

SPECIFICATION

SYSTEM FOR TERMINATING THE SHIELD OF A HIGH SPEED CABLE

Field of the Invention

5 This invention generally relates to the art of electrical connectors and, particularly, to a system for terminating the metallic shield of a high speed cable, such as the metallic braid of the cable.

Background of the Invention

10 A typical high speed cable includes a center conductor or core surrounded by a tube-like inner dielectric. A shield is disposed outside the inner dielectric for shielding and/or grounding the cable. The shield typically is a tubular metallic braid. However, one or more longitudinal conductive wires have also been used  
15 and are commonly called "drain wires." An insulating jacket surrounds the composite cable outside the shield.

Various types of connectors are used to terminate high speed cables. The connectors typically have contacts which are terminated to the center conductor or core of the  
20 cable. The connectors also have one form or another of a terminating member for terminating the metallic shield of the high speed cable, usually for grounding purposes. A typical system in such connectors terminates the metallic shield to the terminating member by soldering. Other  
25 systems use crimping procedures to crimp at least a portion of the terminating member securely to the metallic braid for commoning purposes.

30 With the ever-increasing miniaturization of the electronics in various industries, such as in the computer and telecommunications industries, along with the accompanying miniaturization of electrical connectors, considerable problems have been encountered in terminating miniature high speed cables, particularly in terminating



the metallic shield of the cable. For instance, the outside diameter of a small coaxial cable may be on the order of 0.090 inch. The outside diameter of the inner dielectric surrounding the conductor/core may be on the order of 0.051 inch, and the diameter of the center conductor/core may be on the order 0.012 inch. Coaxial cables having even smaller dimensional parameters have been used.

The problems in terminating such very small coaxial cables often revolve around terminating the metallic shield of the cable. For instance, if soldering methods are used, applying heat (necessary for soldering) in direct proximity to the metallic shield can cause heat damage to the underlying inner dielectric and, in fact, substantially disintegrate or degrade the inner dielectric. If conventional crimp-type terminations are used, typical crimping forces often will crush or deform the inner dielectric surrounding the center conductor/core of the cable.

The above problems are further complicated when the metallic shield of the high speed cable is not terminated to a cylindrical terminating member, but the shield is terminated to a flat terminating member or contact. For instance, it is known to terminate the tubular metallic shield or braid of a coaxial cable to a flat ground circuit pad on a printed circuit board. This is accomplished most often by simply gathering the tubular metallic braid of the coaxial cable into a twisted strand or "pigtail" which, in turn, is soldered to the flat ground pad on the circuit board.

Another example of terminating the metallic shield or braid of a coaxial cable to a flat ground member is shown in U.S. Patent No. 5,304,069, dated April 19, 1994 and assigned to the assignee of the present invention. In that patent, the metallic braids of a plurality of coaxial cables are terminated to a ground plate of a high speed

signal transmission terminal module. The conductors/cores of the coaxial cables are terminated to signal terminals of the module.

5 In terminating the tubular metallic shields or  
braids of high speed cables to flat ground contact pads as  
in a printed circuit board, or to a planar ground plate as  
in the above-referenced U.S. patent, or to any other flat  
or non-tubular terminating member, various design  
10 considerations should be considered as has been found with  
the present invention. It should be understood that there  
is a transition zone created where the center  
conductor/core of the high speed cable goes from a  
"controlled environment" wherein the conductor/core is  
15 completely surrounded by the tubular metallic shield or  
braid, to an "uncontrolled environment" where the braid is  
spread away from the conductor/core for termination to the  
non-tubular terminating member. It is desirable that this  
transition zone be held to as small an area as possible  
20 (i.e., a region bounded by the conductor/core and by the  
braid) and as short a length (i.e., longitudinally of the  
cable) as possible. Preferably, the metallic shield or  
braid should be terminated over an area (or at least at two  
points) approximately 180° apart in relation to the center  
conductor/core of the cable. Preferably, the flat  
25 terminating member should overlap or at least extend to the  
point where the metallic shield or braid is separated from  
its tubular configuration surrounding the conductor/core of  
the cable. Still further, it is desirable that the  
metallic shield or braid of any given high speed cable be  
30 terminated on the same side of the flat terminating member  
as the center conductor/core of the cable.

