal to the semiconductor integrated circuit 100.

[0060] The socket 1b has: a holder member 4b (holder member), which has the above described probes 2 and probe holder, is provided around the probe holder, and suppresses displacement of a semiconductor integrated circuit that comes into contact with the plurality of probes when tested; and a spring member 6, which is attached to a top surface of the holder member 4b and biases the holder member 4b towards the circuit board 200a.

[0061] FIG. 15 is a plan view illustrating a configuration of the holder member ~~4a~~4b of a socket attachment structure according to the third embodiment. The holder member 4b has a main body portion 40b that is formed by using a metal, such as a ferrous metal, a brass, or a stainless steel (SUS), or formed by using a synthetic resin material, a ceramic, or a material formed by insulating the metal. Further, in the main body portion 40b, a sloped portion 401 having a sloped side surface at one end of the main body portion 40b, and the fitting hole 411, in which the above described probe holder 3 is

Around the reduced diameter portions of the shafts 202a and 202b, end portions of the torsion bars 6a and 6b at the bent portions 62a and 62b side are wound (see ~~FIG. 15~~ FIG. 14). The torsion bars 6a and 6b are rotatable about the shafts 202a and 202b being the axes. The end portions of the torsion bars 6a and 6b are prevented from coming off by the enlarged diameters of distal end portions of the shafts 202a and 202b. Further, electrodes, which are not illustrated, are provided in the circuit board 200a.

[0066] FIG. 16 and FIG. 17 are perspective diagrams illustrating a configuration of main parts of the socket according to this third embodiment and are diagrams illustrating a procedure for attaching the holder member 4b to the circuit board 200a. First, the holder member 4b is attached to the circuit board 200a. When that is done, the sloped portion 401 of the holder member 4b is slid with respect to the circuit board 200a to insert the shafts 202a and 202b respectively through the insertion holes 421a and 431a of the first notched portions 421 and 431 (see FIG. 16). Thereafter, an end portion of the holder member 4b at a side opposite to the sloped portion 401 side is pressed towards the circuit board 200a to insert the shafts 202c and 202d respectively through the insertion holes 422a and 432a of the second notched portions 422 and 432 (see FIG. 17). As a result, positioning of the holder member 4a with respect to the circuit board 200a in a plane direction is achieved.

[0067] After the insertion of the shafts 202a to 202d, a load is applied, in a direction of bringing end portions of the torsion bars 6a and 6b at a side opposite to the portions coupled to the shafts closer to the main body portion 40b (see FIG. 17). When this is done, the convex portions 61a and 61b of the torsion bars 6a and 6b are

respectively latched onto the shafts 202c and 202d. Further, the bent portions 62a and 62b of the torsion bars 6a and 6b are respectively fitted with inner surfaces of the notched portions 42 and 43, the inner surfaces forming convex shapes (see FIG. 13). When that is done, the torsion bars 6a and 6b bias the holder member 4b towards the circuit board 200a by their own spring actions. As a result, the holder member 4b is able to be brought into a state of being sandwiched and fixed between the circuit board 200a (shafts 202a to 202d) and the spring member 6, and the holder member ~~4a~~4b is able to be attached to the circuit board 200a.

[0068] By the above described configuration and operations, with respect to the holder member 4b placed on the circuit board 200a, just by applying a load on the spring member 6 and latching the spring member 6 onto the shafts, the holder member 4b is able to be attached to the circuit board 200a. Further, the spring member 6 fixed on the holder member 4b by the shafts 202a to 202d biases the holder member 4b in a direction of pressing the circuit board 200a by its own elastic force, and thus the holder member 4b is able to be closely contacted with the circuit board 200a.

[0069] Further, when the holder member 4b is removed from the circuit board 200a, just by removing the spring member 6 latched onto the shafts 202c and 202d, the holder member 4b is able to be removed from the circuit board 200a.

[0070] According to the above described third embodiment, just by applying a load on the spring member 6 attached to the holder member 4b and latching the spring member 6 onto the shafts, the holder member 4b is attached to the circuit board 200a, and thus the holder member 4b is able to be removed from and attached to the circuit board 200a easily.

principal plane in an approximate column shape and comes into contact with a part of the arm portion; and

a claw portion that protrudes from a part of a side surface of the protruded portion, and

the holder member and the spring member are fixed to each other by the arm portion being latched onto the claw portion.

6. The socket attachment structure according to claim 1, wherein

the spring member is a plurality of bar shaped members that are elastically deformable,

the spring member comprises:

a base portion that is approximately bar shaped; and

a convex portion that is provided at one end side of the base portion and curved in a convex shape, and

the convex portion is latched onto one of the support members and the other end side of the base portion is coupled to another one of the support members.

7. The socket attachment structure according to claim 6, wherein ~~one~~ the other end side of the base portion is wound around the support member and the spring member is rotatable about the support member being a central axis.

8. The socket attachment structure according to claim 1, wherein

the holder member comprises two notched portions that are respectively provided at opposite outer edge sides on a top surface side thereof and that are notched along these outer edges, and

the holder member guides an attachment position of the