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Description

This invention relates to electrical connectors which can be removed from a terminal by applying a small force when required but resist pulling on the cable or other conductor connected to the contact of the connector.

Connectors of this type are known in which the connector includes a forwardly-projecting resilient cantilever finger having a rear facing shoulder for latching engagement with an oppositely facing rigid shoulder on the terminal, the free-end of the finger having an extension for engagement with a suitable tool for unlatching the connector from the terminal. This type of connector is described in UK Patent Specification 1 080 420.

US 2 794 963 describes a connector having a forwardly extending cantilever finger having a latching shoulder for engagement with a recess on a corresponding terminal. The sides of the connector are folded over at the top to form either transverse flanges, or legs which slope downwardly to meet the upper face of the cantilever finger.

An alternative form of known connector as described in UK Patent Specification No. 1 463 751 has a rearwardly projecting resilient cantilever finger. This connector latches to a terminal in a similar manner to the previous connector, but is released by depressing the free-end of the finger, preferably by pulling the connector housing.

All of these connectors have disadvantages. The first connector requires the use of a special tool to release the connector from a terminal. The second connector is separable only by force, no mechanism for unlatching the connector being provided. The third connector has the disadvantage that the extension of the finger needs to be a considerable distance from the rear-facing shoulder on the finger, and hence the free-end of the finger has to be depressed a considerable amount in order to release the latching engagement of the rear-facing shoulder with the terminal.

According to the invention a two part electrical coupling comprises an electrical connector and terminal, the connector comprising an electric contact including a base and two arms, the tops of which are folded over to form a channel with the base, the contact being engageable with the terminal by moving the connector in a forward direction, such that the terminal is received in the channel and confined between the base and the folded over portions of the arms, and a resilient cantilever finger integral with and permanently attached to the electric contact and having a rear facing shoulder for latching engagement with an oppositely facing preformed rigid shoulder on the terminal, the free end of the finger having an extension for engagement for unlatching the connector from the terminal by flexing the finger to release the latching engagement, and a housing having a formation so shaped that when the housing moves in the rearward direction with respect to the contact the formation will engage

the extension of the finger to release the latching engagement, allowing the connector to be removed from the terminal, characterised in that the cantilever finger projects forwardly between the folded over portions of the arms such that they contact the terminal when it is received in the channel, and the cantilever finger and the folded over portions of the arms both urge the terminal towards the base of the contact.

Preferably the extension of the finger and/or the engaging formation on the housing has a flat surface oblique to the mating axis for engaging the other.

Preferably the cantilever finger of the connector is so shaped that when the connector is engaged with the terminal, the terminal abuts a part of the finger to inhibit further relative movement.

This invention does not require the use of a special unlatching tool, and the rear-facing shoulder on the cantilever finger can be positioned adjacent the extension of the finger so that a small amount of movement of the free-end of the finger will release the latching engagement of the rear-facing shoulder with the terminal.

Preferably the contact and the finger are stamped in one piece from sheet metal.

Under normal circumstances the housing will be made from insulating material and in this case, one housing may be common to several connectors.

An embodiment of the invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is a cross-sectional view on the line I-I in Figure 2 of a coupling in accordance with the invention; and

Fig. 2 is a cross-sectional view on the line II-II in Figure 1, with the blade terminal omitted.

The coupling 1 comprises a connector 2 having a sheet-metal contact 3 which has a part 9 which is crimped to a conductor 4 and joined to a part having a channel cross-section 5, the free ends of the arms 6 being curved inwards whereby to engage a blade terminal 7. The contact 3 has a cantilever finger 8 pressed out from the base of the channel part 5, one end remaining attached to the contact 3 between the channel part 5 and the crimping part 9. The finger 8 is bent to form a first part extending 10 upwards, approximately normal to the mating axis, from this end, a second part 11 extending forwards, approximately parallel to the mating axis, and an extension 12 at the free-end extends at an oblique angle away from the mating axis. The upward part 10 of the finger 8 abuts the terminal 7, inhibiting further relative movement. A rear-facing tab 13 is pressed down from the forward part 11 of the finger 8 near its free-end, to form a shoulder 14 which latchingly engages the edge of a hole 15 in the blade terminal 7. The connector 2 also has an insulating housing 16 surrounding the contact 3. The housing has a rearwardly directed formation 17 with a surface 18 oblique to the mating axis in the same

direction as the oblique extension 12 of the finger 8 on the inside of the housing 16 at the blade terminal entry aperture 19. When the housing 16 is moved backwards with respect to the contact 3 the surface 18 of the formation 17 engages under the oblique extension 12 of the finger 8, lifting the tab 13 on the finger 8 out of the hole 15 in the blade terminal 7, allowing the connector 2 to slide freely from the terminal 7.

The length of the sheet-metal blank from which this contact is made does not have to be increased to allow the addition of a cantilever finger.

The upward part 10 of the finger 8 also prevents the conductor 4 from being inserted too far into the connector 2 before the conductor 4 is crimped to the connector 2.

