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(54) Insulation displacement contact terminal.

(57) An insulation displacement contact (IDC) terminal comprises an IDC slot defined by a pair of arms. A ridge is formed on the inner surface of each of the arms. In the IDC terminal of the particular construction, the arms are thinner in the edge portion than in the remaining structure, making it possible to reduce the total stress on to the arms.

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Insulation displacement contact terminal

Background of the Invention

This invention relates to an insulation displacement contact ("IDC") terminal having a pressure-contact section where an individual cable is electrically connected through an insulation displacement.

As is known in the art, this type of IDC terminal includes a pair of arms and a support section formed integral with the arms to support them. The pair of arms form a slot to permit a cable to be inserted and electrically connected with the pair of arms. That is, a cable is forced into the slot between the arms, resulting in removing the insulation, and forming an electrical connection.

In the aforementioned IDC terminal, excessive stress produced in the arms through the forced-in cable produces a strain on the arms. To prevent excessive strain, the conventional practice has been to thicken or widen the arms. However, this approach prevents making further decreases in the size of the arms.

It is therefore an object of this invention to provide a compact IDC terminal with a pair of compact arms with enhanced structural strength.

Summary of the Invention

This and other objects of the invention are accomplished in accordance with the principles of the invention by providing a compact IDC terminnal in which the opposing inner faces of a pair of arms defining a slot for contact are so formed so they have a thickness smaller than that of the rest of the arms. When this is done, it is possible to reduce the stress on the entire arm structure.

Further features of the invention will become apparent from the accompanying drawings and the following detailed description of the invention.

Brief Description of the Drawings

Figs. 1A and 1B are perspective and plan views, respectively, showing an IDC terminal according to one embodiment of this invention; and

Fig. 2 is a partial, cross-sectional view showing a state in which a pressure-connection section of the terminal is brought into contact with a wire group of a cable; and

Fig. 3 is a plan view showing another embodiment of the invention.

Detailed Description of the Preferred Embodiment

In Fig. 1A, IDC terminal 10 has pressure-connection section 20 at its upper portion and additional connection section 30 at its lower portion. These sections 20 and 30 are obtained as a one-piece flat-like conductive plate pattern by punching a metallic plate with a die. Pressure-connection section 20 comprises a pair of arms 21, and a support 22 for supporting the arms 21, whereby slot (hereinafter referred to as an IDC slot) 24 is formed. Arms 21 define a pair of side surfaces of the slot 24 and support 22 constitutes the base. The each forward end portions of arms 21 constitute a pair of ramps 25 each inclining toward IDC slot 24. A pair of ridges 26 each projecting toward slot 24 are formed on the each inner side wall of the arms 21. A thickness d_A of ridge 26 is set smaller than a thickness d_B of the intact arms 21 as shown in Fig. 1B. Such a ridge is obtained by, for example, initially swaging a corresponding area of a conductive metallic plate to a desired thickness. Further, the bottom portion of said slot 24 is substantially circular in cross-section and the distance between the tops of said pair of ridges 26 is smaller than the diameter of said circular cross-section.

The IDC terminal so constructed is settled on housing 51 of electric connector 50. The connection of individual cable 60 to pressure-connecting section 20 is achieved by pushing cable 60 into the IDC slot. That is, individual cable 60, when forced into IDC slot through opening 23, is first guided along ramps 25 and then forced into IDC slot 24 while deflecting arms 21 outward in a lateral direction. At this time, insulation 61 of cable 60 is partially removed by ramps 25 and ridges 26 to expose the wire group 62. As a result, cable 60 is firmly sandwiched between the opposing inner faces of the ridges of arms 21 to permit the exposed wire group 62 to be electrically connected to pressure-connection section 20.

As described above, each thickness of the ridges 26 in contact with the wire group in cable 60, that is, each thickness d_A of the opposite inner faces of the ridges of the arms is smaller than thickness d_B of the rest of the arm. Now, let us compare IDC terminal 10 with a conventional IDC

terminal in which the thickness of its each arm is "d_B" and its arms don't have ridges, the contact area for the arm and the wire group in cable 60 in the present invention is decreased to an extent of d_A/d_B in comparison with that of the conventional counterpart, indicating that all the stress on arms 21 is decreased to the extent of d_A/d_B in comparison with that of the conventional counterpart. That is, according to this invention it is possible to increase the structural strength of arms 21. If the structure of this invention requires the same strength as that of the conventional structure, the width of the arms can be reduced compared with that of the conventional counterpart, thus enabling a more compact IDC terminal.

