

Description

The present invention relates to a modular plug as currently used on communications and data transmission cables.

Modular plugs have become quite popular for use on telephone cords and other communications cables and are well accepted throughout the industry. Such a plug is described in US-A-3 954 320. These plugs are generally designed for use with flat cable. A portion of the jacket is stripped away, leaving the individual insulated conductors aligned for reception in troughs in the floor of a cavity in the plug and thus aligned for termination with insulation piercing terminals aligned above the troughs. An anchoring member is then locked in place on the cable jacket to provide strain relief for the terminations. This arrangement does not allow for varying the orientation of the conductors vis-a-vis the terminals.

Often it is desirable to use such a plug with a round multiconductor cable, but this presents several problems. A round, jacketed cable will not fit in the cavity profiled for reception of a flat cable and allow room for latching the anchoring member as well. Removing the cable jacket from the portion to be inserted in the cavity leaves too much clearance for the anchoring member to compress the conductors to provide strain relief, and further leaves such a long length of free conductors that it is difficult to align them with the troughs under the terminals.

The present invention consists in a modular phone plug assembly of the type having a plug having an input aperture leading to a cavity, conductor aligning troughs in the floor of the cavity remote from the aperture, terminals in slots aligned above the troughs, and a hinged anchoring member above the cavity towards the aperture, characterized by: an adaptor for use with a round multiconductor cable including a base having a planar portion bounded by a first end, an opposed second end, and a planar surface extending therebetween, said base having comb-like planar partitions upstanding from said planar surface at said first end, said planar portion being profiled for reception in said cavity of said plug with said comb-like partitions adjacent said troughs, said comb-like partitions spacing conductors laid on said planar surface in alignment with said terminals, whereby conductors extending through said comb-like partitions and beyond said first end will overlie respective troughs when said planar portion is received in said cavity, said comb-like partitions being captured in said cavity and said conductors being captured between said anchoring member and said planar surface when said anchoring member is hinged down into an anchoring position.

US-A-3 369 214 discloses a plug and socket electrical connector in which the plug includes insulation piercing terminals crimped to the end of a round cord comprising a plurality of conductors encased in an insulating sheath. The cord, with the terminals attached thereto, is mounted in

a moulded grommet and the sub-assembly so formed is positioned between a cover and a support which cooperate to provide an insulating housing. A contact portion of each terminal is exposed for electrical interconnection with mating terminals in the socket.

There is disclosed in US-A-4 160 575 an electrical plug in which individual conductors of a round cord can be terminated by means of spade terminals after the conductors have been inserted into the plug housing. The individual conductors of the cord must, however initially be threaded manually through respective passages in the housing and into cells therein before the spade terminals are inserted into cavities in the housing, the cord having to be pushed into the housing as far as it will go. An anchoring member with two wedge-shaped legs is pressed into engagement with the cord to lock it against rotational and axial forces that may be applied thereto.

In accordance with the present invention, unterminated round conductors can be terminated without the need for pushing or squeezing them into cavities in a housing, since the conductors can be initially laid between said comb-like partitions and the adaptor then inserted into the body of the plug with the conductors aligned with the corresponding terminals.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 is an exploded perspective of the adaptor, a round cable, and a modular plug.

Figure 2 is a perspective of the adaptor assembled to a round cable with conductors aligned for reception in the plug.

Figure 3 is a cross-section taken along line 3-3 of Figure 2.

Figure 4 is a cross-section of the adaptor and cable end in the plug prior to termination and anchoring.

Figure 5 is a cross-section of the adaptor, plug and cable fully assembled and anchored.