35 The present invention is directed to solving the  
above-identified problems and satisfying as many of the  
above-identified design parameters as possible in an  
improved system for terminating the metallic shield of a



high speed cable to a terminating member, such as a ground plate.

Summary of the Invention

5 An object, therefore, of the invention is to provide a new and improved method of terminating the metallic shield of a high speed cable, as well as a system for terminating the shield of the cable.

10 In the exemplary embodiment of the invention, the method includes providing the high speed cable with an exposed portion of the metallic shield. A thermally insulating sleeve is positioned between the metallic shield and the inner dielectric of the high speed cable. A conductive terminating member is provided with a gripping arm. The cable is positioned on the terminating member.  
15 The gripping arm is formed into gripping engagement with the exposed portion of the metallic shield outside the insulating sleeve. The metallic shield then is soldered to the gripping arm as the insulating sleeve protects the inner dielectric from the heat of the soldering.

20 Preferably, the gripping arm is formed with an opening therethrough for registering with the exposed portion of the metallic shield. The soldering step is carried out by soldering through the opening. In the exemplary embodiment, the gripping arm is formed about a  
25 substantial portion of the high speed cable, and the opening is formed as a circumferentially extending slot.

30 The conductive terminating member is disclosed herein as a ground plate having a blade portion with an opposed pair of the gripping arms at opposite edges of the blade portion for gripping a pair of high speed cables therebetween, with both cables including the insulating sleeves. In the preferred embodiment, a pair of the opposed gripping arms are formed on each opposite side of the blade portion of the ground plate. The insulating



sleeves are fabricated of a thermally insulating material such as high temperature plastic.

5 Other objects, features and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings.

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Brief Description of the Drawings

The features of this invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with its objects and the advantages thereof, may be best understood by reference to the following description taken in conjunction with the accompanying drawings, in which like reference numerals identify like elements in the figures and in which:

FIGURE 1 is a perspective view of an electrical connector of a type in which the invention is applicable;

FIGURE 2 is a fragmented vertical section taken generally along line 2-2 of Figure 1;

FIGURE 3 is a perspective view of one of the coaxial cables prepared for use with the invention, in conjunction with one of the insulating sleeves;

FIGURE 4 is a perspective view of the coaxial cable prepared as shown in Figure 3, with the insulating sleeve inserted between the metallic shield and the dielectric of the cable;

FIGURE 5 is a perspective view of a stamped metal blank from which the terminating member or ground plate is formed;

FIGURE 6 is a perspective view of the ground plate, with the gripping arms formed to their preliminary or open positions, and in conjunction with a plurality of coaxial cables having the insulating sleeves inserted therein;

FIGURE 7 is a view similar to that of Figure 6, but showing the coaxial cables properly positioned relative to the gripping arms of the ground plate;

FIGURE 8 is a perspective view similar to that of Figure 7, but with the gripping arms crimped into engagement with the metallic shields of the cable; and

FIGURE 9 is a perspective view of the subassembly of Figure 8 assembled into the terminal module shown in Figure 2.



Detailed Description of the Preferred Embodiment

Referring to the drawings in greater detail, and first to Figures 1 and 2, the invention is embodied in a shielded electrical connector, generally designated 10, which is a hybrid electrical connector for terminating both the conductors of slower data transmission lines and the conductors of high speed or high frequency transmission lines. In particular, electrical connector 10 includes a dielectric housing 12 (Fig. 2) mounting a plurality of data transmission terminals 14 (Fig. 1). A conductive shield, generally designated 16, substantially surrounds dielectric housing 12 and has a shroud portion 18 projecting forwardly about the mating ends of data transmission terminals 14. A two-piece backshell (not shown) substantially in conformance with that shown in U.S. Patent No. 5,358,428, dated October 25, 1994, projects rearwardly of housing 12 and shield 16. An overmolded boot 20 includes an integral cable strain-relief 22 that is in engagement with a composite electrical cable 24 which includes both the data transmission lines and the high speed or high frequency transmission lines. A pair of thumb screws 26 project through the overmolded boot and include externally threaded forward distal ends 26a for securing the connector to a complementary mating connector, panel or other structure.

