

Description

The invention relates to electrical terminals of the type generally known as "insulation displacement contact" (IDC) terminals where insulation surrounding a wire or cable is split and displaced by a pair of tines on the terminal and the locally bared wire or cable is gripped between the tines to achieve electrical contact. Such terminals will hereinafter be referred to as IDC terminals. More particularly, but not exclusively, the invention relates to the IDC terminals for use in an array of terminals for connection to a "flat" cable, being a cable having a multiplicity of insulated conductors arranged alongside one another to have the appearance of a sheet.

An example of an IDC terminal for use in such an array is shown in French Patent No. FR-A-2206598 and in JP-A-57137891. In these and other prior art arrangements, a pair of parallel tines define a conductor gripping slot and mounted on, or in close proximity to the tines, there are a pair of latching members for engagement with an upper part of a housing. Such devices suffer from the disadvantage that movement of the latching portion associated with external forces on the cable can induce undesirable contact movement for the established connection between the cable and connector terminal tines.

According to the invention, there is provided an electrical terminal comprising an insulation displacement contact having a pair of co-planar tines at a first end, a second electrical contact at a second end, a body portion extending between the two electrical contacts and a latching portion for securing together two parts of a housing containing the terminal, in use, characterised in that a support member extends outwardly of the body portion independently of the two electrical contacts, from which support member extends the latching portion including a pair of latches, the latching portion extending from the body portion independently of and spaced apart from the insulation displacement contact.

The latching portion may lie in a plane perpendicular to the plane of the tines. The terminal may have latches with mutually facing latch surfaces and the second electrical contact may lie in a plane parallel to the plane of the tines. The second electrical contact may be a solder tail or female contact.

According to a further aspect of the invention, there is provided an electrical connector assembly for terminating a flat cable having multiple insulated conductors separated by a web, the assembly comprising a plastic block member and a plastic upper housing member, the block member having a multiplicity of channels each retaining an electrical terminal according to the invention as set out above, one latch engaging with a wall in the channel within the block member and the other with a wall in a recess in the upper housing member after piercing the web between a pair of the conductors of the flat cable.

One latch of each terminal may be engaged with an inner wall surface of the block member channel and a like inner wall surface in the recess within the upper housing member is engaged by the other latch. The latch engaged with the block member may have a latch surface mating with a step in the channel and the latch engaged with the upper housing member may have a latch surface mating with a step in the recess. The block member and upper housing member may have mutually engageable holding means. Cable clamping means external of the block and upper housing members may be provided for clamping the cable to the connector assembly.

By way of example, one embodiment of a terminal and modifications thereto according to the invention and one embodiment of a connector assembly and modifications thereto according to the invention will now be described with reference to the accompanying drawings, in which:

Figs. 1A and 1B are two views of a terminal;

Figs. 2A and 2B are views of the terminal of Fig. 1 with a modification thereto;

Fig. 2C is a view showing a further modified terminal;

Fig. 3 is a view of a carrier strip carrying terminals according to Fig. 1;

Fig. 4 shows a carrier strip carrying terminals as shown in Fig. 2;

Fig. 5 shows a detail of a first latch arrangement;

Fig. 6 shows a detail of a second latch arrangement;

Figs. 7A, 7B and 7C show respectively a plan, end and side views of an arrangement of terminals connected to part of a flat cable;

Fig. 8 shows in detail a terminal portion of the terminal of Fig. 1 or Fig. 2;

Fig. 9 shows a set of terminals in a connector assembly;

Fig. 10 shows a flat cable about to be pressed onto a set of terminals in a connector assembly;

Fig. 11 shows a flat cable connected to a connector assembly; and

Figs. 12A and 12B are views showing how the connector assembly adapts to cables of different diameter, Fig. 12A being a sectional view along the line A-A in Fig. 12B.

As shown in Figs. 1A and 1B, an IDC terminal has a body portion 10 from which extends a terminal portion 11 having a pair of tines 12 and 13 and also a latching portion 14, the latching portion including a pair of mutually facing latch surfaces 15 and 16.

