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(54) **Connector compatible for refusion and wave soldering**

Wellen-und Wiederaufschmelzlöten verträglicher Steckverbinder

Connecteur compatible pour soudure à vague et refusion

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Description

[0001] The present application for a Patent of Invention consists, as indicated in its title, in a "CONNECTOR COMPATIBLE FOR REFUSION AND WAVE SOLDERING", which novel characteristics of manufacturing, shaping and design fulfill the object for which had been specifically designed with a maximum of safety and efficiency.

[0002] There exist in the market and therefore can be considered as the state of the art a plurality of connectors which function is that of joining in a determined volume and reunion a set of male and female terminals, centralizing and arranging same and insuring at the same time their perfect electrical connection.

[0003] Also there exist other type of connectors of similar characteristics to the above named but which function is that of insuring the electrical contacts between the base of the connector where the are joined the corresponding terminals duly grouped together and the surface of a printed circuit board or PCB, in such a way that the base of the connector where are joined all the contacts is placed over said printed circuit board, by which all the contacts or male terminals enter through the connector s base establishing the corresponding electrical continuity.

[0004] DE 196 32 870 discloses a connector including all the features of the preamble of claim 1.

[0005] On the other side US 4.601.527 describes a shielded header and cable assembly comprising a latch receptacle provided in a side of a housing proposed to receive a male connector.

[0006] The invention refers more exactly to a connector like the above mentioned in which had been introduced a series of modifications which improve its function, in such a way that it is possible the introduction in said female connector of another male connector by a lever system in combination with a labyrinth of a single tooth in a quick way and without any type of hindrance, having reduced the force that has to be exerted over said lever by having modified the interior of said female connector minimizing the friction among both connectors.

[0007] Other additional object of the present invention is that of improving the ventilation of the PCB once the connector is mounted on same, in such a way that may be possible to evacuate the heat of the refusion soldering and that the soldering paste used in said process is not in contact with the plastic, in such a way that said connector is compatible with said operation of refusion and wave soldering, also named in this technical sector as SMD and THT.

[0008] Another further object of the present invention is the shape modification of the connector base, in such a way that it incorporates a series of openings which allow the checking of the soldering of other components such as condensers, resistances and other which actually, and in the connectors that can be considered the state of the art, is not allowed as it is covered by said base part of the printed circuit board PCB over which these are soldered.

[0009] Lastly, another additional object of the present invention is a shape and design type modification allowing lowering the level between the holes specially arranged in the connector bases and intended for the pins which allow an injection process more suitable avoiding burrs and voids due to the changes of thickness in the material.

[0010] Other details and characteristics of the present application for a Patent of Invention will be manifest through the reading of the description given herebelow, in which reference is made to the figures attached to this description where the above details are depicted in a rather schematic way. These details are given as an example, referring to a case of a possible practical embodiment, but is not limited to the details outlined; therefore this description must be considered from an illustrative point of view and with no limitations whatsoever.

[0011] There follows a report of the several elements numbered in the drawings accompanying the present application: (10) connector, (11 and 12) lateral major bases, (13 and 14) lateral minor base, (15) corners, (16) legs, (17) interior face, (18) guide wall, (19) guide wall, (20) opening, (21) labyrinth, (22) guide wall, (23) thickening, (24) holes, (25) pins, (26) contacts, (27) perimeter, (28) lower base, (29) male terminal.

[0012] Figure 1 is a perspective view of the female connector (10) with a part vision of the upper part of same.

[0013] Figure 2 is a perspective view of female connector (10), with a part vision of the lower base (28) of the female connector (10).

[0014] Figure 3 is a perspective view with a part vision of the interior part of same.

[0015] In one of the preferred embodiments of what is the object of the present patent of invention and as can be seen in Figure 1, the female connector (10) is formed by a body of a noticeably prismatic configuration, lacking of an upper base and in which lower base (28) and in its interior face had been arranged a line for male terminals (28), see Figure 3, being in the inside of said connector an assembly of guiding and securing means for a male connector not shown in the Figures.

[0016] The body of the connector (10) is formed with two lateral and parallel bases (11 and 12) which cooperate with two major lateral bases (13 and 14), being both joined through corners (15) or beveled surfaces.

[0017] In the major lateral bases (13 and 14) are provided openings (20) from the perimeter (27) of which emerge labyrinths in the way of saw teeth, being only one of these in the interior of the (20), whilst the second is formed by the thickening (23) present in the interior face of the wall (13).

[0018] As guide means for making easy the male connector entry into the interior of the connector (10), in the neighbourhood of the corners (15) and in the interior part are provided guiding walls (18 and 19), the first ones as thickenings of the bases (11 and 12) whilst the seconds are perpendicular to the major bases and of a small thickness and of the

same height than (10).