As seen best in Figure 2, a high speed signal transmission terminal module, generally designated 30, is inserted into a passage 31 in dielectric housing 12 from the rear thereof. The terminal module includes a pair of terminal blocks 30a and 30b which clamp a ground plate, generally designated 32, therebetween. Each terminal block includes a post 34 and a recess. The post from each terminal block extends from each terminal block through a hole or slot 44 (Fig. 5) in the ground plate and into a recess in the other terminal block to secure terminal blocks 30a and 30b to ground plate 32 as a subassembly. Once this subassembly is inserted into passage 31 in



housing 12 as shown in Figure 2, the terminal blocks are effective to clamp the ground plate therebetween. The terminal module is held within the dielectric housing by a pair of ramped latches 36 on each terminal block.

5 Each terminal block 30a and 30b is overmolded about at least one high speed signal terminal 38. The contact ends of a pair of the terminals 38, along with the forward end of ground plate 32, are shown projecting forwardly of the connector in Figure 1, within the  
10 surrounding shroud portion 18 of shield 16. The rear ends 38a of terminals 38 (Fig. 9) are terminated to the center conductor/cores 52 of a plurality of coaxial cables, generally designated 40 in Figure 2. The invention is particularly directed to the manner of termination of the  
15 metallic shields 56 of the coaxial cables to ground plate 32, as described below.

More particularly, Figure 5 shows a blank, generally designated "B," stamped from conductive sheet metal material and from which ground plate 32 is formed.  
20 Blank "B" is generally T-shaped and includes a leg or stem portion 42 which will form a blade portion for ground plate 32. The blade portion includes an aperture 44 through which posts 34 (Fig. 2) of terminal blocks 30a and 30b extend. A pair of wings or arms 46 project outwardly at  
25 one end of leg 42 generally at each opposite edge thereof. These wings will form the gripping arms of the ground plate, as will be seen hereinafter. Each wing or gripping arm has an elongated slot 48 to facilitate the solder termination described hereinafter.

30 When soldering the cable shield 56 to ground plate 32, it is desirable to use a soldering iron having a relatively small tip. Although it is desirable to dimension the slot wide enough to facilitate adequate solder flow throughout the slot, it should be narrow enough  
35 to prevent the relatively small tip of the soldering iron from contacting the braid or shield 56 of the cable, which could result in damage to the underlying insulation 54.



Each slot is on the order of approximately 0.040 inch wide, although it is believed that such slot could be within the range of .110 to .010 inch wide. Finally, barbs or teeth 49 are stamped at the opposite edges of blade portion 42 to facilitate holding the subassembly of the ground plate and terminal blocks 30a and 30b within the housing.

Either before or after or simultaneously with stamping blank "B" from sheet metal material, one or more coaxial cables 40 are prepared as shown in Figures 3 and 4. At this point, it should be understood that each coaxial cable 40 is of a conventional construction in that each cable includes a center conductor or core 52 surrounded by a tube-like inner dielectric 54. A metallic shield in the form of a tubular metallic braid 56 surrounds inner dielectric 54. An insulating jacket 58, as of plastic or the like, surrounds metallic braid 56 to form the overall composite coaxial cable 40.

Figure 3 shows that center conductor/core 52 of coaxial cable 40 has been stripped to expose a given length thereof which is soldered to the inner end 38a of one of the high speed signal transmission terminals 38 (Fig. 9). The outer insulating jacket 58 of the cable also has been cut-back to expose a given length of the metallic shield 56. Therefore, the exposed shield can be soldered to ground plate 32 as described hereinafter.

Figure 3 shows the prepared coaxial cable in conjunction with an insulating tubular sleeve 60 which has an inside diameter to fit over inner dielectric 54 of the coaxial cable. The insulating sleeve is positioned over the inner dielectric in the direction of arrow "A" (Fig. 3) and beneath the metallic braid 56 to a position shown in Figure 4 wherein the front end of the sleeve is generally flush with the front end of the dielectric. In other words, the insulating sleeve is sandwiched between the metallic shield and the dielectric. The sleeve is fabricated of a thermally insulating material such as high temperature plastic or a ceramic material that is



sufficiently resistant to heat so that the metallic braid or shield can be soldered, while the sleeve protects inner dielectric 54 from the heat of the soldering process.