Between the tines 12 and 13 extends a slot 17 for engagement of a conductor, the tines 12 and 13 effecting localised separation or stripping of insulation material around the conductor. The slot 17 tapers outwardly at its open end to provide entry ledges for the conductor. The outer profile of the terminal portion 11 is substantially tulip shaped, as can be seen in more detail in Fig. 8. This particular shape with a broad base and narrower free ends of the tines 12 and 13 has the purpose of ensuring that the tines 12 and 13 do

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not short circuit with adjacent conductors of a flat cable, and also ensuring that the separation force exerted on the tines 12 and 13 when a conductor is inserted between them can be withstood by the metal of the terminal portion near the base of the slot 17, such that the tine deflection is maintained in the elastic region of the material.

From the base of the terminal portion 11 extends substantially perpendicularly a shoulder 20 of the body portion 10, and from the shoulder 20 extends substantially perpendicularly a support 21 connected to the latching portion 14. The latching portion 14 lies substantially perpendicularly to the support 21, and also to the shoulder 20.

The terminal has a solder tail 22 extending away from the terminal portion 11. Different forms of solder tail may be provided and it will also be appreciated that the solder tail 22 could be substituted by, for example, a female connector or a connector adapted to be engaged by a contact edge of a printed circuit board. Alternatively a local swaging or deformation may be introduced on the solder tail to allow interference or compliant press-fit connection with a slightly undersized plated-through hole in a printed circuit board.

Figs. 2A and 2B show a modified form of the terminal of Fig. 1. The connector 30 of 2A and 2B has a solder tail 31 and a bend in latch portion 32 at position 33. The bend 33 is provided to afford ease of access for a tool to separate terminals from a carrier strip (Figs. 3 and 4). Fig. 3 shows a carrier strip 35 carrying terminals as shown in Fig. 1 and Fig. 4 shows a carrier strip 36 carrying terminals as shown in Fig. 2A and 2B. With a straight latching portion 14 of the Fig. 1 terminal, there is limited space for a tool to enter and separate the terminal from the carrier strip 35. It is obvious for appropriate latching of housing parts, these parts need to be as long as possible. The Fig. 2A and 2B terminal with a latching portion 32 bent at 33 permits easier access for such a tool yet permitting a relatively long latch.

Fig. 2C shows a terminal of Figs. 2A and 2B further modified by enlarging the radius at the bottom 37 of the conductor slot, such that the diameter exceeds the slot gap. This slot design has arisen from calculations of stress distribution in circumstances where a particularly large wire range needs to be terminated with the same IDC terminals, or where a tougher insulation material than PVC, for example Teflon (Trade Mark) is used.

The terminals shown in Fig. 2 are preferred forms of terminal but for illustration during the remainder of the specification, the Fig. 1 embodiment will be used.

The latching surfaces 15 and 16 are adapted to engage material of two corresponding housing parts forming a connector assembly. Such housing parts are commonly of plastics material, although other suitable materials could be used. Figs. 5 and 6 illustrate two possible latching arrangements. In Fig. 5, a housing part 40 is

formed with a blind hole 41 engaged by one end of the latching portion 14 of a terminal. The blind hole 41 is dimensioned such that the material of the housing part 40 is engaged by a barb 42 formed where the latch surface 15 meets a taper surface 43 of the latching portion. The barb 42 engages positively the material of the housing part 40 to lock the terminal to the housing part 40.

Fig. 6 shows an alternative latching arrangement where latching portion 14' has a latch surface 15' which engages a step 44 in a recess 45 in a housing part 46. The disadvantage of the Fig. 6 arrangement is that usually an open recess 45 is required during conventional part molding, and this allows some exposure of the terminal to the atmosphere permitting electrical contact resistance deterioration with time. The blind hole 41 of Fig. 5 is advantageous in this respect.

Figs. 7A, 7B and 7C show a preferred arrangement of two rows of terminals connected to a flat cable 50. For the sake of clarity, housing parts of a connector assembly are omitted from Fig. 7. The terminals are arranged in two rows at a pitch of 2.54 mm, achieving connection to the flat cable 50 whose conductors are at 1.27 mm separation. As can be seen in Fig. 7A, the terminals in rows 51 and 52 are staggered with respect to each other and the terminals in the two rows are also reversed such that the latching portion of a terminal in a particular row lies on that side of the terminal portion remote from the other row. It will be appreciated that other terminal spacings or arrangements may be used.

