

Description

The present invention relates to a kit which can be used in cooperation with known panel mounted electrical connectors to convert the known connector to interface with a shielded mating connector providing proper shielding at the mating face.

The development of highly sophisticated electronic equipment has created requirements for shielding in order to prevent cross-talk from occurring within the equipment. An effective way of accomplishing this cross-talk prevention is to utilise shielded cable and connectors. While such shielding is necessary when making interconnections between components, it is not necessary to have shielding for connections within a component or unit casing itself. It is highly desirable to be able to adopt existing connectors of the type that are commonly used in such components to enable them to make a shielded interconnection with a shielded connector and cable.

IBM Technical Disclosure Bulletin Vol 23 No. 5, October 1980 discloses a contact interposer comprising a conductive frame having rows of spring fingers arranged to protrude into respective openings in a connector block when the interposer frame is assembled with the connector block in a metal connector housing with the interposer in electrical contact with the housing, whereby electrical contacts inserted into the openings in the housing are interconnected via the interposer spring fingers and connected with the housing.

DE-A-2 613 907 discloses a kit for providing electrical connection between a shielded electrical connector and a metal panel having an aperture for receiving the connector therein, the kit comprising a metal ground plane spring for electrically connecting the connector to the panel the spring having means for mounting on the panel. A pair of spring means are provided interposed between ends of the connector shield and the metal panel, the connector being secured to the panel by a jack bolt and nut.

It is an object to provide an improved kit for readily adapting a panel aperture for receiving a shielded connector and providing electrical connection between the panel and the connector shield.

According to the invention a kit for providing electrical connection between a shielded electrical connector and a metal panel having an aperture for receiving said connector therein, said kit comprising a metal ground plane spring for electrically connecting said connector to said panel, said spring having means for mounting on said panel, is characterised in that for converting a connector receiving aperture in a panel or the like to a shielded pin receptacle connector, said spring comprises a plurality of outwardly directed peripheral spring fingers, a central opening profiled to receive a shielded connector, and a plurality of integral tines about the periphery of said opening and extending substantially normal to the plane of the spring, said kit further comprising

a shroud of insulative material having a central cavity profiled to receive the tines therein, a patterned array of pin receiving apertures in the bottom of said cavity and means for mounting said shroud on said panel with said spring therebetween.

The invention also includes the kit assembled to an apertured panel, the ground plane spring and the shroud being secured thereto with the spring fingers being disposed between the shroud and the panel and abutting the panel around the aperture on a side thereof opposite a connector receiving side, the opening being aligned with the aperture and the tines extending into the cavity.

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 view of the subject invention together with a fragment of a panel and a mating shielded electrical connector;

Figure 2 is a perspective view of the ground plane spring of the present invention;

Figure 3 is a vertical transverse section through the kit of the present invention mated with the shielded connector of Figure 1 and a known pin header and connector;

Figure 4 is a perspective view of the pin header and connector of Figure 3;

Figure 5 is a vertical transverse section through the subject invention mated with the shielded connector of Figure 1 and a right angle header on a circuit board or the like;

Figure 6 is a perspective view of the header and circuit board of Figure 5;

Figure 7 is a vertical transverse section through an assembly of the present invention with the shielded connector of Figure 1 and a one-piece housing pin connector terminating a plurality of conductors; and

Figure 8 is a perspective view of the assembly of Figure 7.

The present invention is comprised of a kit formed by a metal ground plane spring 10 and a shielded header shroud 12 of insulative material. The spring 10 and shroud 12 are used in combination with a panel 14 and a shielded electrical connector 16 terminating a shielded cable 18.

The ground plane spring 10 is a metal member preferably having a plurality of outwardly directed peripheral fingers 20, a central opening 22, and a plurality of integral tines 24 about the periphery of the opening 22 and extending substantially normal to the plane of the spring 10. At least one of the tines 24a is offset with respect to the periphery of the opening 22 to form a keyed or polarized entry, as best seen in Figure 2. The ground plane spring also includes mounting apertures 26.

The shielded header shroud 12 is an elongated member of insulative material having a central cavity 28 (Figure 3). An array of apertures 30 extend through the base 32 of the shroud to enter the cavity 28. The shroud also includes mounting holes 34 aligned with the holes 26 of the ground plane spring 10. The cavity 28 is of sufficient size

and shape to receive the tines 24 of the ground plane spring 10 therein.

The panel 14 is a portion of a standard metal equipment enclosure (not shown) and is provided with an elongated aperture 36 and flanking mounting apertures 38.