Figure 6 shows the stamped blank "B" of Figure 5 with wings 46 having been bent inwardly to form a pair of upper gripping arms 62a and a pair of lower gripping arms 62b. It can be seen that, after forming, slots 48 in the gripping arms extend in a circumferential direction and into blade portion 42 of ground plate 32. Preferably, the slots extend from a point near the distal ends of the gripping arms to a point near the center of blade portion 42. In essence, the ground plate is provided with a pair of opposed gripping arms at opposite edges of the plate for gripping a pair of coaxial cables, as well as providing a pair of opposed gripping arms on each opposite side of the plate. One pair 60a is located at the extreme rear distal end of blade portion 42, and the other pair 62b is located slightly spaced longitudinally forward of the first pair. With this structure, the ground plate can terminate from one to four coaxial cables depending on the specifications of the connector. In some computer applications, three cables may be used to carry the red, green and blue chroma signals for a monitor. A fourth cable might be used for flat screen monitors for carrying the pixel clock timing signals. Three coaxial cables 40, having been prepared and with insulating sleeves 60 inserted thereinto, are shown in Figure 6 about to be positioned onto ground plate 32.

Figure 7 shows the prepared coaxial cables 40 having been positioned onto ground plate 32 and within the confines of gripping arms 62a and 62b that are at a partially formed position. It can be seen that the slots 48 in the gripping arms are in registry with the metallic shields 56 of the respective coaxial cables on the outside of insulating sleeves 60.



The next step in processing the terminal module is to form or crimp gripping arms 62a and 62b into gripping engagement with the coaxial cables about the exposed metallic shields 56, as shown in Figure 8. It should be understood that the gripping arms are not crimped onto the metallic shields as is typical in the prior art. An amount of gripping pressure is used to form the gripping arms inwardly, only to grip or retain the coaxial cables. The gripping or crimping pressure should not be excessive so as to damage or deform the underlying insulating sleeves 60 and/or the dielectric material 54 to any extent, which could affect the electrical performance of the cable assembly.

Ground plate 32 then is mechanically and electrically connected to metallic shields 56 of the coaxial cables by soldering the metallic shields to gripping arms 62a and 62b by soldering through slots 48 in the gripping arms, as at "S" in Figure 8. As stated above, the slots are formed on the order of 0.040 inch wide to prevent the application of concentrated heat directly to the metallic shield sufficient to cause any heat damage to the underlying insulating sleeve or the dielectric. Regardless of the width of the slots, the slots should be sufficiently narrow to at least prevent whatever soldering iron or tool is used from passing through the slots and into direct engagement with the metallic shield. Such engagement might result in damage to the underlying insulating sleeve or inner dielectric. In essence, the slots restrict the amount of soldering heat which is transmitted inwardly. On the other hand, with the slots extending in a circumferential direction and into blade portion 42 of the ground plate, the slots provide a large area of access to the metallic shields in a circumferential direction. Preferably, the soldering slots extend



approximately 180° or more about the center or axis of each respective coaxial cable.

Although the soldering process has been described above as performed in conjunction with a soldering iron or tool, other solder methods are contemplated. For instance, solder paste may be deposited in slots 48, and the solder paste can be reflowed through the subsequent application of heat. In addition, the slots 48 may be removed and the gripping arms may have a heavy tin coating or a solder inlay, and these materials can also be reflowed through the application of heat. In any of these processes, insulating sleeves 60 function to thermally isolate dielectrics 54 and protect the dielectrics from the heat of the soldering process.

Once the subassembly of Figure 8 is fabricated, including the soldering procedures, this subassembly is assembled to terminal blocks 30a and 30b and high speed signal transmission terminals 38 to form terminal module 30 as shown in Figure 9 and described above in relation to Figure 2. Conductors/cores 52 of the coaxial cables are connected, as by soldering, welding or other means to the inner ends 38a of terminals 38, with terminal blocks 30a and 30b clamping blade portion 42 of ground plate 32 therebetween, as shown in Figure 2 and described above. The terminal module then is mounted within dielectric housing 12 as shown in Figure 2. If desired, terminal blocks 30a and 30b could be mounted to blade portion 42 of ground plate 32 prior to inserting cables 40 between gripping arms 50a and 50b. In such case, the ground plate 32 shown in Figure 6 would have the terminal blocks mounted thereon at the beginning of the termination process.