Figure 1 is an exploded perspective of the adaptor, base 30 and strain relief yoke 60 poised for assembly to a round cable 2 and subsequent insertion in cavity 14 of a modular plug 10. These pieces are molded in plastic and will be referred to collectively as the adaptor. The base 30 has a planar portion 32 with a planar surface 38 thereon bounded by a first end 34, a second end 36, and parallel upstanding sidewalls 40. A series of parallel planar comb-like partitions 42 upstanding from the planar surface 38 are spaced to receive individual conductors 6 at the stripped end 8 of the cable 2. The base 30 is molded in plastic and further includes an integral jacket receiving portion 50 having a cylindrical recess 52 therein whose axis is parallel to the planes of partitions 42. The recess 52 serves as a nest for the jacket 4 when conductors 6 are oriented on planar surface 38 and aligned in comb-like partitions 42 and sidewalls 40, as shown in Figure 2. The recess 52 is flanked by parallel slots 54, which in turn are flanked by sidewalls 55 which bound the jacket

receiving portion 50. The slots 54 are profiled to receive the arms 64 extending from cap 62 of strain relief yoke 60. The arms have serrations 66 for latching in the slots.

Figure 2 shows the yoke 60 assembled to the jacket receiving portion 50. The cap 62 is pressed against the cable 4 as arms 64 latch progressively with latch arms 56 in slots 54 (Figure 3). This is best accomplished after the conductors 6 are oriented on planar portion 32, as the alignment of the conductors 6 takes a set when when cable 2 is compressed between the jacket receiving portion 50 and cap 62 (Figure 3). The conductors 6 as shown in Figure 2 extend beyond second end 34 and are correctly spaced for alignment with terminals 20 which are nested in slots 22, and likewise readily slide into the troughs at the end of floor 16 (see U.S. Patent No. 3,954,320). Note that the planar portion 32 is profiled for reception in cavity 14 so that lateral movement, which could misalign the conductors 6, is not possible. The plug 10 is a standard type described in U.S. Patent No. 3,954,320 and is shown with the anchoring member 24 in the open position to permit insertion of the planar portion 32 in the cavity 14. The plug 10 includes a latch 11 for latching with a standard jack.

Figure 4 shows the adaptor assembled on a cable 2 with the planar portion 32 in cavity 14. Note that the second end 36 serves as a stop for the jacket 4 prior to applying yoke 60 so that removing a predetermined amount of jacket 4 assures that the correct length of conductors 6 will be exposed for alignment with terminals 20 without preventing full insertion of the planar portion 32. The anchoring member 24 is still hinged above the conductors 6, as is the restraining bar 28 and terminals 20, which are substantially as disclosed in U.S. Patent No. 3,954,320.

Figure 5 shows the plug 10 after the terminals 20 are pressed home to make contact with the conductive strands 7 of respective individual conductors 6. The restraining member 28 has likewise been pushed into place and the anchoring member 24 is shown pivoted downward about hinge 26 and latched under surface 17, which faces the floor 16 of the cavity 14. The latching of anchoring member 24 into place serves two functions: first, it presses the conductors 6 against the surface 38 of base 30, serving as strain relief; second, the anchoring member 24 bears against the partitions 42 to prevent the planar portion 32 from backing out of cavity 14. The adaptor is thus locked in place against the back of the plug 10. Note that this is the same plug which would be used if the jacketed portion of a flat cable were inserted in the cavity 14; the planar portion 32 is just thick enough to compensate for the absence of the jacket, so that a special plug is not necessary for use with a round cable 2 and the adaptor of the present invention. Strain relief for the jacket 4 is provided by the portion 50 in cooperation with yoke 60.

Claims

1. A modular phone plug assembly of the type having a plug (10) having an input aperture leading to a cavity (14), conductor aligning troughs (at 34) in the floor of the cavity (14) remote from the aperture, terminals (20) in slots (22) aligned above the troughs, and a hinged anchoring member (24) above the cavity towards the aperture, characterized by: an adaptor for use with a round multiconductor (2) cable including a base (30) having a planar portion (32) bounded by a first end (36), an opposed second end (34), and a planar surface (38) extending therebetween, said base (30) having comb-like planar partitions (42) upstanding from said planar surface (32) at said first end, said planar portion (32) being profiled for reception in said cavity (14) of said plug (10) with said comb-like partitions (42) adjacent said troughs (at 34), said comb-like partitions (42) spacing conductors (6) laid on said planar surface (38) in alignment with said terminals (20), whereby conductors (6) extending through said comb-like partitions (42) and beyond said first end (36) will overlie respective troughs (at 34) when said planar portion (32) is received in said cavity (14), said comb-like partitions (42) being captured in said cavity (14) and said conductors (6) being captured between said anchoring member (24) and said planar surface (38) when said anchoring member (24) is hinged down into an anchoring position.

