

ELECTRICAL CONNECTOR

This invention relates to an electrical connector, and more particularly to an electrical connector having at least one L-shaped tongue plate.

5 L-shaped tongue plates have long incorporated in plug connectors for fool-proofing purposes. Referring to Fig. 1, a conventional plug connector includes a dielectric housing 90, and two tongue plates 91 each having a longitudinal portion 911 for receiving a set of terminals
10 (not shown), and a transverse portion 912 serving as a fool-proofing device. The tongue plates 91 are made of a plastic material, and are formed integrally with the dielectric housing 90. Thus, during molding, the L-shaped tongue plates 91 are shrunk. For each of the L-shaped
15 tongue plates 91, since the transverse portion 912 is connected to an end of the longitudinal portion 911, upon solidification of the tongue plate 91, the longitudinal portion 911 is deformed by the shrinkage stress so that an end of the longitudinal portion 911 opposite to the
20 transverse portion 912 is moved a distance (h) along a transverse direction of the connector. The distance (h) is too long to engage the tongue plates 91 fully with receiving cavities in a receptacle connector (not shown).

25 Therefore, an object of this invention is to provide an electrical connector that includes at least one L-shaped tongue plate, which is constructed so as to minimize the deformation of the L-shaped tongue plate during molding.

According to this invention, an electrical connector comprises:

5 a dielectric housing including a body and at least one L-shaped tongue plate, the body having a base wall, the base wall having opposite front and rear wall surfaces, the tongue plate extending forwardly from the front wall surface in a direction perpendicular to the base wall, and having a longitudinal portion and a transverse portion having an end connected to an end of the longitudinal portion, the longitudinal portion being formed with a plurality of terminal-receiving slots each having an opening at the rear wall surface, the housing further including a cavity formed in the rear wall surface and extending into the transverse portion; and

15 a plurality of terminals disposed respectively and fixedly within the terminal-receiving slots in the longitudinal portion of the tongue plate, each of the terminals having a connecting portion extending outwardly from the rear wall surface, and a contact portion exposed outwardly from a side surface of the longitudinal portion.

20 Due to the formation of the cavity, during molding of the tongue plate, the difference between the shrinkage stresses at two opposite ends of the longitudinal portion is reduced. Hence, upon solidification of the tongue plate, the deformation of the longitudinal portion is reduced significantly.

These and other features and advantages of this

invention will become apparent in the following detailed description of a preferred embodiment of this invention, with reference to the accompanying drawings, in which:

Fig. 1 is a front view of a conventional electrical connector;
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Fig. 2 is a partly exploded rear perspective view of the preferred embodiment of an electrical connector according to this invention;

Fig. 3 is a partly exploded bottom perspective view of the preferred embodiment;
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Fig. 4 is an assembled rear perspective view of the preferred embodiment;

Fig. 5 is an enlarged view of a portion of Fig. 4, illustrating cavities in transverse portions of two L-shaped tongue plates;
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Fig. 6 is an assembled bottom perspective view of the preferred embodiment;

Fig. 7 is an assembled top perspective view of the preferred embodiment;

Fig. 8 is a rear view of the preferred embodiment;
20

Fig. 9 is a front view of the preferred embodiment;

Fig. 10 is a sectional view taken along Line X-X in Fig. 9;

Fig. 11 is a bottom view of the preferred embodiment;
25 and

Fig. 12 is a sectional view taken along Line XII-XII in Fig. 11.

Referring to Figs. 2 to 12, the preferred embodiment of an electrical connector according to this invention includes a dielectric housing 1, a plurality of terminals 2, and two mounting members 3. The dielectric housing 1 is made of a plastic material, and includes a body 4 and two L-shaped tongue plates 5. The body 1 has a base wall 41, two short sidewalls 42 connected respectively to two opposite ends of the base wall 41, and a long sidewalls 43 interconnecting the short sidewalls 42. The base wall 41, the short sidewalls 42, and the long sidewall 43 define cooperatively an insert space 44 for receiving a receptacle connector (not shown). The receptacle connector is disposed in front of the plug connector. The mounting members 3 are disposed respectively and fixedly within two grooves 45 in the short sidewalls 42 for attaching the dielectric housing 1 fixedly to a circuit board (not shown).