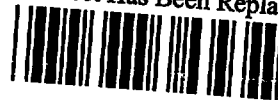
The concepts of the invention have been shown and described herein in conjunction with terminating the metallic shield of the coaxial cable to a terminating member 32 in the form of a ground plate 42. However, it



should be understood that the concepts of the invention are equally applicable for terminating the metallic shield 56 to other types of terminating members, such as electrical terminals themselves.

5           It will be understood that the invention may be embodied in other specific forms without departing from the spirit or central characteristics thereof. The present examples and embodiments, therefore, are to be considered  
10           in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.

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CLAIMS:

1. A method of terminating a cable (40) having an inner conductor (52), an inner dielectric (54) surrounding at least a portion of said inner conductor, a  
5 metallic shield (56) surrounding at least a portion of said inner dielectric and an outer insulating jacket (58) surrounding at least a portion of said metallic shield to a conductive terminating member (32) at least partially disposed at least partially within a dielectric housing  
10 (12) of an electrical connector (10), said method comprising the steps of:

providing said cable with a portion of said outer insulating jacket thereof removed from about said metallic shield so as to expose an exposed portion (56) of said  
15 metallic shield and with an insulating sleeve (54) between said metallic shield and said inner dielectric of said cable;

positioning said cable on said conductive terminating member, said terminating member having a  
20 gripping arm (46);

forming said gripping arm into gripping engagement with said exposed portion of said metallic shield without deforming said insulating sleeve such that said metallic shield is captured between said insulating  
25 sleeve and said gripping arm; and

bonding said metallic shield to said gripping arm such that said insulating sleeve protects said inner dielectric from heat generated when said metallic shield is bonded to said gripping arm.  
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2. The method of claim 1 wherein said gripping arm (46) includes a slot (48) therethrough for registering with said exposed portion (56) of said metallic shield (56) and wherein said metallic shield is bonded to said gripping  
35 arm by using said slot.



3. The method of claim 1 wherein said gripping arm (46) is formed about a substantial circumferential portion of said metallic shield (56).

5 4. A method of terminating a pair of cables (40) each having an inner conductor (52), an inner dielectric (54) surrounding at least a portion of said inner conductor, a metallic shield (56) surrounding at least a portion of said inner dielectric and an outer  
10 insulating jacket (58) surrounding at least a portion of said metallic shield to a conductive terminating member (32) disposed at least partially within a dielectric housing (12) of an electrical connector (10), said method comprising the steps of:

15 providing said cables with a portion of said outer insulating jacket of each of said cables removed from about said metallic shield so as to expose an exposed portion (56) of said metallic shield and with an insulating sleeve (60) between said metallic shield and said inner  
20 dielectric of each of said cables;

positioning said exposed portion of each of said metallic shields on an elongated, generally planar ground plate (42) of said terminating member, said terminating member having a pair of gripping arms (62a) projecting from  
25 opposite edges of said ground plate near one end thereof;

forming said gripping arms into engagement with said exposed portion of said metallic shield of each of said cables without deforming said insulating sleeve thereby clamping said metallic shields between said  
30 gripping arms and said sleeves; and

bonding said metallic shields to said gripping arms such that said insulating sleeves protect said inner dielectrics from heat generated when said metallic shields are bonded to said gripping arms.





5. The method of claim 4 wherein each of said gripping arms (62a) includes a slot (48) therethrough for registering with said exposed portion (56) of said metallic shield (56) of one of said cables (40) and wherein said metallic shield of each of said cables is bonded to one of said gripping arms by using said slot in said gripping arm.

6. The method of claim 4 wherein each of said gripping arms (62a) is formed about a substantial circumferential portion of one of said metallic shields (56).

7. The method of claim 6 wherein each of said gripping arms (62a) includes a circumferentially extending slot (48) therethrough for registering with said exposed portion (56) of said metallic shield (56) about which said gripping arm is formed and wherein each of said metallic shields is soldered (S) to one of said gripping arms using said slot.