2. The assembly of claim 1 wherein said base (30) further comprises a jacket receiving portion (50) integral with said planar portion (32) abutting the first end (36) thereof, said jacket receiving portion having a semicylindrical recess (52) axially aligned with said partitions, the surface of said recess lying below said planar surface (38), whereby said recess serves as a nest for the cable jacket (4) while the conductors (6) of the stripped end of the cable are oriented on the planar surface (38) and in the comb-like partitions (42).

3. The assembly of claim 2, further comprising a strain relief yoke (60) cooperable with said jacket receiving portion (50) to grip said cable jacket (4) therebetween.

4. The assembly of claim 3 wherein said jacket receiving portion (50) is flanked by a pair of parallel slots (54) one on each side thereof, said yoke (60) having a pair of arms (64) for reception in said slots (54), said arms (64) each being serrated for progressive latching to said jacket receiving portion.

Patentansprüche

1. Modultypige Telefonsteckeranordnung des Typs mit einem Stecker (10), der eine in einen Hohlraum (14) führende Eintrittsöffnung, Leiterausrichtrinnen (bei 34) im Boden des Hohlraums (14) an einer von der Öffnung abgelegenen Stelle, Anschlüsse (20) in oberhalb der Rinnen ausgerichteten Schlitz (22) sowie ein scharnierartig angelenktes Verankerungselement (24) über den

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Hohlraum zur Öffnung hin aufweist, gekennzeichnet durch: einen Adapter zur Verwendung bei einem runden Mehrfachleiterkabel (2), der eine Basis (30) mit einem planaren Bereich (32) aufweist, der von einem ersten Ende (36), einem entgegengesetzten zweiten Ende (34) und einer dazwischen liegenden planaren Fläche (38) begrenzt ist, wobei die Basis (30) kammartige planare Trennwände (42) aufweist, die von der planaren Fläche (32) an dem ersten Ende hochstehen, wobei der planare Bereich (32) ein Profil zur derartigen Aufnahme in dem Hohlraum (14) des Steckers (10) besitzt, daß die kammartigen Trennwände (42) den Rinnen (bei 34) benachbart angeordnet sind, wobei die kammartigen Trennwände (42) die auf der planaren Fläche (38) platzierten Leiter (6) in Ausrichtung mit den Anschlüssen (20) voneinander beabstanden, wobei die sich entlang der kammartigen Trennwände (42) und über das erste Ende (36) hinauserstreckenden Leiter (6) über den jeweiligen Rinnen (bei 34) liegen, wenn der planare Bereich (32) in dem Hohlraum (14) aufgenommen ist, wobei die kammartigen Trennwände (42) in dem Hohlraum (14) festgehalten sind und die Leiter (6) zwischen dem Verankerungselement (24) und der planaren Fläche (38) festgehalten sind, wenn das Verankerungselement (24) in eine Verankerungsposition nach unten geschwenkt ist.

2. Anordnung nach Anspruch 1, dadurch gekennzeichnet, daß die Basis (30) weiterhin einen einstückig mit dem planaren Bereich (32) ausgebildeten und an dessen erstem Ende (36) anliegenden Mantelaufnahmebereich (50) aufweist, der eine mit den Trennwänden axial ausgerichtete, halbzyklindrische Aussparung (52) aufweist, deren Oberfläche unterhalb der planaren Fläche (38) liegt, wobei die Aussparung als Aufnahme für den Kabelmantel (4) dient, während die Leiter (6) am abisolierten Ende des Kabels auf der planaren Fläche (38) zwischen den kammartigen Trennwänden (42) ausgerichtet sind.

