

ELECTRICAL CONNECTOR SYSTEM UTILIZING THIN MALE TERMINALS

FIELD OF THE INVENTION

This invention generally relates to the art of electrical connectors and, particularly, to an electrical connector system which includes a connector assembly having thin male terminals with unique supporting means for the terminals.

BACKGROUND OF THE INVENTION

In the electrical connector art, a common type of electrical connector system includes a pair of mating connectors generally of the "pin and socket" type. In other words, one connector assembly includes a plurality of male or pin-type terminals for engagement with a "socket" terminal of the mating connector assembly. The socket terminal may be an actual female socket or it may be of another configuration such as a spring or biased terminal for engaging the male terminal pin.

Male terminal "pins" may be formed or rolled of sufficient thickness to be self-supporting, particularly during mating with the socket or female terminal. On the other hand, it may be desirable to stamp and form the male terminal from thin sheet metal material for various cost and manufacturing purposes. Stamped and formed male terminals also are quite amenable for high density electrical connector systems.

One of the problems with thin male terminals, such as of the stamped and formed type, is that the terminals tend to bend or buckle during mating unless they somehow are sufficiently supported. Providing adequate support for the male terminals often results in the respective connector assembly, itself, being rather bulky or having a large envelope which is undesirable in the ever-increasing miniaturization of electronic components. For instance, the electrical connector assemblies may be used in printed circuit board applications wherein miniaturization is of a premium.

This invention is directed to solving these problems by providing an electrical connector system wherein the respective connector assembly which mounts the thin male terminals, as well as the complementary mating connector assembly, cooperate or combine to support the male terminals, particularly during mating or engagement with the female terminals of the complementary connector assembly.

SUMMARY OF THE INVENTION

An object, therefore, of the invention is to provide a new and improved electrical connector system having improved means for supporting thin male terminals, particularly during mating.

In the exemplary embodiment of the invention, the electrical connector system includes a first connector assembly having an insulative housing defining at least one cavity with a thin male terminal extending thereinto. A second connector assembly has an insulative housing defining a cavity with a spring contact terminal located therein. The thin male terminal is engageable with the spring contact terminal upon mating of the connector assemblies. The connector assemblies may be of the plug and receptacle type, such as a header assembly for mounting on a printed circuit board and for mating with a complementary receptacle connector.

The invention contemplates that the first connector assembly include a supporting wall for supporting one

side of the thin male terminal, with the supporting wall extending only partially along the length of the male terminal to leave an unsupported distal end of the terminal. The second connector assembly includes a preloading wall against which the spring contact terminal is biased for preloading the spring contact terminal. The distal end of the male terminal is insertable between the spring contact terminal and the preloading wall, with the preloading wall supporting the distal end of the male terminal on the one side thereof. Therefore, the supporting wall of the first connector assembly and the preloading wall of the second connector assembly combine to provide support along a substantial length of the thin male terminal.

As disclosed herein, the thin male terminal is a stamped and formed component of sheet metal material. The supporting wall and the preloading wall of the respective connector assemblies have distal ends which are in close proximity to each other when the connector assemblies are mated. Therefore, the walls combine to provide support for the thin male terminal along substantially the entire length thereof.

The invention is shown herein as embodied in a header/receptacle connector system. The respective connectors have a plurality of respective terminals extending lengthwise of the connectors in two rows. The invention is made applicable with such a system by having the supporting wall of the first connector assembly to comprise a partition between pairs of transverse cavities into which pairs of the thin male terminals respectively extend, and the preloading wall of the second connector assembly comprises a partition between pairs of transverse cavities in which pairs of the spring contact terminals respectively are located. Mating pairs of the male terminals and spring contact terminals are spaced longitudinally of the connector assemblies.

Other objects, features and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of this invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with its objects and the advantages thereof, may be best understood by reference to the following description taken in conjunction with the accompanying drawings, in which like reference numerals identify like elements in the figures and in which:

FIG. 1 is an exploded perspective view of an electrical connector system embodying the concepts of the invention;

FIG. 2 is vertical section through the receptacle connector assembly, taken generally along line 2—2 of FIG. 1;

FIG. 3 is a top plan view of the receptacle connector assembly;

FIG. 4 is a bottom plan view of the receptacle connector assembly;

FIG. 5 is a vertical section through the header connector assembly, taken generally along line 5—5 of FIG. 1;

FIG. 6 is an enlarged perspective view of one of the spring contact terminals of the receptacle connector assembly, shown within one of the cavities thereof, the