[0019] The combination of said guiding means formed with the walls (18 and 19) and the configuration of the interior face (17) allows, with a single tooth in the interior of the guide wall (20), a reduction of the effort that must make the operator for the introduction operation of the male connector in the interior of the female connector, when by the corresponding elements is placed one inside the other helping oneself by the labyrinth (21), being received all the pressure of the lever in the thickening (23) and being totally secured when catching the saw tooth to the lever of the male terminal in the labyrinth (21) and in the sole tooth.

[0020] In order to avoid the problems of checking the operation of soldering of the female connector (10) to the printed circuit board or PCB, in the corners of the connector (10) are provided legs (16) formed by skirts as can be seen in the Figure 2, in such a way that the connector base (28) remains at about 2,5 mm over the PCB, obtaining that it is possible to evacuate the heat corresponding to the refusion process and that the soldering paste used has no contact with the material that the connector has been manufactured.

[0021] In order to make possible a sight checking of the connectors (10) assembly there is provided in the lower base (28) the holes (24) allowing the checking in situ of the quality of the soldering effected and the correct positioning of the electric contacts derived from the connector s (10) assembly operation over the printed circuit board not shown in the Figures.

[0022] Additionally and as can be seen in Figure 2, the connector (10) has been designed in such a way that a certain recess exists between the holes of the pins allowing that the injection process is better performed avoiding burrs and voids but a change of thickness in the manufacturing material of (10).

[0023] Once placed the connector (10) in the printed circuit board the operator will be able to check through the corresponding openings (24), the good performance of the soldering of the components placed under said connector (10) to said printed circuit board, later the operator will introduce through the not existing base of (10) the corresponding female connector, in such a way that the solidarization means fit in the walls (18 and 19) and in a way practically with no friction combine the entry means with the labyrinth (21) in such a way that the counter-labyrinth that has said female connector fits with (23) for being kept firmly tightened in the sole tooth (21) of said labyrinth provided in the perimeter (27) of the guide wall (20), being finished in that way the operation of entering and securing between the male and female connectors, being thus established the continuity of the electrical connection and of all the circuits assembled in said connectors.

Claims

1. Female connector compatible with refusion wave soldering formed with a body without its upper base and with its lower base intended to be placed in contact with the printed circuit board or PCB, said female connector comprising a prismatic hollow body (10) formed by the combination of two major lateral opposing bases (13 and 14) and two minor lateral opposing bases (11 and 12) joined through chamfered corners (15) including within guiding walls (18 and 19) for said male connector member, the first one (18) formed by a thickening in the interior face (17) of the minor lateral base (11), whilst the second one (19) is formed by a small wall of little width and whose length covers that of the connector (10), and including immobilization means for securing said male connector comprising a saw teeth labyrinth (21) **characterized in that** said lateral opposing bases (13, 14) are provided with openings (20) in which protrude said saw teeth labyrinth (21) with a single tooth emerging from the perimeter (27) of each opening (20) and wherein at least part of said labyrinth (21) is formed by a thickening (23) of said side walls (13, 14).
2. Connector, according to claim 1, **characterized in that** a second tooth of said labyrinth is provided by said thickening (23).
3. Connector, according to any of the previous claims **characterized in that** said prismatic body is extended in the four vertex of the connector (10) lower base (28) by legs (16) formed by skirts so that when in situ said base (28) of the connector remains at a distance over the PCB.
4. Connector as per Claim 1 **characterized in that** in the lower base (28) of the connector (10) openings (24) are provided.

Patentansprüche

1. Steckdose, die mit Wiederaufschmelzlöten kompatibel ist, gebildet aus einem Körper ohne dessen obere Basis und mit dessen unterer Basis dazu gedacht, in Kontakt mit der Leiterplatte bzw. PCB gebracht zu werden, wobei die

besagte Steckdose einen prismatischen hohlen Körper (10) umfasst, der aus der Kombination von zwei größeren seitlichen gegenüber liegenden Basen (13 und 14) und zwei kleineren seitlichen gegenüber liegenden Basen (11 und 12) gebildet ist, die über abgeschrägte Ecken (15) miteinander verbunden sind, die innerhalb Führungswänden (18 und 19) für das besagte Steckerglied einschließt, wobei die erste (18) durch eine Verdickung an der Innenfläche (17) der kleineren seitlichen Basis (11) gebildet ist, wohingegen die zweite (19) durch eine kleine Wand mit geringer Breite gebildet ist, und deren Länge die der Steckdose (10) abdeckt, und wobei er Feststellmittel zur Sicherung des besagten Steckers einschließt, der ein Sägezahnlabyrinth (21) umfasst, **dadurch gekennzeichnet, dass** die besagten seitlichen gegenüber liegenden Basen (13 und 14) mit Öffnungen (20) ausgestattet sind, in die das besagte Sägezahnlabyrinth (21) hineinragt, mit einem einzigen Zahn, der aus dem Umfang (27) jeder Öffnung (20) hervor-
kommt, und wobei zumindest ein Teil des besagten Labyrinths (21) aus einer Verdickung (23) der besagten Seitenwände (13, 14) gebildet ist.