Fig. 8 shows the side view of two terminals respectively located in the two rows 51 and 52 of Fig. 7 (19), connected with the flat cable 50.

As shown in Fig. 9, a set of terminals is assembled in a lower housing part or terminal block 60 of plastics material. For the purpose of illustration, one terminal is shown prior to insertion in an appropriate recess 61 in the terminal block 60. Part of the terminal block 60 is cut away to illustrate a lower barb of the latching portion 14 of one terminal engaging the material of the terminal block 60, the lower barb engaging a blind hole 62 extending from the recess in which the terminal is engaged. With the terminals fully inserted in associated recesses 61, the lower barbs of the latching portions 14 plough into the material defining the associated blind holes 62 to give desired terminal locking in the terminal block 60. At the same time, the latching portion support 21 rests against the corresponding wall of the recess 61.

The terminal block 60 has four corner posts 63, each of which engage corresponding flats 64 in upper housing part or pierce block 65. The terminal block 60 has a location stud 66 of part cylindrical profile at each of its extreme ends, the studs 66 engaging respectively recesses 67 in the pierce block 65 in its lowest position. Furthermore, the terminal block 60 has four cams 68, two at each end which engage corresponding latches 69 integral with the pierce block 65. The pierce block 65 is preferably of plastics material and the

latches 69 and cams 68 engage with a snap action.

The pierce block has a lower surface formed with part cylindrical grooves 70 to correspond to the outer profile of a flat cable to be inserted, to assist in retaining the flat cable in the assembled connector. The relationship between the grooves 70 and the flat cable 50 can be seen clearly in Fig. 10. The pierce block 65 is formed with two channels 71 at its extreme ends, the channels 71 being aligned with channels 71 in the studs 66. A cable clamping arm 73 is provided having arms 74 and 75 connected to legs 77 and 78. These legs 77 and 78 can be accepted in channels 71 and 72. In a finally assembled connector, the flat cable 50 is fed between the cable clamp 73 and the pierce block 65 to reduce the chance of any external forces experienced by the flat cable 50 being transmitted to the terminals. In Fig. 9, the channel 72 is shown extending completely through the studs 66, whereas in Fig. 10 the channel 72 is shown stopping short of the base of the studs 66. In the Fig. 9 arrangement, the arms 74 and 75 of the cable clamp 73, clamp around the bottom of the terminal block 60, whereas in the Fig. 10 arrangement, holes (not shown) are provided in the studs 66, which holes then accept the arms 74 and 75.

From the position shown in Fig. 10, when the pierce block and terminal block are brought together, latches 68 and 69 engage at four corners of the assembly, while with pierce block 65 at its lowest position the studs 66 engage the recesses 67. During this process, the terminal latching portion 14 of each terminal penetrates a particular web 76 of Fig. 8 of the flat cable 50 and then ploughs into a recess 80 (Fig. 9) in the pierce block 65. The recesses 80 in the preferred embodiment are blind holes, although these could be modified in accordance with Fig. 6. The final assembly step is to bend the flat cable around the pierce block and fit the cable clamp 73.

The advantage of the Fig. 10 embodiment where the arms 74 and 75 of the cable clamp 73 engage holes in the studs 66 is that the cable clamp 73, which is of metal, does not subsequently contact any circuitry of a printed circuit board which may be located below the terminal block 60. The printed circuit board is not shown in Fig. 10. Additionally, the terminal block 60 is provided with plastic protuberances 81 to prevent such electrical contact between metal cable clamp 73 with adjacent circuitry in a printed circuit board.

It is necessary for the connector assembly to adapt to various flat cable sizes, commonly caused by different conductor wire size associated with respective insulation thicknesses in flat cables. In each case, it is necessary that the terminal block and pierce block be locked together. In the foregoing description, locking of the two blocks has been achieved by the terminal latching portions at individual terminal locations, and by engagement of the latches 69 of the pierce block with the cams 68 of the terminal block.