The mating connector 16 is preferably of the type disclosed in US-A-4 337 989. It should be noted that this connector has a terminal carrying module 40 enclosed in a pair of mating metal shells 42, 44 which together, due to their overlap, provide a profiled mating face 46.

A mating portion for the connector 16 is provided by either a pin header 48 and connector 50, as shown in Figures 3 and 4, a right angle header 52 on a circuit board 54, as shown in Figures 5 and 6, or a pin connector 56 as shown in Figures 7 and 8.

The header 48 of Figures 3 and 4 is an insulative member having an overall profile similar to that of the shielding header shroud 12 with a central cavity 58 and a plurality of pin terminals 60 mounted therein extending through the apertures 30 of the shroud 12 and with mounting apertures 62 aligned with the mounting apertures 34, 26 and 38. The mating connector 50 terminates a plurality of individual conductors 64, which can also be in the form of a ribbon cable and the connector is preferably of the type disclosed in US Patent No. 4 243 288.

The header 52 of Figures 5 and 6 is a right angle header having rows of pin terminals 68, 70 aligned to be received in the apertures 30 of the shroud 12 and to be received in similar apertures in circuit board 54 being secured to the circuit board by solder 72 or other conventional means. The header 52 would also, preferably, have mounting apertures 74 for attaching it to the shroud 12 and further mounting recesses 76 for securing it to the circuit board 54 by known means (not shown).

The pin connector 56 of Figure 7 and 8 is here illustrated as a two row connector having two rows of pin terminals 78, 80 each of which has a pin portion 82, 84 of sufficient length to extend through the apertures 30 in the shroud 12 as well as portions 86, 88 to crimping engage respective conductors 90, 92. The connector 56 also includes a housing 94 of rigid insulative material having apertures 96, 98 in which locking lances 100, 102 of the respective terminals 78, 80 protrude.

In each instance the operation of the subject invention is quite similar. The ground plane spring 10 is placed against the panel 14 with the mounting apertures 26, 28 in alignment and the shroud 12 is placed over the ground plane spring 10 with the tines 24 extending into the cavity 28 of the shroud. For the embodiments of Figures 5-8, the pin headers 48, 52 would be joined to the panel 14, spring 10, shroud 12 assembly with the mounting holes 38, 26, 34, 62, 74 aligned and secured together by conventional means (not shown). The mating connector 50 of Figures 3 and 4 could just be applied to this assembly and the shielded connector 16 mated therewith. The pin

terminals 60 of pin header 48 extend in both directions to lie within the cavity 28 of the shroud 12 as well as within the cavity 54 of the header and make interconnection between connectors 16 and 50. The pin header 52 of Figures 5 and 6 is permanently secured to circuit board 54. The pin terminals 68, 70 of header 52 would extend through apertures 30 of the shroud 12 where they would lie in cavity 28 so as to be accessible for mating with shielded connector 16.

The embodiment of Figures 7 and 8 would need no further assembly beyond panel 14, spring 10 and shroud 12. This assembly could be secured together and connector 56 applied with pin portions 82, 84 of the terminals 78, 80 extending through apertures 30 to be mateable with shielded connector 16.

It should be noted that the metal shells 42, 44 of the shielded connector 16 at least partly overlap to give a profile to the mating face 46. At least one tine 24a of the spring 10 is offset from the other tines 24 to define a profiled and/or polarized opening for receiving the shielded connector 16.

Claims

1. A kit for providing electrical connection between a shielded electrical connector (16) and a metal panel (14) having an aperture (36) for receiving said connector (16) therein, said kit comprising a metal ground plane spring (10) for electrically connecting said connector to said panel (14), said spring having means for mounting on said panel, characterized in that for converting a connector receiving aperture in a panel or the like to a shielded pin receptacle connector, said spring (10) comprises a plurality of outwardly directed peripheral spring fingers (20), a central opening profiled to receive a shielded connector (16), and a plurality of integral tines (24) about the periphery of said opening and extending substantially normal to the plane of the spring (10), said kit further comprising a shroud (12) of insulative material having a central cavity (28) profiled to receive the tines (24) therein, a patterned array of pin receiving apertures (30) in the bottom (32) of said cavity (28) and means for mounting said shroud (12) on said panel (14) with said spring (10) therebetween.