3. Anordnung nach Anspruch 2, dadurch gekennzeichnet, daß weiterhin ein Zugentlastungsjoch (60) vorgesehen ist, das zum derartigen Zusammenwirken mit dem Mantelaufnahmebereich (50) ausgelegt ist, daß der Kabelmantel (4) dazwischen gegriffen wird.

4. Anordnung nach Anspruch 3, dadurch gekennzeichnet, daß der Mantelaufnahmebereich (50) von einem Paar paralleler Schlitz (54) flankiert ist, von denen jeweils einer auf jede Seite des Mantelaufnahmebereichs (50) vorgesehen ist, wobei das Joch (60) ein Paar Arme (64) zur Aufnahme in den Schlitz (54) aufweist und die Arme (64) zur fortschreitenden Verriegelung mit dem Mantelaufnahmebereich jeweils mit Kerbverzahnung ausgebildet sind.

Revendications

1. Ensemble à fiche téléphonique modulaire du type comportant une fiche (10) ayant une ouverture d'entrée menant à une cavité (14), des gouttières (en 34) d'alignement de conducteurs dans la base de la cavité (14) à distance de l'ouverture, des bornes (20) dans des fentes (22) alignées au-dessus des gouttières et un élément d'ancrage articulé (24) au-dessus de la cavité vers l'ouverture, caractérisé par: un adaptateur à utiliser avec un câble rond (2) à conducteurs multiples, comprenant une embase (30) ayant une partie plane (32) délimitée par une première extrémité (36), une seconde extrémité opposée (34) et une surface plane (38) s'étendant entre elles, ladite embase (30) ayant des cloisons planes (42) analogues à une peigne qui s'élèvent de ladite surface plane (32) à ladite première extrémité, ladite partie plane (32) étant profilée pour être reçue dans ladite cavité (14) de ladite fiche (10) de façon que lesdites cloisons (42) analogues à un peigne soient adjacentes auxdites gouttières (en 34), lesdites cloisons (42) analogues à une peigne espaçant des conducteurs (6) posés sur ladite surface plane (38) en alignement avec lesdites bornes (20), de manière que des conducteurs (6) passant entre lesdites cloisons (42) analogues à une peigne et allant au-delà de ladite première extrémité (36) s'étendent au-dessus de gouttières respectives (en 34) lorsque ladite partie plane (32) est reçue dans ladite cavité (14), lesdites cloisons (42) analogues à un peigne étant emprisonnées dans ladite cavité (14) et lesdites conducteurs (6) étant emprisonnées entre ledit élément d'ancrage (24) et ladite surface plane (38) lorsque ledit élément d'ancrage (24) est basculé vers le bas dans une position d'ancrage.

2. Ensemble selon la revendication 1, dans lequel ladite embase (30) comprend en outre une partie (50) de réception de gaine réalisée d'une seule pièce avec ladite partie plane (32) en butée contre la première extrémité (36) de celle-ci, ladite partie de réception de gaine présentant un évidement semi-cylindrique (52) aligné axialement avec lesdites cloisons, la surface dudit évidement s'étendant au-dessous de ladite surface plane (38), de manière que ledit élément serve de logement pour la gaine (4) du câble, tandis que les conducteurs (6) de l'extrémité dénudée du câble sont orientés sur la surface plane (38) et dans les cloisons (42) analogues à une peigne.

3. Ensemble selon la revendication 2, comprenant en outre un étrier (60) de soulagement de contrainte pouvant coopérer avec ladite partie (50) de réception de gaine pour enserrer entre eux ladite gaine (4) du câble.

4. Ensemble selon la revendication 3, dans lequel ladite partie (50) de réception de gaine est flanquée de deux fentes parallèles (54), une sur chacun de ses côtés, ledit étrier (60) comportant deux bras (64) destinés à être reçus dans lesdites fentes (54), chacun des bras (64) étant dentelé pour réaliser un verrouillage progressif sur ladite partie de réception de gaine.