8. The method of claim 4 wherein at least one additional cable (40) is to be terminated to said conductive terminating member (32), said additional cable including an additional inner conductor (52), an additional inner dielectric (54) at least a portion of surrounding said additional inner conductor, an additional metallic shield (56) surrounding at least a portion of said additional inner dielectric and an additional outer insulating jacket (58) surrounding at least a portion of said additional metallic shield, a portion of said additional outer jacket being removed to expose an additional exposed portion (56) of said additional metallic shield and wherein said additional cable has an additional insulating sleeve (60) disposed between said additional metallic shield and said additional inner dielectric and wherein said ground plate (42) has an additional pair of



gripping arms (62b) projecting from opposite edges of said ground plate on a side of said ground plate opposite to the side from which said pair of gripping arms (62a) project and wherein the method further includes positioning said additional exposed portion of said additional metallic shield of said additional cable on said ground plate and forming at least one of said additional gripping arms into engagement with said additional exposed portion of said additional metallic shield to thereby clamp said additional metallic shields between said additional gripping arms and said additional sleeves without deforming said additional insulating sleeve.

9. The method of claim 8 wherein said pair of gripping arms (62a) and said additional pair of gripping arms (62b) are spaced longitudinally on said ground plate (42) with respect to each other.

10. The method of claim 8 wherein each of said gripping arms (62a) includes a slot (48) therethrough for registering with said exposed portion (56) of said metallic shield (56) of one of said cables (40) and wherein said metallic shield of each of said cables is bonded to one of said gripping arms by using said slot in said gripping arm and wherein each of said additional gripping arms (62b) includes an additional slot (48) therethrough for registering with said additional exposed portion (56) of said additional metallic shield (56) of said additional cable (40) and wherein said additional metallic shield of said additional cable is bonded to one of said additional gripping arms by using said additional slot in said additional gripping arm.



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11. A termination assembly comprising:

a cable (40) having an inner conductor (52), an inner dielectric (54) at least a portion of surrounding said inner conductor, a metallic shield (56) surrounding at least a portion of said inner dielectric and an outer insulating jacket (58) surrounding at least a portion of said metallic shield, a portion of said outer jacket being removed to expose an exposed portion (56) of said metallic shield;

a thermally insulating member (60) positioned between said metallic shield and said inner dielectric of said cable; and

a conductive terminating member (32) at least partially disposed in a dielectric housing (12) of an electrical connector (10), said terminating member having a gripping portion (62a) positioned in registry with said exposed portion of said metallic shield, said gripping portion gripping said metallic shield without deformation of said insulating member such that said metallic shield is disposed between said insulating member and said gripping portion.

12. The termination assembly of claim 11 wherein said insulating member (60) is a high temperature plastic sleeve (60).

13. The termination assembly of claim 12 wherein said gripping portion (62a) of said conductive terminating member (32) includes a slot (48) therethrough in registry with said exposed portion (56) of said metallic shield (56), said slot being used to solder (S) said exposed portion of said metallic shield to said gripping portion.





14. The termination assembly of claim 11 wherein said conductive terminating member (32) includes a planar ground plate (42) and wherein said gripping portion (62a) comprises a gripping arm projecting from said ground plate.

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15. The termination assembly of claim 14 wherein said gripping arm (62a) has a circumferentially extending slot (48) therethrough for enabling soldering (S) of said exposed portion (56) of said metallic shield (56) to said gripping arm.

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16. The termination assembly of claim 15 wherein said slot (48) extends approximately 180° about said cable (40).