2. The kit of claim 1, assembled to an apertured panel (14), said ground plane spring (10) and said shroud (12) being secured thereto with the spring fingers (20) being disposed between said panel (14) and said shroud (12) around the aperture (36) on a side thereof opposite a connector receiving side, said opening being aligned with said aperture (36), and said tines (24) extending into said cavity (28).

3. The assembly of claim 2 in combination with a shielded electrical connector (16) received through the aperture (36) of said panel (14), said opening in said spring (10), and into said cavity

and shape to receive the tines 24 of the ground plane spring 10 therein.

The panel 14 is a portion of a standard metal equipment enclosure (not shown) and is provided with an elongated aperture 36 and flanking mounting apertures 38.

The mating connector 16 is preferably of the type disclosed in US—A—4 337 989. It should be noted that this connector has a terminal carrying module 40 enclosed in a pair of mating metal shells 42, 44 which together, due to their overlap, provide a profiled mating face 46.

A mating portion for the connector 16 is provided by either a pin header 48 and connector 50, as shown in Figures 3 and 4, a right angle header 52 on a circuit board 54, as shown in Figures 5 and 6, or a pin connector 56 as shown in Figures 7 and 8.

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The pin connector 56 of Figure 7 and 8 is here illustrated as a two row connector having two rows of pin terminals 78, 80 each of which has a pin portion 82, 84 of sufficient length to extend through the apertures 30 in the shroud 12 as well as portions 86, 88 to crimping engage respective conductors 90, 92. The connector 56 also includes a housing 94 of rigid insulative material having apertures 96, 98 in which locking lances 100, 102 of the respective terminals 78, 80 protrude.

In each instance the operation of the subject invention is quite similar. The ground plane spring 10 is placed against the panel 14 with the mounting apertures 26, 28 in alignment and the shroud 12 is placed over the ground plane spring 10 with the tines 24 extending into the cavity 28 of the shroud. For the embodiments of Figures 5—8, the pin headers 48, 52 would be joined to the panel 14, spring 10, shroud 12 assembly with the mounting holes 38, 26, 34, 62, 74 aligned and secured together by conventional means (not shown). The mating connector 50 of Figures 3 and 4 could just be applied to this assembly and the shielded connector 16 mated therewith. The pin

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The embodiment of Figures 7 and 8 would need no further assembly beyond panel 14, spring 10 and shroud 12. This assembly could be secured together and connector 56 applied with pin portions 82, 84 of the terminals 78, 80 extending through apertures 30 to be mateable with shielded connector 16.

It should be noted that the metal shells 42, 44 of the shielded connector 16 at least partly overlap to give a profile to the mating face 46. At least one tine 24a of the spring 10 is offset from the other tines 24 to define a profiled and/or polarized opening for receiving the shielded connector 16.

Claims

1. A kit for providing electrical connection between a shielded electrical connector (16) and a metal panel (14) having an aperture (36) for receiving said connector (16) therein, said kit comprising a metal ground plane spring (10) for electrically connecting said connector to said panel (14), said spring having means for mounting on said panel, characterized in that for converting a connector receiving aperture in a panel or the like to a shielded pin receptacle connector, said spring (10) comprises a plurality of outwardly directed peripheral spring fingers (20), a central opening profiled to receive a shielded connector (16), and a plurality of integral tines (24) about the periphery of said opening and extending substantially normal to the plane of the spring (10), said kit further comprising a shroud (12) of insulative material having a central cavity (28) profiled to receive the tines (24) therein, a patterned array of pin receiving apertures (30) in the bottom (32) of said cavity (28) and means for mounting said shroud (12) on said panel (14) with said spring (10) therebetween.

2. The kit of claim 1, assembled to an apertured panel (14), said ground plane spring (10) and said shroud (12) being secured thereto with the spring fingers (20) being disposed between said panel (14) and said shroud (12) around the aperture (36) on a side thereof opposite a connector receiving side, said opening being aligned with said aperture (36), and said tines (24) extending into said cavity (28).

3. The assembly of claim 2 in combination with a shielded electrical connector (16) received through the aperture (36) of said panel (14), said opening in said spring (10), and into said cavity



(28) of said shroud (12), said tines (24) engaging said connector (16).