Fig. 12 shows how different cable diameters can effect the final configuration of the connector assembly. The configuration of the latches 69 and cams 68 is such that they engage one with the other when a maximum cable diameter is used (left part of Fig. 12A) in the final connector assembled condition.

However, with a minimum cable size, the latches 69 extend beyond the cams 68, there being therefore no engagement between the two. Engagement of the studs 66 with recesses 67 defines the end position of a conductor in an associated terminal slot 14 for minimum sized cables. For both maximum and minimum sized cables, the individual latching portions of each terminal ensure locking at all terminal stations of the connector assembly.

The advantage of the aforesaid embodiments of terminal is that, in a connector assembly, they provide locking together of the pierce block and terminal block of each terminal. This ensures that localised separation of the connector blocks is prevented, which separation could effect long-term contact reliability between the terminal and an associated conductor. The locking achieved by each terminal is, however, independent of the terminal portion so that any possible movement of the latching portion associated with external forces on the cable does not induce any side effects or contact movement for the established connection between the cable and connector terminal times.

Claims

1. An electrical terminal comprising an insulation displacement contact (11) having pair of coplanar tines (12, 13) at a first end, a second electrical contact (22, 31) at a second end, a body portion (10) extending between the two electrical contacts (11; 22, 31), and a latching portion (14), for securing together two parts of a housing containing the terminal, in use, characterised in that a support member (20, 21) extends outwardly of the body portion independently of the two electrical contacts (11; 22, 31), from which support member (20, 21) extends the latching portion (14) including a pair of latches (15, 16), the latching portion (14) extending from the body portion independently of and spaced apart from the insulation displacement contact.

2. A terminal according to Claim 1 wherein the latching portion (14) lies in a plane perpendicular to the plane of the tines (12, 13).

3. A terminal according to Claim 1 or Claim 2 wherein the latches have mutually facing latch surfaces.

4. An electrical terminal according to Claim 1 or Claim 2 or Claim 3 wherein the second electrical contact (22, 31) lies in a plane parallel to the plane of the tines (12, 13).

5. A terminal according to any one of Claims 1 to 4 wherein the second electrical contact is a solder tail (22, 31).

6. A terminal according to any one of Claims 1

latches 69 and cams 68 engage with a snap action.

The pierce block has a lower surface formed with part cylindrical grooves 70 to correspond to the outer profile of a flat cable to be inserted, to assist in retaining the flat cable in the assembled connector. The relationship between the grooves 70 and the flat cable 50 can be seen clearly in Fig. 10. The pierce block 65 is formed with two channels 71 at its extreme ends, the channels 71 being aligned with channels 71 in the studs 66. A cable clamping arm 73 is provided having arms 74 and 75 connected to legs 77 and 78. These legs 77 and 78 can be accepted in channels 71 and 72. In a finally assembled connector, the flat cable 50 is fed between the cable clamp 73 and the pierce block 65 to reduce the chance of any external forces experienced by the flat cable 50 being transmitted to the terminals. In Fig. 9, the channel 72 is shown extending completely through the studs 66, whereas in Fig. 10 the channel 72 is shown stopping short of the base of the studs 66. In the Fig. 9 arrangement, the arms 74 and 75 of the cable clamp 73, clamp around the bottom of the terminal block 60, whereas in the Fig. 10 arrangement, holes (not shown) are provided in the studs 66, which holes then accept the arms 74 and 75.

From the position shown in Fig. 10, when the pierce block and terminal block are brought together, latches 68 and 69 engage at four corners of the assembly, while with pierce block 65 at its lowest position the studs 66 engage the recesses 67. During this process, the terminal latching portion 14 of each terminal penetrates a particular web 76 of Fig. 8 of the flat cable 50 and then ploughs into a recess 80 (Fig. 9) in the pierce block 65. The recesses 80 in the preferred embodiment are blind holes, although these could be modified in accordance with Fig. 6. The final assembly step is to bend the flat cable around the pierce block and fit the cable clamp 73.