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17. A termination assembly comprising:

a pair of cables (40), each of said cables having an inner conductor (52), an inner dielectric (54) surrounding at least a portion of said inner conductor, a metallic shield (56) surrounding at least a portion of said inner dielectric and an outer insulating jacket (58) surrounding at least a portion of said metallic shield, a portion of said outer jacket being removed to expose an exposed portion (56) of said metallic shield;

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a pair of insulating sleeve members (60), one of said sleeve members being positionable between said metallic shield and said inner dielectric of one of said pair of cables and the other of said sleeve members being positionable between said metallic shield and said inner dielectric of said other of said pair of cables; and

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a terminal (32) to which said metallic shields are to be terminated, said terminal being at least partially disposed in a dielectric housing (12) of an electrical connector (10) and having a ground portion (42) including an elongated, generally planar ground plate (42) having a pair of gripping arms (62a) projecting from

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5 opposite edges of said ground plate near one end thereof,  
said gripping arms being clamped onto said exposed portions  
of said metallic shields of said cables thereby clamping  
said metallic shields between said gripping arms and said  
sleeve members without deformation of said sleeve members  
and being bonded to said exposed portions.

10 18. The termination assembly of claim 17 wherein  
said insulating sleeve members (60) are high temperature  
plastic sleeves (60).

15 19. The termination assembly of claim 17 wherein  
each of said gripping arms (62a) of said conductive  
terminating member (32) includes a slot (48) therethrough  
in registry with said exposed portion (56) of one of said  
metallic shields (56), said slot being used in soldering  
(S) of said exposed portion of one of said metallic shields  
to one of said gripping arms.

20 20. The termination assembly of claim 17  
including at least one additional cable (40) to be  
terminated to said ground plate (42), said additional cable  
including an additional inner conductor (52), an additional  
inner dielectric (54) surrounding at least a portion of  
25 said additional inner conductor, an additional metallic  
shield (56) surrounding at least a portion of said  
additional inner dielectric and an additional outer  
insulating jacket (58) surrounding at least a portion of  
said additional metallic shield, a portion of said  
30 additional outer jacket being removed to expose an  
additional exposed portion (56) of said additional metallic  
shield and said termination assembly further including an  
additional insulating sleeve member (60) disposed between  
said additional metallic shield and said additional inner  
35 dielectric of said additional cable and including a pair of  
additional gripping arms (62b) projecting from opposite





edges of said ground plate on a side opposite of said ground plate from which said gripping arms project, at least one of said additional gripping arms gripping said additional exposed portion of said additional metallic shield of said additional cable thereby clamping said additional metallic shield between one of said additional gripping arms and said additional insulating sleeve member without deforming said additional insulating sleeve member and being bonded to said additional exposed portion.

21. The termination assembly of claim 20 wherein said gripping arms (62a) are spaced longitudinally on said ground plate (42) from said additional gripping arms (62b).

22. The termination assembly of claim 20 wherein said conductive terminating member (32) is a stamped and formed sheet metal component.

23. The termination assembly of claim 20 wherein each of said insulating sleeve members (60) and each of said additional insulating sleeve members (60) are high temperature plastic sleeve members (60).

24. The termination assembly of claim 20 wherein each of said gripping arms (62a) of said conductive terminating member (32) includes a slot (48) therethrough in registry with said exposed portion (56) of one of said metallic shields (56), said slot (48) being used to solder (S) said exposed portion of each of said metallic shields to one of said gripping arms and wherein each of said additional gripping arms (62b) of said conductive terminating member includes an additional slot (48) therethrough in registry with said additional exposed portion (56) of said additional metallic shield (56), said additional slot being used to solder (S) said additional exposed portion of said additional metallic shield to one of said additional gripping arms.





25. An electrical connector (10) for termination to a cable (40) that includes an inner conductor (52), an inner dielectric (54) surrounding at least a portion of said inner conductor, a metallic shield (56) surrounding at least a portion of said inner dielectric and an outer insulating jacket (58) surrounding at least a portion of said metallic shield, a portion of said outer jacket being removed to expose an exposed portion (56) of said metallic shield, said electrical connector comprising:

10 a dielectric housing (12) having a mating face, a termination face and a plurality of terminal receiving passages between said mating face and said termination face;

15 a plurality of terminals (38) extending through at least some of said terminal receiving passages;

an insulating sleeve (60) disposed between said metallic shield and said inner dielectric of said cable; and

20 a ground portion (32) at least partially disposed in said housing relative to said terminals, said ground portion including an elongated, generally planar ground plate (42) having at least one gripping arm (62a) projecting from an edge of said ground plate near one end thereof, said gripping arm being adapted to be clamped onto  
25 said exposed portions of said metallic shield of said cable thereby clamping said metallic shield between said gripping arm and said insulating sleeve without deformation of said insulating sleeve.