Although this invention has been explained in connection with one embodiment of this invention, it is not restricted thereto. A variety of changes or modifications can be made without departing from the spirit and scope of this invention. For example, the ridge may be integrally formed also on ramps 25 in which case the stress on the ramps 25 can be diminished when the cable is inserted into the IDC slot. The ridges can be replaced by tapered figure. That is, the side edges of the opposing faces of arms 21 may be tapered along IDC slot 24, as shown in Fig. 3. Another connection section 30 may be not only of a male contact type but also of a female contact type.

According to this invention a contact area between the individual cable and the pair of arms is decreased, thus reducing stress on the arms of the terminal. As a result, it is possible to obtain a compact IDC terminal having a pair of arms of increased structure strength.

Claims

1. An insulation displacment contact terminal of a one-piece plate-like configuration comprising:

a pair of arms between which a slot is formed for electrical connection with a cable; and

a support formed integral with said pair of arms to support said pair of arms and constituting a base for said slot,

in which the opposing inner faces of the arms situated on the side of said slot have a thickness smaller than that of the remaining structure.

2. An insulation displacement contact terminal according to claim 1, in which said opposing inner faces of said arms situated on the side of said slot constitute a pair of ridges.

3. An insulation displacement contact terminal according to claim 1, in which the edges of said opposing inner faces of said arms situated on the side of said slot are tapered.

4. An insulation displacement contact terminal according to either one of claims 1 to 3, in which the bottom portion of said slot is substantially circular in cross-section and the distance between the tops of the opposing inner faces of said arms is smaller than the diameter of said circular cross-section.

FIG. 1A

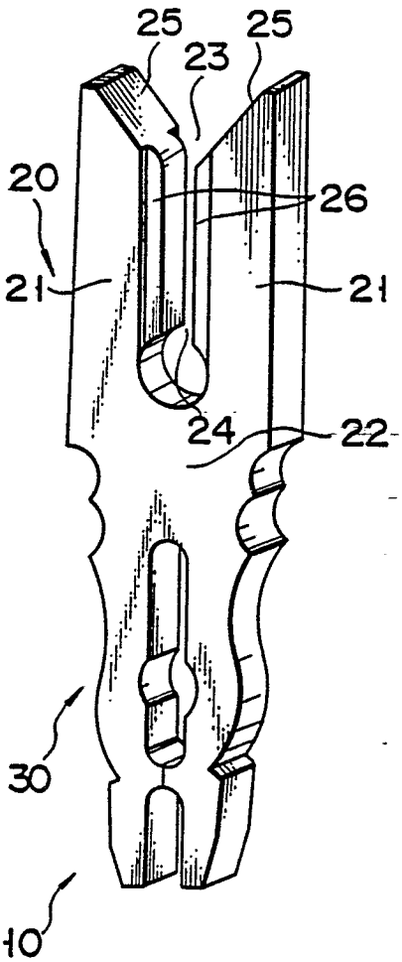

FIG. 2

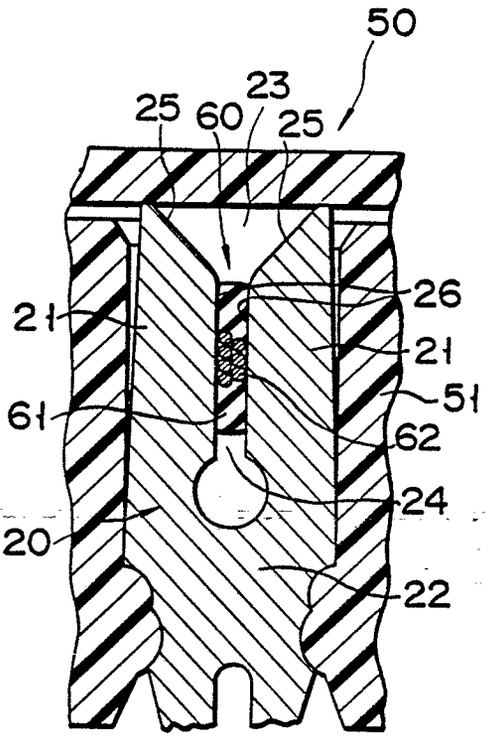

FIG. 1B

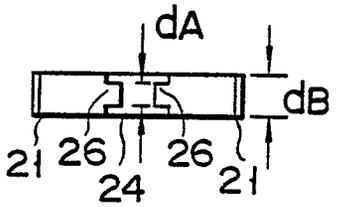

FIG. 3