Claims

1. A two part electrical coupling comprising an electrical connector (2) and terminal (7), the connector comprising an electric contact (3) including a base and two arms (6), the tops of which are folded over to form a channel with the base, the contact (3) being engageable with the terminal (7) by moving the connector in a forward direction, such that the terminal (7) is received in the channel and confined between the base and the folded over portions of the arms (6), and a resilient cantilever finger (8) integral with and permanently attached to the electric contact (3) and having a rear facing shoulder (14) for latching engagement with an oppositely facing preformed rigid shoulder (15) on the terminal (7), the free end of the finger having an extension (12) for engagement for unlatching the connector from the terminal by flexing the finger to release the latching engagement, and a housing (16) having a formation (17) so shaped that when the housing moves in the rearward direction with respect to the contact the formation will engage the extension of the finger to release the latching engagement, allowing the connector to be removed from the terminal, characterised in that the cantilever finger (8) projects forwardly between the folded over portions of the arms (6) such that they contact the terminal (7) when it is received in the channel, and the cantilever finger (8) and the folded over portions of the arms (6) both urge the terminal (7) towards the base of the contact (3).

2. An electrical coupling according to claim 1 characterised in that the cantilever finger (8) is so shaped that when the connector (2) is fully engaged with the terminal (7) the terminal abuts a part (10) of the finger to inhibit further relative movement.

Revendications

1. Accouplement électrique en deux parties comprenant un connecteur électrique (2) et une borne électrique (7), le connecteur comportant un contact électrique (3) comprenant une base et deux ailes (6) dont les extrémités supérieures

sont rabattues de manière à former un couloir avec la base, le contact (3) pouvant venir en contact avec la borne (7) par déplacement du connecteur vers l'avant de telle sorte que la borne (7) soit logée dans le couloir et emprisonnée entre la base et les parties rabattues des ailes (6), et un doigt élastique (8) en porte-à-faux intégré et fixé en permanence au contact électrique (3) et comportant un épaulement (14) orienté vers l'arrière en vue d'un enclenchement verrouillant avec un épaulement rigide préformé (15) orienté en sens opposé sur la borne (7), l'extrémité libre du doigt comportant un prolongement (12) dont l'engagement permet de déverrouiller de la borne le connecteur par fléchissement du doigt pour libérer l'enclenchement verrouillant, et un boîtier (16) comportant un relief (17) profilé de manière telle que, lorsque le boîtier se déplace vers l'arrière par rapport au contact, le relief vienne en contact avec le prolongement du doigt pour libérer l'enclenchement verrouillant, en permettant au connecteur d'être enlevé de la borne, caractérisé en ce que le doigt (8) en porte-à-faux fait saillie vers l'avant entre les parties rabattues des ailes (6) de telle sorte que celles-ci soient en contact avec la borne (7) quand cette dernière est logée dans le couloir, et le doigt (8) en porte-à-faux et les parties rabattues des ailes (6) poussent la borne (7) vers la base du contact (3).

2. Accouplement électrique selon la revendication 1, caractérisé en ce que le doigt (8) en porte-à-faux est profilé de manière telle que lorsque le connecteur (2) est entièrement en prise avec la borne (7), la borne porte contre une partie (10) du doigt pour neutraliser tout autre mouvement relatif.

Patentansprüche

1. Zweiteiliger elektrischer Streckverbinder mit einer elektrischen Verbindungsklemme (2) und einem Anschluss (7), wobei die Verbindungsklemme einen elektrischen Kontakt (3) mit einer Basis und zwei Armen (6) aufweist, deren Oberseite durch Überfalten mit der Basis einen Kanal bilden, der Kontakt (3) durch Vorwärtsbewegen der Verbindungsklemme (3) mit dem Anschluss (7) in Eingriff bringbar ist, so dass der Anschluss (7) in dem Kanal aufgenommen und zwischen der Basis und den übergefalteten Abschnitten der Arme (6) eingeschlossen ist, und wobei ein elastischer, freiliegender Finger (8) dauerhaft an dem elektrischen Kontakt (3) befestigt und mit diesem einstückig ist sowie eine nach hinten weisende Schulter (14) zum Einklinken mit einer entgegengesetzt weisenden, vorgeformten, starren Schulter (15) an dem Anschluss (7) aufweist, wobei das freie Ende des Fingers eine Eingriffsverlängerung (12) zum Ausklinken der Verbindungsklemme aus dem Anschluss aufweist, indem der Finger zum Lösen der Einklinkverbindung gebogen wird, und wobei ein Gehäuse (16) mit einer Struktur (17) so geformt ist, dass bei Bewegung des Gehäuses in Rückwärtsrichtung gegenüber dem Kontakt die Struktur in Eingriff mit der Verlängerung des

Fingers kommt, um die Einklinkverbindung zu lösen, so dass die Verbindungsklemme vom Anschluss gelöst werden kann, dadurch gekennzeichnet, dass der freiliegende Finger (8) nach vorne zwischen die übergefalteten Abschnitte der Arme (6) derart weist, dass diese mit dem Anschluss (7) in Kontakt kommen, wenn er in dem Kanal aufgenommen wird, und dass sowohl der freiliegende Finger (8) als auch die übergefalte-

ten Abschnitte der Arme (6) den Anschluss (7) zur Basis des Kontakts (3) drücken.

2. Elektrischer Steckverbinder nach Anspruch 1, dadurch gekennzeichnet, dass der freitragende Finger (8) so geformt ist, dass bei vollständigem Eingriff der Verbindungsklemme (2) mit dem Anschluss (7) letzterer an einem Teil (10) des Fingers anliegt, um eine weitere Relativbewegung zu verhindern.

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