30 26. The electrical connector (10) of claim 25 wherein said insulating sleeve (60) is a high temperature plastic sleeve (60).

35 27. The electrical connector (10) of claim 25 wherein said gripping arm (62a) of said ground portion (32) includes a slot (48) therethrough in registry with said





exposed portion (56) of said metallic shield (56), said slot being used to solder (S) said exposed portion of said metallic shield to said gripping arm.

- 5                    28. An electrical connector (10) for termination to a pair of cables (40) each of which includes an inner conductor (52), an inner dielectric (54) surrounding at least a portion of said inner conductor, a metallic shield (56) surrounding at least a portion of said inner dielectric and an outer insulating jacket (58) surrounding at least a portion of said metallic shield, a portion of said outer jacket being removed to expose an exposed portion (56) of said metallic shield, said electrical connector comprising:
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- 15                    a dielectric housing (12) having a mating face, a termination face and a plurality of terminal receiving passages between said mating face and said termination face;
- 20                    a plurality of terminals (38) extending through at least some said terminal receiving passages;
- an insulating sleeve (60) disposed between said metallic shield and said inner dielectric of each of said cables; and
- 25                    a ground portion (32) at least partially disposed in said housing relative to said terminals, said ground portion including an elongated, generally planar ground plate (42) having a pair of gripping arms (62a) projecting from opposite edges of said ground plate near one end thereof, said gripping arms being adapted to be clamped onto said exposed portions of said metallic shields of said cables thereby clamping said metallic shields between said gripping arms and said sleeves without deformation of said insulating sleeves.
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29. The electrical connector (10) of claim 28 wherein said insulating sleeve (60) is a high temperature plastic sleeve (60).

5                   30. The electrical connector (10) of claim 29 wherein each of said gripping arms (62a) of said ground portion (32) includes a slot (48) therethrough in registry with said exposed portion (56) of one of said metallic shields (56), said slot being used to solder (S) said  
10 exposed portion of one of said metallic shields to one of said gripping arms.

                  31. The electrical connector (10) of claim 28 including at least one additional cable (40) to be  
15 terminated to said ground plate (42), said additional cable including an additional inner conductor (52), an additional inner dielectric (54) surrounding at least a portion of said additional inner conductor, an additional metallic shield (56) surrounding at least a portion of said  
20 additional inner dielectric and an additional outer insulating jacket (58) surrounding at least a portion of said additional metallic shield, a portion of said additional outer jacket being removed to expose an additional exposed portion (56) of said additional metallic  
25 shield and said electrical connector further including an additional insulating sleeve member (60) disposed between said additional metallic shield and said additional inner dielectric of said additional cable and including a pair of additional gripping arms (62b) projecting from opposite  
30 edges of said ground plate on a side opposite of said ground plate from which said gripping arms project, each of said additional gripping arms being adapted to be formed onto said additional exposed portion of said additional metallic shield of said additional cable thereby clamping  
35 said additional metallic shield between one of said additional gripping arms and one of said additional





insulating sleeve member without deformation of said additional insulating sleeve member.

5           32. The electrical connector (10) of claim 31 wherein said gripping arms (62a) are spaced longitudinally on said ground plate (42) from said additional gripping arms (62b).

10           33. The electrical connector (10) of claim 32 wherein said ground plate (42) is a stamped and formed sheet metal component.

15           34. The electrical connector (10) of claim 32 wherein each of said insulating sleeve members (60) and said additional insulating sleeve member (60) are high temperature plastic sleeves (60).

20           35. The electrical connector (10) of claim 32 wherein each of said gripping arms (62a) of said conductive terminating member (32) includes a slot (48) therethrough in registry with said exposed portion (56) of one of said metallic shields (56), said slot being used to solder (S) said exposed portion of each of said metallic shields to one of said gripping arms and wherein each of said  
25           additional gripping arms (62b) of said conductive terminating member (32) includes an additional slot (48) therethrough in registry with said additional exposed portion (56) of said additional metallic shield (56), said additional slot being used to solder (S) said additional  
30           exposed portion of said additional metallic shield to one of said additional gripping arms.