The advantage of the Fig. 10 embodiment where the arms 74 and 75 of the cable clamp 73 engage holes in the studs 66 is that the cable clamp 73, which is of metal, does not subsequently contact any circuitry of a printed circuit board which may be located below the terminal block 60. The printed circuit board is not shown in Fig. 10. Additionally, the terminal block 60 is provided with plastics protuberances 81 to prevent such electrical contact between metal cable clamp 73 with adjacent circuitry in a printed circuit board.

It is necessary for the connector assembly to adapt to various flat cable sizes, commonly caused by different conductor wire size associated with respective insulation thicknesses in flat cables. In each case, it is necessary that the terminal block and pierce block be locked together. In the foregoing description, locking of the two blocks has been achieved by the terminal latching portions at individual terminal locations, and by engagement of the latches 69 of the pierce block with the cams 68 of the terminal block.

Fig. 12 shows how different cable diameters can effect the final configuration of the connector assembly. The configuration of the latches 69 and cams 68 is such that they engage one with the other when a maximum cable diameter is used (left part of Fig. 12A) in the final connector assembled condition.

However, with a minimum cable size, the latches 69 extend beyond the cams 68, there being therefore no engagement between the two. Engagement of the studs 66 with recesses 67 defines the end position of a conductor in an associated terminal slot 14 for minimum sized cables. For both maximum and minimum sized cables, the individual latching portions of each terminal ensure locking at all terminal stations of the connector assembly.

The advantage of the aforesaid embodiments of terminal is that, in a connector assembly, they provide locking together of the pierce block and terminal block of each terminal. This ensures that localised separation of the connector blocks is prevented, which separation could effect long-term contact reliability between the terminal and an associated conductor. The locking achieved by each terminal is, however, independent of the terminal portion so that any possible movement of the latching portion associated with external forces on the cable does not induce any side effects or contact movement for the established connection between the cable and connector terminal tines.

Claims

1. An electrical terminal comprising an insulation displacement contact (11) having pair of coplanar tines (12, 13) at a first end, a second electrical contact (22, 31) at a second end, a body portion (10) extending between the two electrical contacts (11; 22, 31), and a latching portion (14), for securing together two parts of a housing containing the terminal, in use, characterised in that a support member (20, 21) extends outwardly of the body portion independently of the two electrical contacts (11; 22, 31), from which support member (20, 21) extends the latching portion (14) including a pair of latches (15, 16), the latching portion (14) extending from the body portion independently of and spaced apart from the insulation displacement contact.

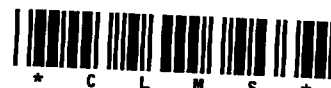
2. A terminal according to Claim 1 wherein the latching portion (14) lies in a plane perpendicular to the plane of the tines (12, 13).

3. A terminal according to Claim 1 or Claim 2 wherein the latches have mutually facing latch surfaces.

4. An electrical terminal according to Claim 1 or Claim 2 or Claim 3 wherein the second electrical contact (22, 31) lies in a plane parallel to the plane of the tines (12, 13).

5. A terminal according to any one of Claims 1 to 4 wherein the second electrical contact is a solder tail (22, 31).

6. A terminal according to any one of Claims 1





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to 4 wherein the second electrical contact is a female contact.

7. An electrical connector assembly for terminating a flat cable having multiple insulated conductors separated by a web, the assembly comprising a plastics block member (60) and a plastics upper housing member (65), the block member (60) having a multiplicity of channels (61) each retaining an electrical terminal according to any one of Claims 1 to 5, one latch (16) engaging with a wall in the channel (61) within the block member (60) and the other with a wall in a recess (80) in the upper housing member (65) after piercing the web between a pair of the conductors of the flat cable.

8. An electrical connector assembly according to Claim 7 wherein one latch (16) of each terminal is engaged with an inner wall surface of the block member channel (61) and a like inner wall surface in the recess (80) within the upper housing member (65) is engaged by the other latch (15).