2. Steckdose nach Anspruch 1, **dadurch gekennzeichnet, dass** ein zweiter Zahn des besagten Labyrinths durch die besagte Verdickung (23) vorgesehen ist.
3. Steckdose nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der besagte prismatische Körper in die vier Spitzen der unteren Basis (28) der Steckdose (10) durch Beine (16) ausgedehnt ist, die aus Einfassungen gebildet sind, sodass die besagte Basis (28) der Steckdose, wenn sie sich in situ befindet, in einem Abstand über der PCB bleibt.
4. Steckdose nach Anspruch 1, **dadurch gekennzeichnet, dass** in der unteren Basis (28) der Steckdose (10) Öffnungen (24) vorgesehen sind.

Revendications

1. Connecteur femelle compatible avec brasage à la vague - refusion avec un corps sans sa partie supérieure et avec sa partie inférieure destinée à être mise en contact avec la carte de circuit imprimé ou PCB, ledit connecteur femelle comprenant un corps creux prismatique (10) formé par la combinaison de deux grandes bases latérales en regard (13, 14) et deux petites bases latérales en regard (11 et 12) unies à travers des chanfreins de pointe (15) incluant à l'intérieur des parois de guidage (18 et 19) pour ledit élément connecteur femelle, la première (18) étant formée par un épaississement dans la face intérieure (17) de la petite base latérale (11), tandis que la deuxième (19) est formée par une petite paroi de faible largeur et dont la hauteur couvre celle du connecteur (10), et incluant des moyens d'immobilisation pour fixer ledit connecteur mâle qui comprennent un labyrinthe à dents de scie (21), **caractérisé en ce que** lesdites bases latérales en regard (13, 14) sont pourvues d'ouvertures (20) dans lesquelles ledit labyrinthe à dents de scie (21) est en vol à faux avec une seule dent émergeant du périmètre (27) de chaque ouverture (20) et dans lesquelles au moins une partie dudit labyrinthe (21) est formée par un épaississement (23) desdites parois latérales (13, 14).
2. Connecteur, selon la revendication 1, **caractérisé en ce qu'**une deuxième dent dudit labyrinthe est prévue par cet épaississement (23).
3. Connecteur, selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit corps prismatique s'étend sur les quatre sommets de la base inférieure (28) du connecteur (10) par des branches (16) formées par des jupes de manière que, lorsque ladite base (28) du connecteur se trouve à sa place, elle demeure à une distance par-dessus la carte de circuit imprimé.
4. Connecteur selon la revendication 1 **caractérisé en ce que** sur la base inférieure (28) du connecteur (10) sont prévues des ouvertures (24).

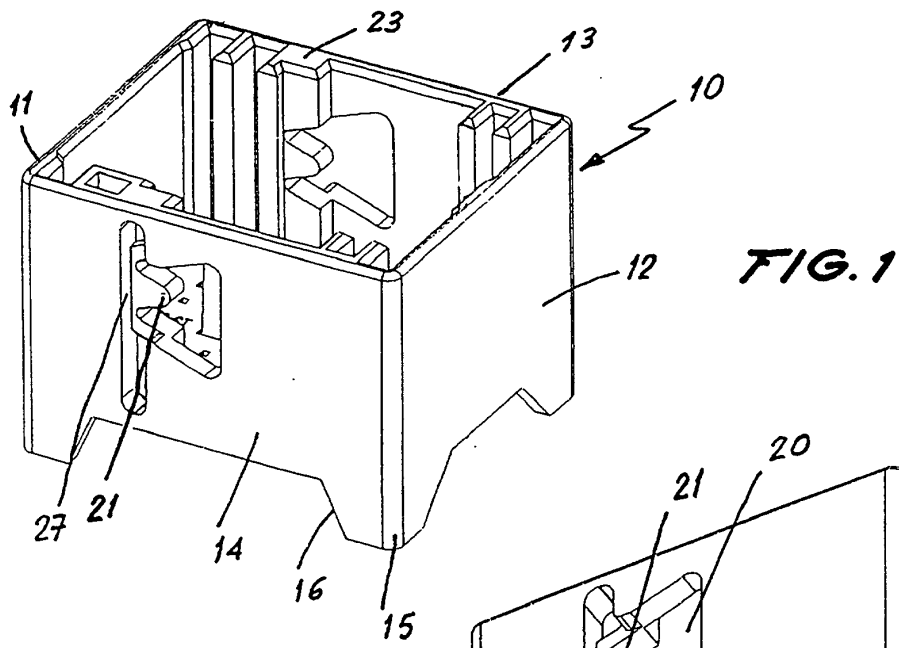


FIG. 2