The base wall 41 has opposite front and rear wall surfaces 411, 412. The tongue plates 5 are located in the insert space 44. Each of the tongue plates 5 extends integrally and forwardly from the front wall surface 411 in a direction perpendicular to the base wall 41, and has a longitudinal portion 51 parallel to the long sidewall 43, and a transverse portion 52 having an end connected to an end of the longitudinal portion 51.

The longitudinal portion 51 of each of the tongue plates 5 is formed with a plurality of terminal-receiving slots 511 each having an opening at the rear wall surface 412.

Top surfaces 513 (see Fig. 7) of the longitudinal portions 51 are flat.

The terminals 2 are disposed respectively and fixedly within the terminal-receiving slots 511 in the tongue plates 5. Each of the terminals 2 has an anchor portion 21 disposed fixedly within the corresponding terminal-receiving slot 511 in a conventional manner, a connecting portion 22 extending rearwardly from the anchor portion 21 and exposed outwardly from the rear wall surface 412, and a contact portion 23 extending forwardly from the anchor portion 21 and exposed outwardly from a bottom side surface 512 of the corresponding longitudinal portion 51. The connecting portions 22 of the terminals 2 are used for in electrical connection with the circuit board. The contact portions 23 of the terminals 2 are used for in electrical contact with terminals of the receptacle connector. In this embodiment, the connecting portions 22 are soldered to the circuit board. However, the manner in which the terminals 2 are connected to the circuit board is not limited thereto. For example, the connecting portions 22 of the terminals 2 may be configured as terminal pins extending respectively through holes in the circuit board. Alternatively, the connecting portions 22 may be connected to the circuit board under pressure.

With particular reference to Figs. 5, 8, and 12, the housing 1 further includes two cavities 521 formed in the rear wall surface 412 and extending respectively into the

transverse portions 52 of the tongue plates 5. As such, the transverse portions 52 of the tongue plates 5 are hollow. Due to the formation of the cavities 521, the plastic material required for forming the tongue plates 5 and the shrinkage stress at the junction between the longitudinal portion 51 and the transverse portion 52 of each of the tongue plates 5 can be reduced significantly. Thus, the difference between the shrinkage stresses at two ends of the longitudinal portion 51 of each of the tongue plates 5 and the deformation of the tongue plates 5 during molding are minimized.

CLAIMS:

1. An electrical connector comprising:

5 a dielectric housing including a body and at least one L-shaped tongue plate, the body having a base wall, the base wall having opposite front and rear wall surfaces, the tongue plate extending forwardly from the front wall surface in a direction perpendicular to the base wall, and having a longitudinal portion and a transverse portion having an end connected to an end of
10 the longitudinal portion, the longitudinal portion being formed with a plurality of terminal-receiving slots each having an opening at the rear wall surface, the housing further including a cavity formed in the rear wall surface and extending into the transverse portion;
15 and

a plurality of terminals disposed respectively and fixedly within the terminal-receiving slots in the longitudinal portion of the tongue plate, each of the terminals having a connecting portion exposed outwardly
20 from the rear wall surface, and a contact portion exposed outwardly from a side surface of the longitudinal portion.

2. The electrical connector as claimed in Claim 1, wherein the body further has two short side walls connected
25 respectively to two opposite ends of the base wall, and a long sidewall interconnecting the short sidewalls and parallel to the longitudinal portion such that the base

wall, the short sidewalls, and the long sidewall define cooperatively an insert space for receiving a complimentary connector, the tongue plate being located in the insert space.

5 3. The electrical connector as claimed in Claim 1, wherein the dielectric housing includes two the L-shaped tongue plates.

10 4. The electrical connector as claimed in Claim 3, wherein the body further has two short side walls connected respectively to two opposite ends of the base wall, and a long sidewall interconnecting the short sidewalls and parallel to the longitudinal portions of the tongue plates such that the base wall, the short sidewalls, and the long sidewall define cooperatively an insert space
15 for receiving a complimentary connector, the tongue plates being located in the insert space.