9. An electrical connector assembly according to Claim 7 wherein the latch (16) engaged with the block member (60) has a latch surface mating with a step in the channel (61) and the latch (15) engaged with the upper housing member (65) has a latch surface (15') mating with a step in the recess (80).

10. An electrical connector according to any one of Claims 7 to 9 wherein the block member (60) and upper housing member (65) have mutually engageable holding means (68, 69).

11. An electrical connector assembly according to any one of Claims 7 to 10 wherein cable clamping means (73) external of the block (60) and upper housing member (65) clamps the cable to the connector assembly.

Patentansprüche

1. Elektrischer Anschluß, der einen Isolierungsverschiebungskontakt (11) aufweist, der ein Paar koplanarer Zinken (12, 13) an einem ersten Ende, einen zweiten elektrischen Kontakt (22, 31) an einem zweiten Ende, einen Körperabschnitt (10), der sich zwischen den beiden elektrischen Kontakten (11; 22, 31) erstreckt und einen Verriegelungsteil (14) hat, um die beiden Teile eines den Anschluß enthaltenden Gehäuses fest miteinander im Gebrauchszustand zu verbinden, dadurch gekennzeichnet, daß ein Stützelement (20, 21) sich von dem Körperabschnitt unabhängig von den beiden elektrischen Kontakten (11; 22, 31) nach außen erstreckt, daß von diesem Stützelement (20, 21) sich der Verriegelungsabschnitt (14) weg erstreckt, der ein Paar Verriegelungen (15, 16) enthält, und daß der Verriegelungsabschnitt (14) sich von dem Körperabschnitt unabhängig von dem Isolierungsverschiebungskontakt unter einem Abstand von diesem erstreckt.

2. Anschluß nach Anspruch 1, bei dem der Verriegelungsabschnitt (14) in einer Ebene senkrecht zur Ebene der Zinken (12, 13) liegt.

3. Anschluß nach Anspruch 1 oder 2, bei dem die Verriegelungen wechselweise einander gegenüberliegende Verriegelungsflächen haben.

4. Elektrischer Anschluß nach Anspruch 1 oder Anspruch 2 oder Anspruch 3, bei dem der zweite elektrische Kontakt (22, 31) in einer Ebene parallel zur Ebene der Zinken (12, 13) liegt.

5. Anschluß nach einem der Ansprüche 1 bis 4, bei dem der zweite elektrische Kontakt ein aus Lötmedium bestehendes Einsatzstück (22, 31) ist.

6. Anschluß nach einem der Ansprüche 1 bis 4, bei dem der zweite elektrische Kontakt ein Aufnahmekontakt ist.

7. Elektrische Verbindungsanordnung zum Anschließen eines Flachkabels, das eine Vielzahl isolierter Leiter hat, die durch einen Steg getrennt sind, wobei die Anordnung ein Kunststoffblockteil (60) und ein aus Kunststoff bestehendes oberes Gehäuseteil (65) aufweist, bei welcher das Blockteil (60) eine Vielzahl von Kanälen (61) hat, die jeweils einen elektrischen Anschluß gemäß einem der Ansprüche 1 bis 5 festhalten, bei der eine Verriegelung (66) mit einer Wand in dem Kanal (61) in dem Blockteil (60) und die andere mit einer Wand in einer Ausnehmung (80) in dem oberen Gehäuseteil (65) nach dem Durchdringen des Steges zwischen einem Leiterpaar des Flachkabels zusammenarbeitet.

8. Elektrische Verbindungsanordnung nach Anspruch 7, bei der eine Verriegelung (16) jedes Anschlusses mit einer inneren Wandfläche des Kanals (61) zusammenarbeitet und eine ähnliche innere Wandfläche in der Ausnehmung (80) in dem oberen Gehäuseteil (65) mit der anderen Verriegelung (15) zusammenarbeitet.

9. Elektrische Verbindungsanordnung nach Anspruch 7, bei der die mit dem Blockteil (60) zusammenarbeitende Verriegelung (16) eine Verriegelungsfläche hat, die passend zu einer Stufe im Kanal (61) ausgebildet ist und bei der die mit dem oberen Gehäuseteil (65) zusammenarbeitende Verriegelung (15) eine Verriegelungsfläche (15') hat, die zu einer Stufe in der Ausnehmung (80) paßt.