Patentansprüche

1. Ausrüstung zur Schaffung einer elektrischen Verbindung zwischen einem abgeschirmten Verbinder (16) und einer Metallplatte (14), die ein Loch (36) aufweist, in dem der Verbinder (16) aufnehmbar ist, wobei die Ausrüstung eine Grundebenenfeder (10) aus Metall zum elektrischen Verbinden des Verbinders mit der Platte (14) aufweist und wobei die Feder eine Einrichtung zur Befestigung an der Platte aufweist, dadurch gekennzeichnet,

daß zum Umwandeln einer Verbinderaufnahmeöffnung in einer Platte oder dergleichen in einen abgeschirmten Stiftaufnahmeverbinder die Feder (10) eine Mehrzahl nach außen weisender, an der Peripherie derselben befindlicher Federfinger (20), eine zentrale Öffnung, die ein Profil zur Aufnahme eines abgeschirmten Verbinders (16) besitzt, sowie eine Mehrzahl einstückig mit dieser ausgebildeter Zinken (24) aufweist, die um den Rand der Öffnung herum vorgesehen sind, und sich im wesentlichen senkrecht zu der Ebene der Feder (10) erstrecken, und

daß die Ausrüstung außerdem eine Abdeckung (12) aus isolierendem Material aufweist, die eine zentrale Ausnehmung (28) mit einem derartigen Profil aufweist, daß die Zinken (24) darin aufnehmbar sind, und die eine nach einem Muster vorgesehene Anordnung von Stiftaufnahmeöffnungen (30) in dem Boden (32) der Ausnehmung sowie eine Einrichtung zum Befestigen der Abdeckung (12) an der Platte (14) unter Zwischenschaltung der Feder (10) aufweist.

2. Ausrüstung nach Anspruch 1, die an einer mit einem Loch versehenen Platte (14) montiert ist, wobei die Grundebenenfeder (10) und die Abdeckung (12) derart an der Platte (14) befestigt sind, daß die Federfinger (20) zwischen der Platte (14) und der Abdeckung (12) um das Loch (36) herum auf einer einer Verbinderaufnahmeseite entgegengesetzten Seite des Lochs (36) angeordnet sind, wobei die Öffnung mit dem Loch (36) ausgerichtet ist und sich die Zinken in die Ausnehmung (28) hineinerstrecken.

3. Anordnung nach Anspruch 2 in Kombination mit einem abgeschirmten elektrischen Verbinder (16), der durch das Loch (36) der Platte (14) und

die Öffnung in der Feder (10) hindurch sowie sich in die Ausnehmung (28) der Abdeckung (12) hinein erstreckend aufgenommen ist, wobei die Zinken (24) an dem Verbinder (16) angreifen.

Revendications

1. Kit pour établir une connexion électrique entre un connecteur électrique blindé (16) et un panneau métallique (14) présentant une ouverture (36) destinée à loger ledit connecteur (16), ledit kit comprenant un ressort plat métallique (10) de masse destiné à connecter électriquement ledit connecteur audit panneau (14), ledit ressort comportant des moyens de montage sur ledit panneau, caractérisé en ce que, pour transformer une ouverture de réception d'un connecteur, ménagée dans un panneau ou autre, en un connecteur blindé à douille à broches, ledit ressort (10) comprend plusieurs doigts périphériques (20) à ressort dirigés vers l'extérieur, une ouverture centrale profilée pour recevoir un connecteur blindé (16) et plusieurs dents (24) réalisées d'une seule pièce sur la périphérie de ladite ouverture centrale et s'étendant à peu près perpendiculairement au plan du ressort (10), ledit kit comprenant en outre une jupe (12) en matière isolante présentant une cavité centrale (28) profilée pour loger les dents (24), un ensemble configuré d'ouvertures (30) de réception de broches ménagées dans le fond (32) de ladite cavité (28) et des moyens de montage de ladite jupe (12) sur ledit panneau (14) de manière que ledit ressort (10) soit placé entre eux.

2. Kit selon la revendication 1, assemblé sur un panneau perforé (14), ledit ressort plat (10) de masse et ladite jupe (12) lui étant fixée de manière que les doigts à ressort (20) soient disposés entre lesdits panneaux (14) et ladite jupe (12), autour de l'ouverture (36), sur un côté de celle-ci opposé à un côté de réception d'un connecteur, ladite ouverture centrale étant alignée avec ladite ouverture (36) et lesdites dents (24) pénétrant dans ladite cavité (28).

3. Ensemble selon la revendication 2 en combinaison avec un connecteur électrique blindé (16) reçu à travers l'ouverture (36) dudit panneau (14), ladite ouverture centrale dudit ressort (10) et dans ladite cavité (28) de ladite jupe (12), lesdites dents (24) étant en contact avec ledit connecteur (16).