10. Elektrische Verbindungsanordnung nach einem der Ansprüche 7 bis 9, bei der das Blockteil (60) und das obere Gehäuseteil (65) wechselweise ineinandergreifende Halteeinrichtungen (68, 69) haben.

11. Elektrische Verbindungsanordnung nach einem der Ansprüche 7 bis 10, bei der die Kabelklemmeinrichtung (73) an der Außenseite des Blockes (60) und des oberen Gehäuseteiles (65) das Kabel mit der Verbindungsanordnung zusammenklemmt.

Revendications

1. Borne électrique comprenant un contact à déplacement d'isolation (11) comportant une paire de dents co-planaires (12, 13) à une première extrémité, un deuxième contact électrique (22, 31) à une deuxième extrémité, une partie de corps (10) s'étendant entre les deux contacts électriques (11; 22, 31) et une partie de verrouillage (14) pour fixer ensemble deux parties d'un boîtier enfermant la borne en service, caractérisée en ce qu'un organe support (20, 21) s'étend vers l'extérieur par rapport



à la partie de corps indépendamment des deux contacts électriques (11; 22, 31), la partie de verrouillage (14) s'étendant à partir de l'organe support (20, 21) et incluant une paire de verrous (15, 16), cette partie de verrouillage (14) s'étendant à partir de la partie de corps indépendamment du contact à déplacement d'isolation dont elle est écartée.

2. Borne selon la revendication 1, dans laquelle la partie de verrouillage (14) se trouve dans un plan perpendiculaire au plan des dents (12, 13).

3. Borne selon la revendication 1 ou 2, dans laquelle les verrous comportent des surfaces de verrous mutuellement en regard.

4. Borne électrique selon la revendication 1 ou 2 ou 3, dans laquelle le deuxième contact électrique (22, 31) se trouve dans un plan parallèle au plan des dents (12, 13).

5. Borne selon l'une quelconque des revendications 1 à 4, dans laquelle le deuxième contact électrique est une queue de soudure (22, 31).

6. Borne selon l'une quelconque des revendications 1 à 4, dans laquelle le deuxième contact électrique est un contact femelle.

7. Ensemble connecteur électrique pour terminer un câble plat, comportant des conducteurs multiples isolés et séparés par un voile, l'ensemble comprenant un organe formant un bloc en matière plastique (60) et un organe formant un boîtier supérieur en matière plastique (65), l'organe bloc (60) comportant une multiplicité de canaux (61) dont chacun maintient une borne

électrique selon l'une quelconque des revendications 1 à 5, un verrou (16) s'appliquant contre une paroi dans le canal (61) à l'intérieur de l'organe bloc (60) et l'autre contre une paroi d'un évidement (80) de l'organe boîtier supérieur (65) après avoir percé le voile entre deux des conducteurs du câble plat.

8. Ensemble connecteur électrique selon la revendication 7, dans lequel un verrou (16) de chaque borne s'applique contre une surface de paroi intérieure du canal d'organe bloc (61) et une surface de paroi intérieure analogue dans l'évidement (80) à l'intérieur de l'organe boîtier supérieur (65) est engagée par l'autre verrou (15).

9. Ensemble connecteur électrique selon la revendication 7, dans lequel le verrou (16) engagé par l'organe bloc (60) comporte une surface de verrou s'adaptant à un gradin dans le canal (61) et le verrou (15) engagé avec l'organe boîtier supérieur (65) présente une surface de verrou (15') adaptée à un gradin dans l'évidement (80).

10. Ensemble connecteur électrique selon l'une quelconque des revendications 7 à 9, dans lequel l'organe bloc (60) et l'organe boîtier supérieur (65) comportent des moyens de maintien (68, 69) mutuellement engageables.

11. Ensemble connecteur électrique selon l'une quelconque des revendications 7 à 10, dans lequel un moyen de serrage de câble (73) externe au bloc (60) et à l'organe boîtier supérieur (65) serrent le câble sur l'ensemble connecteur.

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